Technical Specifications

For

Brothers Ranch Hydrologic Restoration Project

Prepared for
Resource Conservation District of Santa Cruz County

Bid Set

June 2, 2026

FOR USE IN CONNECTION WITH

STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, CURRENT EDITION

The following sets forth a general description of the type of work for each bid item listed in the schedule but is not intended to be all inclusive. All work specifically shown, called for, or indicated in the Contract Documents shall be performed regardless of whether it is specifically listed under an item description.

Technical Specifications
100% Submittal

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SECTION 013300
SUBMITTAL PROCEDURES

1. GENERAL

1.1 SUBMITTAL REQUIREMENTS

A. General:

1. All submittals shall be transmitted via email with attachments as PDFs or JPGs.
2. All submittals shall be identified by Project title and number and shall include Contractor's name, date, and revision date. In addition, shop drawings, product data and samples shall include names of subcontractor and supplier, applicable specification section number and Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, and compliance with Contract Documents.
3. All submittals shall be accompanied by a submittal transmittal form. Equipment numbers shall be listed for items being submitted. A separate form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.
4. A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "###"; where "###" is the sequential number assigned by the Contractor. Resubmittal shall have the following format: "###-Y"; where "###" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals; i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of Submittal 25.

B. Product Data: Submit electronic copies of each item of product data required by the Specifications. Modify product data by deleting information which is not applicable to the Project or by marking each copy to identify pertinent products. Supplement standard information, if necessary, to provide additional information applicable to Project. It is recognized that in some cases manufacturer’s product data will be adequate and further shop drawings as stated in the Specifications may not be required, unless requested by the RCD.

C. Review Procedure: Unless otherwise specified, the RCD will review and return the submittal within 7 working days after receipt of the submittal. The returned submittal will indicate one of the following actions:

1. If the review indicates that the material, equipment, or work method is in general conformance with the design concept and complies with the Drawings and Specifications, submittal copies will be marked "NO EXCEPTION TAKEN". In this event the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.
2. If the review indicates that limited corrections are required, copies will be marked "MAKE CORRECTIONS NOTED”. The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided; otherwise, no further action is required.

3. Submittal Completeness: Submittals which do not have all the information required to be submitted are not acceptable and will be marked “SUBMIT SPECIFIED ITEM”. Except at its own risk, the Contractor shall not undertake Work covered by this submittal until the attached comments have been either confirmed by a separate written communication or the submittal has been revised, resubmitted, and returned marked with "NO EXCEPTIONS TAKEN" or " MAKE CORRECTIONS NOTED."
4. If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "REVISE AND RESUBMIT". Except at its own risk, the Contractor shall not undertake Work covered by this submittal until the attached comments have been either confirmed by a separate written communication or the submittal has been revised, resubmitted, and returned marked with "NO EXCEPTIONS TAKEN" or " MAKE CORRECTIONS NOTED."
5. If the review indicates that the material, equipment, or work method is not in general conformance with the design concept or in compliance with the Drawings and Specifications, copies of the submittal will be marked "REJECTED". Except at their own risk, the Contractor shall not undertake Work covered by such submittals until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

D. Effects of Review of Contractor's Submittals: Review of Drawings, method of work, or information regarding materials or equipment the Contractor proposes to provide, shall not relieve the Contractor of its responsibility for errors therein and shall not be regarded as an assumption of risks or liability by the Owner, and the Contractor shall have no claim under the Contract on account of the failure, or partial failure, of the method of work, material, or equipment so reviewed. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" shall mean that the RCD has no objection to the Contractor, upon the Contractor's own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

1.2 SCHEDULE OF SUBMITTALS

A. Schedule of Submittals: Establish for each item for which shop drawings, product data, or samples are required, the date that submission will be made, and the date approval is required for the installation to be completed in accordance with the Construction Schedule.

B. The Contractor shall immediately advise the RCD of any proposed changes in his submitted schedules. If, in the opinion of the RCD, any submitted schedule is inadequate to ensure completion of Work within the time limit, or is otherwise not in accordance with the Specification, or if the Work is not being adequately or properly prosecuted in any respect, the RCD shall have the right to require the Contractor to submit new schedules providing for proper and timely completion of the Work.

2. PRODUCTS – NOT USED

3. EXECUTION – NOT USED

4. MEASUREMENT AND PAYMENT – NOT USED

END OF SECTION

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SECTION 015000
MOBILIZATION

1. GENERAL

1.1 DESCRIPTION

A. The work covered by this Section shall consist of compensation for bonds, insurance, required permits and fees, shop drawings, project phasing, supervision, traffic control, temporary chain link or other fencing and gates, temporary power and water (unless otherwise noted), temporary construction entrances and tracking control, coordination of concurrent work with other contractors, meetings, pre-construction documentation of project area (photos and video), "as-built" plans or record drawings, cleanup of the work area, movement of personnel, equipment, supplies, and incidentals to and from the project site; for the establishment of all other facilities necessary for work on the project; for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items of work on the project site; and work and improvements called for or implied by the Contract Documents, which are not included in the other bid items but are required to complete the Work.

B. Demobilization shall consist of work and operations necessary to disband all mobilized items and cleanup the site. The removal of all temporary crossings, ramps, access ways, roads, signs, and fencing; dewatering facilities; and temporary facilities or works, and the restoration of surfaces to an equal or better than existing condition shall also be included as part of demobilization.

1.2 RELATED SECTIONS

A. Section 015626, Temporary Fence – Type ESA

B. Section 015713, Temporary Erosion Control and BMPs

C. Section 015713.01, Fiber Roll

D. Section 015713.02, Silt Fence

E. Section 015713, Stormwater Pollution Prevention Plan Implementation

F. Section 024100, Demolition

G. Section 311100, Clearing and Grubbing

H. Section 313519.16, Slope Protection Fabric

I. Section 0312316, Excavation

1.3 SUBMITTALS

A. Hazardous Materials and Spill Prevention Plan, per Section 3.11.

2. PRODUCTS – NOT USED

3. EXECUTION

3.1 CONTRACTOR'S PLANT AND EQUIPMENT:

A. Security. Contractor shall, at all times, be responsible for security of their plant and equipment. Owner shall not be responsible for missing or damaged equipment, tools, or personal belongings.

B. Water & Power. Construction water will be provided onsite at locations to be discussed at the prebid walk. Contractor shall provide the equipment necessary to fill water trucks from the source. Contractor shall provide all electrical power necessary for construction as specified. Generators shall produce less than 65 decibels. Generators used outside working hours shall be enclosed in acoustic panels or equivalent, if requested by the Engineer.

C. Communication Facilities. Contractor shall be responsible for providing sufficient communication facilities to construct the work.

D. Storage Facilities.

1. Provide storage facilities for the protection of materials and supplies from weather and keep the facilities clean and in proper order at all times.
2. Provide a storage area for lubricants, oils, and hazardous materials with sufficient means to contain spills. Facilities, handling, and any required cleanup will comply with all current local, state, and federal standards. Petroleum products stored on the site shall be secured from vandalism.

E. Sanitary Facilities. Maintain adequate toilet facilities at or near the work site.

F. Solid Waste Handling. Provide sufficient solid waste handling facilities to maintain site in a clean, orderly condition.

3.2 MOBILIZATION AND DEMOBILIZATION

A. General. Perform mobilization and demobilization activities in accordance with the Drawings, and as specified.

3.3 PROJECT SIGNS

A. General. Erect project, safety, and hard hat signs at each work site prior to the commencement of work.

3.4 EXCAVATION

A. The Contractor, and any subcontractor, is required to notify U.S.A. forty-eight hours in advance of performing excavation work, by calling the toll-free number (800) 642-2444 or 811.

3.5 PROTECTIVE BARRIERS

A. Protective barriers shall be erected around sensitive areas as designated on the Drawings or as directed by the Engineer. Barriers shall be constructed using bright orange plastic safety fencing (type ESA), per Section 015626, Temporary Fence – Type ESA.

3.6 BULLETIN BOARD

A. Provide a bulletin board at the project site, or in a location approved by the Engineer. The bulletin board shall be always easily accessible and shall contain wage rates, equal opportunity notice, and other items required to be posted.

3.7 STAGING AREAS

A. General. Staging areas at the project site are provided for the Contractor's use. By making this area available to the Contractor, the Engineer, and any other person or agency connected with the properties shall in no way be responsible or liable for any activity of the Contractor, subcontractors, or any individual or organization connected with the project.

B. Alternative Staging Areas. Alternative sites must be acceptable to Owner, and the Contractor must make all arrangements for their use at the Contractor's expense, and in accordance with all local, State and Federal regulations.

C. Additional Storage Areas. Should the Contractor require space in addition to that available on-site, the Contractor shall make arrangements for storage of materials and equipment in locations off the construction site and shall provide the Engineer a copy of the letter of authorization for storage from the Owner.

D. Spoils. Do not place spoils over vegetation or in locations where they could be mobilized and enter a stream or other sensitive habitat, unless specifically shown on the Drawings. Spoils shall be immediately hauled offsite or temporarily stockpiled in an upland location and covered with plastic sheeting whenever rain is predicted.

3.8 PARKING

A. General. Limited parking shall be available alongside the roadway in the vicinity of the work area. Parking shall be restricted to only those spaces identified by the Engineer during the pre-bid walk.

3.9 DUST CONTROL

A. Refer to Section 015713, Temporary Erosion Control and BMPs.

3.10 HAZARDOUS MATERIALS CONTROL AND SPILL PREVENTION PLAN

A. General. Before starting work on the project, the Contractor shall submit for acceptance by the Engineer a Hazardous Materials Controls and Spill Prevention Plan. The Plan shall include:

1. Names and contact information for personnel responsible for spill response or general site cleanup and maintenance.
2. Written description of proposed provisions for preventing hazardous materials from contaminating soil or entering water courses.
3. Written narrative of proposed Spill Prevention and Countermeasure Plan.

B. Facilities. Provide staging and storage areas for equipment, as required to contain contaminants away from water courses. Provide a contained, locked storage facility for fuels, lubricants, construction chemicals and other hazardous materials and supplies stored at site.

C. Concrete. Provide a lined pit for concrete washdown, located where spills or overflow cannot enter nearby watercourses or storm drains. The pit shall be located the greater of 75 feet from any flowing watercourse, or as specified in the permit conditions.

D. Equipment Maintenance. Clean and maintain equipment to prevent any leakage of fuel and lubricants. Establish a designated equipment refueling area. All fueling and maintenance of vehicles and other equipment and staging area shall occur at least 75 feet from any riparian habitat or water body.

E. Spills Countermeasures. Isolate work areas during in-water construction activities by using oil containment booms. Maintain a supply of oil booms, sorbent pads and other supplies to

contain and clean spills. Contain and cleanup any hazardous material spills immediately and notify Engineer.

F. Equipment over Drip Pans. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream and riparian areas shall be positioned over drip-pans.

G. Check Equipment for Leaks. Any equipment or vehicles driven and/or operated adjacent to the stream and riparian corridor shall be checked and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life, wildlife or riparian habitat. Vehicles shall be moved away from the stream prior to refueling and lubrication.

3.11 CONSTRUCTION SITE HOUSEKEEPING

A. Remove rubbish, trash, and debris from site on a regular basis. Transport and dispose of all rubbish and debris in accordance with all local regulations. Maintain staging area in an orderly manner. Regularly clean mud and debris, resulting from work at the site, from roadways. Cleanup and dispose of all concrete debris and washings offsite at an appropriate facility when concrete work is complete.

3.12 PROTECTION OF EXISTING IMPROVEMENTS

A. Existing facilities, utilities, and property shall be protected from damage resulting from the Contractor's operations. Roadways and other improved surfaces shall be protected from damage by vehicles with tracks or lugs. Any damage resulting from the Contractor's operations shall be repaired by the Contractor to the condition which existed prior to the damage, and to the satisfaction of the Engineer, at no additional cost to the Owner.

B. Contractor shall film the site and submit to the Engineer photographs and a written description of all pre-existing damage to pavements, trees, or other improvements that may be affected by the work. Unless this information is provided, prior to mobilization, the Contractor may be held responsible for damages discovered during work or project closeout/punch list walk that that appear to be caused by Contractor's activities.

3.13 RESTORATION OF STRUCTURES AND SURFACES

A. Structures, Equipment, and Pipework. The Contractor shall remove such existing structures, equipment, and pipework as may be necessary for the performance of the work, and shall rebuild, or replace, the items thus removed in as good a condition as found. Contractor shall repair any existing structures that were damaged as a result of the Work.

B. Roads and Streets. Roadways used by the Contractor for hauling materials, equipment, supplies, etc., shall be cleaned and repaired if the condition of the roadway is damaged, or otherwise affected, due to the Contractor's operations.

C. Curbs, Gutters, Driveways, and Sidewalks. All curbs, gutters, driveways, sidewalks, and similar structures that are broken, or damaged, by the installation of the work shall be reconstructed by the Contractor. Reconstruction shall be of the same kind of materials with the same finish, and in not less than the same dimensions as to original work. Repairs shall be made by removing and replacing the entire portions between joints or scores, and not merely refinishing any damaged part. All restoration work shall match the appearance of the existing improvements, as nearly as possible.

D. Cultivated Areas and Other Surface Improvements. All cultivated and natural areas, either agricultural or lawns, and other surface improvements which are damaged by actions of the

Contractor, shall be restored, including roadside drainage ditches, as nearly as possible, to their original conditions.

3.14 STORAGE OF MATERIALS AND EQUIPMENT

A. Materials and equipment shall be stored so as to ensure the preservation of their quality and fitness for the work. Stores of equipment and materials shall be located so as to facilitate inspection. The Contractor shall be responsible for all damages that occur in connection with the care and protection of all materials and equipment, supplied by the Contractor, until completion and final acceptance of the Work by the Owner.

3.15 TRAFFIC CONTROL

A. General. The Contractor shall be responsible for public safety and traffic control at all times.

B. The Contractor shall furnish, install, and maintain temporary construction warning signs, flaggers, barricades, and other devices necessary to safeguard the general public and the work, and to provide for the safe and proper routing of all vehicular and pedestrian traffic within and through the limits of the project during the performance of the work.

C. Maintain Access. Contractor shall generally maintain access to existing roads and driveways at all times. Temporary road closures for materials or equipment delivery shall be limited to 20 minutes.

D. Work includes furnishing, placing, maintaining, and removing signs and temporary supports or barricades for the signs; posting parking restrictions; pilot car including driver, radios, and any other equipment and labor required to operate a pilot car; furnishing and operating the flashing arrow sign trucks, including drivers and any other equipment or labor required to operate the flashing arrow sign trucks; barricades, flaggers, temporary pavement, trench plates, and temporary facilities required for the safe handling of pedestrian and vehicular traffic for 24 hours per calendar day in accordance with the "California Manual of Uniform Traffic Control Devices, by the State of California, Department of Transportation (Caltrans)", and the approved project traffic control plans for the duration of the Work, complete. If, due to a change in the Contractor's work schedule a change in sign posting is required, all labor, equipment, and materials required for second and subsequent postings shall be furnished at the Contractor's sole expense.

E. All work shall comply with NRCS Specification "CS 009 – Traffic Control" and the current edition of the Caltrans Manual on Uniform Traffic Control Devices, available on the internet at:

https://dot.ca.gov/programs/safety-programs/camutcd

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Work under this section will be measured for payment on a lump sum basis.

4.2 PAYMENT

A. The lump sum contract price for Mobilization & Demobilization will include full compensation for the furnishing of all labor, materials, tools, equipment, administrative costs, and incidentals for mobilization; demobilization; and temporary facilities and controls.

B. Payment will be made under:

Pay Item	Pay Unit
Mobilization & Demobilization	Lump Sum

END OF SECTION

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SECTION 015626
TEMPORARY FENCE – TYPE ESA

1. GENERAL

1.1 DESCRIPTION

A. Work under this section includes furnishing all labor, materials, equipment, and incidentals to install, maintain, and remove Temporary Fence – Type ESA , as shown on the Drawings, as specified, or as otherwise directed by the Engineer.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 015713, Temporary Erosion Control and BMP's

C. Section 015723.1, SWPPP Implementation

D. Section 311100, Clearing and Grubbing

E. Section 312316, Excavation

1.3 REFERENCES

A. State of California, Department of Transportation (CALTRANS) State Standard Specifications, current edition

1.4 SUBMITTALS

A. Submit to the Engineer, for review, the following:

1. Manufacturer's data for proposed fencing fabric.
2. Manufacturer's data or descriptive literature for proposed fence posts.

2. PRODUCTS

2.1 MATERIALS

A. High Visibility Fabric. High visibility fabric shall be machine produced, orange colored mesh manufactured from polypropylene or polyethylene. High visibility fabric may be made of recycled materials. Materials shall not contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. High visibility fabric shall be fully stabilized ultraviolet resistant and a minimum of four feet in width with a maximum mesh opening of 2" x 2". High visibility fabric shall be furnished in one continuous width and shall not be spliced to conform to the specified width dimension.

B. Posts. Posts for temporary fence (Type ESA) shall be of one of the following:

1. Wood posts shall be fir or pine, shall have a minimum cross section of 2" x 2", and a minimum length of 5.25 feet. The end of the post to be embedded in the soil shall be pointed. Wood posts shall not be treated with wood preservative.
2. Steel posts shall have a "U," "T," "L," or other cross sectional shape that resists failure from lateral loads. Steel posts shall have a minimum weight of 0.75 pounds per linear foot and a minimum length of 5.25 feet. One end of the steel post shall be pointed and the other end shall have a high visibility colored top.

C. Fasteners. Fasteners for attaching high visibility fabric to the posts shall be as follows:

1. The high visibility fabric shall be attached to wooden posts with commercial quality nails or staples, or as recommended by the manufacturer or supplier.
2. Tie wire or locking plastic fasteners shall be used for attaching the high visibility fabric to steel posts. Maximum spacing of tie wire or fasteners shall be 24 inches along the length of the steel post.

D. Used materials may be installed provided the used materials conform to these Specifications.

3. EXECUTION

3.1 INSTALLATION

A. All fence construction activities shall be conducted from the work side of the ESA as shown on the Drawings or as flagged in the field by the Engineer.

B. Posts shall be embedded in the soil a minimum of 16 inches. Post spacing shall be eight feet maximum from center to center and shall at all times support the fence in a vertical position.

C. Temporary fence (Type ESA) shall be constructed prior to clearing and grubbing work, shall enclose the foliage canopy (drip line) of protected plants, and shall not encroach upon visible roots of the plants.

D. Temporary fence (Type ESA) shall be located so that it is clearly visible, as determined by the Engineer.

3.2 MAINTENANCE

A. Temporary fence (Type ESA) that is damaged during the progress of the work shall be repaired or replaced by the Contractor the same day the damage occurs.

3.3 REMOVAL

A. When Type ESA fence is no longer required, as determined by the Engineer, it shall be removed and disposed of in conformance with the provisions in Section 14-10, “Solid Waste Disposal and Recycling,” of the Standard Specifications, except when reused as provided in this section.

B. Holes caused by the removal of Temporary Fence shall be backfilled with materials matching adjacent surfaces and conforming to adjacent grades, in accordance with Section15-1.02 of the Standard Specifications.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Temporary Fence – Type ESA will be measured by the linear foot of Temporary Fence – Type ESA installed at the locations indicated on the Drawings, as specified, or as directed by the Engineer.

4.2 PAYMENT

A. Temporary Fence – Type ESA will be paid for at the contract price per linear foot, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to install, maintain throughout the construction, and to remove Temporary Fence – Type ESA after site stabilization.

B. Payment shall be made under:

Pay Item	Pay Unit
Temporary Fence – Type ESA	Linear Foot

END OF SECTION

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SECTION 015713
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SECTION 015713
TEMPORARY EROSION CONTROL AND BMPS

1. GENERAL

1.1 DESCRIPTION

A. This work shall consist of all temporary erosion control and water or air quality control measures, devices, and BMPs shown on the Drawings, specified in the Contract Documents, Project Permit(s), Standard Specifications, these Technical Specifications, or required to control erosion and protect air and water quality during the life of the contract, and that are not separately measured for payment within other sections.

B. These measures shall typically include, but not be limited to:

1. Berms, dikes, dams, sediment basins,
2. Gravel or rock surfacing,
3. Mulches, grasses,
4. Temporary slope drains
5. Filtration devices,
6. Dust control,
7. Silt fence and/or fiber roll (where not measured independently for payment)
8. Tree protection,
9. Slope protection fabric not shown on the Drawings,
10. Plastic covers or tarps, or other devices or methods required to control water or air pollution or otherwise reduce impacts to air or water quality or natural resources.

C. Temporary erosion control measures and other BMPs will be required within the work area and at temporary staging, storage, and access areas utilized during project construction. Said work is intended to provide prevention, control, and abatement of water and air pollution and to minimize damage to the work, adjacent properties, vegetation proposed to remain, receiving streams or other bodies of water.

D. The erosion control elements shown on the Drawings serve as a minimum for the requirements of erosion control during construction. Contractor has the ultimate responsibility for providing adequate erosion control and water quality throughout the duration of the project. Therefore, if the provided plan is not working sufficiently to protect project areas, then the Contractor shall provide additional as required to obtain the required protection. Contractor shall include in the bid price for Temporary Erosion Control and BMPs a minimum of all items shown on the Drawings or specified and any additional items that may be needed to control erosion and water or air pollution.

E. Installation and maintenance of temporary erosion control measures, devices and BMPs shall conform to the requirements as shown on the Drawings stated within these Technical Specifications, and as required by all permit conditions. In the event of conflict between these requirements and erosion and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

F. Where the project includes a Stormwater Pollution Prevention Plan, the work included within this Section includes implementation maintenance, and removal of BMPs required by the SWPPP, in addition to those shown on the Drawings or otherwise specified, unless specifically measured for payment under other Sections.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 015626, Temporary Fence – Type ESA

C. Section 015723.1, SWPPP Implementation

D. Section 015713.01, Fiber Roll

E. Section 015713.02, Silt Fence

F. Section 311100, Clearing and Grubbing

G. Section 312319, Dewatering

1.3 SUBMITTALS

A. Submit the following for favorable review by the Engineer:

1. Product data for all proposed imported BMP materials, including rock, geotextile fabric, stockpile covers, mulch, tackifier, straw, seed, fencing, rope, or other items, whether shown on the Drawings, specified herein, or proposed by the Contractor.
2. Schedule and sequencing plan for Temporary Erosion Control.

2. PRODUCTS

A. Refer to material specifications on the Drawings.

B. Seed: All seed shall conform to Section 329200, and must be approved by the Engineer prior to installation.

C. Fertilizer and soil conditioners, if used, shall be approved by ENGINEER and in accordance with local regulations prior to installation.

3. EXECUTION

3.1 GENERAL

A. Provide temporary soil stabilization for water pollution control in all disturbed work areas that are considered inactive (i.e., excess of 14 days) or before forecast storm events. Should any temporary erosion control of this nature be required elsewhere as directed by the Engineer and/or regulatory agencies, install them within 48 hours of notification. Where applicable and upon acceptance of the Engineer, furnish and apply/install temporary mulch, temporary hydraulic mulch, temporary erosion control blankets, or temporary covers in conformance with the Standard Specifications and these Technical Specifications. Materials and construction methods shall comply with the Standard Specifications and these Technical Specifications.

B. Maintain a temporary cover on all stockpiles at all times and install and maintain appropriate BMPs (fiber rolls or wattles, filter fence, check dams, etc.) around the perimeter at the base of stockpile to control the potential runoff of any loose sediments and pollutants. Whenever a temporary cover is removed to perform other work, replace, and secure the temporary cover within one (1) hour of stopping work.

3.2 MAINTENANCE

A. Contractor shall be responsible for maintaining temporary erosion control measures as specified in the Drawings and Contract Documents until such time as Work has been

accepted by Owner. Maintain all temporary erosion control measures, devices, and/or BMPs placed in the work for the duration of the project.

B. Maintenance shall follow all Manufacturer's recommendations, and includes but is not limited to the following actions during project implementation phase:

1. Inspect temporary erosion control devices and/or BMPs routinely, immediately after each rainfall event, and at least daily during prolonged rainfall events.
2. Immediately repair, upon discovery, damage to any temporary erosion control devices and/or BMPs at the Contractor's expense.
3. Inspect construction limit and tree protection fencing daily and repair, secure, and/or replace as necessary to maintain and preserve its intended purpose.
4. Routinely inspect all signage as required for the project and repair or replace upon discovery of damage, vandalism, and/or missing parts.
5. If BMP materials decompose or become ineffective prior to the end of the expected usable life and while still necessary, replace promptly.
6. Replace single or group of gravel bag(s) when the bag material is ruptured or when the yarn has failed, allowing the bag contents to spill out.
7. Routinely inspect stakes and/or rope used to secure fiber rolls in place and repair as necessary if found to be loose or ineffective.
8. Remove sediment deposits and other debris when they reach approximately one-half the height of any sediment barrier (or as recommended by the Manufacturer) and dispose of sediments in a manner acceptable to the Engineer, and in conformance with project permits.
9. Remove and dispose of all sediment deposits remaining in place after the temporary erosion control measure and/or BMPs is no longer required in a manner acceptable to the Engineer, and in conformance with the project permits.

3.3 PROTECTION OF ADJACENT PROPERTIES

A. Properties adjacent to the site of a land disturbance shall be protected from sediment deposition.

B. In addition to the erosion control measures required on the DRAWINGS, perimeter controls may be required if damage to adjacent properties is ongoing or likely (in the opinion of the Engineer), and may include, but is not limited to:

1. Vegetated buffer strip around the lower perimeter of the land disturbance. a. Vegetated buffer strips may be used only where runoff in sheet flow is expected and should be at least twenty (20) feet in width.
2. Sediment barriers such as straw bales, erosion logs, and silt fences.
3. Sediment basins and porous landscape detention ponds.
4. Exclusion or tree protection fencing
5. Combination of above measures.

3.4 CONSTRUCTION ACCESS ROUTES

A. Where sediment is transported onto a public road surface, the roads shall be cleaned thoroughly at the end of each day.

B. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment-controlled disposal area.

C. Street washing shall be allowed only after sediment is removed in this manner.

3.5 PROTECTIVE BARRIERS

A. Protective barriers shall be erected around sensitive areas as designated on the Drawings or as directed by the Engineer. Barriers shall be constructed using bright orange plastic safety fencing (type ESA), per Section 015626, Temporary Fence – Type ESA.

B. Tree protection. Tree protection shall consist of the installation of standard timber and wire tree protection detail at locations shown on the Drawings, as specified, or as directed by the Engineer.

3.6 DUST CONTROL

A. General. The Contractor shall be responsible for the control of dust within the limits of the project at all times. The Contractor shall take whatever steps are necessary to eliminate the nuisance of blowing dust. Responsibility for any damage to property, crops, or orchards from dust caused by the Contractor's operations shall be borne by the Contractor.

B. Dust Control. Periodically, water or otherwise treat access roads, or graded areas as required to suppress dust. Cover or control water content of earthen materials being hauled, as required to control dust emissions. Cover or otherwise stabilize soil stockpiles to prevent erosion by wind.

C. Cleanup. The Contractor shall keep all streets, roadways, and easements, as well as all ground adjacent to the project site, clean and free of dust, mud and debris resulting from the Contractor's operations. Daily cleanup throughout the project shall be required as the Contractor progresses with the work. Spillage of earth, gravel, concrete, asphalt, or other materials resulting from hauling operations along or across any public street or private driveway or access road shall be removed immediately by the Contractor.

3.7 HAZARDOUS MATERIALS CONTROL AND SPILL PREVENTION PLAN

A. General. Refer to Section 015000, Mobilization

3.8 CONSTRUCTION SITE HOUSEKEEPING

A. Remove rubbish, trash, and debris from site on a regular basis. Transport and dispose of all rubbish and debris in accordance with all local regulations. Maintain staging area in an orderly manner. Regularly clean mud and debris, resulting from work at the site, from roadways; per SWRCB General Permit governing pollution from construction activities, sweeping and washing construction site sediment tracked onto roadways into roadside ditches is a violation. Cleanup and dispose of all concrete debris and washings when concrete work is complete.

B. Vehicle cleaning is not allowed on site. Clean all vehicles prior to arrival.

3.9 DISPOSITION OF TEMPORARY MEASURES

A. All temporary erosion and sediment control measures shall be disposed of within thirty (30) days after final site stabilization is achieved or after the temporary measures are no longer needed as determined by OWNER.

B. Trapped sediment and other disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Temporary Erosion Control and BMPs will be measured on lump sum basis.

B. Tree Protection will be measured on a unit basis for each individual tree protected as shown on the Drawings, as specified, and as directed by the Engineer.

4.2 PAYMENT

A. The lump sum contract price for Temporary Erosion Control and BMPs will include full compensation for the furnishing of all labor, materials, tools, equipment, administrative costs, and incidentals for temporary erosion control measures, devices, and BMPs, including but not limited to stockpile management, dust control, sweeping, installation maintenance and - where appropriate - removal of all such water pollution control measures that may be shown on the Project Drawings, and as specified in the Contract Documents, Project Permit(s), Standard Specifications, these Technical Specifications, and as directed by the Engineer, and no additional compensation shall be allowed therefore.

B. Tree protection will be paid for at the contract unit price for each tree protected including all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing each tree protection, as shown on the Drawings, as specified herein, or as directed by the Engineer.

C. Payment will be made under:

Pay Item	Pay Unit
Temporary Erosion Control and BMPs	Lump Sum (LS)
Tree Protection	Each (EA)

END OF SECTION

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SECTION 015713.01
FIBER ROLL

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SECTION 015713.01
FIBER ROLL

1. GENERAL

1.1 DESCRIPTION

A. Work under this Section includes furnishing all labor, materials, equipment, and incidentals to install, maintain, remove and dispose of Fiber Roll, as shown on the Drawings, as specified in the Storm Water Pollution Prevention Plan, as specified herein, or as otherwise directed by the Engineer.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 015713, Temporary Erosion Control and BMP's

C. Section 015723, Stormwater Pollution Prevention Plan Implementation

D. Section 312316, Excavation

E. Section 312319, Dewatering

F. Section 313519.16, Slope Protection Fabric

G. Section 329200, Seeding

1.3 SUBMITTALS

A. Submit to the Engineer, for review, the following manufacturer's data and Certification's:

1. A certificate stating the name of the Fiber Roll manufacturer, product name, style compositions of filaments or yarns and other pertinent information to fully describe the geotextile, along with the manufacturer's certification of compliance with the material specifications contained herein.

2. PRODUCTS

2.1 MATERIALS

A. Coir Roll. Coir Roll shall be:

A pre-manufactured roll made from coconut fiber encapsulated within a biodegradable jute, sisal, or coir fiber netting. The use of plastic/photodegradable netting shall not be allowed. The netting shall have a minimum durability of 2 years after installation. The netting shall be secured tightly at each end of the roll.

1. Rolls shall be 12-inch diameter and have a minimum weight of approximately 5.5 lbs/ft.

B. Stakes. Wood stakes shall be a minimum of 1" x 2" x 24" with notches for twine. Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. They shall be straight and free of loose or unsound knots and other defects which would render them unfit for the purpose intended. Metal stakes shall not be used.

C. Rope. Rope shall be biodegradable, such as sisal or manila, with a minimum diameter of 1/4 inch.

3. EXECUTION

3.1 INSTALLATION

A. Fiber Roll shall be installed as follows, at locations shown on the Drawing or otherwise directed by the Engineer:

1. Rope and notched stakes shall be used to restrain the Fiber Rolls against the ground. Stakes shall be driven into the slope until the notch is even with the top of the Fiber Roll. Rope shall be double-knotted at each stake and laced between stakes. After installation of the rope, stakes shall be driven into the slope such that the rope will hold the Fiber Roll tightly to the ground. Furrows will not be required.
2. The bedding area for the Fiber Roll shall be cleared of obstructions including rocks, clods, and debris greater than one inch in diameter before installation.
3. Fiber Roll shall be installed approximately parallel to the slope contour and the terminus of rows shall be angled up-slope at 45 degrees for a distance of three feet. Where fiber rolls meet, provide an overlap of two feet, with adjacent rolls tightly abutting each other.
4. Fiber Roll shall be installed prior to seeding where used without slope protection fabric.
5. Fiber roll shall be installed over fabric (after seeding) where slope protection fabric is specified.

3.2 MAINTENANCE

A. The Contractor shall inspect all Fiber Roll immediately after each rainfall, and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor.

B. The Contractor shall also make a daily review of the location of Fiber Roll in areas where construction activities have altered the natural contour and drainage runoff to ensure that the Fiber Rolls are properly located for effectiveness. Where deficiencies exist as determined by the Engineer, additional Fiber Rolls shall be installed as directed by the Engineer.

C. Damaged or otherwise ineffective Fiber Roll shall be repaired or replaced promptly. Fiber Roll shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. Split, torn, or unraveling rolls shall be repaired or replaced. Broken or split stakes shall be replaced. Sagging or slumping Fiber Roll shall be repaired with additional stakes or replaced. Locations where rills and other evidence of concentrated runoff have occurred beneath the rolls shall be corrected. Fiber Roll shall be repaired or replaced within 24 hours of identifying the deficiency.

3.3 REMOVAL

A. Fiber Rolls shown on the Drawings shall remain in place after project completion, unless otherwise specified, and be allowed to naturally degrade.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Fiber Roll will be measured by the linear foot of Fiber Roll installed at the locations indicated on the Drawings, as specified, or as directed by the Engineer.

B. Fiber Roll that the Contractor installs for the implementation of the SWPPP, in addition to that shown on the Drawings, shall not be separately measured for payment.

4.2 PAYMENT

A. Fiber Roll will be paid for at the contract price per linear foot of Fiber Roll furnished and installed as specified, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to install, maintain throughout the construction, and, where specified, to remove Fiber Roll after site stabilization.

B. Fiber Roll that the Contractor installs for the implementation of the SWPPP, in addition to that shown on the Drawings, shall be paid for under Temporary Erosion Control and BMP's, Section 015713.

C. Fiber Rolls required or used on a short term basis that are not permanently staked in place or are anticipated to be moved on a daily or routine basis (such as areas immediately adjacent to trench excavations, temporary stockpiles, active areas for soil processing/screening operations, spill containment devices, etc.) shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed.

D. Payment shall be made under:

Pay Item	Pay Unit
Fiber Roll	Linear Foot

END OF SECTION

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SECTION 015713.02
SILT FENCE

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SECTION 015713.02
SILT FENCE

1. GENERAL

1.1 DESCRIPTION

A. Work under this Section includes furnishing all labor, materials, equipment, and incidentals to install, maintain, and remove silt fence, as shown on the Drawings, as specified in the Storm Water Pollution Prevention Plan (if applicable), as specified herein, or as directed by the Engineer.

B. This Specification is applicable to the use of a geotextile as a vertical, permeable interceptor designed to remove suspended soil from overland water flow. The function of a temporary silt fence is to filter and allow settlement of soil particles from sediment-laden water. The purpose is to prevent the eroded soil from being transported off the construction site by water runoff.

1.2 RELATED SECTIONS

1. Section 015000, Mobilization
2. Section 015713, Temporary Erosion Control and BMP's
3. Section 015723, Stormwater Pollution Prevention Plan Implementation
4. Section 312316, Excavation
5. Section 312319, Dewatering

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
2. D 4491 - Test Methods for Water Permeability of Geotextiles by Permittivity.
3. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
4. D 4751 - Test Method for Determining Apparent Opening Size of a Geotextile.
5. D 4873 - Guide for Identification, Storage, and Handling of Geotextiles.

1.4 SUBMITTALS

A. Submit to the Engineer for review, the following:

B. Manufacturer's Data and Certification:

1. The Contractor shall provide the Engineer a certificate stating the name of the silt fence manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the silt fence fabric.
2. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the Specification. Documentation describing the quality control program shall be made available upon request.
3. Manufacturing Quality Control (MQC) test results shall be provided upon request.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Silt fence fabric labeling, shipment and storage shall follow ASTM D 4873.

B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

D. Each silt fence roll shall be wrapped with a material that will protect the silt fence from damage due to shipment, water, sunlight, and contaminants.

E. The protective wrapping shall be maintained during periods of shipment and storage. If the wrapping is damaged prior to installation, the outer wrap of silt fence material must be discarded before installation.

F. During storage, silt fence rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F)m and any other environmental condition that might damage the silt fence .

2. PRODUCTS

2.1 MATERIALS

A. At the Contractor's option, temporary silt fence shall be prefabricated or constructed with silt fence fabric, posts, and fasteners.

B. Silt Fence Fabric. Silt fence fabric shall be geotextile manufactured from woven polypropylene or polymer material. Silt fence fabric may be virgin, recycled, or a combination of virgin and recycled polymer materials. No virgin or recycled polymer materials shall contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. Silt fence fabric shall conform to the following requirements:

Specification	Requirements
Width, inches, min.	36
Grab breaking load, 1-inch grip in each direction,(min, lb) ASTM Designation: D 4632	120, min.
Apparent Elongation, percent minimum in each direction ASTM Designation: D 4632*	15, min.
Permittivity, 1/sec., min. ASTM Designation: D 4491	0.05, min.
UV resistance, retained grab breaking load, 500 hours, (min., percent) ASTM Designation: D 4355 (xenon-arc lamp and water spray weathering method)	70, min.

* or appropriate test method for specific polymer

C. Posts. Posts for temporary silt fence shall be one of the following:

1. Untreated fir or pine, a minimum of 2" x 2" in size, and four feet in length. One end of the post shall be pointed.
2. Steel and have a "U," "T," "L," or other cross-sectional shape that can resist failure from lateral loads. The steel posts shall have a minimum weight of 0.8-pound per foot and a minimum length of 4 feet. One end of the steel posts shall be pointed, and the other end

shall be capped with an orange or red plastic safety cap which fits snugly to the steel post. The Contractor shall submit to the Engineer for approval a sample of the capped steel post prior to installation.

D. Fasteners. Fasteners for attaching silt fence fabric to posts shall be as follows:

1. When prefabricated silt fence is used, posts shall be inserted into sewn pockets.
2. Silt fence fabric shall be attached to wooden posts with nails or staples as shown on the Drawings or as recommended by the manufacturer or supplier. Tie wire or locking plastic fasteners shall be used to fasten the silt fence fabric to steel posts. Maximum spacing of fasteners shall be eight inches along the length of the steel post.

3. EXECUTION

3.1 FIELD ASSEMBLY:

A. The silt fence fabric shall be installed on the side of the posts facing the slope.

B. The silt fence fabric at the bottom of the fence shall be buried in a "J" configuration to a minimum depth of 150 mm (six inches) in a trench so that no flow can pass under the silt fence. Mechanically pushing 12 inches of the silt fence fabric vertically through the soil may be allowed if the Contractor can demonstrate to the Engineer that the silt fence fabric will not be damaged and will not slip out of the soil resulting in sediment passing under the silt fence fabric.

C. The trench shall be backfilled and the soil compacted over the upslope side of the silt fence fabric.

D. When joints are necessary, filter fence fabric shall be spliced together only at a support post, with a minimum twelve (12) inches overlap and securely sealed or stitched.

E. The Contractor must demonstrate to the satisfaction of the Engineer that the silt fence fabric can withstand a sediment load of 1/3 the height of the fence.

F. The posts shall be placed at the spacing as shown on the Drawings. Post should be driven or placed a minimum of 450 mm (18 inches) into the ground. Depth shall be increased to 600 mm (24 inches) if fence is placed on a slope of 3:1 or greater. Where 450 mm (18 inches) depth is impossible to attain, the posts should be adequately secured to prevent overturning of the fence due to sediment loading.

G. Support fence, if required, shall be fastened securely to the upslope side of the fence post. The support fence shall extend from the ground surface to the top of the silt fence fabric.

H. When self-supported fence is used, the silt fence fabric shall be securely fastened to fence posts.

I. Temporary silt fence shall be installed parallel with the slope contour in reaches not to exceed 500 feet. A reach is considered a continuous run of temporary silt fence from end to end or from an end to an opening, including joined panels. Each reach shall be constructed so that the elevation at the base of the fence does not deviate from the contour more than 1/3 of the fence height. The fence shall be placed such that water cannot runoff around the end of the fence; this may be accomplished by constructing end-returns that angle up the slope.

J. The silt fence should be limited to handle an area equivalent to 90 square meters (100 sy) per three meters (ten feet) of fence. Caution should be used where the site slope is greater than 1:1 and water flow rates exceed three liters (0.8 gallons) per second per three meters (ten feet) of fence.

3.2 INSPECTION

A. The Contractor shall inspect all temporary silt fences immediately after each rainfall, and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor.

B. The Contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist as determined by the Engineer, additional silt fence shall be installed as directed by the Engineer. Damaged or otherwise ineffective silt fences shall be repaired or replaced promptly.

C. Should the filter fence fabric decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, the fabric shall be replaced promptly.

D. Sediment deposits shall either be removed when the deposit reaches one third the height of the fence, or a second silt fence shall be installed as directed by the Engineer.

3.3 REMOVAL

A. The silt fence shall remain in place for the complete duration of the project as necessary to conform to the Project Permit(s), or until the Engineer directs it be removed. Upon removal, the Contractor shall remove and dispose of any excess sediment accumulations, use hand tools to grade disturbed areas to drain in the pre-disturbance direction, and revegetate all bare areas in accordance with contract requirements. Trimming the silt fence fabric and leaving it in place will not be allowed.

B. Removed silt fence may be used at other locations provided the silt fence fabric and other material requirements continue to be met to the satisfaction of the Engineer.

C. Ground disturbance caused by the installation and removal of the temporary silt fence shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, “Preservation of Property,” of the Standard Specifications.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Temporary Silt Fence will be measured by the linear foot of silt fence installed at the locations indicated on the Drawings, or as directed by the Engineer.

B. Temporary Silt Fence installed by the Contractor in fulfillment of the SWPPP, in addition to that specifically shown on the Drawings shall not be measured for payment under this Section.

4.2 PAYMENT

A. Silt Fence will be paid for at the contract price per linear foot, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to install, maintain throughout the construction, and to remove silt fence at the completion of construction.

B. Silt Fence that the Contractor installs for the implementation of the SWPPP, in addition to that shown on the Drawings, shall be considered incidental to the contract lump sum price paid under Section 15713, Temporary Erosion Control and BMPs.

C. Silt Fence that the Contractor installs in addition to that shown on the Drawings - as may be required based on weather conditions, permit requirements, or Contractors means, methods,

and schedule, shall be considered incidental to the contract lump sum price paid under Section 15713, Temporary Erosion Control and BMPs.

D. Payment shall be made under:

Pay Item	Pay Unit
Silt Fence	Linear Foot

END OF SECTION

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SECTION 015723
STORM WATER POLLUTION PREVENTION PLAN IMPLEMENTATION

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SECTION 015723
STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IMPLEMENTATION

1. GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of implementation of an approved Storm Water Pollution Prevention Plan (SWPPP), as specified in the SWPPP, as specified in this Section, and in compliance with the requirements of the State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities, Water Quality Order No. 2022-0057-DWQ, General Permit No. CAS000002, adopted September 8, 2022, (hereafter Construction General Permit (CGP)).

B. The project has been identified as **Risk Level 2**. Attention is directed to Attachment D of the CGP, which identifies monitoring and reporting requirements for Traditional Construction Projects. Risk Level 2 projects are required to meet the reporting and monitoring requirements of Risk Level 1 projects in addition to those requirements for Risk Level 2 Projects.

C. The Contractor shall be solely responsible for penalties assessed on the Contractor or the Owner as a result of the Contractor's failure to comply with the provisions of the Construction General Permit or with the applicable provisions of the Federal, State, and local regulations and requirements. Penalties as used in this section shall include fines, penalties, and damages, whether proposed, assessed, or levied against the Owner or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

D. The Contractor shall perform the role of Qualified SWPPP Practitioner (QSP), as outlined in the SWPPP.

E. The Owner or their designated representative will perform the role of Qualified SWPPP Developer (QSD). Where referenced in this Section, the words “Engineer” and “QSD” are synonymous.

F. Nothing in the terms of the Contract nor in these Technical Specifications shall relieve the Contractor of the responsibility for compliance with Sections 5650 and 12015 of the Fish and Game Code, or other applicable statutes relating to prevention or abatement of water pollution.

G. All areas of exposed earth created by the Contractor, beyond what is shown on the Drawings, and referred to in the Technical Specifications or the SWPPP, shall also be subject to the provisions of this Section, except that the Contractor shall be fully responsible for all additional costs and liabilities associated with SWPPP Implementation in these areas.

H. The Contractor shall keep a copy of the SWPPP at the job site. A current copy of the site-specific SWPPP and any site inspection reports required by the Construction General Permit may be kept in electronic format at the site so long as the information requested by a federal,

state, or municipal inspector can be made available during an inspection. All maps are legible and available in hard copy at the site. Requests from the public shall be directed to the Engineer.

I. The SWPPP shall be periodically amended by the QSD, as necessary, to reflect current site conditions. The Owner will not be liable to the Contractor for delays to the Work due to the Contractor's failure to implement the amended SWPPP.

J. The erosion control measures specified on the Drawings are a minimum, and do not address interim field conditions that may exist during construction. The Contractor is responsible to perform all additional work, beyond what is shown on the Drawings, or the SWPPP, as necessary to meet changing or unforeseen sight conditions and to comply with the CGP, at no additional cost to the Owner.

1.2 RELATED SECTIONS

1. Section 015000, Mobilization
2. Section 015626, Temporary Fence – Type ESA
3. Section 015713.01, Fiber Roll
4. Section 0157130.2, Silt Fence
5. Section 312319, Dewatering
6. Section 313519.16, Slope Protection Fabric
7. Section 329200, Seeding
8. Section 329300, Planting

1.3 REFERENCES

A. State Water Resources Control Board (SWRCB) Order No. 2022-0057-DWQ, NPDES General Permit No. CAS000002, Storm Water Discharges Associated With Construction and Land Disturbance Activities, September 8, 2022, hereafter Construction General Permit (CGP).

B. The California Stormwater Quality Association (CASQA) "Stormwater Best Management Practice Handbook: Construction" including Appendix C, "Traditional Storm Water Pollution Prevention Plan Template" and addenda thereto issued up to, and including, the date of advertisement of the Project, hereafter referred to respectively as the "Manuals." Copies of the Manuals and the National Pollutant Discharge Elimination System (NPDES) permits may be obtained by accessing the CASQA's Internet Web Site portal at: http://www.cabmphandbooks.com/

C. Approved Project Storm Water Pollution Prevention Plan (SWPPP).

1.4 SUBMITTALS

A. The Engineer's review and approval of Contractor's submittals shall not waive any contract requirements and shall not relieve the Contractor from complying with the CGP, the SWPPP, or Federal, State and local laws, regulations, and requirements.

B. Submit to the Owner's Representative, for review, Manufacturer's product information for materials proposed for use on site for implementation of the SWPPP.

C. The Owner will submit permit registration documents (PRDs) necessary for coverage under the Construction General Permit (CGP), including but not limited to: the Notice of Intent (NOI), Risk Level Determination, Certification, Site Maps and Drawings, the SWPPP and other documents required by the CGP.

D. Prior to start of work, the Contractor shall submit for approval by the Owner's Representative, the names and qualifications of qualified staff designated by the Contractor to implement the SWPPP, defined by the CGP as follows:

1. Qualified SWPPP Practitioner (QSP): The Contractor's QSP shall have obtained the required registrations/certifications listed in Section V.F. of the CGP and successfully completed the SWRCB sponsored or approved QSP training course and QSP exam.
2. Qualified SWPPP Practitioner (QSP) Delegate: The QSP Delegate shall have received training based on the guidelines set by the Construction General Permit Training Team for the Delegate's respective tasks.
3. If the QSP or QSP Delegate is no longer employed by the Contractor or is no longer associated with the Work, the Contractor shall notify the Owner's Representative within 24 hours, designate a replacement within 48 hours, and update the SMARTS system within 72 hours. The replacement QSD, QSP, or QSP Delegate shall have the required registrations/certifications and/or training listed herein.

E. Submit completed authorization form with name of proposed Data Submitters, to obtain approval by the Owner's Representative, acting as the legally responsible party (LRP), to upload data electronically into Storm Water Multi-Application & Reporting System (SMARTS). The quarterly inspection reports, Annual Reports, and all sampling results shall be uploaded onto SMARTS by the QSP or their designated Data Submitter, following Owner's Representative's review and approval.

F. The QSP or QSP Delegate shall prepare an Annual Report summarizing corrective actions, lab reports, sampling and analyses, and any corrective actions not implemented as per Section IV.P. of the Construction General Permit covering each yearly period in accordance with the permit conditions. The QSP or QSP Delegate shall upload the Annual Report to SMARTS by August 15th, or within one week of final site stabilization, and shall immediately notify the QSD and LRP of upload. LRP or their Duly Authorized Representative shall review and provide comments within one week of upload to SMARTS. The QSP or QSP Delegate shall address comments and revise report as necessary, prior to August 27th, to allow LRP's final review and acceptance prior to Sept. 1st deadline.

G. The SWPPP shall contain a detailed schedule of anticipated construction activities. The QSP shall update the schedule monthly or as directed by the Engineer, and shall submit updates to the QSD for incorporation into the amended SWPPP.

H. The SWPPP shall be amended by the QSD in accordance with the Construction General Permit, such as whenever there is a proposed field modification which may affect the site drainage patterns or potential discharge of pollutants to surface waters, groundwater, or a separate municipal storm sewer system. The changes shall be recorded by amending the SWPPP in accordance with the regulatory provisions for SWPPP amendment. The SWPPP shall also be amended to incorporate new measures whenever existing measures are deemed ineffective by the QSP, the QSD, or regulatory agency inspectors. SWPPP amendments shall be performed and submitted to SMARTS by the QSD.

I. Changes to the pollution control measures specified in the SWPPP will be allowed, provided they comply with the CGP. The Contractor's designated QSP shall submit written documentation of these changes to the QSD for amendments to the SWPPP, within 48 hours of their implementation.

J. The QSP, or their Delegate, shall perform all sampling and analyses required by the CGP and the SWPPP. Sampling and testing of water quality (discharges) shall be performed in accordance with sampling and analysis requirements of the CGP. Risk Level 2 and 3 dischargers shall obtain

a minimum of one sample from each discharge location per 24-hour period of each Qualifying Precipitation Event, as defined by the CGP, during active discharge. Risk Level 2 and 3 dischargers shall electronically submit through SMARTS all field sampling results within 30 days of the completion of the precipitation event or within 10 days if the field sampling results demonstrate the exceedance of the pH, and/or turbidity numeric action levels. Risk Level 2 and 3 dischargers that exceeded the pH and/or turbidity numeric action levels shall prepare a Numeric Action Level Exceedance Report when requested, in writing, from a Regional Water Board delegate and shall submit and certify each Numeric Action Level Exceedance Report through SMARTS within 30 days of receiving the written request, in accordance with the CGP. In the event of exceedances, QSP shall immediately notify the QSD, and initiate corrective action. Documentation of such an event shall be submitted to QSD in writing within 24 hours.

K. For potential violations of the NPDES permits, Contractor shall notify the Owner's Representative and initiate corrective action, documenting activity as required by law.

L. Contractor shall notify the Owner of any regulatory agency inspections within 24 hours of the inspection(s). The Contractor shall submit written notification to the Owner of any findings by the agencies, including verbal warnings.

M. Contractor shall provide all information required to complete the SWPPP within 15 calendar days of when the contract is approved or prior to the issuance of the notice to proceed (whichever is sooner). This information shall include, but not be limited to, the following:

1. List of subcontractors and material suppliers,
2. Construction schedule,
3. Project Work/Business hours,
4. List of sampling equipment (field meters),
5. Laboratory information,
6. Identify Data Submitters.

N. Upon request, the Contractor shall provide copies of all inspection reports for the project to the Owner's Representative within 24 hours of such request.

1.5 QUALITY ASSURANCE

A. Comply with all applicable permits, laws, and the approved SWPPP.

2. PRODUCTS

2.1 MATERIALS

A. Unless otherwise indicated, all erosion control products shall be certified weed-free.

B. Unless otherwise specified, all slope stabilization fabrics and fiber rolls shall be free of plastic netting. All netting shall be biodegradable.

3. EXECUTION

3.1 GENERAL

A. Contractor shall not begin site disturbing activities until the SWPPP has been approved for use, uploaded to SMARTS and a Waste Discharge Identification (WDID) Number received.

B. Implementation of SWPPP measures shall be the first order of business upon site mobilization.

C. The Contractor shall exercise every reasonable precaution to protect the watercourses within the Project area from pollution, including fuels, garbage, oils, chemicals, and other harmful

materials, and shall conduct and schedule the operations so as to avoid introduction of these materials into the watercourses, in accordance with the CGP. Contractor shall coordinate water pollution control work with all other Work done on the Contract.

D. The Contractor's designated QSP shall be:

1. Be responsible for oversight, inspection, documentation, and coordination of implementation, repair, upgrades, or maintenance of pollution control measures. Physical installation, maintenance, replacement, and removal of BMPs shall be performed and paid for under Section 015713, Temporary Erosion Control and Best Management Practices.
2. Be responsible for sampling, monitoring, reporting, and record keeping, as outlined in the SWPPP.
3. Be responsible for turbidity and pH testing.
4. Be the primary contact for pollution control work.
5. Have authority to mobilize crews to make immediate repairs to pollution control measures.

E. If the QSD or QSP identifies a deficiency in any aspect of the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately (within 72 hours of identification). The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the QSD in writing, but not later than the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the Project shall be in noncompliance. Attention is directed to the Contract Documents for possible noncompliance penalties.

F. The Contractor shall be responsible for notifying QSD, and conducting emergency response and cleanup in the event contaminated water reaches onsite catch basins, offsite catch basins, ditches, or creeks. All response measures shall be documented, and shall be inspected for effectiveness and maintained in good working order. Ineffective measures shall be repaired or replaced immediately at Contractor's cost and schedule expense.

G. The weather forecast for the appropriate project's zip code shall be monitored and used by the Contractor on a daily basis. If there is any chance of rain forecast within 72 hours, the forecast shall be printed out and kept with the SWPPP. If a Qualifying Precipitation Event, as defined by the CGP, is forecast, the QSP shall conduct a pre-Qualifying Precipitation Event inspection and necessary water pollution control practices shall be deployed prior to the onset of the precipitation.

H. The National Weather Service weather forecast is found at: https://www.weather.gov/

I. The Contractor shall maintain a rain gage at the site at all times during construction. Locate the gauge in an open area away from obstructions. Mount the gauge on a post at a height of 3 to 5 feet with the gauge extending several inches beyond the post. Make sure the top of the gauge is level. Rain gage readings shall be recorded daily and provided to the Owner's Representative within 72 hours whenever the daily rainfall total is greater than 0.25 inches per day or whenever the rainfall is a part of a Qualifying Precipitation Event as defined by the CGP.

J. The Owner will not be responsible for delays caused by the Contractor's failure to comply with the SWPPP, this Section, or the CGP. The Owner's Representative may order the suspension of construction operations which create or have the potential to create water pollution, at the sole expense of the Contractor.

K. The Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 13-3.03, "Construction," of the State Specifications.

3.2 BEST MANAGEMENT PRACTICES (BMP'S)

A. Contractor shall be responsible throughout the duration of the Project for coordinating and documenting the installation, inspection, maintenance, removal, and disposal of water pollution control practices included in the Drawings, Specifications, the SWPPP, and any amendments thereto. Physical implementation, installation, construction, maintenance, replacement, removal, and disposal of BMPs and erosion control measures shall be performed and paid for under Section 015713, Temporary Erosion Control and Best Management Practices. Requirements for inspection, documentation, monitoring, reporting, and administration of water pollution control practices are specified in the Drawings, Specifications, SWPPP, the Manuals, and herein.

B. Implementation of pollution control measures (BMPs) shall conform to the Drawings, the SWPPP, the CGP conditions, and these Specifications.

C. Implementation of water pollution control practices may vary by season. The SWPPP, this Section, and the Manuals shall be followed for control practice selection of year round, rainy season and non-rainy season water pollution control practices.

D. Contractor may be directed to apply permanent erosion control in small or multiple units as disturbed soil areas are deemed substantially complete by the Owner's Representative.

E. Temporary and permanent BMP's shown on the Drawings represent a mandatory minimum level of treatment. Contractor shall be responsible for these BMP's in addition to all others required by the SWPPP, the CGP or as directed by the Engineer.

3.3 MAINTENANCE, INSPECTION AND REPAIR

A. The QSP or QSP Delegate shall conduct inspections, sampling and analyses, as required by the CGP and the SWPPP, at all active areas and all areas with installed BMPs.

B. If the Contractor or the Owner's Representative identifies a deficiency in any aspect of the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately (within 72 hours of identification). The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Owner's Representative in writing, but not later than the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the Project shall be in noncompliance.

C. Contractor shall provide Water Pollution Control training as required by the CGP. Documentation of training shall be provided to the Owner's Representative within one week of the training.

D. The QSP shall inspect the pollution control measures to identify their effectiveness and direct necessary repairs or corrective actions as required by the SWRCB. Physical repair, replacement, and maintenance of BMPs shall be performed and paid for under Section 015713.

E. Contractor shall furnish sufficient qualified personnel and administrative support to perform required SWPPP inspections, monitoring, sampling, testing, reporting, documentation, and compliance activities throughout the duration of the Contract. Physical maintenance, repair, replacement, and removal of temporary water pollution control measures shall be performed and paid for under Section 015713, Temporary Erosion Control and Best Management Practices. Failure to fully comply with the requirements of the Construction General Permit shall subject the Contractor to all fines, damages, and job delays incurred due to failure to implement, inspect, monitor, and properly update the SWPPP.

F. If the measures being taken by the Contractor are inadequate to control water pollution effectively, the Owner Representative may direct the Contractor to revise its operations and its SWPPP program. Such directions will be in writing and will specify the items of Work for which the Contractor's water pollution control measures are inadequate. No further Work shall be performed on said items until the water pollution control measures are adequate and, if also required, a revised SWPPP program has been accepted.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. SWPPP Implementation is a lump sum pay item.

4.2 PAYMENT

A. SWPPP Implementation will be paid for at the contract lump sum price for SWPPP Implementation, which will be considered payment in full for furnishing all labor, tools, equipment, testing, sampling, analysis, inspections, reporting, documentation, administration, qualified personnel, and incidentals necessary for compliance with the SWPPP and the Construction General Permit. Payment under this Section includes completion of inspections, monitoring, sampling, analysis, reporting, SMARTS administration, corrective action documentation, and related SWPPP compliance activities. Physical implementation, installation, maintenance, replacement, and removal of BMPs and erosion control measures shall be paid for separately under Section 015713, Temporary Erosion Control and Best Management Practices.

B. During each estimated period the Contractor fails to conform to the provisions in this section, or fails to implement the control measures (BMPs) shown on the Drawings or specified elsewhere in these Specifications as items of work, the Owner will withhold 25 percent of the payment for that phase of the SWPPP implementation.

C. Withholds for failure to perform SWPPP work will be in addition to all other withholds provided for in the contract. The Owner will return performance-failure withholds in the progress payment following the correction of noncompliance.

D. Separate payment will not be made for implementation of BMPs in areas outside the project area and not specifically provided for in the SWPPP or in these Specifications.

E. Payment will be made under:

Pay Item	Pay Unit
SWPPP Implementation	Lump Sum

END OF SECTION

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SECTION 017123.16
CONSTRUCTION SURVEYING

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SECTION 017123.16
CONSTRUCTION SURVEYING

1. GENERAL

1.1 DESCRIPTION

A. The work required under this Section shall include, but is not limited to, all labor, tools, materials, equipment and incidentals required to perform construction surveying necessary to establish the lines and grades of the proposed work, as shown on the Drawings, as specified, or as directed by the Engineer.

1.2 WORK INCLUDED

A. The Contractor shall be responsible for procuring professional land surveying services to construct this project. A California licensed Land Surveyor, or Civil Engineer authorized to practice land surveying as defined in the Professional Land Surveyors Act, shall be in responsible charge of all survey work to be performed in conjunction with the scope of work of this project.

B. The Contractor shall preserve and protect all project survey control and reference points shown on the Drawings and located outside the limits of disturbance. Monuments disturbed by the Contractor shall be reestablished by the Contractor at their sole expense.

C. The Contractor shall be solely responsible for the protection and maintenance of all existing and Contractor-established survey marks and monuments.

D. Engineer's site observations do not relieve the Contractor of their sole responsibility for the accuracy of all constructed lines and grades.

1.3 RELATED SECTIONS

A. Section 312316, Excavation

B. Section 312323, Engineered Fill

1.4 REFERENCES

A. State of California, Department of Transportation (CALTRANS) State Standard Specifications (current edition).

1.5 SUBMITTALS

A. The Contractor shall provide the name, license number, and documentation for the required minimum qualifications of the Land Surveyor to be employed by the Contractor for the Project, prior to any work being completed by the Contractor or Surveyor.

1.6 QUALITY ASSURANCE

A. All Work shall be performed to the satisfaction of the Engineer.

B. The Engineer may, at their sole discretion, perform their own surveys for: verification of project control points, verification of lines and grades, and inspection of survey monument preservation. Contractor shall provide unrestricted access for the Engineer to spot-check the work. This does not relieve the Contractor of their responsibility to perform additional independent surveying, as need to complete the work.

C. If the construction staking reveals a design inconsistency or error, Contractor shall notify the Engineer immediately and shall not proceed with the work until directed by the Engineer.

2. PRODUCTS (NOT USED)

3. EXECUTION

A. The Engineer will establish a minimum of three survey control monuments, as shown on the Drawings. The Contractor's surveyor will be provided with the northing, easting and elevation of the control points existing in the field as shown on the Drawings. In addition, the Engineer of Record will also provide the Contractor's surveyor with the final linework file developed in AutoCAD Civil 3D. The Contractor's surveyor will be required to access AutoCAD to use the electronic files. Civil 3D information does not transfer to base AutoCAD or older versions of AutoCAD and therefore will not be available to Land Surveyors who do not have this program.

B. From this information, the Contractor shall establish the baseline control points and reference points for horizontal and vertical control and make all additional detailed surveys and measurements and establish markings or monuments necessary for the construction of the work as dimensioned on the Drawings.

C. At a minimum, construction staking shall include the following:

1. Proposed clearing and grubbing limits,
2. Proposed channel alignment (centerline),
3. Proposed earthwork,
4. Proposed concrete structures,
5. Proposed culverts and pipeline alignments,
6. Proposed road alignments (centerline),
7. Any other items required for a full, complete, and accurately built project.

D. All stakes and survey markers will be conspicuously marked with flagging tape or paint by the Contractor. The Contractor shall be responsible for protecting and maintaining all stakes from destruction.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Construction Surveying will not be separately measured for payment.

4.2 PAYMENT

A. No separate payment will be made for the work covered under this section. Full compensation for all costs in connection with Construction Surveying shall be included in the contract price for related work.

B. The cost of resetting and verifying the Engineer's survey control points that are located outside the designated limits of disturbance and that are disturbed by the Contractor will be solely borne by the Contractor. The cost of any such verification or replacement of benchmarks and/or control survey points will be deducted from any monies due to the Contractor. The Contractor will not be allowed any adjustment in working days for such verification or replacement of survey control points.

END OF SECTION

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SECTION 024100
DEMOLITION

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SECTION 024100
DEMOLITION

1. GENERAL

1.1 DESCRIPTION

A. Perform all demolition and disposal work as shown on the Drawings, as specified herein, or as otherwise directed by the Engineer.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 311100, Clearing and Grubbing

2. PRODUCTS (NOT USED)

3. EXECUTION

3.1 GENERAL

A. Before beginning any work, carefully inspect the work and examine the Drawings and Specifications to determine the extent of the work to be performed. In the company of the Engineer, visit the site and verify the extent of the demolition and other work to be performed.

B. Contact all appropriate utilities and agencies to coordinate and verify all abandonments and relocations.

C. Provide a minimum of 48 hours of notice to any residences affected by a planned utility disruption.

D. Use of explosives will not be permitted.

E. Prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

F. Comply with all local regulations regarding dust generation, hauling and disposal.

G. Materials projecting above-ground shall be cut off at a minimum of one foot below finished grade. Backfill and compact all holes caused by removal of materials. Areas of site not detailed on the Drawings shall be filled and graded to drain, generally matching existing conditions.

3.2 PROTECTION OF EXISTING WORK

A. Take all necessary precautions to ensure against damage to existing work to remain in place, or to be salvaged. Any damage to such work shall be repaired or replaced as directed by the Engineer.

B. Construct and maintain shoring, bracing, and supports, as required. Ensure that structural elements are not overloaded and increase structural supports, or add new supports, as may be required because of any cutting, removal, or demolition work performed.

3.3 UTILITY DISCONNECTS

A. Coordinate utility disconnections with responsible utilities as designated on the Drawings.

B. Water is available on site. Contractor shall be required to provide their own power, as specified in Section 015000.

3.4 DEMOLITION

A. General. Extent of removal of existing facilities shall be as shown on the Drawings. Materials not identified as being salvaged by Owner shall be removed and disposed.

B. Hazardous Materials. Comply with all local rules, regulations, ordinances, and statues for handling and disposal of hazardous materials encountered.

C. Utilities. Remove all abandoned above and below ground utilities, of six-inch diameter or greater, as shown on the drawings or as directed by the Engineer.

D. Demolition. Demolish all specified structures in accordance with all local regulations. Completely remove footings, foundation, and above-ground construction as shown on the Drawings. Demolition includes all hard landscaping, utilities (and associated structures), posts, piping, conduits, fences, access driveways, culverts, and other similar permanent improvements specified on the Drawings.

3.5 SELECTIVE DEMOLITION

A. Fences, Walls and Gates. Preserve access control where fencing, walls and gates are removed during construction. Where shown in the Drawings or otherwise authorized by the Engineer, existing fences and gates may be removed to facilitate work. All fences or gates that are modified by the Contractor shall be replaced in kind, as specified, and to the satisfaction of the landowner and the Engineer. Repair damage caused by work under this contract to the satisfaction of the Engineer. Fence repairs are measured under Section 015000, Mobilization.

3.6 DEBRIS REMOVAL

A. Concrete, asphalt, carpet, trash, treated wood, old farm implements, pipe, irrigation supplies, appliances, and other non-organic debris which is not specifically shown to be demolished on the drawings and which are the products of the clearing and grubbing operations or exposed during excavation shall be disposed of off-site. All such materials shall be stockpiled in the staging area for measurement by the Engineer, prior to disposal. Remove all of the non-organic products of clearing and grubbing operations from the site and dispose of the material at other locations or through other sources arranged for, by, and at the expense of the Contractor, in accordance with applicable laws and ordinances.

3.7 DISPOSITION OF MATERIALS

A. Salvaged Materials. Salvage of materials for reuse by the Owner shall include removal of the material, equipment, etc., from its present location and transporting, bundling, protecting, cleaning, and storing it in a designated location on the work site, as approved by the Engineer. Items which are specified to be reused, and are damaged during removal or storage, shall be repaired to the Engineer's satisfaction, or replaced with new matching materials, at no cost to the Owner.

B. Wasted Materials. Title to all debris to be wasted and demolished materials is vested to the Contractor upon receipt of the Notice-to-Proceed. Contractor shall assume responsibility for any loss or damage to such property after the Notice-to-Proceed. The condition of such material is not guaranteed and the Contractor shall assume all liability for reuse of any such material.

C. Disposal. All materials removed under this section which are not salvaged by the facility owner for reuse or otherwise recycled, shall be disposed of off-site at appropriate disposal areas

approved in advance by the Owner. The material shall be removed from the job site before completion of the contract. Material shall not be sold on the site. All loading, hauling, dumping, and disposal fees are the responsibility of the Contractor.

D. Hauling. Debris shall be removed and transported by approved haul routes in a manner as to prevent spillage on streets or adjacent areas.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Demolition work will be measured on a lump sum basis.

B. Buried Debris Disposal will be measured by ton, based on weight tags provided by the landfill.

4.2 PAYMENT

A. Demolition will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the demolition, salvage, disposal, and reuse of materials, as specified.

B. Buried Debris Disposal. Debris Disposal will be paid for by the contract unit price per ton, which price will include stockpiling debris by category, hauling and disposing of non-organic debris, and all associated dump fees.

C. Payment will be made under:

Pay Item	Pay Unit
Demolition	Lump Sum
Buried Debris Disposal	Ton

END OF SECTION

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SECTION 311100
CLEARING AND GRUBBING

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SECTION 311100
CLEARING AND GRUBBING

1. GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of furnishing all labor, equipment, and materials necessary to perform the clearing and grubbing, the removal or disposal of all cleared and grubbed materials, and the filling of all grubbing holes, as specified, as shown on the Drawings, or as directed by the Engineer.

B. Removal and off-site disposal of non-organic debris where specified on the Drawings or otherwise encountered within the limits of proposed clearing and grubbing, shall be performed as specified in Section 02 41 00, Demolition.

C. The mapping did not locate all trees within the project area. The tree survey focused on locating the oak trees designated to remain. Contractor shall visit the site and make their own determination of the total quantity of trees to be removed or salvaged and replanted.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 015626, Temporary Fence – Type ESA

C. Section 015713, Temporary Erosion Control and BMPs

D. Section 024100, Demolition

E. Section 312316, Excavation

F. Section 312323, Engineered Fill

G. Section 354200, Log Structures

1.3 REFERENCES

A. State of California, Department of Transportation (CALTRANS) State Standard Specifications, current edition.

B. Geotechnical Report: Geotechnical Engineering Investigation by:

CMAG Engineering, Inc.
Job No. 24-125-M
Dated: February 16, 2026

2. PRODUCTS (NOT USED)

3. EXECUTION

3.1 CLEARING

General. All work shall comply with Section 015713, Temporary Erosion Control and BMPs, and Section 17, Clearing and Grubbing of the Standard Specifications.

A. All trees, stumps, down timber, snags, brush, vegetation, old piling, stone, concrete rubble, abandoned structures, and similar debris shall be cleared within the limits of the construction extents, unless otherwise shown on the Drawings or directed by the Engineer.

B. In areas where grubbing is not required, the clearing operations shall consist of the complete removal of all obstructions above the ground surface.

C. Contractor shall flag all vegetation greater than 6-inches diameter at breast height to be removed for approval by Owner's Representative, prior to its removal. Flagging shall be colored using three colors to indicate whether the material will be:

1. Salvaged for slash or chipped and dispersed on site (orange)
2. Salvaged for log structures, or (blue)
3. Salvaged for re-installation as live shrub transplants (red)

D. Once the flagging is completed, notify the Owner's Representative so they can walk the vegetation removal areas and approve them prior to Contractor initiating clearing and grubbing activities.

E. Downed plant materials shall be removed from tree protection zones and protected natural resource areas by hand or with equipment located outside fencing. Contractor shall extract debris by lifting the material out, not skidding it across the soil surface.

F. Trees. Where trees are approved by the Owner's Representative for removal, trees shall be felled in such a manner as to avoid damage to trees left standing, to the existing structures and installations, as well as with due regard for the safety of employees and others. Stumps shall be removed to minimum depth of 4 feet, or to a point where remaining roots are less than 1.5 inches in diameter, whichever depth is greater. Trees located beyond the limits for clearing and grubbing that are not marked for removal, shall be protected from damage, as indicated on the Drawings and as specified.

G. Vegetation. Vegetation to be removed shall consist of all heavy growth of brush and woody vegetation, unless shown otherwise on the Drawings or directed by the Engineer.

3.2 GRUBBING

A. General. Grubbing shall consist of the removal of all stumps, roots, buried logs, old piling, old paving, concrete, abandoned utilities, timbers, fencing, and other objectionable matter encountered.

B. Limits. Except as noted on the Drawings, the entire area within the limits of the footprint of proposed grading shall be thoroughly grubbed.

C. Filling of Holes. All holes caused by grubbing operations, except in borrow areas, shall be excavated with 3 to 1 (horizontal to vertical) side slopes in conformance with Section 312316, Excavation. The excavation shall then be backfilled with compacted embankment material to a minimum of 90 percent relative compaction, in conformance with Section 312323, Engineered Fill and the Geotechnical Investigation.

3.3 DISPOSAL OF DEBRIS

A. Cleared and Grubbed Organic Materials. Except as hereinafter specified or otherwise indicated on the Drawings, all logs, brush, strippings, shall either be salvaged and replanted in accordance with Section 32 9300, Planting, shall be incorporated into Log Structures or slash, in accordance with Section 35 42 00, Log Structures, or shall be chipped and distributed on the finished surface of the excavated channel banks at 1-3 inch thickness. If sufficient slash material is not

generated from on-site clearing and grubbing operations to meet the coverage requirements specified herein or shown on the Drawings, the Contractor shall notify the Engineer immediately. Do not chip material until slash installation is completed and approved by the Engineer.

B. Concrete, asphalt, carpet, trash, treated wood, old farm implements, pipe, irrigation supplies, appliances, and other non-organic debris which are the products of the clearing and grubbing or demolitions operations shall be stockpiled on site and ultimately disposed of by the Contractor, as specified under Section 02 41 00, Demolition.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Clearing and Grubbing will be measured as a lump sum pay item.

4.2 PAYMENT

A. Clearing and Grubbing will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to complete the clearing and grubbing operation as specified, including disposal or salvage of materials, placement of slash, and restoration of ground surfaces.

B. Payment will be made under:

Pay Item	Pay Unit
Clearing and Grubbing	Lump Sum

END OF SECTION

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SECTION 312316
EXCAVATION

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SECTION 312316
EXCAVATION

1. GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of furnishing all labor, equipment, materials, and performing all operations necessary to complete Excavation, as specified, as shown on the Drawings, or as directed by the Engineer. Work includes, but is not limited to the following:

1. Excavation for removal of unsuitable material.
2. Control of groundwater during excavation.
3. Channel Excavation
4. Construction Staking
5. Other miscellaneous excavation incidental to the construction of the improvements.

1.2 RELATED SECTIONS

A. Section 015713.01, Fiber Roll

B. Section 015626, Temporary Fence – Type ESA

C. Section 015713.02, Silt Fence

D. Section 017123.16, Construction Surveying

E. Section 311100, Clearing and Grubbing

F. Section 312323, Engineered Fill

G. Section 329200, Seeding

H. Section 354200, Log Structures

1.3 REFERENCES

A. State of California, Department of Transportation (CALTRANS) State Standard Specifications (current edition).

B. Surveys. Refer to Section 017123.16, Construction Surveying.

C. Geotechnical Report: Geotechnical Engineering Investigation by:

CMAG Engineering, Inc.
Job No. 24-125-M
Dated: February 16, 2026

1.4 QUALITY ASSURANCE

A. Comply with all applicable permits and regulations.

B. Contractor shall provide necessary construction staking and references points, as required to meet the specified tolerances for the work.

2. PRODUCTS (NOT USED)

3. EXECUTION

3.1 GENERAL

A. The Contractor shall protect existing utilities in performing any excavation work.

B. The Contractor shall comply with all permit conditions in performing any excavation work.

C. Contractor shall perform an independent earthwork estimate for the purpose of preparing bid prices for earthwork. Quantities indicated on the Drawings are approximate estimates provided only for permitting purposes, do not represent all efforts required to complete the work, and are not suitable for bidding purposes.

D. The bid price shall include costs for any necessary export and proper disposal of excess or unsuitable earth materials off-site, at locations to be arranged and paid for by the Contractor.

3.2 EXCAVATION

A. General. Excavations shall extend into firm, undisturbed native soils. Excavation shall consist of removal of material for embankment foundation preparation, mass excavation and finish grading of the channel and slope improvements, and other miscellaneous excavations to the lines and grades shown on the Drawings, or as directed by the Engineer. If organic materials, yielding sub-grade (pumping) or other deleterious materials are encountered during foundation excavations, they shall be removed as directed by the Engineer.

B. Control of Water. Water control shall be performed in accordance with project permit conditions, the approved SWPPP, and Dewatering, Section 312319 of these Specifications. When water is encountered, either ground water or surface runoff, the Contractor shall furnish, install, maintain, and operate all necessary machinery and equipment required to keep the excavation reasonably free from water, as approved by the Engineer, until the placement of concrete or backfill material has been completed, inspected, and approved, and all danger of flotation and other damage is removed. Water pumped from the excavation shall be disposed of in such manner as will not cause injury to public or private property, or constitute a nuisance or menace to the public, and the disposal method shall be subject to the approval of the Engineer. Water shall be controlled until work is complete. **See the Geotechnical Investigation for further information regarding the control of water to help facilitate excavation if difficult grading conditions are encountered due to wet soft soils.**

C. Excess Excavation. Care shall be exercised by the Contractor not to excavate below the grades shown on the Drawings, except as specified herein, and as directed by the Engineer. All excavations extending below the grades shown on the Drawings, which are not directed by the Engineer, shall be backfilled with compacted embankment at the Contractor's expense, per Section 312323, Engineered Fill.

D. All excavations must comply with all applicable local, state and federal safety regulations and specifications, which should include reference to the State of California Trenching and Shoring Manual. This includes compliance with California Occupational Safety and Health Regulations (Cal/OSHA). These safety regulations are contained within the larger California Code of Regulations, Title 8 Industrial Relations (CCR Title 8). It is the Contractor's responsibility to maintain a safe work environment and to select the means, methods, and sequencing of all construction operations.

E. Heavy construction equipment, construction materials, excavated soils, and vehicular traffic may act as surcharge and therefore should not be allowed within a specified distance from the excavation. Recommendations for setback distances can be provided by the Geotechnical Engineer upon request.

F. Temporary Excavations. With exposure and drying, on-site soils may experience progressive sloughing if excavated near vertical and left un-shored during construction. Engineer suggests that the soils on-site should be considered Type C when applying OSHA regulations.

G. Tolerances. The excavation tolerance shall typically be +0.1 feet to -0.2 feet from the grades shown on the Drawings, except within the low flow channel, where excavation tolerance shall be +0.1 feet to -0.1 feet from the elevations shown on the Drawings.

3.3 UNCLASSIFIED EXCAVATION

A. Unclassified Excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature, which is not otherwise classified and paid for under Excavation of Unsuitables described below. Unclassified Excavation includes excavation required to reach finished grade. Over-excavation for the placement of materials (e.g., Log Structures) or the removal of unsuitables, as described below under Excavation of Unsuitables, is not included in Unclassified Excavation.

3.4 EXCAVATION OF UNSUITABLES

A. Excavation of Unsuitables. Areas of unsuitable in-place soils, as determined by the Engineer, may also be encountered. Material shall not be classified as unsuitable solely based on moisture content. Material within the limits of Excavation, as described above under Unclassified Excavation, or within the limits of over-excavation for the placement of materials (e.g. Engineered Streambed Material, Weir Boulders, Log Structures) shall not be classified as unsuitable. The Contractor shall anticipate having to over-excavate areas of unsuitables as directed by the Geotechnical Engineer, dispose of these materials, and replace them with Engineered Fill in accordance with Section 8.4 of the Geotechnical Report. The actual locations of these excavations will be determined in the field by the Engineer. The side slopes of the excavations shall be no steeper than 1 to 1 (horizontal to vertical). The over-excavations shall be backfilled with embankment materials in accordance with Section 312323, Engineered Fill.

B. Disposition of Unsuitable Materials. The excavated materials that are considered unsuitable based solely on moisture content shall be processed as necessary to meet specification requirements for suitability and used as embankment material. Materials which are unsuitable based on organic content will be ordered wasted and shall be disposed of off-site in accordance with Section 14-10, “Solid Waste Disposal and Recycling”, of the Standard Specifications

3.5 SPOILS DISPOSAL

A. All excess earthen material excavated at the project site shall be disposed of on-site in a pile for use by the owner, as directed by the Engineer. Excess earthen material (i.e. spoils) includes material generated to reach finished grade and excess material generated during any over-excavation required for project construction. This paragraph is also applicable to the disposal of organic strippings generated during clearing and grubbing operations as described in Section 311100, Clearing and Grubbing.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Unclassified Excavation. Unclassified Excavation will be measured by the cubic yard of Unclassified Excavation, based on the neat-line Dimensions shown on the Drawings. Unclassified Excavation is a Final Pay Item in accordance with Section 9-1.02C "Final Pay Item Quantities" of the Standard Specifications. Where the dimensions of any portion of the work are revised by the Engineer, or a portion of the work is eliminated, the change will be measured by the cubic yard.

B. Excavation - Unsuitable Materials. Excavation to remove materials that are designated by the Engineer as unsuitable for reuse will be measured by the cubic yard of material excavated from the stripped foundation dimensions shown on the Drawings and replaced with Engineered Fill. Measurement will be based on the calculated neat-line quantity from surveyed cross sections before and after the excavation.

C. Spoils Disposal. Spoils Disposal will not be separately measured for payment.

D. Other Miscellaneous Excavations. All other excavations will not be measured for payment.

E. Surveys: Construction staking will not be separately measured for payment.

4.2 PAYMENT

A. Unclassified Excavation, measured as specified above, will be paid for at the contract unit price per cubic yard, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to complete Unclassified Excavation, as specified, including mass excavation and finish grading of channel banks and floodplains, to the lines and grades shown on the Drawings.

B. Excavation - Unsuitable Materials, measured as specified above, will be paid for at the contract unit price per cubic yard, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to complete the excavation and backfill the excavation with Engineered Fill, as specified, including dewatering, all handling of materials, and disposal of unsuitable materials.

C. Spoils Disposal. No separate payment will be made for Spoils Disposal. All costs in connection with this work will be considered incidental to the contract cubic yard price for Unclassified Excavation.

D. No separate payment will be made for other miscellaneous grading incidental to the work. All costs in connection with this work will be considered incidental to the cost of construction of associated improvement.

E. Surveys: No separate payment will be made for surveys or construction staking. All costs in connection with this work will be considered incidental to the contract price per cubic yard for Excavation.

F. Mixing and transport of suitable materials for reuse shall be paid for under Engineered Fill, Section 02226.

G. Payment will be made under:

Pay Item	Pay Unit
Unclassified Excavation	Cubic Yard (F)
Excavation – Unsuitable Materials	Cubic Yard

END OF SECTION

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SECTION 312319
DEWATERING

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312319
DEWATERING

1. GENERAL

1.1 DESCRIPTION

A. Furnish all labor, materials, equipment, and incidentals necessary to design, construct, operate, maintain, and remove all diversion and dewatering elements, including but not limited to, pipes, cofferdams, flumes, shoring, turbidity curtains, filtration systems and/or other measures, including pumping, to dewater the construction site, temporary excavations and drilled shafts, and to divert streamflow and other surface waters and groundwater through or around the project area 24 hours a day during the entire field construction period, as shown on the Drawings, as specified, or as directed by the Engineer.

B. Dewatering details on the Drawings (if provided) are schematic. The design and implementation of the Dewatering Plan is solely the responsibility of the Contractor. Contractor shall make their own independent evaluation of water sources (surface and groundwater) in preparing their Dewatering Plan. Flow estimates, if provided to the Contractor by the Owner, Engineer, or others are solely for informational purposes and do not relieve the Contractor of the sole responsibility to determine appropriate flow estimates for design purposes and to adjust to changing site conditions, Contractor's schedule, and Contractor's chosen means and methods of construction.

C. Dewatering shall comply with all project permit conditions, applicable laws and local ordinances.

1.2 RELATED SECTIONS

A. Section 015713, Temporary Erosion Control and BMP's

B. Section 015713.01, Fiber Roll

C. Section 015713.02, Silt Fence

D. Section 015723, Stormwater Pollution Prevention Plan Implementation

1.3 SUBMITTALS

A. The Contractor shall submit the following for review and approval of the Engineer:

1. A Dewatering Plan listing materials, method of work, equipment to be used, methods for disposal of pumped water, provisions to prevent scour and erosion, and the proposed schedule shall be submitted to the Engineer. The dewatering plan shall include a site map with the location of all proposed diversion and dewatering elements. If the project is phased, include separate maps for each phase of dewatering. Approval of the Engineer and Owner's Representative shall be required before the Contractor proceeds with water control measures. Engineer and/or Owner's approval of Contractor's proposed Diversion and Dewatering Plan does not relieve the Contractor of their sole responsibility for design, implementation, and maintenance of the Diversion and Dewatering Plan.

2. Product data for:

   a. Pumps (primary and secondary, if required)
   b. Electrical service
   c. Silt control filter fabric
   d. Washed rock
   e. Impervious liners
   f. Cofferdam material
   g. Other materials used in dewatering

1.4 QUALITY ASSURANCE

A. Comply with all applicable permits and regulations.

B. Comply with scheduling requirements set forth in the approved Storm Water Pollution Prevention Plan and Dewatering Plan.

C. Comply with approved Hazardous Materials Control and Spill Prevention Plan, in accordance with Section 015000.

D. Notify Engineer at least 5 working days in advance of installation of temporary cofferdam(s) or diversion.

E. Notify Engineer at least 5 working days in advance of removal of temporary cofferdam(s) or diversion.

F. Where there maintenance of water quality is dependent on pumping to bypass or filter water, the Contractors shall be required to maintain on-site a fully redundant power source and standby pump(s), capable of deployment if the primary system fails. These materials shall be included in the Dewatering Plan submittal, as outlined below.

2. PRODUCTS

2.1 MATERIALS

A. Pipe. Pipe used for the clearwater diversion must meet or exceed the minimum dimensions shown on the Drawings and shall have water-tight joints. Single-walled corrugated HDPE pipe with split couplers will not be accepted. The pipe dimensions shown on the Drawings represent the minimum allowable size of any single pipe, not an indication of the required diversion capacity.

B. Imported Rock. Use only clean washed gravel to fill sandbags. Sand will not be allowed.

C. Dewatering Facilities. Provide and operate dewatering facilities of suitable size and capacity. The use of equipment shall be consistent with the manufacturer's recommendations.

D. Silt Fence. Comply with Section 015713.02, Silt Fence.

3. EXECUTION

3.1 GENERAL

A. Contractor is solely responsible for the design, construction, and maintenance and monitoring of the diversion and dewatering facilities. Comply with the Drawings, Specifications, and applicable permit conditions.

3.2 SEDIMENT CONTROL

A. General. Comply with all applicable permit conditions.

B. Cofferdam Construction. During construction of the cofferdams within flowing water, install silt barrier(s) along the water side of the installation, as necessary to minimize mobilization and entrainment of disturbed soils within the active flowing channel, to a level in accordance with the permit conditions.

C. Discharge of diverted flow. Unless otherwise specified, a diversion must discharge into the same natural drainage way in which its headworks are located. Where feasible, discharge to existing pools or onto bedrock or otherwise erosion resistant surfaces. Construct energy dissipators at diversion outlets, where necessary to prevent scour at point of discharge.

D. Discharge of Seepage/Groundwater. Discharge water from the dewatered construction site either by gravity or pumping in a manner to prevent excessive turbidity from entering the receiving waters and to prevent scour and erosion outside of the construction site. Pumped water should be pre-filtered with a gravel pack around sumps for subsurface flows and a silt fence, hay bales, or approved equivalent around pumps for surface flow.

E. Discharge clean (i.e., sediment free) pumped water into the clearwater diversion or downstream of the work area.

F. Discharge turbid water into isolated local depressions, or spray on agricultural fields to promote infiltration, as shown on the Drawings. Where discharge of pumped water will create excessive turbidity in receiving waters, route water through a sediment interceptor, filter, or other facilities to remove sediment from water.

G. Isolation of Construction Area. Where feasible, limit water quality impacts by isolating the work area from surface waters using coffer dams.

3.3 HAZARDOUS MATERIAL CONTROL

A. General. Comply with the approved Hazardous Materials Control and Spill Prevention Plan (HMC&SPP) in accordance with Section 015000, Mobilization.

B. Equipment and Lubricants. Steam-clean all equipment prior to its use. Inspect all equipment for cleanliness and fluid leaks prior to use and monitor during its use. Maintain equipment as required. Equipment refueling shall only take place in a designated, contained area.

C. Isolation of Construction Area. Prior to performing work within flowing water, outside of cofferdams, install oil containment booms downstream of the work area. Maintain booms until completion of the work within the channel is complete.

D. Spills. Maintain a supply of oil spill booms, sorbent pads, and other supplies to contain and clean spills. Comply with approved HMC&SPP should spills occur.

3.4 COFFERDAMS

A. General. The Contractor is solely responsible for the design, construction, maintenance, and monitoring of cofferdams, dikes and other isolation facilities. Cofferdams with an exposed height greater than 6 feet shall be designed by a Professional Engineer registered in the State of California, based on available soil data.

B. Configuration. Cofferdam alignments, as shown on the Drawings, reflect the maximum allowable encroachment into the channel. Construct cofferdam alignments as shown or

the Drawings, unless otherwise approved by Engineer. Provide cofferdams high enough to account for water surface fluctuations.

C. Secondary Dikes/Seepage Control. Secondary dikes within the isolated construction area can be used to control seepage and groundwater around excavations, provided all dike materials are removed from the exposed channel upon completion, prior to re-watering the work area.

3.5 FLOW BYPASS

A. Capacity. Bypass surface water, if present during construction, around construction site using a cofferdam and bypass pipe as shown on the Drawings or equivalent facility, as approved by the Engineer. The bypass system shall be capable of passing the flows present at the time construction begins, with a minimum of 12 inches of freeboard (measured vertically from water surface to lowest point on dam). Gravity flow bypass pipe(s) shall have a minimum diameter of 10 inches to minimize the likelihood of clogging by debris.

B. Storm Events. During the designated period for instream work, the Contractor shall be solely responsible for the integrity of the dewatering system. If rain is predicted, the Contractor shall perform flood fighting activities as directed by the Engineer and regulatory agencies.

C. The diversion system may require adjustment to accommodate the sequence of work. No additional compensation shall be provided for any adjustments, revisions, or reinstallations of diversion elements.

D. The diversion and dewatering shall result in conditions that allow the required compaction to be achieved and shall prevent sediment-laden water that exceeds the effluent discharge limits from entering the drainage ways.

E. Unless otherwise specified, a diversion must discharge into the same natural drainage way in which its headworks are located.

3.6 DEWATERING

A. General. Remove water from construction area using pumping, well points, drains, or other approved methods. Discharge of water shall comply with Section 3.2, Sediment Control. Turbid water from active construction areas shall be retained on site and allowed to infiltrate or routed through sediment interceptors or other facilities to remove contaminants and sediment. Excavated slopes in the saturated soils may need to be retained, tied back, or otherwise stabilized. Refer to the Geotechnical Report.

B. Well Points. Well points shall be designed to preclude the loss of fine soil by gravel packing or other suitable means.

C. Pumping Facilities. All pump intakes shall be screened to prevent the entrainment of aquatic species, in accordance with project permit conditions. Pumps and discharge piping shall be suitable for the type of service provided and shall be a sufficient size and capacity to satisfactorily dewater work areas. Engines shall be muffled to avoid excess noise and pump intakes shall be fitted with screens as required.

D. Power Supply. Consider the availability and reliability of power sources for dewatering operation in dewatering system design and make provisions for temporary or backup power supply as deemed necessary. Where the primary diversion is operated by pumping, provide a backup system with automatic controls capable of starting the backup upon failure of the primary system. Generators shall be limited to a maximum of

65 dBA, or shall be fitted with enclosures to limit sound to this level. Where electrical power is provided by the owner, Contractor shall assume all responsibility for related safety precautions and perform necessary investigations to evaluate suitability, reliability, and safety of source.

E. Groundwater. Dewatering shall maintain water surfaces below the base of temporary excavations or trenches as necessary to ensure groundwater does not flow through disturbed areas, or as required to allow for visual inspection of the work by the Engineer. This requirement shall apply continuously, including nights, weekends, or periods when work is stopped. Lower groundwater tables within excavations for structures to a minimum of two (2) feet below foundations or as otherwise required to establish a firm, stable foundation. Control groundwater within excavation until completion of backfill operations.

3.7 WATER LEVELS DURING THE CONSTRUCTION PERIOD

A. The Contractor shall be responsible for making an independent evaluation of site conditions. The Contractor's dewatering plan shall address all potential sources of surface and groundwater, including but not limited to streamflow (natural or managed), backwatering of the channel from downstream blockages, domestic water lines, storm drain outfalls, irrigation tailwater, industrial discharges, seepage, and direct rainfall.

B. Construction Dewatering. Groundwater in excavations is discussed in the Geotechnical Report . Note that the water levels shown in the geotechnical borings may not reflect conditions during work. Water levels vary seasonally and spatially, and the subsurface information it limited.

3.8 CLEANUP

A. Thoroughly clean up area to remove debris and contaminated materials. Remove fine sediments and restore disturbed area prior to removal of the dewatering facilities. Clean and round river run gravels or cobbles, if used in cofferdam construction, may be spread in the creek channel in lieu of removal, provided grading will not interfere with facility operation.

3.9 REMOVAL OF DEWATERING FACILITIES

A. Prior to removal of the dewatering facilities, complete the following activities:

1. Complete required tests and inspections.
2. Thoroughly cleanup work site.
3. Perform final walkthrough with Engineer.

B. Prior to removal of cofferdams and diversion, equalize the water surface levels on both sides of the dams.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Dewatering will be measured on a Lump Sum basis.

4.2 PAYMENT

A. Dewatering will be paid for at the lump sum contract price for Dewatering, which price will include payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the dewatering operations, as specified, including temporary cofferdams, pumping, silt control, filter fabric, sediment control, erosion control, removal of muck, disposal of materials, and removal of dewatering facilities.

Pay Item	Pay Unit
Dewatering	Lump Sum

END OF SECTION

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SECTION 312323
ENGINEERED FILL

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SECTION 312323
ENGINEERED FILL

1. GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of furnishing all plant, labor, and materials, and performing all operations necessary for the construction of Engineered fills, including surveying, subgrade preparation, furnishing, loading, and on-site and off-site hauling of materials, processing, screening placement and compaction of Engineered Fill materials, construction of keyways and benches, construction of ramps, and other incidental earthwork as may be necessary to complete the Engineered Fills, as specified in the Geotechnical Report, as shown on the Drawings, as specified, or as otherwise directed by the Engineer.

B. All grading shall comply with Section 19 of the Standard Specifications, and with the recommendations of the Geotechnical Investigation. Prior to beginning work, the Contractor shall be familiar with the geotechnical investigation. In the event of discrepancy between the report and the notes herein, the report shall prevail. It shall be the responsibility of the Contractor to visit the site and make their own interpretations with regard to materials, methods and equipment necessary to perform the work required for this project.

C. Temporary erosion control and BMP's shall be installed and approved by the Engineer prior to beginning Engineered Fill Construction.

D. The Contractor is responsible to locate, identify, and protect all existing utilities from damage.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 015713, Temporary Erosion Control and BMPs

C. Section 015723.1, Stormwater Pollution Prevention Plan Implementation

D. Section 017123.16, Construction Surveying

E. Section 311100, Clearing and Grubbing

F. Section 312316, Excavation

G. Section 329200, Seeding

1.3 REFERENCES

A. Geotechnical Report: Geotechnical Engineering Investigation by:

CMAG Engineering, Inc.
41 Hangar Way, Suite D
Watsonville, CA 95076
Job No. 24-125-M
Dated: February 16, 2026

B. American Society for Testing and Materials (ASTM) Standards:

1. D 1557 - Test Method for Moisture-Density Relations of Soils and Soil-Aggregate Moistures Using 10 lb (4.54 kg) Rammer and 18-inch (457 mm) Drop
2. D 2974 - Test Method for the Organic Content of Soils
3. D 4318 - Test Method for the Liquid Limit and Plastic Limit of Soils
4. D 6938 - Standard Test Method for in place density and water content of soil and soil aggregate by nuclear methods (shallow depth)
5. D 422C - Particle-Size Analysis of Soils

C. State of California, Department of Transportation (CALTRANS) State Standard Specifications, current edition.

D. Surveys. All construction staking shall be performed by the Contractor. Survey control points are shown on the Drawings.

2. PRODUCTS

2.1 MATERIALS

A. Water. Refer to Section 015000, Mobilization

B. Engineered Fill Materials. To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent engineered fill. The suitability of materials for specific purposes will be subject to the approval of the Engineer, in conformance with these specifications. Materials used for engineered fill shall conform to the quality and gradation requirements as follows:

1. Less than 3% organic material;
2. Shall contain no rock or clods greater than 3-inches in diameter;
3. Shall have a low expansion potential;
4. Shall have no more than 15 percent larger than 2 ½ inches;
5. Shall be predominantly granular;
6. Shall have a minimum effective friction angle, ϕ' = 35 degrees;
7. Shall contain no sod, brush, roots, or other perishable or unsuitable material;
8. On-site clay soils shall not be used for engineered fill, unless blended under the observation of the Geotechnical Engineer to meet requirements.
9. Moisture conditioning of native soils should be anticipated regardless of season;
10. Soils shall be processed to achieve a uniform material suitable for compaction;

C. Surplus Materials. All surplus or unsuitable excavated materials will be designated as waste and shall be disposed in accordance with Section 312316, Excavation.

D. Imported Engineered Fill. Importing of Engineered Fill material, if necessary or required to meet the grades and elevations shown on the plans, shall be considered included in the Contractor's bid for the various items of work involved and no additional compensation will be made therefore. Should such imported material be required, the Contractor shall notify the Geotechnical Engineer of the borrow site location at least 5 working days in advance and provide an adequate sample size so the Geotechnical Engineer can verify the suitability of the material. All imported materials shall be proposed by the Contractor in writing in accordance with the submittal requirements of these Special Provisions and the Standard Specifications. The Contractor shall perform and/or submit all material testing reports and other data as necessary to provide the

Engineer with established laboratory values for optimum moisture and maximum dry density, for any imported material requiring density testing. Any proposed engineered fill that deviates from the criteria stated herein, shall have written acceptance from the Engineer and geotechnical engineer prior to import or placement in the work.

E. If a disagreement between the Contractor and the Geotechnical Engineer occurs over the suitability of materials, the Contractor shall perform laboratory testing to demonstrate compliance with the specifications. The failure of the Contractor to perform the testing shall not relieve the Contractor from the obligation to provide suitable materials.

3. EXECUTION

3.1 ENGINEERED FILL CONSTRUCTION

A. General. Compacted Engineered Fill in Engineered Fills shall be placed in the dry and compacted as specified herein.

B. Borrow Areas. Refer to Section 312316, Stripping and Excavation.

C. Subgrade Preparation. Following Clearing and Grubbing, the subgrade surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the Engineered Fill, and the surface materials of the subgrade shall be compacted and bonded with the first layer of Engineered Fill.

D. Prepared subgrade surface shall be free of loose, uncompacted earth in excess of two inches in depth normal to the slope and shall be at such a moisture content that the Engineered Fill can be compacted against it ensure a good bond between the engineered fill and the subgrade. Subgrade surfaces shall not be steeper than 1 horizontal to 1 vertical. Additional excavation may be required where wet, soft, loose, or pumping soils are encountered.

E. Fill shall not be placed until the required subgrade preparation has been completed and approved by the Geotechnical Engineer.

F. Fill shall not be placed on or in standing water, nor upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill. Placement of fill over saturated, unstable, or pumping subgrades shall not proceed until corrective measures acceptable to the Geotechnical Engineer have been implemented.

G. If soft, wet, or pumping subgrade soils are present, the required minimum level of compaction for the initial fill lift may be adjusted to eighty-five percent (85%) of the soil's maximum dry density as determined in accordance with ASTM D 1557, subject to approval of the Geotechnical Engineer. The intent of the reduction is to limit the amount of construction traffic that could lead to further deterioration and destabilization of the exposed subgrade and to build a more stable pad upon which to place subsequent fill lifts.

H. Horizontal Layer Construction. The compacted Engineered Fill shall be constructed to a sufficient section so as to achieve the required compaction throughout the finished section. Materials to be compacted shall be placed or spread in layers not more than eight (8) inches in loose thickness prior to compaction. Materials excavated to form keyways or over-excavations, and suitable for use as Engineered Fill, shall be blended

uniformly with other excavated soils or disposed of. All fill slopes shall be keyed and benched into native soils in accordance with the Geotechnical Report and the Drawings. Base keyways shall be a minimum of 10 feet wide and extend a minimum of 3 feet below lowest adjacent grade or 2 feet into firm material, whichever is greater. Keyways shall slope a minimum of 2 percent back into the slope. Benches shall extend a minimum of 1.5 feet below existing grade or 1 foot into firm material, whichever is greater. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed. Fill placed around structures will be brought up at approximately uniform height on all sides of the structure.

I. Compaction. The degree of compaction required is expressed as a percentage of the maximum dry density, based on laboratory test procedure, ASTM D 1557. The Engineered Fill shall be compacted to a minimum of 90% of the maximum dry density, unless otherwise specified herein or directed by the Engineer. Construction equipment shall be operated over each layer of fill to ensure that the required compaction is obtained. Special equipment shall be used if needed to obtain the required compaction. Heavy compaction equipment shall not be operated within 2 feet of any structure. Fill adjacent to structures, pipe, conduits, and anti-seep collars shall be compacted to a density equivalent to that of the surrounding fill by means of hand tampers or plate vibrators. Hand directed tampers or compactors shall be used on areas not accessible to heavy compaction equipment. Fills compacted in this manner shall be placed in layers not greater than 4 inches in thickness before compaction and shall meet the same density requirement as for the adjacent area. A sheepsfoot compactor or other approved heavy vibratory compaction equipment shall be used for embankment fill compaction unless otherwise approved by the Engineer.

J. Compaction Testing. All compaction testing shall be performed by the Owner, unless otherwise noted. Any costs to the Owner for testing layers which fail the compaction requirements may be deducted from any progress payment due to the Contractor when, in the opinion of the Engineer, such failure results from the Contractor's lack of diligence in pursuing compaction effort. In the event that a test fails, any testing after the first shall be at the Contractor’s expense.

K. At the discretion of the Engineer, the top 18 inches of fill, within areas specified to receive revegetation treatments, may be compacted to between 80% and 85% of the maximum dry density, to facilitate plant establishment. Prior to seeding, the surface shall be prepared as specified in Section 329200, Seeding.

L. Compaction of backfill adjacent to structures shall not be started until after the expiration of the following minimum time interval after placement of the concrete:

1.	Counterforts, vertical or near-vertical	
2.	Walls with earth loading on one side only	14 days
3.	Walls and counterforts, backfilled on both	
4.	Sides simultaneously	7 days
5.	Anti-seep, collars, conduits,	
6.	Cantilever outlet bents	3 days

M. Moisture Control. Moisture conditioning of native soils shall be anticipated throughout the project regardless of season. The moisture content required is expressed as a percentage, based on laboratory test procedure ASTM D 1557. The moisture shall be uniformly distributed throughout the layer prior to compaction and shall be 1% to 4%

above the optimum moisture content. If the material is not within the required moisture content, the Contractor will be required to moisture condition the soil. The moisture conditioning of fill materials shall be performed prior to placement in the section. The final minor moisture conditioning may be made on the fill, as required. Harrowing, or other approved methods will be required to work the moisture into the material until a uniform distribution of moisture is obtained. Water applied on a layer of fill shall be accurately controlled in amount and distribution so that free water will not appear on the surface during or subsequent to rolling. If the material is too wet for proper compaction or soft and yielding sub-grade is experienced (pumping), the Contractor will be required to aerate the material to a moisture content within the desired limits prior to compaction. If the top surface of the preceding layer of compacted fill or a subgrade or abutment surface in the zone of contact with the fill becomes too dry to permit suitable bond, it shall either be removed or scarified and moistened to an acceptable moisture content prior to placement of the next layer of fill.

N. Dressing. Engineered Fill slopes shall be dressed by over-building and cutting back to the required grade. The Contractor may compact the shoulder of each lift during the placement of fill materials to assist in the subsequent dressing of the slopes.

3.2 CROSS SECTIONS AND ZONING OF MATERIALS

A. Standard Engineered Fill Sections. The dimensions, slopes, and zoning of materials shall conform to the sections shown on the Drawings and specified herein.

B. Zoning of Materials. Unless otherwise specified, the Engineered Fill materials shall be homogeneous. The Engineered Fill shall be free of pockets, lenses, streaks, layers, etc. of different materials.

3.3 FINISH

A. The finished grades shall transition naturally into adjacent existing grades to provide a functional and naturalistic finished surface. Due to the complex nature of the project and the desired aesthetic and functional features, not all details can be accurately represented on the Drawings. As a result, the Contractor may be directed by the Engineer to make minor adjustments to finish grades to best achieve these results. These adjustments may include smoothing or rounding conforms, or changing slope angles or daylight points as necessary to conform to the variable geometry inherent in natural topography. Compensation for this work shall be considered as included in the price paid for the various contract items of work involved, and no additional compensation will be allowed.

B. After the placement of the engineered fills and spoils, the sides and top shall be dressed by final passage of compaction equipment or by dragging to give a smooth surface. The surface area shall be graded to provide surface drainage to flow to desired locations.

3.4 ROADS AND RAMPS

A. Maintain Access. At locations where access roads to existing facilities are destroyed because of the work required under this contract, the Contractor shall provide temporary roads, if directed by the Engineer, to give access to fields and buildings during the construction period. Such facilities shall be removed to the extent required by the Engineer.

B. Temporary Haul Roads. Temporary haul roads shall be constructed as required to transport materials from borrow source or excavation to Engineered Fill site. Temporary ramps to be constructed for the Contractors convenience need not comply with these foundation preparation and Engineered Fill construction requirements. Unless otherwise directed by the Engineer, temporary ramps shall be removed prior to completion of the work and original grades restored.

C. Refer to Section 015000, Mobilization, for additional requirements related to establishment of temporary access.

3.5 GRADE TOLERANCES

A. General. Engineered Fills shall be constructed to the net grade and cross section shown on the Drawings.

B. Grade Tolerances. At all points a tolerance of 0.2 (two-tenths) foot above, and 0.1 (zero) foot below the prescribed grade will be permitted in the final dressing, provided that any excess material is so distributed that the crown of the Engineered Fill drains in the desired direction and that there are no abrupt humps or depressions in surfaces. However, this tolerance above grade may be modified at locations where, in the opinion of the Engineer, such modifications will not impair the design or appearance of the project.

3.6 SPECIAL MEASURES

A. Measures and construction methods shall be incorporated as needed and practical that enhances fish and wildlife values. Special attention shall be given to protecting visual resources and maintaining key shade, food, and den trees.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Engineered Fill. Engineered Fill will be measured on a lump sum basis.

4.2 PAYMENT

A. Engineered Fill, measured as specified above will be paid for at the contract lump sum price, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to construct compacted Engineered Fills as specified, including hauling of excavated materials from the source.

B. No separate payment will be made for the Engineered Fill foundation preparation, including over-excavation and keyway and bench construction, shrinkage of material or materials placed above the net grades and slopes as allowance for shrinkage. All costs associated with this work will be considered incidental to the Engineered Fill lump sum pay item.

C. No separate payment will be made for incidental grading beyond the projected toe of the Engineered Fill cross section. The cost for this work shall be included in contract unit price for compacted Engineered Fill.

D. No payment will be made for construction or removal of temporary roads or ramps.

E. No additional payment will be made for costs associated with stabilizing unstable materials. The cost for this work shall be included in contract Lump Sum price for compacted Engineered Fill.

F. Payment will be made under:

Pay Item	Pay Unit
Engineered Fill	Lump Sum

END OF SECTION

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SECTION 313519.16
SLOPE PROTECTION FABRIC

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SECTION 313519.16
SLOPE PROTECTION FABRIC

1. GENERAL

1.1 DESCRIPTION

A. Work under this section includes furnishing all labor, materials, equipment, and incidentals to install and maintain Slope Protection Fabric to protect newly constructed or excavated and seeded soil slopes, as shown on the Drawings, as specified in the Storm Water Pollution Prevention Plan (where applicable), and as specified herein, or as otherwise directed by the Engineer.

1.2 RELATED SECTIONS

A. Section 015000, Mobilization

B. Section 015713.01, Fiber Rolls

C. Section 015723, Storm Water Pollution Prevention Plan Implementation

D. Section 312316, Excavation

E. Section 329300, Planting

F. Section 329200, Seeding

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 1117 – Standard Guide for Evaluating Nonwoven Fabrics
2. D 6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
3. D 6475 - Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets.
4. D 6525 - Standard Test Method for Measuring Nominal Thickness of Rolled Erosion Control Products.
5. D 6567 – Standard Test Method for Measuring the Light Penetration of a Turf Reinforcement Mat (TRM)
6. D 6818 - Standard Test Method for Ultimate Tensile Properties of Rolled Erosion Control Products.

1.4 SUBMITTALS

A. Submit to the Engineer, for review and approval, the following manufacturer's data and certifications:

1. A certificate stating the name of the Slope Protection Fabric manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.
2. A certificate stating that the furnished products meet requirements of the Specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.

B. Independent Performance Test Results shall be provided upon request.

C. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the Specification. Documentation describing the quality control program shall be made available upon request.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Slope Protection Fabric labeling, shipment and storage shall follow ASTM D 4873.

B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

D. Each Slope Protection Fabric roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.

E. The protective wrapping shall be maintained during periods of shipment and storage.

F. During storage, Slope Protection Fabric rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F) and any other environmental condition that might damage the Slope Protection Fabric.

1.6 QUALITY ASSURANCE

A. Slope Protection Fabric shall be subject to sampling and testing to verify conformance with this Specification. Sampling for testing shall be in accordance with ASTM D 4354.

B. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.

C. Sewn Seams (if required):

1. For seams that are to be sewn in the field, the Contractor shall provide at least a 2 meter (six-foot) length of sewn seam for sampling by the Engineer before the geotextile is installed.
2. For seams that are sewn in the factory, the Engineer shall obtain samples of the factory seams at random from a roll of geotextile that is to be used on the project.
3. If seams are to be sewn in both directions, samples of seams from both directions shall be provided.
4. For seams that are field sewn, the seams sewn for sampling shall be sewn using the same equipment and procedures as will be used for the production seams.
5. The seam assembly description shall be submitted by the Contractor along with the sample of the seam. The description shall include the seam type, sewing thread, and stitch density

2. PRODUCTS

2.1 SLOPE PROTECTION FABRIC

A. Fabric. Slope Protection Fabric shall be "North American Green Rollmax BioNet C125BN", or equivalent, meeting the following Specifications:

B. The Slope Protection Fabric shall meet requirements established by the Erosion Control Technology Council (ECTC) Specification and the U.S. Department of Transportation, Federal

Highway Administration's (FHWA) Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-03 2003 Section 713.17 as a Type 4, Long-term Erosion Control Blanket.

C. Slope Protection Fabric shall be a long-term erosion control blanket, constructed of 100% biodegradable materials containing a 100% coconut fiber matrix, with a functional longevity of up to 24 months. The coconut fiber shall be evenly distributed over the entire area of the blanket. The blanket shall be covered on the top and bottom with 100% biodegradable natural organic fiber netting woven into an approximate 0.50 x 1.00 inch (1.27 x 2.54 cm) mesh. The blanket shall be sewn together with biodegradable thread on 1.50 inch (3.81 cm) centers.

Property	**Test Method**	**Typical**
Thickness	ASTM D6525	0.23 in (5.84 mm)
Resiliency	ECTC Guidelines	85%
Mass per Unit Area	ASTM D6475	9.79 oz/yd² (333 g/m²)
Water Absorption	ASTM D1117	365%
Swell	ECTC Guidelines	40%
Stiffness	ASTM D1388	0.11 oz-in (1,218 mg-cm)
Light Penetration	ASTM D6567	16.20%
Smolder Resistance	ECTC Guidelines	Yes
MD Tensile Strength	ASTM D6818	206.4 lbs/ft (3.06 kN/m)
MD Elongation	ASTM D6818	15.3%
TD Tensile Strength	ASTM D6818	145.2 lbs/ft (2.15 kN/m)
TD Elongation	ASTM D6818	12.9%
Biomass Improvement	ASTM 7322	473%
MD – Machine Direction		
TD – Transverse Direction		

2.1 STAKES

A. Stakes shall be shaped hardwood pins designed to safely and effectively secure the slope stabilization fabric. The wood stake must exhibit ample rigidity to enable being driven into hard ground, with sufficient flexibility to resist breakage. The wood stake shall be the Tensar (North American Green) Eco-Stake or approved equal, with the following dimensions:

Feature	**Dimension**
Leg Length	11.00 in.
Head Width	1.25 in.
Head Thickness	0.40 in.
Leg Width	0.60 in. (tapered to a point)
Leg Thickness	0.40 in.
Total Length	12.0 in.

3. EXECUTION

3.1 PREPARATION

A. Grade and compact areas to be treated with Slope Protection Fabric as specified or as directed by Engineer.

B. Remove large rocks, soil clods, vegetation, and other sharp objects that could keep Slope Protection Fabric from intimate contact with subgrade.

C. Prepare seedbed by loosening the upper 50 to 75 mm (two to three inches) of soil.

D. Apply seed in accordance with Section 329200, “Seeding” to the scarified surface prior to installation of Slope Protection Fabric.

E. Construct 150 x 150 mm (six-inch x six-inch) anchor trench at top of slope.

3.2 INSTALLATION

A. Install Slope Protection Fabric at elevation and alignment indicated.

B. Secure upslope edge of Slope Protection Fabric into a six-inch x six-inch trench with a row of staples/stakes approximately 12 inches apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to compacted soil and fold remaining 12 inch portion of Slope Protection Fabric’s back over seed and compacted soil. Secure Slope Protection Fabric over compacted soil with a row of staples/stakes spaced approximately 12 inches apart across the width of the Slope Protection Fabric . Embed the entire perimeter within a key trench.

C. Unroll Slope Protection Fabric downslope. Consecutive rolls spliced down or along the slope must be placed end over end (shingle style) with 12 inches overlap. Staple through overlapped area, approximately 12 inches apart across entire Slope Protection Fabric’s width.

D. Secure Slope Protection Fabric to slope with ground anchoring devices in accordance with the manufacturer’s recommendations for the application (slope or channel).

E. Alternate installation methods must be approved by Engineer prior to execution.

3.3 INSPECTION AND MAINTENANCE

A. The Contractor shall inspect Slope Protection Fabric immediately after each rainfall, and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor.

B. The Contractor shall also make a daily review of the location of Slope Protection Fabric in areas where construction activities have altered the natural contour and drainage runoff to ensure that the Slope Protection Fabric is properly located for effectiveness. Where deficiencies exist as determined by the Engineer, repairs or replacement shall be performed as directed by the Engineer.

C. Damaged or otherwise ineffective Slope Protection Fabric shall be repaired or replaced promptly.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Slope Protection Fabric will be measured by the square yard of slope protection fabric installed in accordance with the Drawings, as specified, or as directed by the Engineer. Measurements will be taken parallel to the finished surface. No additional payment will be made for seams, overlaps, anchor trenches, or wastage.

B. Slope Protection Fabric that the Contractor installs as a temporary BMB, in addition to that shown on the Drawings, will not be separately measured for payment.

4.2 PAYMENT

A. Slope Protection Fabric will be paid for at the contract unit price per square yard, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing fabric, complete in place, including trench excavation and backfill, and maintenance, as shown on the Drawings, as specified herein, or as directed by the Engineer.

B. Payment will be made under:

Pay Item	Pay Unit
Slope Protection Fabric	Square Yard

END OF SECTION

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SECTION 329200
SEEDING

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SECTION 329200
SEEDING

1. GENERAL

1.1 DESCRIPTION

A. Work covered under this section consists of furnishing all labor, tools, materials, equipment and incidentals required to perform Seeding, as specified, as shown on the Drawings, or as directed by the Engineer.

1.2 RELATED SECTIONS

A. Section 015713.01, Fiber Roll

B. Section 312316, Excavation

C. Section 312323, Engineered Fill

D. Section 313519.16, Slope Protection Fabric

E. Section 329000, Planting

1.3 SUBMITTALS

A. Provide submittals for all materials in accordance with Section 21-2.01C, Submittals, of the State Standard Specifications.

1.4 QUALITY ASSURANCE

A. All seed shall be labeled in accordance with the California Food and Agricultural Code and shall be delivered to the site in sealed individual, unmixed bags with the vendor's certificate attached. Seed shall be sampled and tested in accordance with the State Standard Specifications, Section 21-2.01D(3). Seed treated with mercury compounds shall not be used.

B. Seed which has become wet, moldy, or otherwise damaged in transit or in storage, will not be acceptable.

2. PRODUCTS

2.1 MATERIALS

A. Seed Source. Seed shall be provided by the Resource Conservation District of Santa Cruz County.

B. Quantities shown on the Drawings represent pure live seed (pls).

C. At no time shall the seed mix contain noxious weed seed. Seed shall be maintained in optimal health and be protected at all times from animal damage; vandalism; inclement weather conditions, including drought, wind, and frost; toxic water; sunlight; moisture; or contact with vehicles, equipment, and tools and any other conditions that would damage or reduce the viability of the seed.

D. Seed Mix. The seed mix and application rates **are as shown on the Drawings**. No substitutions are allowed without written consent of the Engineer.

E. Fiber. Fiber shall comply with Section 21-2.02D of the State Standard Specifications

F. Tackifier. Tackifier shall comply with Section 21-2.02E of the State Standard Specifications.

G. Straw Mulch. Straw mulch shall be derived from rice straw. 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. Straw shall be free of mold. Straw shall be cured and dry with no water added after baling. Source must meet or exceed state certification standards for "weed free".

H. Water. Water shall be free of chemicals detrimental to the seed mixture.

3. EXECUTION

3.1 PREPARATION

A. General. Seed the areas disturbed by construction activities, as specified herein or as directed by the Engineer.

B. Debris Removal. Prior to ground surface preparation operations remove and dispose of all wire, rubbish, stones, and other material which might hinder proper grading, and subsequent maintenance.

C. Surface Preparation. Surfaces which are too hard or smooth to accept the seeding, as determined by the Engineer, shall be broken up to a minimum depth of 3 inches, by disking or other methods approved by the Engineer, until the condition of the soil is acceptable. When conditions are such, by reason of excessive moisture or other factors, that satisfactory results are not likely to be obtained, the work shall be stopped and shall be resumed only when directed. Slopes in excess of 25% shall be prepared by track-walking or equivalent method approved by the Engineer.

3.2 APPLICATION OF SEED, MULCH, AND TACKIFIER

A. Existing Features. During seeding operations, care shall be taken to avoid damaging existing facilities, vegetation to remain, or any other items on or around the planting areas. This includes cautiously moving hoses and not coating plants to remain with hydroseed slurry.

B. Seeding Areas: Apply seed to areas indicated on the Drawings, or as directed by the Engineer.

C. Time of Seeding: Perform all seeding between October 1st and October 31st of the year construction begins. The seeding operation shall be halted when, in the opinion of the Engineer, conditions of high winds, excessive moisture or other factors are not conducive to satisfactory results. Upon written request of the Contractor, and upon written approval of the Engineer, seeding may be done during off seasons provided that:

1. The resulting stand of grass shall be at least equal to the stand that might be expected from planting during the normal season; and
2. The establishment period shall be lengthened, as required, to produce the above specified stand at no additional cost to the Owner.
3. Perform seeding prior to placement of erosion control fabric, where erosion control fabric is specified.

3.3 METHOD OF SEEDING

A. Seeding shall be performed with hydro-seeding equipment, except as noted below.

3.4 HYDRO-SEEDING.

A. Apply hydroseed in accordance with Section 21-2.03, Hydromulch and Hydroseed, of the State Standard Specifications, as modified below.

B. The seed and tackifier shall be mixed with the fiber and water to form a slurry. Mix the slurry in tanks having continuous agitation so that a homogeneous mixture is discharged hydraulically through hoses on the area to be seeded. Seed species shall be added to the hydro-seeder in the Engineer's presence to ensure a seeding rate and quality as specified on Drawings. Seed shall be discharged within 2 hours. If mixture remains in tank for more than 2 hours, it shall be removed from the job site and replaced at the Contractor's expense. The Contractor shall employ the following two-step Hydro-seeding process.

   1. Step 1: Apply a complete mixture as follows: Apply Seed mix at the rate specified on the Drawings, tackifier at a rate of 150 pounds per acre, and Fiber at a rate of 500 pounds per acre.
   2. Step 2: Apply Fiber at a rate of 3000 pounds per acre.

3.5 BROADCAST SEEDING.

A. Broadcast seeding may be used in lieu of hydro-seeding for small areas of less than one half acre, or to reseed any previously hydro-seeded areas disturbed during planting operations, where approved by the Engineer. Seed shall be dry-applied by the following method:

   1. Broadcast seed at the rates specified on the Drawings, uniformly by hand, mechanical hand seeder, combination seed spreader and cultipacker, or other approved equipment. Where seed is broadcast by hand or mechanical hand seeder, half the seed shall be sown with the sower moving in one direction, and the remainder sown with the sower moving at right angles to the first sowing. Broadcast seeding shall not be done during windy weather.
   2. Rake seed into the soil to achieve a sowing depth of approximately 1/8 inch to 1/4 inch.
   3. Following the application of seed, straw mulch shall be pneumatically applied or hand broadcast at the rate of 3,000 pounds per acre (typically 1.5 to 2 tons/acre), where erosion control fabric is not specified, and 500 lbs per acre where erosion control fabric will be used.
   4. Following the application of straw mulch, Apply stabilizing emulsion with Hydro-seeding equipment at a rate of 100 pounds per acre.

3.6 REPAIR

A. General. When any portion of the ground surface becomes gullied or otherwise damaged following seeding within the period of Contractor's responsibility, repair the affected portion to re-establish the condition and grade of the soil prior to planting and then reseed as specified for initial planting, all at no cost to the Owner.

B. Reseeding. When it becomes evident that the seeding has been unsuccessful, the Engineer will require that these areas be reseeded with the same seed and quantity as specified for the initial seeding. Complete reseeding within fifteen (15) days following notification and these areas shall be maintained by watering, as specified above, until the successful grass is established. Prepare the area to be reseeded as directed by the Engineer.

3.7 FIELD QUALITY CONTROL

A. During the course of work or upon completion of the project, a check of the quantities of materials will be made against the areas treated, and if the minimum rates of application have not been met, the Engineer will require the distribution of additional quantities of those materials to make up the minimum applications specified.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Seeding will be measured on a per acre basis for each acre of seed furnished and installed by the Contractor and approved by the Engineer (as shown on the Drawings).

B. Areas disturbed by the Contractor and requiring seeding outside the designated limits of disturbance shall not be measured for payment.

4.2 PAYMENT

A. Seeding will be paid for at the contract unit price for each acre seeded, which price will include furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the Seeding as specified, as shown on the Drawings, or as directed by the Engineer.

B. The cost of seeding areas outside the designated limits of disturbance shall be solely borne by the Contractor.

C. Payment will be made under:

Pay Item	Pay Unit
Seeding	Acre

END OF SECTION

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SECTION 329300
PLANTING – SHRUB TRANSPLANTS

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SECTION 329300
PLANTING

1. GENERAL

1.1 DESCRIPTION

A. The work required under this Section includes, but is not limited to, all labor, tools, materials, equipment, and incidentals required to salvage, install, and maintain Willow Transplants for installation at locations specified on the Drawings or otherwise directed by the Engineer. Work includes all grading associated with installation of salvaged materials, as shown on the Drawings, described in these Specifications, or as directed by the Engineer. Work includes watering to maintain Plantings through the specified maintenance period.

1.2 RELATED SECTIONS

A. Section 329200, Seeding

1.3 SUBMITTALS – NOT USED

1.4 QUALITY ASSURANCE

A. Proper Installation. The Contractor shall be responsible for properly salvaging, storing and installing the native transplants, to ensure healthy and vigorous growth and development according to the Plans, these Specifications and the Engineer's direction.

B. Substitutions. No materials substitutions will be allowed without approval from the Engineer.

2. PRODUCTS

2.1 GENERAL

2.2 MATERIALS

A. Live Willow Transplants. Live Willow Transplants are live willow boles with intact rootwads that have been excavated from the project area. They shall have a minimum rootwad diameter of 30-inches when placed, including soil retained on the roots. Final approval of qualifying transplants shall be subject to approval of the Engineer. Plant materials shall be sound, healthy specimens, identified for salvage by the Engineer, salvaged as specified herein, and as directed by the Engineer.

3. EXECUTION

3.1 GENERAL

A. Drawings. The Drawings are intended to show general layout and quantity, but not necessarily the exact individual planting locations for each species to be installed. The Contractor shall be responsible for the installation of all of the plants at the typical spacing and layouts shown on the Drawings and described in these Specifications, and as directed by the Engineer.

B. Schedule. The Contractor's strict conformance to the Project schedule is essential for the success of this Project.

1. Willow Transplants: Salvage willow transplants as excavation proceeds and replant them within 4 hours of salvage.

C. Live plant materials storage. Live plant materials shall be always protected from animal damage; vandalism; inclement weather conditions, including drought, wind, and frost; toxic water; excessive sunlight, or contact with vehicles, equipment, and tools and any other conditions that would damage or reduce the viability of the materials. Protect from desiccation and always keep out of direct sunlight. Materials found left in direct sunlight will be rejected.

D. Disturbed areas. Do not disturb areas outside of the designated limits of disturbance, unless authorized in writing by the engineer. All associated restoration and revegetation of disturbed areas outside the designated limits of disturbance, as shown on the drawings, shall be borne solely by the contractor.

3.2 SITE CONDITIONS

A. Site Conditions. The contractor shall verify site conditions and be familiar with existing grade conditions, locations of existing features to be preserved, and all existing vegetation to remain. Field adjustments may be necessary to avoid disturbances to existing vegetation to remain. Before ordering materials or proceeding with work, the Contractor shall verify all dimensions and quantities between the Drawings, these Specifications and field conditions; all discrepancies shall be reported immediately to the Engineer.

B. Field Adjustments. Field Adjustments necessary to accommodate or to minimize disturbances to existing site conditions shall be done at the Contractor's expense. Work shall be postponed in any area of discrepancy with the Drawings or these Specifications until the Engineer has provided a written resolution to the conflict. The Contractor shall assume full responsibility for proceeding with work without written approval.

C. Coordination. The Contractor shall coordinate the planting installation to avoid conflicts with roads, utilities, other construction, and any existing features.

D. Vandalism. Throughout the Contract period, the Contractor shall be responsible for the replacement or repair of any part of the plant installation that is damaged because of vandalism; the Contractor shall be responsible for securing the Project site to minimize negative effects from vandalism.

3.3 WILLOW TRANSPLANTS

A. Salvage

1. Willow Transplants to be salvaged for transplanting will be flagged in the field by the Contractor, as specified in Section 31 11 00, Clearing and Grubbing.
2. Prior to removal, branches shall be lopped to 6-18 inches above the root crown, using sharp, clean tools.
3. The rootwad and a minimum 18-inch layer (at sides and base) of roots and soil shall be removed from the ground and either transported directly to the proposed planting location for installation or stored as outlined below. Perform salvage and relocation in such a manner as to minimize handling and associated disturbance to the soil bound by the roots.
4. If the Willow Transplant is not planted within 60 minutes of salvage, it shall be immediately wrapped with a single layer of saturated burlap to prevent desiccation of the roots and placed under a shade covering. Contractor shall water the transplants daily to maintain saturation of the burlap and soil mass until planted. If, in the opinion of the Engineer, the willows are allowed to desiccate, they will be chipped for mulch and will not be measured for payment.

5. Do not stack Willow Transplants on top of one another during storage.
6. **In no event shall salvaged rootwads be stored for periods exceeding 72 hours, without prior written permission of the Engineer.**

B. Installation

1. Willow Transplants shall be placed at floodplain locations to be flagged in the field by the Engineer.
2. The excavated rootwad shall be placed in a pre-prepared hole. The hole shall be
3. Thoroughly watered immediately prior to planting. The sides of the planting hole shall be scarified prior to planting.
4. Remove burlap prior to planting. Backfill the hole half-way with native soil and jet with water to remove voids after placement. Continue to add soil and water until the saturated backfill material covers the top of the root crown to the approximate original depth of soil, prior to salvage.

3.4 CLEAN UP

A. Daily Cleanup. Site cleanup shall occur daily. All garbage, construction debris, excess plants and dirt, other discarded materials, and extraneous equipment caused by or due to the Contractor shall be removed offsite at the Contractor's expense and in accordance with State and local regulations.

3.5 OBSERVATION AND TESTING

A. Observations. The Contractor shall provide the Engineer with 48-hours advance notification for the following required planting stage acceptance observations.

1. Field marking of individual planting site locations,
2. Observation and acceptance of plant materials before installation,
3. Preparation for individual planting sites,
4. Planting operations. The Contractor shall be responsible for the complete installation of plants according to the Drawings and as specified herein. Any unacceptable plants or planting operations shall be corrected according to the Engineer's direction and at the Contractor's expense before the Final Acceptance observation.

3.6 MAINTENANCE PERIOD

A. Site Conditions. The contractor shall verify site conditions and be familiar with existing grades, locations of existing features to be preserved, and all existing vegetation to remain.

B. Vandalism. Throughout the Maintenance period, the Contractor shall be responsible for the replacement or repair of any part of the plant installation that is damaged because of vandalism; the Contractor shall be responsible for securing the Project site to minimize negative effects from vandalism.

C. Records. All regular observations and subsequent maintenance activities shall be recorded monthly in Maintenance Report forms, according to this Specification section.

D. Watering. Contractor shall water all Willow Transplants upon installation and at least twice weekly until December 1st, unless otherwise directed by the Owner's Representative. Water shall be applied by hand, using a hose, or through temporary irrigation. Water trucks are not an acceptable alternative. Each willow transplant shall receive a minimum of 20 gallons per week.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Willow Transplant will be measured on a unit basis for each individual Willow Transplant completely supplied and installed by the Contractor and approved by the Engineer.

4.2 PAYMENT

A. Willow Transplant. Payment for Willow Transplant, measured as specified, will be paid at the contract unit price for each Willow Transplant, which price will include all costs in connection therewith.

Pay Item	Pay Unit
Willow Transplant	Each

END OF SECTION

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SECTION 334000
STORM DRAINAGE FACILITIES

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SECTION 334000
STORM DRAINAGE FACILITIES

1. GENERAL

1.1 DESCRIPTION

A. The work covered by this section consists of furnishing and installing the subsurface and surface storm drainage facilities as shown on the Drawings, as specified herein, or as otherwise directed by the Engineer. Work includes, but is not limited to the following:

1. Install all pipes, flumes, precast concrete inlets and associated precast structures, ballast blocks, adjustable flashboard weirs, debris racks, cleanout boxes, outlet energy dissipaters, anti-seepage collars, and perform associated structural excavation, trenching and backfill, and compaction.

B. Related Sections

1. Section 312319, Dewatering
2. Section 312316, Excavation
3. Section 312323, Engineered Fill
4. Section 017123.16, Construction Surveying

1.2 REFERENCES

A. State of California Department of Transportation (CALTRANS) Standard Specifications

B. Geotechnical Engineering Investigation by:

CMAG Engineering
41 Hangar Way, Suite D
Watsonville, CA 95076
831.475.1411
Job No. 24-125-M
Dated: February 16, 2026

1.3 SUBMITTALS

A. Submit to the Engineer, for review the following:

1. Proposed gradation and quarry source for all rock and bedding materials.
2. HDPE Pipe. Manufacturer's catalog data and installation instructions for pipe materials. A Certificate of Compliance(s) for each type of plastic pipe furnished and proposed for installation. The certificate shall also certify that the plastic pipe and joints comply with the requirements of the specifications, and shall include the resin material cell classification, unit weight of pipe, average pipe stiffness, joint property requirements, and date of manufacture. Submit the manufacturer's certification or copy of plant audits and test results from the National Transportation Product Evaluation Program (NTPEP) for the current cycle of testing for each pipe diameter furnished and its conformance with AASHTO minimum requirements.
3. Shop drawings showing dimensions, materials, reinforcement, penetrations, frame, and grate, etc. of the proposed precast concrete structures.
4. Proposed Debris racks.

2. PRODUCTS

A. Comply with the Drawings and Section 61 of the State Standard Specifications.

B. Pipe. Pipe shall be Type S, conforming to the provisions in Sections 64, “Plastic Pipe” and Section 61, “Culvert and Drainage Pipe Joints” of the Standard Specifications and this Section. Pipe shall be dual-walled high-density polyethylene (HDPE) pipe with a smooth (non-corrugated) interior surface, and shall have a Manning's roughness coefficient of 0.

C. Precast Concrete Structures. Comply with the notes and details on the Drawings.

D. Debris Rack. Comply with the notes and details on the Drawings.

E. Backfill. Backfill shall comply with the notes and details on the Drawings, the Geotechnical Investigation, and Section 64-2.02 of the Standard Specifications.

F. Anti-Seepage Collar. Comply with the notes and details on the Drawings and the Geotechnical Report.

3. EXECUTION

3.1 GENERAL

A. The drainage materials shall be installed in accordance with the manufacturer’s recommendations, as shown on the Drawings, as specified herein, and in conformance with the provisions in Section 64, “Plastic Pipe” of the Standard Specifications.

B. Trenching dimensions shall comply with the notes and details on the Drawings and the Geotechnical Investigation.

3.2 PLASTIC PIPE.

A. Conform to the provisions in Sections 64, “Plastic Pipe” and Section 61, “Culvert and Drainage Pipe Joints” of the Standard Specifications.

B. Plastic pipe, fittings, gaskets, and other components shall be stored in a way that protects materials from the weather, heat sources, and corrosive liquids, in addition to protection from direct sunlight by storing in containers and/or covering with tarpaulins or other suitable materials. To minimize the potential for pipe shrinkage after installation, the temperature of pipe to be laid must not be more than five (5) degrees Fahrenheit higher than the ambient temperature of the trench. Should the Contractor not provide adequate cover of the pipe or install during changes in temperature the Engineer will not accept the pipe and the Contractor will be required to replace the pipe which is deemed unacceptable by the Engineer. The Contractor will bare all costs associated with the replacement and no additional compensation will be allowed for.

C. Pipes shall be laid to the lines and grade shown on the Plans with the sections properly jointed, following generally accepted practices, the Manufacturer’s recommendations, the Standard Specifications, these Special Provisions, and as directed by the Engineer. Care shall be taken not to damage pipe sections, joints, or gaskets during assembly. Contractor shall make use of pipe lubricant, installation stub, etc. and follow manufacture recommendations to ensure all pipe sections are pushed “home.” A “come-along” or other similar method should be used; construction equipment such as an excavator bucket, etc. must not have direct contact with the plastic pipe end sections unless an installation stub and large timber or other suitable cushioning medium is utilized. Excavation and backfill shall conform to Section 19-3, “Structure Excavation and Backfill”, of the Standard Specifications. Attention is directed to Section 64-1.02B “Backfill” of the Standard Specifications for additional information specific to the gradation of structure backfill for plastic pipes. The Contractor shall clean the interior of the pipeline as work progresses and the pipeline shall be clear and free of debris and sediment before acceptance by the Engineer.

D. The trench shall be excavated to the depth and width as necessary to allow for proper installation of the pipe and compaction of backfill material to the lines and grades as shown on the Project Plans and applicable details. The bottom of the trench shall be graded and prepared so as to provide a firm and uniform bearing for the pipe along its entire length. Where the trench bottom or immediate adjacent side walls are unsuitable (i.e. clay, peat, soft muck/refuse or bedrock/unyielding material unable to provide long-term pipe support), the Contractor shall excavate to a depth required by the Engineer and replace with suitable material as specified or directed by the Engineer. In addition and at the discretion of the Engineer, a geotextile material may be required to stabilize the bottom of the trench. In-situ trench foundation shall be no less than 90% standard proctor; any materials placed to stabilize trench bottom foundation shall be no less than 95% standard proctor. Suitable bedding material shall be Class I or II in accordance with ASTM D2321, or accepted native soils. Minimum bedding thickness shall be 4 inches. Suitable material for the initial backfill or pipe embedment (up to minimum 12 inches above top of pipe) including the haunch area and pipe zone shall be Class I or II in accordance with ASTM D2321. The final backfill section shall be structure backfill, aggregate base, or accepted native soils, as shown on the Plan details, and in conformance with Section 19-3, "Structure Excavation and Backfill", of the Standard Specifications. Any trench backfill shall be placed in uniform lifts (not to exceed 8 inches) and shall be compacted to a relative compaction of 95 percent. Where conditions (i.e. space constraints, poor trench wall soil qualities, etc.) are cause for the Contractor's inability to achieve the backfill compaction requirements, flowable fill or controlled low strength material (CLSM) shall not be placed in the work without prior acceptance of the Engineer.

E. In situations where the plastic pipe is placed under asphalt concrete paving or other concrete surface improvement and the cover over the pipe, from top of pipe to top to finished grade is 18-inches or less, then structural backfill shall be slurry cement backfill.

F. Allowable joint deflection or longitudinal bending is dependent on pipe size and/or joint design, and shall not exceed the pipe manufacturer's published limits. No deflection in pipe shall be allowed without prior written acceptance by the Engineer.

G. Where pipes are installed in manholes, drainage inlets, junction boxes or other structures, the connection shall be at least equal to that of the pipe joint performance requirements. Soil-tight pipe joints are specified, the ends of the pipes shall be placed flush or cut off flush with the inside face of the structure, and be grouted in place with hydraulic cement "non-shrink" grout, unless otherwise directed by the Engineer. Performance of the pipe, fittings, and connections is highly dependent on proper installation procedures. Installation shall be in conformance with all manufacture recommendations, the Project Plans and applicable details, the Standard Specifications, these Special Provisions, and as directed by the Engineer. The costs for these connections (including all materials, adapters, gaskets, seals, band clamps, couplings, grout, concrete collars, etc.) shall be included in the associated bid item of work and no additional compensation will be allowed for. There will be no separate payment for the connections required for a complete construction of the project.

H. Where pipes are to connect to existing pipes, proper couplings and methods shall be utilized to connect the plastic pipe to the existing pipe (including differing sizes and material), and the connection shall be at least equal to that of the pipe joint performance requirements. The connection shall be in conformance with all manufacturer recommendations, these Special Provisions, the Standard Specifications, and as directed by the Engineer. The costs for these couplings (including all materials, gaskets, seals, grout, concrete collars, etc.) shall be included in the associated bid item of work and no additional compensation will be allowed for. There will be no separate payment for the couplings required for a complete construction of the project.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Drainage Facilities is a lump sum pay item.

4.2 PAYMENT

A. Drainage Facilities will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the drainage facilities, as specified, as shown on the Drawings, or as directed by the Engineer.

B. Payment will be made under:

Pay Item	Pay Unit
Storm Drainage Facilities	LS

END OF SECTION

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SECTION 354200
LOG STRUCTURES

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SECTION 354200
LOG STRUCTURES

1. GENERAL

1.1 DESCRIPTION

A. Work within this section includes furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the Log Structures, complete in place, including excavation, slash, log supply, preparation, placement, and backfilling, as specified, as shown on the Drawings, or as otherwise directed by the Engineer.

1.2 RELATED SECTIONS

1. Section 311100, Clearing and Grubbing
2. Section 312319, Dewatering
3. Section 0312316, Excavation

1.3 SUBMITTALS

A. Submit to the Engineer, for review and approval, the following, prior to placing log structures:

1. Photos of all logs. Each log shall be tagged with a number, referenced in the photos.

2. PRODUCTS

2.1 MATERIALS

A. Logs.

1. Logs may be imported or salvaged from the construction site, and shall meet the material specifications shown on the Drawings.
2. All logs shall be inspected for approval by the Engineer, prior to installation.
3. Refer to for the Drawings for trees available for salvage.

B. Backfill. Backfill shall consist of native material meeting the requirements of Engineered Fill Material, per Section 312323, to match surrounding surface treatments shown on the Drawings.

3. EXECUTION

3.1 GENERAL

A. Prior to the start of work, the Engineer shall designate a representative authorized to observe the Contractor's placement of Log Structures. Contractor shall notify the authorized representative 72 hours prior to placement of Log Structures. Construct all Log Structures in the presence of the authorized representative.

B. Log structure designs are shown conceptually due to the inherent variability of material properties. The design requires that the Engineer or their designated representative continuously observe construction of the log structures to ensure the intent of the design is met. Observations must include log selection, placement, and placement of backfill. Any log structures constructed without the Engineer or their designated representative present may result in rejection of the work by the Engineer and reconstruction by the Contractor at no additional cost to the Owner.

C. The construction of Log Structures requires equipment which can place logs in precise locations. An excavator of a suitable size and containing a thumb is suggested.

D. Log Placement. Log placement locations shown on the Drawings are approximate. Exact locations shall be as approved by the Engineer, or his authorized representative.

3.2 FIELD QUALITY CONTROL

A. Tolerances. Log and placements shown are approximate. Final location and orientation shall be as directed by the Engineer.

B. Logs. All logs shall be inspected for approval by the Engineer, prior to installation.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Log Structures will be measured by the number of Log Structures installed, as shown on the Drawings, as specified, and as directed by the Engineer.

4.2 PAYMENT

A. Log Structures will be paid for at the contract unit price for each Log Structure installed including all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing each Log Structure, complete in place, including excavation and backfill, as shown on the Drawings, as specified herein, or as directed by the Engineer.

B. Payment will be made under:

Pay Item	Pay Unit
Log Structures	Each (EA)

END OF SECTION