TECHNICAL SPECIFICATIONS
FOR
DONNER CREEK RESTORATION PROJECT
SITE 1

Prepared for:

Truckee River Watershed Council
Truckee, CA

foriver
TRUCKEE RIVER WATERSHED COUNCIL

Prepared by:

WILDSCAPE
ENGINEERING

Prepared for

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SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section describes how to use and protect the establishment of control points, benchmarks, and grade staking implemented for the layout and installation of the Project.

B. The reference points to be provided by the Engineer will include referenced monuments and elevation benchmarks in the vicinity of the project.

C. The Contractor will meet onsite with the Engineer and Licensed Land Surveyor to discuss the extent and positioning of grade stakes and information to be recorded on the stakes to adequately locate and construct project features at Site 1.

1.2 SURVEY AND STAKING REQUIREMENTS

A. Preserve all reference and control points. After beginning construction, replace all destroyed or disturbed initial reference or control points necessary to the Project.

B. Survey and establish controls and staking shall be within the tolerances as follows.

	Horizontal	Vertical
Permanent Reference Points	0.05 feet	0.05 feet
Excavation and Earthwork	0.20 feet	0.20 feet

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

A. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 01110

SUMMARY OF WORK AND DEFINITION OF BID ITEMS

PART 1 GENERAL

1.1 DESCRIPTION

The Donner Creek Restoration Project Site 1 (Project) sponsored by the Truckee River Watershed Council will restore and stabilize a heavily eroded bank that runs alongside an existing mobile home park near the Union Pacific Railroad culvert outlet. Due to the juxtaposition of the railroad crossing culvert immediately upstream from and pointed directly at the outer bend bank at Site 1, extensive erosion has occurred from the "jetting" of high flows through the culvert directly onto the hillside during prior heavy winter storms.

Designs will restore the bank to a 1.5 to 1 slope and stabilize with large boulders, place rock and rootwad revetments, willow plantings, and shrubs, blanketing and seeding. See the plan set for specific Project access, grading, and construction details.

The construction activities detailed below provide a partial overview of the project's scope and should not be considered an exhaustive list of all the tasks and responsibilities that the Contractor is expected to fulfill. In accordance with the project Specifications and Plans the Contractor is required to execute all work, both those explicitly mentioned in this summary and within the Contract Documents, to ensure the successful and complete execution of the project in accordance with the specified requirements and standards.

The work at **Site #1** consists of the following:

1. Mobilization to Temporary Staging Area
2. Installing construction limits fencing
3. Installing signage for public safety
4. Constructing temporary access ramp
5. Installing reinforced silt fencing
6. Installing turbidity curtain
7. Salvaging on-site boulders
8. Salvaging willow poles onsite from opposite and downstream bank
9. Regrading bank to 1.5H:1V slope using spoils from on-site grading
10. Installing rootwad revetment with 2-ton boulders as directed by Engineer
11. Installing 1-ton, ½-ton, and ¼-ton boulders with Caltrans backing Class No. 3 moving upslope as directed by Engineer
12. Installing willow poles/bundles and containerized plantings concurrently with rock slope protection
13. Installing seed/blanket treatments per field direction
14. Revegetation

1.2 SPECIAL CONSTRUCTION REQUIREMENTS

A. Construction is expected to begin July 1, 2024, and be completed by October 15, 2024.

B. Construction at Site 1 shall only be conducted after flow rates in Donner Creek at USGS Gage Station 10338700 drop below 100 cubic feet per second. USGS gage station data is available for review at: https://waterdata.usgs.gov/nwis/uv/?Site_no=10338700

C. Utility/Infrastructure Discovery: Locate existing structures and utilities prior to construction and maintain them in service except as otherwise specified. Prior to any excavation work the Contractor shall contact Underground Service Alert (USA) to have utilities marked on the ground by the various utility owners. Contractor to pothole and confer with the utilities as needed to determine the exact location of all underground utilities within the project limits and identify any connections that could be disrupted ahead of any excavation work.

D. Utility/Infrastructure Protection: Contractor shall immediately notify the Engineer of any changed conditions or discrepancies from the plans so that field fit changes may be made in a timely manner. The Contractor shall provide protection and be responsible for and repair any damage to underground utilities caused by the Work at no increase in Contract price.

E. Potholing: Contractor shall commence potholing to determine the actual location of underground utilities where in close proximity to any excavation work based on USA markings. Underground utilities shall be uncovered to one foot below the pipe where crossing interferences or connections are shown on the plans. Once uncovered the Contractor shall record and clearly mark the depth of the utility at the pothole location and inform the Engineer. Excavations around underground utilities shall be performed using extreme caution to prevent injury to workers or damage to the utilities. All potholes shall be backfilled and compacted.

F. Interruption of Services: Contractor shall make provisions to accomplish the work of this Contract without undue interference of operation of adjacent facilities. Interruptions to services for the purpose of making or breaking connection shall be made only after consultation with TRWC and Caltrans (if in regard to Caltrans electrical) a minimum of two weeks in advance of connection break and shall be at such time and of such duration as directed.

G. Changed Conditions: The Contractor shall promptly notify TRWC and the Engineer prior to earth disturbance activities if any of the following is discovered;

   a. Material that the Contractor believes may be material that is hazardous waste, as defined in Cal Health and Safety Code § 25117, that is required to be removed to a Class I, II or III disposal site in accordance with the law.
   b. Subsurface or latent physical conditions of the site differing from those

indicated.

c. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

H. Tree Protection: Any trees outside of the grading limits or not identified for tree protection within the grading limits that are injured or damaged by the work under this Contract shall be repaired as recommended by TRWC, which may include removal of severely damaged branches or sealing of wounds or cuts.

I. Storm Water Pollution Prevention Plan (SWPPP): The Contractor shall have a copy of the SWPPP on site and adhere to it at all times during construction.

J. Spill Prevention and Control: The Contractor shall take any and all precautions to prevent accidental spills during construction. Spill cleanup materials and proper disposal containers shall be kept on site where readily accessible. In the event of a spill the Contractor shall immediately contain and prevent leaks and spills from entering any storm drains or surface water drainages or water bodies and properly clean up and dispose of waste and clean up materials in compliance with Federal, state, and local hazardous waste requirements. Contractor shall not wash any spilled materials into the streets, gutters, storm drains, drainages or waterways.

K. Vehicle/Equipment Maintenance and Fueling: The Contractor shall inspect vehicles and equipment arriving or working on site for any leaking fluids and shall promptly repair or replace any that are leaking. Drip pans shall be immediately placed under the leaks and use of the leaking equipment suspended until repairs are made. The Contractor shall perform maintenance and fueling of vehicles or equipment in designated staging areas a minimum of 50 feet away from any surface water drainage or waterway. The Contractor shall use secondary containment such as a drip pan to catch any leaks or spills anytime that vehicle or equipment fluids are dispensed, changed, or poured. The Contractor shall clean up any leaks or spills of fluids immediately and dispose of the waste and cleanup materials as required for hazardous waste.

L. Construction Sequence and Schedule: Before initiating construction, Contractor shall confer with TRWC to review sequence of construction operations. Contractor shall provide TRWC with construction progress schedules as required by the Contract.

M. Hours of Work: Contractor shall perform the Work of the Contract Monday through Friday, between the hours of 8:00 AM and 6:30 PM. Days and hours outside of this may be permitted upon review and approval by TRWC and Caltrans.

N. Site Conditions: Contractor shall keep highway, roadway, drainage, walkways, and paved areas clean and free of mud and dirt, obstacles, etc. so that normal drainage, vehicular and pedestrian travel may be maintained.

O. The time intervals for trenching or excavating for Underground Utilities shall be kept to

the absolute minimum.

P. This project is covered by several regulatory permits and environmental compliance documents secured by the TRWC. The Contractor shall be responsible for complying with the requirements of and maintaining on-site copies of project permits and compliance documents during construction. These permits include the following:

1. CEQA Categorical Exemption for Small Habitat Restoration Projects;
2. USACE Section 404 Nationwide permit;
3. Lahontan Regional Water Quality Control Board Section 401 Water Quality Certification General Order For Small Habitat Restoration Projects;
4. State Water Resources Control Board NPDES Construction General Permit;
5. California Dept. of Fish and Wildlife Section 1653 Habitat Restoration and Enhancement Act Approval;
6. Town of Truckee Grading Permit; and
7. California Department of Transportation (Caltrans) Encroachment Permit.

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 DESCRIPTION

A. Compensation provided for in the Contract is full payment for performing all contract work in a complete and acceptable manner. All risk, loss, damage, or expense arising out of the nature or prosecution of the work is included in the compensation provided by the Contract.

B. Work under this Contract has been subdivided into "Items," each item with a "Unit Price" and "Estimated Quantities" or "Lump Sum" Price per 2.1.A below.

C. Measurement and payment for contract work will be made only for and under those pay items DESIGNATED IN THE SCHEDULE OF ITEMS (BID SHEET). Any and all other work and materials will be considered as included in the payment for the pay items shown. No payment will be made for work performed in excess of that staked, ordered, or otherwise authorized.

D. The bid items as listed are meant to encompass all construction and work items as called out in the Contract Documents. If an item is not specifically mentioned, it shall be assumed to be included in the most appropriate bid item.

E. Contractor shall be familiar with the approved SWPPP and all permit conditions for the Project and shall be responsible for any additional costs incurred due to any work stoppage as a result of Contractor's non-compliance with the SWPPP requirements or permit conditions.

1.2 UNITS OF MEASURE

Payment will be defined by units defined and determined according to measure. Unless otherwise specified, the meanings of the following terms are as follows:

A. Each (EA). One entire unit, which may consist of one or more parts. The quantity is the actual number of units completed and accepted.
B. Cubic Feet (CF). Measure of volume.
C. Cubic Yard (CY). Measure of volume.
D. Square Feet (SF). Measure on a plane parallel to the surface being measured or horizontal.
E. Square Yard (SY). Measure on a plane parallel to the surface being measured or horizontal.
F. Linear Feet (LF). Measure along the horizontal plane.

G. Lump Sum (LS). Do not measure directly. The bid amount is complete payment for all work described in the contract and necessary to complete the work for that item.

1.3 METHODS OF MEASUREMENT

One of the following methods of measurement for determining final payment is DESIGNATED IN THE SCHEDULE OF ITEMS for each PAY ITEM.

A. DESIGNATED QUANTITIES (DQ). These quantities denote the final number or units to be paid for under the terms of the contract. They are based upon the original design data available prior to advertising the project. Original design data include the preliminary survey information, design assumptions, calculations, drawings, and the presentation in the contract. Changes in the number of units SHOWN in the SCHEDULE OF ITEMS may be authorized under any of the following conditions:

1. As a result of changes in the work authorized by the TRWC's appointed Engineer (Engineer) or the TRWC's Representative.

2. As a result of the Engineer or the TRWC's Representative determining that errors exist in the original design that causes a pay item quantity to change by 15 percent or more.

3. As a result of the contractor submitting to the Engineer or the TRWC's Representative a written request showing evidence of errors in the original design that cause a pay item quantity to change by 15 percent or more. The evidence must be verifiable and consist of calculations, drawings, or other data that show how the designed quantity is believed to be in error.

B. ACTUAL QUANTITIES (AQ). These quantities are determined for measurements of completed work.

C. LUMP SUM QUANTITIES (LSQ). These quantities denote one complete unit of work as required by or described in the contract, including necessary materials, equipment, labor to complete the job. They will not be measured.

PART 2 PRODUCTS

2.1 SCHEDULE OF ITEMS

A. The table on the next page shows the SCHEDULE OF ITEMS (BID SHEET). Note that these specifications cover the bid items for Site 1 only plus a proportion of the total mobilization/demobilization and revegetation warranty/maintenance costs at the Contractor's discretion.

Description	UNIT PRICE	UNIT	QUANTITY	COST
Site 1 Staging, Access, Temp. Erosion Control				
Install temporary signage		EA	6	
Install construction limit fence		LF	200	
Install turbidity curtain/reinforced silt fence		LF	215	
Construct temporary access ramp		LS	1	
			Subtotal	
Site 1 Restoration Earthwork				
Salvage onsite boulders		TON	20	
Salvage/import onsite/local rootwads/footer logs		EA	6	
Regrade bank/prep for install		SY	472	
Install Caltrans Class No. 2 backing		CY	12	
Install rootwad revetments		EA	6	
Install boulders and RSP backfill		CY	400	
Remove fill spoils pile/regrade/decompact, place as backfill		CY	50	
			Subtotal	
Site 1 Revegetation				
Salvage willow pole cuttings and prepare for planting		EA	126	
Install willow pole plantings		EA	126	
Purchase containerized plants		EA	140	
Install containerized plants		AC	0.06	
Purchase seed mix		MSF	2.40	
Apply upland seed and purchase and install Coir 70/700		SY	56	
Apply wood mulch		MSF	6	
Irrigate plantings/success guarantee		LS	1	
			Subtotal	
Site 2 Staging, Access, Temp. Erosion Control				
Install temporary signage		EA	6	
Install construction limit fence		LF	630	
Install silt fence		LF	40	
Install in-channel creek diversion and crossing over diversion (includes dewatering)		LS	1	
Install steel plates along access route for sanitary sewer line protection		LS	1	
			Subtotal	
Site 2 Restoration Earthwork				
Rework gravel bar (restore floodplain and secondary channels remove debris pile)		CY	220	
Salvage onsite boulders		TON	11	
Rebuild bank w/ planted rock slope protection (RSP)		CY	330	
Install boulder bendway weirs		EA	5	
			Subtotal	
Site 2 Revegetation				
Salvage willow pole cuttings and prepare for planting		EA	80	
Install willow pole plantings concurrent with RSP		EA	80	
Purchase seed mix		AC	0.28	
Broadcast Revegetation Seed Mix 1 & 2		MSF	5.0	
Scarify and Hydroseed Revegetation Seed Mix 1 & 2		MSF	7.3	
Purchase and Install Coir 70/700		SF	750	
			Subtotal	
Site 3 Staging, Access, Temp. Erosion Control				
Construct stabilized entrance		EA	1	
Install construction limit fence		LF	1430	
Remove (E) chain link fence sections, replace at end		EA	4	
Install silt fence		LF	100	
Potholing		LS	1	
Purchase and install sand/oil interceptor		EA	2	
			Subtotal	
Site 3 Restoration Earthwork				
Excavate, salvage sod and emergent vegetation, grade extended basins		CY	3300	
Off haul excavated material		CY	2000	
Install rock apron swale outlet		EA	1	
			Subtotal	

Description	UNIT PRICE	UNIT	QUANTITY	COST
Site 3 Revegetation				
Reapply salvaged material to finish grade		CY	545	
Salvage willow pole cuttings and prepare for planting		EA	150	
Install willow pole plantings		EA	150	
Purchase seed mix		AC	0.53	
Broadcast Revegetation Seed mix 3		MSF	14.7	
Scarify and Hydroseed Revegetation Seed Mix 2		MSF	8.2	
Purchase and Install Coir 40/400		SF	9800	
			Subtotal	
Site 4 Staging, Access, Temp. Erosion Control				
Install silt fence		LF	933	
Remove (E) chain link fence sections, replace at end		EA	1	
Construct temporary ramps		EA	2	
Install in-channel creek diversion and crossing over diversion (includes dewatering)		LS	1	
Temporary Traffic Control		LS	1	
Potholing		LS	1	
			Subtotal	
Site 4 Restoration Earthwork				
Excavate Floodplain benches		CY	280	
Rebuild south bank (install RSP - includes incorporation of D/S deposited material)		CY	150	
Extend RSP at Lower Site 4		CY	60	
Import rootwad bendway weir logs from TRWC source		LS	1	
Install rootwad bendway weirs		EA	9	
Install grass-lined swale		LF	875	
Install rock check dams within grass-lined swale		LF	9	
Off-haul spoils from bench lowering on Site #4 to Site #1		LS	1	
Off-haul and dispose of spoils from grass-lined swale		CY	140	
Install rock apron swale outlet		EA	1	
			Subtotal	
Site 4 Revegetation				
Salvage willow pole cuttings and prepare for planting		EA	80	
Install willow pole plantings		EA	80	
Purchase seed mix		AC	0.9	
Broadcast Revegetation Seed Mix 1 (Scarify where lowered floodplain)		MSF	16.7	
Hydroseed Revegetation Seed Mix 2 and 4 (Scarify where compacted staging and access)		MSF	22.5	
			Subtotal	
Mobilization/Demobilization				
Mobilization/Demobilization		LS	1	
			Subtotal	
Revegetation Warranty/Maintenance (3 years)				
Revegetation Warranty/Maintenance (2 years)		LS	1	
			Subtotal	
TOTAL				

AC = acres, EA = each, LF = linear feet, MSF = 1000 SF, SY = square yards, BCY = bank cubic yards, CY = cubic yards (loose), SFCA = Square Foot of Contact Area

Bid Sheet

PART 3 EXECUTION

Not used.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

A. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1 .1 DESCRIPTION

A. The work of this section consists of submittal requirements before and during construction.

1.2 SUBMITTAL AND APPROVAL PROCEDURES

A. As specified in the individual sections, forward submittals electronically to the Engineer or TRWC's Representative at least 7 days before the need for approval. Unless a different number is specified, submit 1 reproducible original and 2 copies of each shop drawing, 2 copies of manufacturer's catalog sheets (cut sheets), 2 specimens of each sample, and 2 copies of all other submittals requested.

1. Shop Drawings: Include the following information with each copy of shop drawings:

    a. Date

    b. Date of revisions (when applicable)

    c. Contractor's certification that shop drawing has been checked for compliance with Contract documents

    d. Details of fabrication, assembly, and erection, including connections and engagement to contiguous work

    e. Materials used

    f. All required dimensions

2. All work to be performed by others shall be identified by Contractor or subcontractor name, discipline, or trade.

3. Samples: Samples shall be large enough to clearly illustrate the functional characteristics and full range of color, texture, or pattern.

4. Manufacturers' Catalog Sheets: Submit only pertinent pages; mark each copy of standard printed data to identify specific products proposed for use.

5. Manufacturer's Installation Instructions: When Contract documents require compliance with manufacturer's printed instructions, provide 1 complete set of instructions for TRWC and keep another complete set of instructions at the project site until substantial completion.

6. Provide ASTM data sheets for any applied/sprayed erosion control products.

B. The Engineer reserves the right to require submittals in addition to those called for in individual sections.

C. Approved Equals:

1. For each item proposed as an *approved equal,* submit supporting data, including:

a. Drawings and samples as appropriate

b. Comparison of the characteristics of the proposed item with that specified

c. Changes required in other elements of the work because of the substitution

d. Name, address, and telephone number of vendor

e. Manufacturer's literature regarding installation, functionality, operation, and maintenance, including schematics for electrical and hydraulic systems, lubrication requirements, and parts lists. Describe availability of maintenance service, and state source of replacement materials.

D. Engineer's Review:

1. Any work done or orders for materials or services placed before approval shall be at the Contractor's own risk.

2. The returned submittal will be marked in one of three ways:

a. APPROVED: Acceptable with no corrections.
b. APPROVED WITH NOTATIONS: Minor corrections or clarifications required. All comments are clear, and no further review is required. The Contractor shall address all review comments when proceeding with the work.
c. DISAPPROVED - RESUBMIT: Rejected as not in accordance with the Contract or as requiring major corrections or clarifications. The Engineer, Engineer's representative or TRWC will identify the reasons for disapproval. The Contractor shall revise and resubmit with changes clearly identified.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

A. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 01500

MOBILIZATION AND TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION

A. Work shall consist of preparatory work, providing temporary services and facilities required for Contractor's performance of the work of this contract and operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site, and for all other work and operations that must be performed or that cause costs to be incurred prior to beginning work on the various items on the project site.

B. Work also includes obtaining any necessary permits, insurance, and bonds. The Contractor shall utilize the proposed staging area and temporary access routes as shown on the Plans. Any proposed deviations must be approved by the Engineer and TRWC. At least 30 days prior to mobilization, the Contractor shall submit a Staging and Access plan that includes the following details:

- Any proposed deviations from the access route alignments and staging area configuration;
- Fuel and chemical storage areas;
- Materials/equipment staging areas; and
- Employee parking areas

1.2 SUBMITTALS

A. Spill Prevention and Response Plan Submittal: Contractor shall submit at least 7 days prior to construction a Spill Prevention and Response Plan (Plan) to the TRWC and Engineer for review and approval. The Plan that the Contractor shall be prepared to implement needs to include at a minimum the operational and notification guidelines to mitigate any potential spills and effectively address them if they were to occur. The Plan shall also include a list of spill kits or spill response materials and used spill response material containment that will be kept on site and on any vehicles that carry fuel.

PART 2 PRODUCTS

2.1 CONSTRUCTION EQUIPMENT

A. Erect, equip, operate, and maintain construction equipment in strict accordance with applicable statutes, laws, ordinances, rules, and regulations of authorities having jurisdiction.

2.2 SANITARY FACILITIES

A. Mobilization shall include sanitary facilities. The Contractor shall furnish and install

temporary sanitary facilities for use throughout construction period. This includes containers to dispense drinking water, enclosed toilet facilities and general washing facilities for construction personnel, which complies with OSHA safety and health regulations for these facilities.

B. All sanitary facilities are to be within the project site.

C. Sanitary facilities are to be in a staging area located away from natural drainages, streams, and wetlands.

D. Sanitary facilities are to be maintained and cleaned at least weekly and removed following completion of the Project.

2.3 WATER

A. A water truck used for dust control shall be capable of meeting any applicable requirements as described below. Water truck supply port shall be equipped with an approval backflow device or air gap.

a. Ensure a uniform application of water for optimum moisture content. Avoid excess runoff and minimize water waste.
b. Use water truck to keep dust to a minimum at removal site and on haul roads while in use.

PART 3 EXECUTION

3.1 AIR QUALITY

A. Use water trucks or spray from hoses to control dust.

B. Streets at the construction ingress/egress when used for hauling shall be swept daily when soils are visibly carried onto public streets.

C. At the discretion of the Engineer or TRWC's Representative, grading and construction may be prohibited during periods of high winds, which have the potential to result in the generation of windblown dust and sediment not reasonably controllable with standard watering techniques.

D. Equipment and vehicles shall be maintained in accordance with the manufacturers' specifications to avoid excessive emissions.

E. Trucks are required to be covered or have a minimum of 1-foot of freeboard and be watered to prevent airborne dust**.**

F. Traffic speeds on unpaved roads shall be limited to 10 mph.

3.2 WATER QUALITY

A. Restoration work and access will take place within sensitive upland and riparian habitat where water quality protection is of utmost importance. Contractor shall remain within all access and construction limits.

B. All stockpiles inactive for greater than 14 days or prior to a storm are to be enclosed by a filter barrier and tarped.

C. Before beginning construction activities, such as grading or excavating, Contractor shall install temporary structures to guide runoff away from the work area and to capture eroded material before it reaches natural watercourses. The measures shall be in accordance with the approved SWPPP.

D. Contractor shall implement spill prevention measures, including:

1. Training workers to avoid and manage spills.
2. Preventing construction and maintenance materials from entering surface waters and groundwater.
3. Having adequate spill kits and absorbent materials and cleaning up spills immediately and notifying the Engineer or TRWC's Representative of spills.
4. Servicing vehicles offsite or only in designated equipment staging areas.
5. Immediately repairing or removing leaking vehicles from the work area.

3.4 STAGING AND STORAGE AREAS

A. All staging areas to be located, marked in the field, and approved at the discretion of the Engineer or TRWC's Representative. No staging or storage activities will be permitted until the location of a staging area is approved.

3.5 SECURITY

A. Contractor is responsible for security of this Project, during entire time of Contract. Make good all damages to work and loss of materials due to vandalism or theft, within this responsibility.

3.6 MAINTENANCE OF TEMPORARY FACILITIES

A. Keep refuse and recycling containers covered with working lids and latches and secure container latches at the end of each workday. <u>All trash containers must be bear-proof.</u>

B. Ensure erosion and sediment control structures remain effective throughout excavation and grading operations. Inspect erosion and sediment control structures daily and before, during, and after each significant rainfall. Promptly repair all breaches.

3.7 REMOVAL OF FACILITIES

A. All temporary facilities shall be removed prior to final inspection at the end of the Project or by October 15th with the exception of those authorized to remain by the TRWC's Representative.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: Mobilization work will be part of a Lump Sum under Schedule of Items.

4.2 Basis of Payment

A. The method of measurement will be designated in the SCHEDULE OF ITEMS.

B. The mobilization lump sum will be paid as follows:

1. If applicable, bond premiums will be reimbursed according to FAR clause 52.232-5, Payment Under Fixed-Price Construction Contracts, after receipt of evidence of payment.
.
2. Fifty percent of the lump sum, not to exceed 5 percent of the original contract amount, will be paid following completion of 5 percent of the original contract amount, not including mobilization.

3. Payment of the remaining portion of the lump sum, up to 10 percent of the original contract amount, will be paid following completion of 10 percent of the original contract amount, not including mobilization.

4. Any portion of the lump sum in excess of 10 percent of the original contract amount will be paid after final acceptance.

END OF SECTION

SECTION 1600

PRODUCT STORAGE AND HANDLING REQUIREMENTS

PART 1 GENERAL

1 .1 DESCRIPTION

A. The work of this section consists of the general procedures for handling, storing, and protecting material and equipment.

1.2 TRANSPORTATION AND HANDLING

A. Arrange deliveries of materials in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site. Deliver materials in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

1 .3 STORAGE AND PROTECTION

A. Store materials in staging areas designated in the plans or designated by the Engineer or the TRWC's Representative.

B. Store materials in accordance with manufacturer's instructions, with seals and labels accessible for inspection.

C. Exterior Storage:

1. Store products subject to damage by the elements in weather tight enclosures.

2. Store fabricated products above the ground, on blocking or skids; prevent soiling or staining. Cover products subject to damage or deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

3. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

A. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1 .1 DESCRIPTION

A. The work of this section consists of final site cleanup, closeout submittals, and final inspection procedures.

1 .2 SUBMITTALS

A. Project Record Drawings in electronic and hard copy, consisting of clear and legible delineations and notations on existing design sheets.

B. Guarantees, Warranties and Bonds

C. Spare parts and material

D. Closeout Reports

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3 .1 SITE CLEANUP

A. Before scheduling the final inspection, remove all tools, equipment, surplus materials, construction debris, and rubbish. Replace or refinish fencing, gates, or other infrastructure that are damaged due to the work of this contract to previous condition as directed by TRWC's Representative.

3.2 PROJECT RECORD DRAWINGS

A. The Contractor is responsible for maintaining one complete full-size set of contract drawings. Clearly mark changes, deletions, and additions. Show additions in red, deletions in green, and special instructions in blue.

B. Keep record drawings current. Make record drawings available to the TRWC's Representative for inspection at the time of progress payment requests. If project record drawings are not current, TRWC may retain the progress payment.

C. On completion of the total project, the Contractor shall submit complete record drawings. Include all shop drawings, sketches, and additional drawings that are to be included in the final set, with clear instructions showing the location of these drawings.

3.3 CLOSEOUT SUBMITTALS

A. Submit before final inspection request:

1. Project Record Drawings: As specified above.

2. Guarantees, Warranties and Bonds: As specified in individual sections.

3. Spare Parts and Materials: As specified in individual sections.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

A. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 02110

CLEARING AND GRUBBING

PART 1 GENERAL

1 .1 DESCRIPTION

A. The work of this section consists of clearing, grubbing, removing vegetation, salvaging topsoil, and stockpiling salvaged material within the construction limits.

PART 2 PRODUCTS

2.1 SALVAGED FILL

A. Soil and other organic material salvaged during grubbing activities shall be stockpiled for later reuse on disturbed areas.

B. Topsoil: The top 6 inches of soil will be salvaged and stockpiled on site within the construction limits as a top-dressing after existing grades per the Plans have been met.

C. Salvaged topsoil and subsoil shall be covered prior to and in the event of rain or snow.

PART 3 EXECUTION

3.1 LAYOUT

A. The Contractor shall layout the grading limits (and hence the clearing and grubbing limits) prior to clearing and grubbing work, for review and approval by the TRWC's Representative or Engineer.

3.2 CLEARING

A. Remove all brush and vegetation from areas designated for new construction. No trees should be removed without prior approval of the TRWC's Representative or Engineer.

3.3 DEBRIS DISPOSAL

A. Vegetative debris shall be chipped and spread evenly in areas adjacent to the clearing limits in depths no greater than 3 inches.

B. All other debris to be disposed of at an authorized offsite disposal facility.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

A. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 02111

TEMPORARY EROSION CONTROL

PART 1 GENERAL

1 .1 DESCRIPTION

A. Temporary erosion control shall consist of, but not be limited to, constructing such facilities, and implementing such measures that are necessary to prevent, control and abate sediment laden water, airborne dust, or pollutant discharges from entering surface waters, drainages, or groundwater.

B. Temporary erosion control and water protection measures (BMPs) are to be put into place prior to any earth disturbing activities.

C. The Storm Water Pollution Prevention Plan (SWPPP) shall be kept onsite and adhered to at all times and may require additional temporary BMPs.

D. Efforts shall be made during construction to prevent disturbed soil movement by both wind and water. A water truck will be required on site to maintain moist soil conditions in the construction and staging/access areas to minimize airborne dust.

1 .2 SUBMITTALS

A. Contractor to provide Reinforced Silt Fence and Turbidity Curtain product information to Engineer for review and approval.

PART 2 PRODUCTS

2.1 Requirements: The Contractor is responsible for furnishing, installing, and maintaining all erosion control measures shown in the Staging, Access & Temp Erosion Control plans. This includes construction limit fencing, reinforced silt fencing, turbidity curtains, and stabilized construction entrances as depicted in the project plans. Materials used must meet the specifications or approved equivalents as confirmed by the Engineer. The Contractor shall furnish erosion control product of the material types specified in the project design details or equivalents approved in writing by the Engineer.

A. Reinforced Silt Fence: The Contractor shall acquire and install a prefabricated Wire Back Silt Fence or an approved equivalent reinforced silt fence using separate wire backing/support with woven polypropylene filter fabric upon review and acceptance by the Engineer.

B. Turbidity curtain: The Contractor shall acquire and install a Triton Type 2 Contractor Turbidity Curtain or an approved equivalent with either a 3-ft or

standard 5-ft skirt, following Engineer's review and acceptance.

PART 3 EXECUTION

3.1 For silt fence installation, a trench shall be excavated approximately 6 inches wide and six inches deep, ensuring the posts are oriented away from water flow. Backfill and compact soil over the fabric and support the fence using iron T-post or wood stakes every six (6) feet. Refer to project plans for more details.

3.2 For turbidity curtain, follow all manufacturer's installation guidelines.

3.2 Construction Limit Fence/Tree Protection: Temporary Construction Limit fencing shall be installed where needed and around the driplines of trees to be preserved as shown on the plans and where directed by the Engineer to protect public safety or sensitive resources. Fencing shall be a minimum of 4-ft high and orange in color to alert equipment operators and the public.

3.3 Stabilized Construction Entrance shall be furnished and installed in accordance with Section 13-7.03 "Temporary Construction Roadways and Entrances" of the Caltrans Standard Specifications. Rumble or Track out plates may be used in lieu of a constructed stabilized entrance under the condition that they alone or in combination with daily crew sweeping prevent noticeable sediment tracking.

3.6 Maintenance of any silt fencing, construction limit fencing, turbidity curtain, and stabilized construction entrances shall be conducted daily or as directed by the Engineer.

3.7 At the end of the Project all temporary fencing, stabilized entrances, drain inlet protection and steel plates shall be removed and become the property of the Contractor who shall reuse or dispose of it outside of the Project site.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: Construction limit fence, turbidity curtain and silt fence will be paid by linear feet under the Schedule of Items.

B. The payment quantity for temporary erosion control bid items paid for by the length is the length measured along the centerline of the installed material.

4.2 Basis of Payment

C. Payment for these items shall be as listed under Schedule of Items.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 GENERAL

1 .1 DESCRIPTION

Dewatering is not anticipated, however if groundwater is encountered during excavation, the follow measures shall be put into place.

The work under this item shall consist of furnishing all labor, tools, equipment, and materials necessary to dewater work areas to maintain a reasonably dry excavation for the proper installation of restoration features as shown on the Project Plans. The locations where water is pumped must be approved by the Engineer.

1.2 SUBMITTALS

A. The Contractor shall submit a Dewatering Plan to the TRWC and the Engineer for review and approval at least four (4) weeks prior to start of construction. The Dewatering Plan may differ from what is shown on the plans, however, Contractor must be able to demonstrate that the dewater installations will keep up with any anticipated surface and groundwater intrusion while continuously protecting water quality. The plan shall include a list of any pumps, pipes and generator equipment that is to be used, including sizes and horsepower.

PART 2 PRODUCTS

2 .1 MATERIALS

Not used.

PART 3 EXECUTION

3 .1 DEWATERING

C. Dewatering: All groundwater and nuisance water removed from work areas must be properly applied to upland areas either via a water truck for dust control along access roads or spread via a sprinkler system or flow spreader pipe in upland areas away from any storm drains, drainages, or waterways. If sufficient dust control or upland areas are unable to be located, a

sedimentation tank(s) may be staged to collect and desilt the water, however adequate de-siltation (or clarity) of the decant water through turbidity testing must be demonstrated prior to release in areas that could reach drainages or waterways. Methods of dewatering proposed shall be described in detail in the Diversion and Dewatering submittal under Item 1.2 for review and approval prior to implementation.

D. Dewatering Operations: Nuisance water (sediment-laden water) shall not be pumped directly into any drainage, waterway, or diversion bypass. A dewatering structure should be sized to allow water to flow through any outlet filtering media without overflowing the structure. An energy dissipater may be needed to prevent erosion at the outlet.

E. If a sedimentation tank(s) is used, decant water from the tank can be further treated by running the water through an approved filter bag if turbidity levels need to be reduced further prior to discharging back into Donner Creek. The contractor is responsible for the design and establishment of the containment system to be approved by TRWC and the Engineer via the Diversion and Dewatering Plan. All sediment collected from dewatering the construction area will be disposed of offsite by the Contractor to an approved location.

F. Pump intakes and outlets should be designed to minimize turbidity and the potential to wash contaminants into adjacent creeks or wetlands.

G. Pumps shall be placed in flat areas and be well away from the stream channel. Refuel pumps in an area that is at least 50 feet away from the stream channel and use secondary containment and absorbent pads while refueling.

H. Pump intakes should be completely screened with wire mesh, sized, and approved by the TRWC or the Engineer to prevent fish and amphibians from entering the pump system. Check intake periodically to ensure the screen is functioning properly.

I. A dewatering structure should be sized to allow water to flow through any outlet filtering media without overflowing the structure. An energy dissipater may be needed to prevent erosion at the outlet.

J. Any turbid water pumped from the work site itself to maintain it in a dewatered state shall be disposed of in an approved location, water truck, sediment settling tank, or equivalent, where it will not drain directly into any stream channel. The turbidity control methods need to be approved by the TRWC or the Engineer prior to implementation.

K. Any generators or pumps shall have secondary containment (i.e., leak free

trays). Refuel pumps in areas well away from stream channels and wetlands and where approved by the COR.

L. Once construction is completed, the dewatering facilities are to be removed. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with the SWPPP and the TRWC or Engineer approves their removal.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: The work described in this section will not be measured for payment.

4.2 Basis of Payment

B. Payment: No direct payments for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 02300

EARTHWORK

PART 1 GENERAL

1 .1 DESCRIPTION

A. The work of this section shall consist of a) performing all operations necessary to prepare the site for excavation, b) excavating, backfilling, and grading to finish grades and contours per the Plans and these specifications, and c) furnishing all labor, materials, tools, equipment, and incidentals.

1.2 FIELD MEASUREMENTS

A. It is the responsibility of the Contractor to verify that survey benchmarks and intended elevations for layout of the work are as indicated on the plans and as specified in Section 01050 (Field Engineering). If discrepancies are discovered the Contractor shall immediately notify the TRWC's Representative or Engineer to correct the problem or determine the next course of action.

1.3 SUBMITTALS

A. The Contractor shall submit to the Engineer for review and approval an **Order of Work** at least seven (7) days after the Award of Contract or seven (7) working days prior to construction start. The Order of Work shall include installation of all temporary BMPs, grading, planted rock slope protection installation and revegetation operations.

1 .4 REFERENCES

A. Work shall comply with the rules and regulations of the Division of Industrial Safety and other local and State agencies having jurisdiction. Nothing contained herein shall be construed as permitting work that is contrary to such rules, regulations, and code.

B. AASHTO Standards.

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

1. The latest edition of the following standards may apply:

a. D422 Standard Test Method for Particle-Size Analysis of Soils
b. Dl557 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort

c. Dl556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
d. D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock
e. D2922 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) (AASHTO T238)
f. D3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) (AASHTO T239)

1.3 EXISTING CONDITIONS

A. Existing soil conditions may include the occurrence of large, buried boulders or the interception of existing bedrock. Contractor shall be prepared to move, relocate, and incorporate existing large boulders where shown on the plans. Where boulders cannot be moved or shallow bedrock is encountered, Contractor shall work with the Engineer to alter the grading in a manner which maintains the intent of the design. Cost assumptions are based on Contractor utilizing excavation materials in project improvements.

PART 2 PRODUCTS

2.1 FILL MATERIAL

A. Where possible, material produced from project excavations will be salvaged and used as fill material.

2.2 TOPSOIL

The top 6” of native material salvaged and re-applied as top dressing to disturbed areas.

PART 3 EXECUTION

3.1 PREPARATION AND LAYOUT

A. Site preparation shall include removing all vegetation and over-size debris from the areas that will be graded.

B. Establish extent of grading and excavation by area and elevation. Designate and identify datum elevation and project reference points. Set required lines, levels, and elevations.

D. Protect tree and shrub vegetation outside of construction disturbance.

3.2 EXCAVATION

A. Earth excavation shall include the satisfactory removal and off haul regardless of the nature of the materials, the condition of the materials at the time they are excavated, or the manner in which they were excavated.

B. Where excavated materials from inset floodplain bench creation at Site 4 are deemed suitable by the TRWC or the Engineer, they may be incorporated into the Site 4 bank revetments where shown on the plans or if there is sufficient excess, locally hauled and incorporated into bank revetment where called for in the plans at Sites 1 and 2. Site 4 vegetated swale and Site 3 wetland swale spoils are not to be re-used onsite but off-hauled and properly disposed of.

C. The Contractor shall select, install, and maintain shoring, sheeting, bracing, and sloping as necessary to maintain safe excavations. The Contractor shall be responsible for ensuring such measures; (1) comply fully with 29 CFR Part 1926 OSHA Subpart P Excavations and Trenches requirements, (2) provide necessary support to the sides of excavations, (3) provide safe access to the Contracting Officer's sampling and testing within the excavation (4) provide safe access for backfill, compaction, and compaction testing, and (5) otherwise maintain excavations in a safe manner that shall not endanger property, life, health, or the Project schedule. All earthwork shall be performed in strict accordance with applicable law, including local ordinances, applicable OSHA, CalOSHA, California Civil Code, and California Department of Industrial Safety requirements.

3.3 BACKFILL, PLACEMENT, AND COMPACTION

A. Provide adequate equipment to achieve consistent and uniform compaction of fill and backfill materials.

B. Spread approved fill material uniformly in layers not to exceed 8 inches of loose thickness over entire fill.

C. When backfilling over planted rock slope protection, voids between rocks shall be less than two (2) inches to prevent surface water piping. Use hand labor with shovels or similar, to aid final surface backfill operations and ensure no large voids between rocks or rocks and plants.

D. Lift thickness requirements may be modified in the field by the Engineer to suit equipment and materials or other conditions when required to assure satisfactory compaction and minimization of voids.

E. Place and compact each layer of fill using bucket of excavator or similar method to be approved by the Engineer in the field to roughly 85 percent compaction before placing additional fill material. Repeat filling until the proposed grade or slope profile is attained.

F. Suspend fill operations when satisfactory results cannot be obtained because of environmental or other unsatisfactory site conditions. Do not use muddy (or frozen) fill materials. Do not place fill material on muddy (or frozen) subgrade surface.

Maintain surface conditions that permit adequate drainage of rainwater and prevent ponding of surface water in pockets. When fill placement is interrupted by rain, remove wet surface materials, or permit to dry before placing additional fill material.

3.4 SITE GRADING

A. Performing Grading: Perform grading within project limits, including adjacent to transition areas, to new elevations, levels, profiles, and contours indicated. Provide subgrade surfaces parallel to finished grade surfaces. Provide uniform levels and slopes between new elevations and existing grades.

B. Grade subgrade and final grade surfaces smooth and even, free of voids to the required subgrade elevation.

3.5 FINISH GRADE

A. All backfill, and grading work shall meet subgrade elevations where materials are to be applied to meet finish grades or final grades where channel improvements are proposed or restore existing elevations and contours as shown on the plans in areas outside of the new channel crossing.

3.6 SALVAGED TOPSOIL

A. Any salvaged topsoil shall be applied to areas restored to finish grade by spreading evenly and raked into the top two to three inches.

3.7 STOCKPILING

A. Cover stockpiles prior to rain or when not actively used for more than 14 days. Excavated materials may be temporarily stockpiled on-site in areas identified on the plans for immediate reuse. Best Management Practices (tarps, coir log, etc.) to be used on all temporary stockpiles to minimize the

potential for erosion or pollution. All material stockpiles shall be removed at the completion of the work.

3.8 DISPOSAL OF MATERIAL

A. Remove from site and legally dispose of all waste material, including trash and debris.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: Excavation and grading work will be paid by cubic yard (CY) under the Schedule of Items.

4.2 Basis of Payment

A. Payment for this item shall be paid by cubic yard (CY) under Schedule of Items: Cut and fill and as cubic yards for any material hauled.

END OF SECTION

SECTION 02500

ROCK AND AGGREGATE

PART 1 GENERAL

1 .1 DESCRIPTION

Several large boulders are needed to protect the bank toe and large rock is needed a distance up the restored 1.5:1 bank to stabilize the bank and prevent further erosion. A small portion of these boulders can be salvaged and reused on site however a large remainder will need to be purchased from a nearby quarry.

1.2 SUBMITTALS

A. The Contractor shall provide information on the rock and quarry site where the rock is to be purchased to TRWC and the Engineer for review and approval prior to purchase and delivery to the site.

PART 2 PRODUCTS

2.1 2-Ton Boulders

A minimum of 2-ton boulders shall be keyed into the toe of the bank in locations shown on the plans.

2.2 ¼ Ton, ½ Ton and 1-Ton Rock Slope Protection

Rock size gradations including ¼ ton, ½ ton, and 1-ton shall be clean subangular or angular granite rock with sizes as shown in Table 1 Caltrans Rock Size Classes.

2.3 8- to 12- Inch Clean Cobble

Clean cobble in range of 8 to 12 inches is to be used as the base for the temporary access ramp as shown on the plans. As Contractor is decommissioning the access ramp, this material can be used to back fill in the rock slope protection under the direction of the Engineer.

2.4 4- to 12- Inch Clean Cobble

Clean cobble in range of 4 to 12 inches is to be used in upper layers of temporary access ramp. As Contractor is decommissioning the access ramp, this material can be used to back fill in the rock slope protection under the direction of the Engineer.

Table 1. Caltrans Rock Size Classes

Nominal RSP class by median particle diameter[b]		Nominal median particle weight W_{50}[c,d]	d_{15}[c] (inches)		d_{50}[c] (inches)		d_{100}[c] (inches)	Placement
Class[a]	Diameter (inches)		Min	Max	Min	Max	Max	Method
I	6	20 lb	3.7	5.2	5.7	6.9	12.0	B
II	9	60 lb	5.5	7.8	8.5	10.5	18.0	B
III	12	150 lb	7.3	10.5	11.5	14.0	24.0	B
IV	15	300 lb	9.2	13.0	14.5	17.5	30.0	B
V	18	1/4 ton	11.0	15.5	17.0	20.5	36.0	B
VI	21	3/8 ton	13.0	18.5	20.0	24.0	42.0	A or B
VII	24	1/2 ton	14.5	21.0	23.0	27.5	48.0	A or B
VIII	30	1 ton	18.5	26.0	28.5	34.5	48.0	A or B
IX	36	2 ton	22.0	31.5	34.0	41.5	52.8	A
X	42	3 ton	25.5	36.5	40.0	48.5	60.5	A
XI	46	4 ton	28.0	39.4	43.7	53.1	66.6	A

[a]For RSP Classes I–VIII, use Class 8 RSP fabric. For RSP Classes IX–XI, use Class 10 RSP fabric.
[b]Intermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness.
[c]d%, where % denotes the percentage of the total weight of the graded material.
[d]Values shown are based on the minimum and maximum particle diameters shown and an average specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

Rock material must comply with the requirements shown in the following table:

Table 2. Rock Material Requirements

Quality characteristic	Test method	Requirement
Apparent specific gravity (min)	California Test 206	2.5
Absorption (max, %)	California Test 206	4.2
Durability index (min)	California Test 229	52

Notes:
Durability absorption ratio (DAR) = course durability index/(percent absorption + 1)
If the DAR is greater than 10, the absorption may exceed 4.2 percent.
If the DAR is greater than 24, the durability index may be less than 52.

A few boulders and rock may be salvaged onsite and used as part of the bank restoration under the direction of the Engineer. All remaining boulders and rock shall be purchased from an approved quarry or acquired from a nearby approved project source. Boulders shall be composed of dense, non-friable stone and free of organic material.

2.5 Granular Bedding

Caltrans #3 Backing per Table 3 shall be used as needed for a base layer and or to backfill the voids along with native sourced materials.

2.6 All purchased rock must be sourced from a certified weed-free quarry.

Table 3. Caltrans RSP Size Chart

STANDARD Rock SIZE or Rock MASS or Rock WEIGHT		GRADING OF ROCK SLOPE PROTECTION **PERCENTAGE LARGER THAN**											
		RSP-Classes [A]											
		Method A Placement					Method B Placement						
		RSP-Classes other than Backing									Backing No.		
US unit		8 ton	4 ton	2 ton	1 ton	1/2 ton	1 ton	1/2 ton	1/4 ton	Light	1 [B]	2	3
	SI unit	8 T	4 T	2 T	1 T	1/2 T	1 T	1/2 T	1/4 T	Light	1 [B]	2	3
16 ton	14.5 tonne	0-5											
8 ton	7.25 tonne	50-100	0-5										
4 ton	3.6 tonne	95-100	50-100	0-5									
2 ton	1.8 tonne		95-100	50-100	0-5		0-5						
1 ton	900 kg			95-100	50-100	0-5	50-100	0-5					
1/2 ton	450 kg				95-100	50-100	-----	50-100	0-5				
1/4 ton	220 kg					95-100	95-100	-----	50-100	0-5			
200 lb	90 kg							95-100	-----	50-100	0-5		
75 lb	34 kg								95-100	-----	50-100	0-5	
25 lb	11 kg									95-100	90-100	25-75	0-5
5 lb	2.2 kg											90-100	25-75
1 lb	0.4 kg												90-100

[A] US customary names (units) of RSP-Classes listed above SI names, example US is "2 ton" metric is "2 T".
[B] "Facing" has same gradation as "Backing No. 1". To conserve space "Facing" is not shown .

Example for determining RSP-Class of outside layer. By using Equation 1, if the calculated W=135 kg (minimum stable rock size):
1. Enter table at left and select closest value of STANDARD Rock SIZE which is greater than calculated W, in this case 220 kg
2. Trace to right and locate "50-100" entry 3. Trace upward and read column heading "1/4 T", then 1/4 T is first trial RSP-Class.

Source: Caltrans (California Department of Transportation). 2000. California Bank and Shore Rock Slope Protection Design. Practitioner's Guide and Field Evaluations of Riprap Methods. Page 24.

PART 3 EXECUTION

3.1 It is essential that the 2-, 1-, and ½-ton boulders are placed individually under the direction of the Engineer in order to achieve adequate key depth, coverage, and functional integration with prescribed rootwad, willow pole and containerized plant installations. Rock shall be placed to the vertical elevations shown on the plans under the direction of the Engineer. RSP shall be tapered on either end to tie into an existing boulder to the N/W and existing aspen trees to the S/E.

3.2 Boulder installation shall begin with placement of the largest, 2- and 1- ton boulders at the base of the bank in the vicinity of the existing cobble toe and Contractor shall work up the slope as boulders are placed individually.

3.3 No boulders or rock are to be dumped as single loads and allowed to roll down the slope.

3.1 See Section 02501 Planted Rock Slope Protection

3.2 See Section 02503 for Rootwad Revetments

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. The method of measurement will be designated in the SCHEDULE OF ITEMS.

4.2 Basis of Payment

A. Payment for this item shall be broken out as listed in the Schedule of Items: including but not limited to CY of rock.

END OF SECTION

SECTION 02501

PLANTED ROCK SLOPE PROTECTION

PART 1 GENERAL

1 .1 DESCRIPTION

Site 1 will require the installation of planted rock slope protection (RSP) as shown in the Plans and specified in this section. The Contractor shall not begin this work until the reinforced silt fence and turbidity curtain are installed and approved by the Engineer.

PART 2 PRODUCTS

2.1 See Section 02500 Rock and Aggregate

PART 3 EXECUTION

3.1 The Contractor shall rebuild the designated banks to 1.5:1 (H:V) max slope using imported rock backfilled with the excavated material from the designated onsite material location as available. The Contractor will need to supplement with fill materials from local sources with approval from the Engineer. Purchased rock used in installation of the Planted RSP must meet Caltrans Standard Specifications for rock materials as described in Section 02500.

3.2 It is essential that boulders are placed individually under the direction of the Engineer to achieve adequate key depth, coverage, and functional integration with prescribed rootwad revetments and willow pole plantings. Rock shall be placed to the vertical elevations shown on the plans under the direction of the Engineer. Planted RSP shall be tapered on either end to tie into existing slope protection elements such as rip rap or rooted trees as directed by the Engineer.

3.3 Rock placement for planted rock slope protection shall be done concurrently with willow planting under field direction by the Engineer and/or Restoration Specialist and base boulders must be keyed in and not simply placed on top of grade.

3.4 Boulder installation shall begin with placement of the largest boulders at the toe of the slope either in a footing trench or individual boulder key trenches and Contractor shall work up the slope as boulders are placed individually. Local surface irregularities of the Planted RSP must not vary from the planned slope by more than 1 foot as measured at right angles to the slope. At the completion of slope protection work, fill voids in the footing trench and between boulders with excavated material. Compaction shall be accomplished by pushing/tamping of the excavator bucket under Engineer’s supervision.

3.5 For rocks above the foundation course, place them such that each rock has a 3-point bearing

on underlying rocks; do not bear them on smaller rocks which may be used for chinking voids.

3.6 No boulders or rock are to be dumped as single loads and allowed to roll down the slope.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

B. The method of measurement will be designated in the SCHEDULE OF ITEMS.

4.2 Basis of Payment

B. Payment for this item shall be broken out as listed in the Schedule of Items: including but not limited to CY of rock.

END OF SECTION

SECTION 02503

ROOTWAD REVETMENTS

PART 1 GENERAL

1 .1 DESCRIPTION

Rootwad revetments are to be installed within the bank at Site 1 to improve lateral stability and reduce shear forces on the outer banks.

Positioning and anchoring are critical to the long-term stability of these structures; therefore, the Contractor shall construct these features under the direction of the Engineer.

PART 2 PRODUCTS

2.1 For boulder sizes and characteristics see the Plans and Specification Section 02500 Rock and Aggregate

2.2 Large trees for the Rootwad Revetments are to be provided by TRWC and are currently being staged at nearby Donner Memorial State Park. Contractor to coordinate with TRWC regarding pickup and delivery of the trees to the project site.

PART 3 EXECUTION

3.1 Rootwad revetments shall be installed where indicated on the plans.

A. Prior to installation, under the direction of the Engineer excavate and set aside the necessary volume of floodplain bench and bank material to properly key and install the Rootwad Revetments as shown on the plans. A certain amount of subgrade may be able to be preserved as the rootwads and boulders can be pushed or tamped in with the bucket of the excavator a certain degree after placement, and the first installation typically reveals the amount of additional key depth that can be achieved with tamping in order to avoid over-excavating. The less excavation and ground disturbance required to do the installation the more stable the installation will be.

B. At the foundation of each Rootwad Revetment structure, a footer log, with a minimum diameter of 24 inches DBH, must be positioned roughly parallel to the direction of flow and securely embedded to a depth of 1-foot within the floodplain bench at the toe of the proposed slope. The 24-inch diameter rootwad log must then be set directly on the footer log angled slightly downward with the rootwad facing outward and slightly upstream. A minimum of 8 feet of the trunk of the rootwad log shall be embedded within the bank. Boulders shall be placed individually around and within the front facing portion of each rootwad revetment to provide extra ballast without damaging the exposed root portion of

the rootwad log.

C. Rootwad revetments shall be secured and weighted down with large rocks that are angular to subangular and individually placed at the direction of the Engineer. Rock shall be 1-Ton to 2-Ton, Caltrans Class VIII/IX, as indicated on the plans. Rock shall have a minimum specific gravity of 2.5 and be durable and of suitable quality, free from cracks, seams and other defects that would increase deterioration from weathering. No dumping shall be allowed except as approved/directed by the Engineer.

D. Rocks for Rootwad Revetments shall be placed following subgrade preparation and inspection by the Engineer. Footer rocks shall be the largest rocks and keyed into the floodplain bench as shown on the plans in a manner such that they exert pressure on each other and into the banks. The next layer of rocks shall be placed so that each rock rests on two halves of each supporting footer rock.

E. Rootwad Revetments shall be backfilled with the native material (well graded mix of washed river run rock, cobble, and gravels) to prevent seepage flow as field directed by the Engineer. The backfill material shall be tamped down and if needed jetted in with a water hose so that the voids are filled to the satisfaction of the Engineer.

F. Contractor to deliver logs with rootwads from Donner Memorial State Park to the Project site and stage in areas shown on the plans or request and acquire approval for any additional staging areas.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

C. The method of measurement for Rootwad Revetments will be measured as each in place and include delivery and installation as designated in the SCHEDULE OF ITEMS.

4.2 Basis of Payment

C. Payment for this item shall be broken out as listed in the Schedule of Items.

END OF SECTION

SECTION 02901

REVEGETATION

PART 1 – GENERAL

1.1 DESCRIPTION

Commercial erosion control materials.

Table 1. Products, Suppliers, Contacts

Product	**Suppliers**	**Contact Information**
Seed	Comstock Seed	(775) 746-3681, http://www.comstockseed.com/
	Pacific Coast Seed	(926) 373-4417
	S & S Seeds	(805) 684-0436
Soil Inoculants	Plant Health LLC	(541) 740-3691
	Pacific Coast Seed	http://www.pcseed.com/docs/nonseedproducts.pdf
Fertilizer	RTI	Reforest.com
Coir Erosion Control Blankets 70/700	Rolanka	https://rolanka.com/product/biod-mat-70-woven-bristle-coir-mat/
	Nedia Enterprises	http://www.nedia.com/woven_coir_Koirmat400.html
Biodegradable stakes	Tensar/North American Green	http://www.tensarnagreen.com/Installation/Installation-products
Container Plants	Nevada Division of Forestry	775-849-0213; http://forestry.nv.gov/ndf-state-forest-nurseries/washoe-state-tree-nursery/
	Cornflower Farms	http://www.cornflowerfarms.com
	Plants of the Wild	http://www.plantsofthewild.com/

1.2 RELATED SECTIONS

A. Section 01330 Submittal Procedures

B. Section 02300 Earthwork

1. 3 DEFINITIONS

A. C-27 Landscape Contractor. The Contractors State License Board defines a landscape contractor as someone who constructs, maintains, repairs, installs, or subcontracts the development of landscape systems and facilities for public and private gardens and other areas which are designed to aesthetically,

architecturally, horticulturally, or functionally improve the grounds within or surrounding a structure or a tract or plot of land. In connection therewith, a landscape contractor prepares and grades plots and areas of land for the installation of any architectural, horticultural, and decorative treatment or arrangement. California Code of Regulations, Title 16, Division 8, Article 3. Classifications Authority cited: Sections 7008 and 7059, Reference: Sections 7058 and 7059 (Business and Professions Code) www.cslb.ca.gov.

For this project, the C-27 is tasked with all work associated with vegetation and bioengineering.

B. Scope of Work: Scope of work includes soil decompaction, broadcast seeding, mulch application, containers plantings, erosion control blanket installation, willow pole plantings, and irrigation/maintenance.

1.4 SUBMITTALS

A. General: Submit as per the requirements of the Contract provisions.

B. Samples and Documentation:

1. Construction Schedule
2. Revegetation Seed Mix
3. Soil Inoculant
4. Fertilizer
5. Coir Erosion Control Blankets
6. Stakes
7. Container Plants
8. Wood chip mulch/tub grindings
9. Irrigation plan. Submit methods, materials, application rates and schedule for review and approval by the Restoration Specialist. This plan shall address container plantings as well as willow poles.
10.

1.5 QUALITY CONTROL

A. All revegetation work shall be overseen by a Certified Professional Erosion and Sediment Control Restoration Specialist and shall be documented on a

daily basis.

1.6 SITE CONDITIONS

A. Unfavorable Weather Conditions:

1. All restoration work shall not be performed during weather conditions that might damage or be detrimental to the condition of existing ground, in-progress work, or completed work.

B. Prevention of Erosion: Comply with requirements specified in Section 01 35 44 Environmental Requirements, the Project SWPPP, and the following:

1. Prevent erosion of stockpiles, ditches, embankments, filled, backfilled, and graded areas until such time as permanent drainage and erosion control measures have been installed.

2. Perform "protective grading" to provide positive drainage and to minimize ponding of surface water.

PART 2 - PRODUCTS

2.1 SEED

A. General:

1. All seed shall conform to all laws and regulations pertaining to the sale and shipment of seed required by the California Department of Food and Agriculture and the Federal Seed Act. Test all seed within twelve (12) months prior to application date. Seed tags must reflect the most recent test date. Submit original seed tests by lot number to the Restoration Specialist a minimum of ten (10) days prior to application for approval. Following approval by the Restoration Specialist, seed may be mixed and delivered to the site.

2. All seed shall be delivered to the project site in sealed bags with proper labeling. Weed seed shall not exceed 0.15% of the pure live seed specified and shall not include any seed of cheatgrass (Bromus tectorum) or sweet clovers (Melilotus officinalis, M. alba). Crop seed shall not exceed 0.25%. The Restoration Specialist may reject any seed that includes other undesirable weedy species.

3. The Contractor shall notify the Restoration Specialist at least 72 hours in advance of any seeding.

4. The Restoration Specialist shall remove seed labels from the seed bags at the time of seeding to verify species in the mix and application rate in accordance with these Special Provisions.

5. Seed tags shall show the following information:

    a. Scientific name

    b. Common name

    c. Lot number

    d. Percent purity

    e. Percent germination, including hard and dormant seed

    f. Percent weed seed

    g. Percent crop seed

    h. Origin

6. The Revegetation Seed Mix shall be the following:

Table 2. Revegetation Seed Mix

Scientific Name	**Common Name/Variety**	**PLS lbs/acre**
Achillea millefolium	yarrow	0.10
Bromus carinatus	California brome	3.00
Elymus elymoides	squirreltail	4.00
Elymus trachycaulus	slender wheatgrass, 'Pryor'	4.00
Lupinus argenteus	silvery lupine	3.00
Poa secunda	big bluegrass, 'Sherman'	1.00
Purshia tridentata	antelope bitterbrush	3.00
Ribes cereum	Wax currant	1.00
Thinopyrum ponticum	Intermediate wheatgrass	4.00
Total		23.10

2.2 SOIL INOCULANT

A. General:

1. Mycorrhizal inoculants consist of spores, mycelium, and mycorrhizal root fragments in a solid carrier suitable for handling in dry applications. The carrier must be the material in which the inoculum was originally produced and may include organic materials,

vermiculite, perlite, calcined clay, or other approved materials consistent with proper application, and good plant growth.

2. Each endomycorrhizal inoculum should carry a supplier's guarantee of number of propagules per unit weigh or volume of bulk material. Inoculum shall contain *Rhizophagus irregularis*. The inoculum should have a propagule count of 120 per gram of which a minimum of 100 spores per gram present at random tested sampling.

3. A representative 100-gram sample (from a re-mixed bag in order to obtain a homogeneous sample) shall be drawn from the inoculant bags using the chart in part B.2.

4. This sample shall be submitted to an authorized laboratory thirty days prior to application for verification of spore count (a rounded ½ cup kitchen measuring scoop will yield roughly 100 g of material). Independent testing results of actual counts of viable spores using standard spore extraction methods as described by Schenck et al in "Methods and Principles of Mycorrhizal Research," University of Florida should be conducted.

B. Testing shall be as follows:

Table 3. Inoculant Testing Laboratories

Laboratory	Address	Contact Information
Western Laboratories, Inc.	211 Highway 95 Parma, ID 83660	Tel: 800-658-3858 Harry Kreeft
U of Florida, Soil & Water	2169 McCarty Hall, PO Box 110290 Gainesville, FL 32611 0290	Tel: 352-392-1951, ext 220 Abid Al Agely
MycoRoots	1970 NW Lance Way Corvallis, OR 97330-2209	Tel: 541-752-0339 Efren Cazeres

1. If the inoculant spore-density is below specified counts, the Contractor shall be required to supply additional material to meet specifications. Inocula shall be transported and stored in areas with a temperature of less than 90 °F. Use a dust mask when handling the material.

2. When an inoculant lot consists of six bags or less each bag should be samples from points throughout the bags. Regardless of lot size the maximum sample number is 30. See chart below:

Bags in lot	5	7	10	23	50	100	200	300	400
Samples	5	6	6	7	10	15	25	30	30

2.3 FERTILIZER

A. Fertilizer shall be MYKO Start 60 4-2-2 Paks.

2.4 EROSION CONTROL NETTING AND STAKES

A. Erosion control blankets shall be 70/700 100% biodegradable woven bristle coir erosion control mat with 780 g/m2 (23 oz./SY2) unit weight and 48% open area. This blanket is available in 3.28 ft.x83 ft.; 6.5 ft.x166 ft., 9.8 ft.x166 ft. and 13 ft.x83 ft. roll sizes.

B. Stakes shall be 12 inches in length, manufactured from a hardwood (Eco-STAKE or equivalent), or as approved by the Restoration Specialist.

2.5 CONTAINER PLANTS

A. Container plants shall consist of *Purshia tridentata* (bitterbrush) on the upper part of the slope as shown on the plans and as directed and *Rosa woodsii* (Woods rose) as shown on the plans and as directed.

B. All container plants shall be grown in deepots (cylindrical container 2" in diameter and 10" deep) with a slight taper to the bottom and rounded at the bottom or pre-approved equal.

C. Plants shall be nursery-grown in accordance with good horticultural practices under climatic conditions similar to those of the project site. Plants shall be sound, healthy, and vigorous; free of disease, insect pests, eggs, or larvae; comprised of healthy, well-developed root systems; free from physical damage or adverse conditions that would prevent thriving growth.

D. Root systems must be completely free of circling, or kinks. Upon inspection, plants found to contain kinked, circling, or girdling roots will be rejected. Size, including height and widths, shall be typical for these species. Root to shoot ratio shall be 1:1.

2.6 WOOD CHIPS OR TUB GRINDINGS

A. Mulch shall be wood chips or tub grindings. Particle size shall be between ½ inch and two (2) inches in length and not less than ½ inch in width and 0.125 inches in thickness, with at least 95% conforming to the specified sizes.

B. All material shall be clean from rock, garbage, weeds, or other deleterious material.

2.8 WILLOW POLES

A. All branches for poles shall be cut from healthy, live, dormant branches of willow (*Salix lemmonii, S. geyeriana, Salix lucida ssp lasiandra*) and shall be taken from suitable materials within the project area as identified by the Restoration Specialist. This work shall take place late in the fall if feasible after the on-site willows have gone dormant.

B. Poles shall be at minimum five (5) ft. in length, depending on the size of the riprap and no more than one inch in diameter. The poles must be long enough so that 75% of the length of the pole is planted into the soil.

C. Material shall not be cut more than seven (7) days prior to installation unless approved by the Restoration Specialist, and stored in cool, shaded conditions. Keep all materials in a water filled bucket. Poles shall be straight, with all leaves removed from the stems. All cuts shall be clean without frayed ends. Cut bottoms on a 45° angle.

2.9 IRRIGATION

A. Materials for the system must be submitted and approved in writing.

B. Pumping from the river is acceptable.

C. System may include the use of portable tanks and/or a water truck.

PART 3 - EXECUTION

3.1 GENERAL

A. All revegetation and restoration work shall include a two-year maintenance and warranty period.

B. Prior to seeding the access road ensure compaction is not greater than 85% at +/- 2% of optimum moisture content as measured using the Standard Method (ASTM D 698).

C. A C-27 licensed in the state of California and shall perform all vegetation work as specified herein, in accordance with the provisions of these Special Provisions and the Plans.

3.2 BROADCAST SEEDING AND INOCULANT APPLICATION

A. For the access road evenly hand broadcast seed at specified rates and inoculant at 60lbs./acre, and rake to incorporate to a depth of ¼ - ½ “.

B. For the slope, evenly hand broadcast seed at specified rates and inoculant at 60 lbs./acre.

3.3 WOOD CHIP APPLICATION

A. Where specified along the access road, staging areas, and other disturbed soils, following broadcast seeding apply wood chip mulch one layer deep to achieve approximately 85% cover.

3.4 EROSION CONTROL NETTING INSTALLATION

A. Broadcast Revegetation Seed Mix and inoculant.

B. Install blankets from the top of slope to behind the riprap as shown on the drawings. Excavate a six (6) inch by six (6) inch trench at the top of all slopes. Overlap blankets six (6) inches and stake with twelve (12) inch hard wood stakes, on an average of two (2) stakes per square yard in a diamond pattern. Lay blankets loosely, allowing for good soil contact, and reducing opportunities for bridging, or erosion under the blankets.

C. Carefully key in blankets under all structures and at all ends of the blankets.

3.5 WILLOW POLE INSTALLATION

A. Install willow poles on average five (5) ft. centers as shown on the drawings for a total of 120 poles.

B. Install concurrently with the rock while building the RSP on a 45° angle so that the poles are planted into permanently moist soils. Pre-prepare the planting hole for poles using re-bar, a ‘stinger’ or other suitable tool to the depth of the pole to be placed in the soil so as to not damage the bark of the pole during installation. Plant so that two to three nodes are above the riprap and at minimum 75% of the pole is in the ground. Tightly pack all loose soils around the poles so that they cannot be removed by hand prior to carefully placing the rock. If installation late in the season when willow poles are dormant is not feasible due to the need to install concurrently with rock for RSP, irrigate to achieve 65% survival.

3.6 PLANTING CONTAINERIZED PLANTS

A. Plant all container plants on average three-ft. centers in the spring, after the ground has thawed, or in the fall before night temperatures fall below 32 degrees [°] Fahrenheit [F]) and as directed. Ambient air temperatures during the day shall average above 55 degrees [°] Fahrenheit [F]).

B. Plant a total of 70 Woods’ rose and 70 bitterbrush.

C. Excavate a planting hole in between the rocks, as shown on the drawings, an additional four inches below the depth of the container in order to achieve a planting hole at a minimum depth of 14 inches, and two inches wider than the container (one inch on either side). Loosen soils in the bottom and along the sides of the hole.

D. Place one MYKO Start 60 Paks in the bottom of each planting hole

E. Thoroughly water holes prior to planting and plant immediately to avoid drying of soils.

F. Loosen bound roots as directed.

G. Place the plant in the hole and backfill with the excavated moist soil so that the crown is one inch below grade, forming a planting pocket. Tamp soil. Water thoroughly.

3.7 MAINTENANCE WARRANTY

A. Irrigate container plants 2 to 3 times per week, starting in June and terminating at the end of August, for two years, with one gallon each per plant, or as site conditions dictate, and as directed to achieve health and new growth. Warranty 80% survival of poles.

B. Warranty adequate cover by seeded species so there is no evidence of rill or sheet erosion.

C. Re-seed as needed and directed by the Restoration Specialist.

3.8 WARRANTY

A. For two full years following completion of the work, warranty no occurrence or evidence of rill or sheet erosion.

B. Warranty 65% survival of poles

C. Warranty 100% survival of container plants.

PART 4 MEASUREMENT AND PAYMENT

4.1 Method of Measurement

A. Units: Salvaging and installing willow pole plantings and purchasing and installing containerized plantings will be paid by each under the Schedule of Items.

B. The payment quantity for purchasing seed mix will be paid by thousands of square feet under the Schedule of Items.
C. The payment quantity for applying upland seed and installation of erosion control blanket will be paid by the square yard under the Schedule of Items.

D. The payment quantity for applying wood mulch will be paid by the thousands of square feet under the Schedule of Items.

E. The payment quantity for irrigation of plantings and 2-year warranty will be paid by the lump sum under the Schedule of Items.

4.2 Basis of Payment

F. Payment for these items shall be as listed under Schedule of Items.

END OF SECTION