TECHNICAL SPECIFICATIONS

for

SARATOGA TO SANBORN TRAIL

Prepared for:

CITY OF SARATOGA

100% SUBMITTAL

August 26, 2019

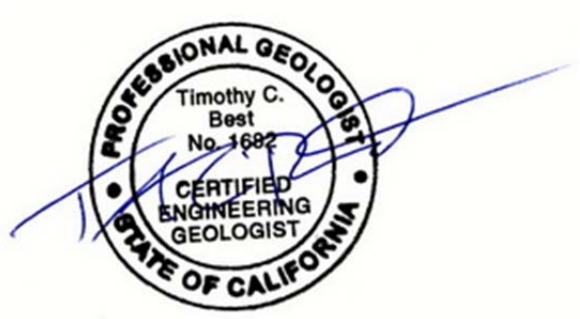

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TABLE OF CONTENTS

SECTION 014200
REFERENCES

SECTION 014200
REFERENCES

1 GENERAL

1.1 DESCRIPTION

A Section includes

Abbreviations
Slope Notation
Definitions

1.2 RELATED SECTIONS

A Information provided in this section is used where applicable in individual specification sections.

1.3 ABBREVIATIONS

A Whenever these abbreviations are used in the specifications, they represent the following:

AASHTO	American Association Of State Highway And Transportation Officials
ANSI	American National Standards Institute
AQ	Actual Quantities
CO	Contracting Officer
CEG	Engineering Geologist
CF	Cubic Feet
CY	Cubic Yard
DQ	Design Quantities
EA	Each
hr	Hour
lb	Pound
LF	Linear Feet
LS	Lump Sum
LSQ	Lump Sum Quantities
mi	Mile
OSHA	Occupational Safety & Health Administration
QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Practitioner
SF	Square Feet
SQ	Staked Quantities
SY	Square Yard
WWPA	Western Wood Products Association

1.4 SLOPE NOTATION (VERTICAL: HORIZONTAL)

A For slopes flatter than 1:1, express the slope as the ratio of one unit vertical to a number of units horizontal. For slopes steeper than 1:1, express the slope as the ratio of a number of units vertical to one unit horizontal. For example 1.5:1 os equal to 1.5 horizontal by 1.0 vertical.

1.5 DEFINITIONS

The following terms, or pronouns in place of them, are used in these specifications or in other contract documents, the intent and meaning are as follows:

Base Course. The layer or layers of specified material of designed thickness placed on a trailbed to support surfacing.
Backfill. Fill material placed behind retaining walls. May be reinforced with geogrid.
Batter. A backward and upward slope of the face of a wall.
Berm. The ridge of material formed on the outer edge of the trail that projects higher than the tread.
Borrow. Suitable materials taken from approved sources designated on the plans or on the ground, to Spread of earthen material not used for construction of embankments.
Cap Rock. Rock placed in the top or uppermost layer in a constructed rock structure, such as a talus or rubble rock section or rock retaining wall.
Clearing Limit. The area over and beside the trail that is cleared of trees, limbs, and other obstructions.
Climbing Turn. A reverse in direction of trail grade without a level landing used to change elevation on a steep slope.
Compacted. Consolidation that is obtained by tamping or rolling suitable material until no noticeable displacement of material is observed.
Cut Bench. Trailbed constructed entirely on undisturbed material.
Designated on the Ground. The location of materials, work areas, and construction items, including lines and grades, marked on the ground with stakes, flagging, tags, or paint.
Drainage Dips. A structure cut into the trailbed used for turning water off the trail, includes reverse grade dips, knicks and waterbars.
Duff. Organic material overlying rock or mineral soil.
Embankment. A structure of suitable material placed on the prepared ground surface and constructed to the trailbed elevation.
Excess Excavation. Material in the trailway in excess of that needed for construction of designed trailways.
Grade. The vertical distance of ascent or descent of the trail expressed as a percentage of the horizontal distance.
Hazard Tree. An unstable tree that is likely to fall across the trail.
Header Rock. Rock laid with the narrow end towards the face of the wall.
Inslope. Where the trails tread is sloped downward toward the backslope.
Leave Tree. Trees designated to be left or to remain undisturbed after trail construction.
Mineral Soil. Soil or aggregate that is free from organic substances and contains no particles larger than 2 inches at their greatest dimension.
Outslope. Where the trail tread is sloped downward toward the embankment or daylight side of the trailway.
Sideslope. The natural slope of the ground, usually expressed as a percentage.
Slough. That material from the backslope or the area of the backslope that has raveled onto the trailbed.
Surfacing. Material placed on top of the trailbed or base course that provides the desired tread.

Suitable Material. Rock that can be accommodated in the trail structure, and soil free of duff with a recognizable granular texture.
Switchback. A reverse in direction of trail grade with a level landing used to change elevation on a steep slope, usually involving special treatment of the approaches, barriers, and drainages.
Trailbed. The finished surface on which base course or surfacing may be constructed. For trails without surfacing the trailbed is the tread.
Trailway. The portion of the trail within the limits of the excavation and embankment.
Tread. The surface portion of the trail upon which traffic moves.
Turnout. A short section of extra trail width to provide for passage of trail users.
Watercourse. Any natural or constructed channel where water naturally flows or will collect and flow during spring runoff, rainstorms, etc.

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS
(a.k.a. Mobilization & Demobilization)

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS
(a.k.a. Mobilization & Demobilization)

1 GENERAL

1.1 DESCRIPTION

A The work covered by this section consists of the construction facilities and temporary controls, including mobilization and demobilization, as specified, as shown on the Drawings, or as otherwise directed by the Engineer.

B Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, safety and security precautions, equipment, supplies, and incidentals to the site; for the establishment of all offices, traffic control, temporary fencing, restrooms and other facilities necessary for work on the project; and for all other work and operations which must be performed, or costs incurred prior to beginning work, on the various items on the project site.

C 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.

D All work shall comply with the approved Storm Water Pollution Prevention Plan (SWPPP).

1.2 RELATED SECTIONS

015713 TEMPORARY EROSION CONTROL
015723 SWPPP IMPLEMENTATION

1.3 REFERENCE STANDARDS – NOT USED

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS

A Temporary construction and protection fencing

1) Unless otherwise indicated, protection fencing shall consist of plastic high visibility safety fencing (Type ESA) or approved high visibility flagging subject to Engineers approval.

1.6 QUALITY ASSURANCE – NOT USED

2 EXECUTION

2.1 CONTRACTOR'S PLANT AND EQUIPMENT

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

B Construction Power and Communication Facilities. Contractor shall be responsible for providing sufficient electrical power and communication facilities to construct the work.

C Storage Facilities.

1. Provide storage facilities for the protection of materials and supplies from weather, and shall 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.

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

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

F Water. Water is available onsite at the entrance to Quarry Park .The water facilities will be described at the prebid meeting.

2.2 MOBILIZATION AND DEMOBILIZATION

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

2.3 PROJECT SIGNS

A Erect project, safety and hard hat signs at each work site within five (5) days after commencement of work at that site.

2.4 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.

2.5 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 plastic high visibility safety fencing (Type ESA) or, if approved, high visibility flagging.

B Temporary fencing shall be maintained during construction. Except as directed by the Engineer. Barriers shall be removed after completion of work.

C Tree Protection shall be erected around trees as required to protect trees, as designated on the Drawings, or directed by the Engineer. Fencing shall be constructed using bright orange plastic safety fencing (type ESA) or bright orange flagging as approved by the Engineer.

2.6 BULLETIN BOARD

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

2.7 STAGING AREAS

A General. Staging areas at the project site are provided for the Contractor's use and are shown on the Drawings. By making these areas 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 Impacts to the access routes must be minimized and disturbance along the access route shall be restored to pre-construction conditions upon project completion.

C The contractor shall carefully preserve the surrounding property by confining operations within the limits of work. Construction work or equipment operations shall not be conducted outside the designated work area boundary without approval of the City.

D Access over existing roads shall be maintained. If through access cannot be maintained, a schedule for closure must be approved by a city's representative.

E No area within the contract limits is available for the exclusive use of contractor. Use of contractor's work areas and any mobilization areas shall be at contractor's own risk, and city shall not be held liable for any damage or loss of materials or equipment located within such areas.

F Alternative staging areas. Alternative sites must be acceptable to city, 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.

G 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.

2.8 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 provisions for preventing hazardous materials from contaminating soil or entering water courses and shall establish a 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. Provide a lined pit for concrete washdown, located where spills or overflow cannot enter nearby watercourses or storm drains. The pit shall be located a minimum of 75 feet from any flowing watercourse.

C **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.

D **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.

2.9 CONSTRUCTION SITE HOUSEKEEPING

A Maintain the site in a neat and orderly manner throughout the construction process. Store all materials within approved staging areas.

B 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. 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.

C The contractor is responsible to maintain all vehicles and equipment and to inspect them frequently for leaks. Equipment washing, refueling, and/or servicing shall not take place except with appropriate precautions to avoid fuel spills, at least 100 feet away from stream channels, for vehicle and equipment maintenance.

D Clean up any spills on a dirt area by digging up and properly disposing of contaminated soil at an appropriate facility.

2.10 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.

2.11 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.

2.12 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.

2.13 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 Traffic Control Plan. The Contractor will provide a traffic control plan to the Engineer for review and approval prior to project construction including: access points to Bear Creek Road, staging areas, dump sites, operating hours, project duration, scheduling and phasing, and total number of construction vehicles and their respective haul routes, per project phase.

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

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

3.2 PAYMENT

A The lump sum contract price for Construction Facilities and Temporary Controls, also known as Mobilization and 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

SECTION 015713:
TEMPORARY EROSION CONTROL

SECTION 015713:
TEMPORARY EROSION CONTROL

1 GENERAL

1.1 DESCRIPTION

A This Section describes work consisting of the furnishing, installing, maintaining, removing, and disposing of Temporary Erosion and Sediment Control (TESC) and Construction Stormwater Pollution Prevention.

B The TESC shall be designed and implemented to prevent erosion and scour, to treat sediment laden water for acceptable discharge, and to prevent the conveyance of sediment into surface waters, drainage systems, and environmentally critical areas

C This work shall consist of temporary erosion control and water or air quality control measures, devices, and BMPs that may be shown on the Drawings, and as specified in the Contract Documents, Project Permit(s), Project SWPPP, Standard Specifications, these Technical Specifications, or as directed by the Engineer during the life of the contract. Temporary erosion control measures and other BMP's will also be required at staging/storage areas utilized during project construction.

D Attention is directed to the "Storm Water Pollution Prevention Plan". As part of the SWPPP certification and submittal process, the Contractor shall submit two (2) copies of any proposed revisions to the applicable Project Plan sheets for Temporary Erosion Control and the Dewatering and/or Diversion operations. Do not start work until the SWPPP, applicable plan sheets, schedules and methods of operation for temporary pollution control are reviewed and accepted by the Engineer and RWQCB. The project must satisfy the requirements of all permit(s) issued for the project. During the course of project construction, cooperate with the Engineer, the City and other regulatory officials and take immediate action as directed to protect water bodies and sensitive areas, and provide for erosion or other pollution control.

1.2 RELATED SECTIONS

015000 MOBILIZATION
015723 SWPPP IMPLEMENTATION

1.3 REFERENCE STANDARDS – NOT USED

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS – NOT USED

1.6 QUALITY ASSURANCE

A At the preconstruction conference, the Contractor shall be prepared to discuss temporary erosion and sedimentation controls.

B Temporary erosion control shall be installed to the satisfaction of the Engineer and conform to applicable codes and to the approved SWPPP.

2 EXECUTION

2.1 GENERAL

A During construction, the Contractor shall incorporate practices that prevent erosion, or control erosion when prevention is unavoidable, and shall make every effort to maintain effective erosion and sediment controls throughout the work, including implementing timely corrective actions as may be necessary. Sediment shall be prevented from entering any surface water, drainage facility, and natural drainage system and shall be prevented from transport to beyond the project site. Work shall comply with the approved SWPPP

B The following strategies to ensure that storm water pollution is prevented shall be employed:

1) Minimize erosion and sedimentation during construction.

2) Eliminate pollution of storm runoff by chemicals and materials used in the construction process.

3) All temporary erosion and sediment controls shall be in place prior to the commencement of construction as well as at the end of each work day. At a minimum, silt fences, or equivalent apparatus, shall be installed at the perimeter of the construction site to prevent construction related runoff and/or sediment from entering into the watercourses.

4) The Contractor (and Permitee) shall monitor weather forecasts and take appropriate precautions in advance of storm events.

C Install temporary soil stabilization materials 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 Details shown on Drawings, SWPPP, and these Technical Specifications.

2.2 SEDIMENT CONTROL

A Newly exposed mineral soils outside of the trail running surface greater than 50 square feet (sf) and with exposed slope distance exceeding 5 feet and with less than 80% ground coverage of natural vegetation shall be mulched unless otherwise directed by the Engineer.

1) Native Mulch and Slash

a) Where feasible and available, native mulch or slash shall be used instead of straw much.
b) Native vegetation cleared at work sites shall be stockpiled and re-applied on the disturbed ground surface as directed by the Engineer or City.
c) Native much shall consist of duff and/or small diameter woody debris lopped into maximum 12 inch length to promote good contact with the soil surface.

2) Straw Mulch

a) Use only certified weed-free rice straw. Documentation of purchase must be provided

prior to spreading on site.

b) Spread straw 2" thick with 90% ground coverage or better.

3) Fiber Roll:

a) Install fiber rolls parallel to the contour where bare slopes exceed 10 feet in length in downslope direction unless otherwise directed by the Engineer. Install per Standard Details shown on Drawings and to manufacturer's recommendations

4) Erosion Control Blanket:

a) Where specified on Drawings or directed by the Engineer, exposed slopes shall be covered with approved erosion control blanket (Tensar Rollmax C125BN or equivalent) in accordance with the manufacturer's recommendations and as directed by the Engineer. Erosion control blankets are not anticipated.

5) Silt fence

a) Install silt fences downslope of work area as specified on Drawings, directed by the Engineer, and in areas where site grading has the potential to dislodge soil and rock that can enter a watercourse. Extreme cases may warrant the use of wire reinforced silt fence. Install per Standard Details shown on Drawings and to manufacturer's recommendations

B Unnecessary grading and disturbance of soil shall be avoided.

C The contractor shall have tools, equipment, and materials to install the erosion control measures before beginning construction.

D Throughout project construction, the contractor is responsible for maintaining all slopes to prevent erosion during or after a rainfall event.

E During the winter grading period (after October 15th and prior to April 15th), the erosion control measures shown here shall be in place at all times in areas where soils are stockpiled, areas that have been disturbed by grading or are downslope from those areas. During the remainder of the year (after April 15th and prior to October 15th), these erosion control measures shall be put in place whenever the start of any rain causes overland flow across or along the disturbed surface, or when the National Weather Service forecast calls for a greater than 30% chance of rain, a flash flood warning, or a flash flood watch, and when directed by the Engineer, Engineer or Owner. The Contractor (and Permitee) shall monitor weather forecasts and take appropriate precautions in advance of storm or events.

F Erosion control Best Management Practices (BMP's), including straw bale barriers, silt fences, fiber rolls (wattles), gravel bag sediment barriers and/or other means shall be employed to prevent turbid runoff from discharging into ponds or creeks.

G Earthmoving equipment shall be inspected prior to leaving the site and, if necessary, cleaned to prevent sediment transport off-site.

H .

I Stockpiles. Maintain a temporary cover on all stockpiles at all times and install and maintain appropriate BMPs (sediment logs, 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.

2.3 MAINTENANCE

A Maintain all temporary erosion control measures, devices, and/or BMPs placed in the work for the duration of the project. Maintenance includes all Manufacturer recommendations, and includes but is not limited to the following

B Immediately repair upon discovery damage to any temporary erosion control devices and/or BMPs during the course of the project at the Contractor's expense Inspect temporary erosion control devices and/or BMPs routinely, immediately after each rainfall event, and at least daily during prolonged rainfall events. Make required repairs immediately.

C Inspect construction limit and tree protection fencing daily and repair, secure, and/or replace as necessary to maintain and preserve its intended purpose.

D Routinely inspect all signage as required for the project and repair or replace upon discovery of damage, vandalism, and/or missing parts.

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

F Should a sediment log decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, replace sediment log promptly.

G 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.

H Routinely inspect stakes and/or rope used to secure a sediment log in place and repair as necessary if found to be loose or ineffective.

I Repair or replace damaged temporary gravel bag berm (or other measures which require gravel bags per the Project Drawings, Project Permits, these Technical Specifications and the SWPPP) on the same day when the damage occurs or is discovered.

J Remove sediment deposits and other debris when they reach approximately one-third the height of the sediment barrier (or as recommended by the Manufacturer) and dispose of in a manner acceptable to the Engineer, and in conformance with the SWPPP.

K Maintain temporary gravel bag berm (or other measures which require gravel bags per the Project Drawings, Project Permits, these Technical Specifications and the SWPPP) to provide a sediment holding capacity of approximately one-third the height of the gravel bag berm above the ground. When sediment exceeds this height or when directed by the Engineer, remove and dispose of sediment in a manner acceptable to the Engineer, and in conformance with the SWPPP.

L Remove and dispose of 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 SWPPP.

2.4 DUST CONTROL

A The Contractor shall be responsible for the control of dust within the limits of the project at all times. 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 Periodically, water or otherwise treat access roads and haul roads, 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. Keep all 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. Immediately remove 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.

2.5 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.

3 MEASUREMENT AND PAYMENT

Temporary Erosion Control and BMP's will not be separately measured for payment. All Costs in connection with Temporary Erosion Control and BMP's shall be considered incidental to the lump sum contract price paid for SWPPP Implementation, under Section 015723.

END OF SECTION

SECTION 015723:
STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IMPLEMENTATION

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 the 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. 2009-0009-DWQ, General Permit No. CAS000002, adopted September 2, 2009, and associated amendments (hereafter Construction General Permit (CGP).

B The project is currently specified as a Risk Level (TBD, either 2 or 3), based on a completion date of earlier than October 23rd. Attention is directed to Attachments D and E of the CGP, which identify monitoring and reporting requirements for Risk Levels 2 and 3. Risk Level 2 projects are required to meet the reporting and monitoring requirements of Risk Level 1 projects (Attachment C) in addition to those requirements for Risk Level 2 Projects (Attachment D).

C The Contractor shall be responsible for penalties assessed on the Contractor or the Owner as a result of the Contractor's failure to comply with the provisions in 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 SWPPP will be periodically amended by the QSD to reflect current site conditions. The Owner will not be liable to the Contractor for Contractor’s failure to accept all or any portion of an amended or revised SWPPP program, nor for any delays to the Work due to

the Contractor's failure to implement the amended SWPPP.

I The measures outlined in the SWPPP reflect the minimum requirements of the CGP. The Contractor is responsible to perform all additional work, beyond what is shown on the Drawings or the approved SWPPP at the time the contract is awarded, as necessary to meet changing or unforeseen site conditions and to comply with the CGP, at no additional cost to the Owner.

1.2 RELATED SECTIONS

015000 MOBILIZATION
015713 TEMPORARY EROSION CONTROL

1.3 REFERENCE STANDARDS

A State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, NPDES General Permit No. CAS000002, Storm Water Discharges Associated With Construction and Land Disturbance Activities, September 2, 2009 as modified on November 16, 2010, and associated amendments, hereafter Construction General Permit (CGP).

B The California Stormwater Quality Association (CASQA) "Stormwater Best Management Practice Handbook Portal: Construction" including Appendix B, "Storm Water Pollution Prevention Plan Outline" and Appendix D, "Field Monitoring and Analysis Guidance" 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 Engineer, for review, Manufacturer's product information for materials proposed for use on site for implementation of the SWPPP.

C The Owner's Representative 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), the SWPPP, appropriate fees, and other documents required by the CGP.

D Prior to start of work, the Contractor shall submit for approval 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 VII of the CGP and successfully completed the SWRCB sponsored or approved QSP training course and QSP exam.

2) If the QSP 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 Storm Water Multi-Application & Reporting System (SMARTS) within 72 hours. The replacement QSP shall have the

required QSP registrations/certifications listed herein.

E Submit to the Engineer, 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 SMARTS. The quarterly inspection reports, Annual Reports, and all sampling results shall be uploaded onto SMARTS by the QSP or designated Data Submitter, following Owner Representative's review and approval.

F QSP shall prepare an Annual Report summarizing corrective actions, lab reports, sampling and analyses, and any corrective actions not implemented as per Section XVI of the Construction General Permit covering each yearly period in accordance with the permit conditions. QSP 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 designated representative shall review and provide comments within one week of upload to SMARTS. QSP 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 municipal separate storm sewer system (MS4). 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. The Contractor's designated QSP shall submit written notification of field modifications to the QSD for his use in amending the SWPPP, within 48 hours of their implementation.

I If directed by the Engineer or requested in writing by the Contractor and approved by the Engineer, 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 shall perform all sampling and analyses required by the CGP and the SWPPP. QSP shall sample runoff regardless of whether the total rainfall exceeds the CGP qualifying rain event (QRE), but only needs to report the readings taken during a QRE. Sampling and testing of water quality (discharges) shall be performed in accordance with sampling and analysis requirements of the CGP. In the event of exceedance, as defined in CGP Section V, 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. Exceedance reporting forms can be found in Appendix G of the SWPPP.

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 The Contractor shall keep a copy of the approved SWPPP at the job site. The SWPPP shall be made available when requested by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental

Protection Agency, or the local storm water management agency. Requests from the public shall be directed to the Engineer.

M Contractor shall notify the QSD of any RWQCB inspections within 24 hours of the inspection. The Contractor shall submit written notification to the QSD of any findings by the RWQCB, including verbal warnings.

N 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, SWPPP Section 300.7
2) Construction schedule, SWPPP Section 500.6
3) Identify Data Submitters, SWPPP Appendix D

O After project initiation, as per the scheduling or deadlines outlined in the SWPPP, the Contractor shall submit to the Owner's Representative all data, reports, and other information required to fulfill the requirements of the SWPPP, which will include but not be limited to, the following:

1) Verification that rain gauge has been installed, Section 700.5.2
2) CSMP Weather Reports, Section 700.6.4
3) Contractor personnel training for inspectors, and samplers, Section 300.8
4) Rain Event Action Plan (prior to predicted storm event), Section 600.3
5) NAL Exceedance notification to QSD and Approved Signatory and submit to SMARTS within 10 days of conclusion of storm event, Section 700.3.3
6) NAL Exceedance report (if required by Regional Board), Section 900.3
7) Non Compliance Report (if required), Appendix A
8) Annual Report Section 900.2

P 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 PRODUCTS – NOT USED

1.6 QUALITY ASSURANCE

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

2 EXECUTION

2.1 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) Responsible for implementation, repair, upgrades, or maintenance of pollution control measures.

2) Responsible for sampling, monitoring, reporting, and record keeping, as outlined in the SWPPP.

3) Responsible for preparation of Rain Event Action Plans (REAPs)

4) Responsible for turbidity and pH testing.

5) The primary contact for pollution control work.

6) 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 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 48 hours, the forecast shall be printed out and kept with the SWPPP. If the chance of precipitation is predicted to be greater than 50 percent, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation, and monitoring shall increase, as required by law and outlined in the Construction General Permit. For Risk Level II and III locations within the project, a Rainfall Event Action Plan (REAP) shall be prepared as required by the SWPPP. The REAP shall be provided to the QSD within 72 hours of completion.

H The National Weather Service weather forecast is found at:http://www.wrh.noaa.gov/mtr/

I The Contractor shall maintain a rain gage at the site at all times during construction. Rain gage readings shall be recorded daily and provided to the State 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 storm event as defined by the CGP.

J The Owner will not be responsible for delays caused by the Contractor's failure to conform to the approved 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 8-1.05, "Temporary Suspension of Work," of the State Specifications.

2.2 BEST MANAGEMENT PRACTICES (BMP'S)

A Contractor shall furnish sufficient personnel, materials and adequate equipment to perform the water pollution control maintenance work immediately and to work continuously until its completion. Water pollution control maintenance work shall consist of maintaining and replacing temporary water pollution control measures throughout the duration of the Contract until permanent stabilization measures are accepted by the Owner. Maintenance work and SWPPP shall be considered as integral functional practices to implement water pollution control.

B If the measures being taken by the Contractor are inadequate to control water pollution effectively, the Owner's 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.

C Contractor shall be responsible throughout the duration of the Project for installing, constructing, inspecting, maintaining, removing and disposing of the water pollution control practices included in the SWPPP, the Drawings, the Technical Specifications, and any amendments thereto. Unless otherwise directed by the Engineer, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of Work ordered in conformance with the Contract Provisions. Requirements for installation, inspection, maintenance, removal, and disposal of water pollution control practices are specified in the Drawings, the SWPPP, the Manuals, and herein.

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

E 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.

F Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 14 days. Non-active areas shall be protected as required within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

G Contractor may be directed to apply permanent erosion control in small or multiple units as disturbed soil areas are deemed substantially complete by the QSD.

H 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.

2.3 MAINTENANCE, INSPECTION AND REPAIR

A For all project Risk Levels, the QSP, or an approved substitute designated and trained by the QSP (QSP- designee) shall inspect the site before a forecast storm (within 48 hours prior to a

forecast storm), during the storm (at required intervals during extended rains), and after a storm (not later than 48 hours after rain event). Inspections shall be documented as specified in the SWPPP. Inspection forms shall be provided to the Owner's Representative within 72 hours of a request from the State Representative.

B Stormwater inspections shall be performed at all active areas and all areas with installed BMPs as required required by permit and the SWPPP, and on a minimum weekly basis, year-round by the QSP or individual trained by the QSP. More frequent monitoring is required for rain events.

C Non-Stormwater inspections shall be performed quarterly by the QSP or QSP-designee (quarterly inspection time periods are January-March, April-June, July-September, and October-December).

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

E 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.

F 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.

G The QSP shall inspect the pollution control measures to identify their effectiveness and implement repairs as required by the SWRCB.

H Contractor shall furnish sufficient personnel, materials and adequate equipment to perform the water pollution control maintenance work immediately and to work continuously until its completion. Water pollution control maintenance work shall consist of maintaining and replacing temporary water pollution control measures throughout the duration of the Contract until permanent measures are accepted by the Owner's Representative. Maintenance work and SWPPP shall be considered as integral functional practices to implement water pollution control. 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 and properly update the SWPPP.

I If the measures being taken by the Contractor are inadequate to control water pollution effectively, the Owner's 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.

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

A SWPPP Implementation is a lump sum pay item.

4 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, materials, tools, equipment, and incidentals and for doing all the work necessary to implement and maintain SWPPP measures and controls, including, sampling, analysis, reporting, and maintenance and removal of the measures through the end of the rainy season following completion of construction activities and submittal of the Notice of Termination (NOT).

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.

Pay Item	Pay Unit
SWPPP Implementation	Lump Sum

SECTION 017123
FIELD ENGINEERING (LAYOUT AND STAKING)

SECTION 017123
FIELD ENGINEERING (LAYOUT AND STAKING)

1 GENERAL

1.1 DESCRIPTION

A This work consists of trail layout and establishing any control points needed in addition to existing staking, and removing and disposing of all construction stakes, tags, flagging, and plastic ribbon from the project area.

1.2 RELATED SECTIONS

311100	CLEARING AND GRUBBING
312000	EARTH WORK
312000.0010	TRAIL DRAINAGE
312000.0020	CLIMBING TURNS
323200	RETAINING WALLS AND ROCK FILL BUTTRESSES
333400	TRAIL BRIDGE
334100	STORM DRAINAGE SYSTEMS

1.3 REFERENCE STANDARDS – NOT USED

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS – NOT USED

1.6 QUALITY ASSURANCE

A Subject to review and approval of the Engineer

2 EXECUTION

2.1 LAYOUT

A The Contractor shall layout and install all construction to lines and grades in accordance with the Drawings or as staked/flagged in the field, and to the approval of the Engineer. Where discrepancy exists between Drawings and field staking, field staking shall take prescient. Modifications to the alignment may be made based on onsite conditions and approval of engineer.

B The alignment shall conform to natural terrain to create an aesthetically pleasing alignment. The alignment should avoid long straight reaches. The alignment should incorporate natural terrain features to form required reverse grades dips to the extent feasible.

C Unless otherwise specified on the Drawings, the trail shall have a maximum sustained grade of 10% with smooth transitions. Where the sustained trail grade exceeds 10%, the Contractor shall review the alignment with the Engineer prior to construction.

D Trail shall be drained by outsloping and drainage dips installed at the time of construction per Drawings

2.2 DUSKY FOOTED WOOD RAT NESTS

A Trail shall avoid mapped Dusky Footed Wood Rat nests as shown on Drawings and as

encountered in the field. Where nests cannot be avoided, the final trail alignment shall be reviewed by the Engineer and project biologist prior to construction and the alignment modified as required.

B The contractor shall notify the Engineer of any wood rat nests encountered along the alignment prior to construction.

2.3 MODIFICATIONS

A Any modifications to the alignment shall be reviewed and approved by the engineer and City representative prior to the commencement of that work.

2.4 STAKING

A The Engineer will set initial construction stakes or flagging, and control points, and furnish the contractor with all necessary information relating to lines, slopes, and grades. These stakes and flagging constitute the field control.

B The Contractor shall furnish and maintain additional stakes, flagging, templates, batter boards, and other materials and supplies necessary for marking and maintaining points and lines established. Do not perform work in the absence of control points. If any construction control points are destroyed, displaced, or erroneous, notify the engineer. Uniformly contour alignment and construct grade from control point to control point.

C Remove all construction stakes, tags, flagging, and plastic ribbon from the project area within 7 days after the final inspection of all other work on the project. Dispose of all stakes, tags, flagging, and plastic ribbon off site unless otherwise designated.

3 MEASUREMENT AND PAYMENT

Trail layout, staking, flagging, and cleanup will be considered incidental to other pay items in this contract, and additional payment will not be made. There will be no separate measurement for this item.

END OF SECTION

SECTION 311100:
CLEARING AND GRUBBING

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, grubbing, trimming, removing, and treating trees, logs, limbs, branches, brush, plants, and other vegetation along with removal of rocks, undermined roots and hazard trees within the clearing limits, as specified, as shown on the Drawings, or as directed by the Engineer. Includes the felling and treatment of designated trees outside the clearing limits. Also, included are the protection from injury or defacement of trees and other objects not designated for removal and treatment of damaged trees.

1.2 RELATED SECTIONS

017123	TRAIL LAYOUT
015713	TEMPORARY EROSION CONTROL
312000.0020	CLIMBING TURN
312000	EARTHWORK
323200	RETAINING WALLS AND ROCK FILL BUTTRESSES

1.3 REFERENCE STANDARDS– NOT USED

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS– NOT USED

1.6 QUALITY ASSURANCE

A Subject to review and approval of the Engineer

2 EXECUTION

2.1 CLEARING

A Remove and dispose of trees, logs, limbs, branches, brush, herbaceous plants, other vegetation and objectionable material within the clearing limits to the satisfaction of the Engineer.

B All vegetation shall be cleared and grubbed only within the clearing limits (12 inches beyond top of cut and to base of fill) unless otherwise specified on drawings and to the satisfaction of Engineer. Care shall be made to avoid damage to trees outside the work area.

2.2 TREE REMOVAL

A Fall and limb all trees within the trail tread, trees shown on drawings, and any hazard trees as identified during construction. The majority of trees greater than 8 inches dbh proposed for removal are show on Drawings. Additional unmapped trees may exist.

B Fall and limb all trees over 4 inches in diameter that are leaning into the clearing limits and that are within 8 feet above the trailbed. Stump height of leaning trees that are cut outside

the clearing limits shall not exceed 12 inches as measured on the uphill side of the stump.

C Contractor shall flag all trees to be removed for approval by City Representative prior to its removal. Once the flagging is completed, City Representative will walk the vegetation removal areas and approve them prior to Contractor initiating clearing and grubbing activities.

D Fall and limb all hazard trees and snags that are broken off or that are in a leaning, unstable position over the trailway as shown on drawings or as directed by the Engineer. Stump height of leaning trees that are cut outside the clearing limits shall not exceed 12 inches as measured on the uphill side of the stump.

E Do not leave felled trees parallel with the trail unless there are sufficient barriers to keep them from rolling or sliding onto the trail. Lop limbs to reduce slash concentration and scatter the clearing debris outside and below the clearing limits. If the trunk or a portion thereof, falls within the trailway, remove that portion within 4 feet of either side of the trail centerline and scatter a minimum distance of 4 feet beyond and below the trail centerline.

F When felling, cutting, or trimming, do not cause bark damage to standing timber. Fall and limb trees with major roots exposed by construction that are rendered unstable.

2.3 PRUNING

A Cut all limbs and branches that extend into the trail/bridge corridor to leave 8 foot (minimum) high vertical clearance. Cut limbs flush with the tree trunks or stems or cut at the ground surface. When pruning, prevent branches from damaging tree or stripping the bark when the branch falls to the ground.

2.4 LOG REMOVAL

A Cut and remove all logs that extend across or into the clearing limits. The portions of cut logs that remain on the upper side of the trail shall be either firmly anchored to prevent sliding or rolling onto the trailway or moved across the trail to the lower side and scattered outside the clearing limits.

2.5 GRUBBING

A Grubbing shall consist of the removal of all stumps, roots, buried logs, and other objectionable matter encountered to a depth of 6 inches below native grade

B Except as noted on the Drawings or otherwise specified by the Engineer, the entire area within the trailway shall be thoroughly cleared and grubbed.

C All roots exposed during construction shall be clean cut to avoid tree damage

D Stumps (root wads)

1) Remove all stumps within the trailbed.

2) Remove stumps located between the edge of the trailbed and the edge of the trailway that cannot be cut flush with the finished slope or that are not tightly rooted.

3) Fill holes in the trail tread caused by removing woody material with suitable material.

2.6 DISPOSAL OF DEBRIS

A Except as hereinafter specified or otherwise indicated on the Drawings, all logs, brush, strippings, slash, and other organic debris which are the products of the clearing and

grubbing operations shall be disposed of on site at locations to be approved by the Engineer, typically below the trailway. Approved organic debris may be used as mulch for erosion control on disturbed areas.

B Lop vegetation into less than 6 foot pieces as necessary and scatter on ground on the lower side of the trailway outside the clearing limit, at height no more than 18 inches (unless otherwise used as native mulch for erosion control to satisfaction of Engineer – 015713 Temporary Erosion Control). Do not cover existing vegetation with debris. Do not place such materials in stream channels, drainage ways, ditches, culvert catch basins or other locations where they would prevent the free flow of water away from the trailbed.

C Remove sticks or wood chunks exceeding 2 inches in diameter and 12 inches in length that have fallen onto the trailbed.

2.7 ROCK REMOVAL

A This work consists of removal and disposal of rocks from the traibed.

B Remove loose rocks that are larger than 2 inches at their greatest dimension from the trailbed, and rocks that project more than 2 inches above the surface of the trail tread, when removal can be accomplished by hand or when rocks can be pried out with a pick mattock, shovel, pry bar, or similar tool unless otherwise approved by the Engineer. Remove any loose rock in drainage dips or ditches that may impede water flow off the trail.

C Shatter any protruding rocks in trail tread that are too large to be pried out with a pick and bar by using either a rock sledge or explosives. Remove the protrusion down to the level of the tread surface. Fill any resulting depressions with suitable material and compact by tamping.

D Fill any holes remaining from rock removal with suitable material and compact.

E If the rock removed is not needed for other items, scatter the rock by side-casting to the lower side of trailway beyond the clearing limits, and distribute rock to ensure that no blockage of drainage or creation of a windrow occurs. Do not dispose of waste materials in watercourses.

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

A Unless otherwise specified below, clearing and grubbing shall be considered incidental to other pay items in this contract, and additional payment will not be made. This includes but not limited to:

1) Clearing, grubbing, removal of rocks, falling and limbing of trees less than or equal 12 inches dbh, removal of stumps (root wads) less than or equal to 8 inches dbh, pruning, and treatment of logs

B Falling and limbing of trees greater than 12 inches dbh shall be payed by unit cost.

C Removal of root wads on trees greater than 8 inches dbh shall be payed by unit cost.

3.2 PAYMENT

The contract price for clearing and grubbing 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. Payment will be made under:

Pay Item	**Pay Unit**
Clearing, grubbing and rock removal (excludes falling and limbing of trees > 12” dbh and removal of stumps > 8” dbh)	Incidental to trail construction. No separate measurement for this item
Falling and limbing of trees > 12” dbh	Each
Stump (root wad) removal > 8” and <= 18” dbh	Each
Stump (root wad) removal > 12” dbh and <= 18”	Each
Stump (root wad) removal > 18” dbh	Each

END OF SECTION

SECTIONS 312000
EARTH WORK (TRAIL CONSTRUCTION)

SECTIONS 312000
EARTH WORK (TRAIL CONSTRUCTION)

1 GENERAL

1.1 DESCRIPTION

A The work covered by this section consists of furnishing all labor, equipment, materials, and performing all operations for the excavation and placement of all excavated material, regardless of its nature, from within the trailway or from other sources.

B This work includes but is not limited to the excavation and embankment construction required to shape and finish the trailbed, trench excavation and back fill, excavation for borrow, excess spoil broadcast and disposal, construction of ditches and drainage dips, and other miscellaneous excavation incidental to the construction of the improvements.

C This work does not include the additional work associated with portions of trail constructed through “climbing turns”. New Trail Construction

1) New trails shall be constructed to the dimensions, grades and specifications shown on Drawings and Standard Details.

2) Modifications to the alignment may be made on written approval of the Engineer and in accordance Technical Specification 017123

D Road to Trail Conversions

1) Trail shall be constructed along the existing old overgrown trail bed per the dimensions and specifications shown on Drawings and Standard Details.

2) Modifications to the alignment may be made on written approval of the Engineer and in accordance Technical Specification 017123 FIELD ENGINEERING (LAYOUT AND STAKING)

1.2 RELATED SECTIONS

015000	MOBILIZATION
015713	TEMPORARY EROSION CONTROL
015723	SWPPP IMPLEMENTATION
017123	LAYOUT
323200	RETAINING WALLS AND ROCK FILL BUTTRESSES
312000.0010	TRAIL DRAINAGE
312000.0020	CLIMBING TURNS
334100	STORM DRAINAGE FEATURES

1.3 REFERENCE STANDARDS

A California Department of Transportation (Caltrans), Standard Specifications

B American Society for Testing and Materials ASTM D 1557 — Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3)

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS – NOT USED

1.6 QUALITY ASSURANCE

A Engineer shall review final alignment, site soil and groundwater conditions assumed in design are correct for the site.

B Contractor shall conform to inspection schedule per Drawings.

2 EXECUTION

2.1 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 and are not suitable for bidding purposes.

D In the event that any unusual conditions not covered by the Drawings and specifications are encountered during excavation operation, the Engineer shall be immediately contacted for directions. It shall be the contractor's responsibility to immediately notify the Engineer upon discovery of any conflicts between Drawings and field conditions.

E Slope height, inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state or federal safety regulations, i.e. OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926 Subpart P, or successor regulations.

F Contractor shall apply appropriate erosion control measures, such as silt fences, to prevent soil and rock that has been excavated or otherwise dislodged by trail work from traveling downslope (raveling, sliding, sloughing, etc.) with the potential to enter a watercourse.

G After the earthwork operations have been completed and the Engineer has finished his observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the Engineer.

2.2 STRIPPING

A Stripping. Strip surfaces of trail prism, excavations and fill foundations of heavy growth of crops, grass, weeds and other vegetation as specified in Section 311100, Clearing and Grubbing. Greater depths of stripping may be necessary in selected areas to remove vegetation, as determined by the Engineer.

B Unless otherwise specified, the stripped materials shall be dispersed on-site, at locations to be identified by the Engineer.

2.3 EXCAVATION

A Areas to be graded shall be cleared of all obstructions, including trees and other unsuitable material.

B Excavations shall extend into firm, undisturbed native soils and rock to satisfaction of the engineer. Excavation shall consist of removal of earth material and rock for trail tread, embankment foundation preparation, retaining walls, mass excavation and finish grading for bridges foundations, and other miscellaneous excavations to the lines and grades shown on Drawings, typical cross sections, and/or as directed by the Engineer.

C In the event that organic materials, yielding sub-grade (pumping) or other deleterious

materials are encountered during foundation excavations, they shall be removed as directed by the Engineer.

D Back slopes shall be inclined per Drawings and details. Temporary cuts in soil shall be inclined no steeper than 1:1 or flatter for heights of 6 feet as directed by Engineer. Steeper inclinations may be acceptable based on site review by the Engineer.

E Where cuts expose seepage then provisions must be made for its control and discharge in a way so as not to cause erosion. Notify the Engineer immediately where seepage or signs of seepage are identified in cut slops.

F 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 in excess of the grades shown on the Drawings which are not directed by the Engineer shall be backfilled with compacted embankment at the Contractor's expense.

2.4 ROCK EXCAVATION

A This work consists of removal and disposal of hard igneous, metamorphic, and/or sedimentary rock in solid beds or masses in original or stratified position. The need for specialized rock excavating equipment should be anticipated.

B Remove loose rocks that are larger than 2 inches at their greatest dimension from the trailbed, and rocks that project more than 2 inches above the surface of the trail tread, when removal can be accomplished by hand or when rocks can be pried out with a pick mattock, shovel, pry bar, or similar tool unless otherwise approved by the engineer. Remove any loose rock in drainage dips or ditches that may impede water flow off the trail.

C Shatter any protruding rocks in trail tread that are too large to be pried out with a pick and bar by using a rock sledge. Remove the protrusion down to the level of the tread surface. Fill any resulting depressions with suitable material and compact by tamping.

D Fill any holes remaining from rock removal with suitable material and compact.

E If the rock removed is not needed for other items, scatter the rock by side-casting to the lower side of trailway beyond the clearing limits, and distribute rock to ensure that no blockage of drainage or creation of a windrow occurs. Do not dispose of waste materials in watercourses.

F The limit of rock excavation is not determined. The Contractor shall determine the amount of rock excavation require and prepare their bid accordingly. No additional compensation will be provided for rock excavation.

G Rock generated by excavation may be used for rock retaining walls and rock fill buttresses in lieu of import rock if approved by the Engineer

2.5 EXCESS AND DELETERIOUS SPOILS

A Separate clean excavated soils that is to be used for compacted fill from excess and deleterious soils, stumps and vegetation.

B Excess and deleterious soils including topsoil, fat clay soils, organic rich soils, decayed woody debris rich soils, and other material, as identified by the Engineer, shall be disposed at 1) an approved stable location as directed by the Engineer or City representative, or 2) uniformly spread downslope (broadcast) and outside the trail tread, not more than 6 inches in depth (unless otherwise approved by the Engineer).

C The contractor shall be responsible for conforming to existing surrounding conditions with smooth transition in grading, and shall avoid any abrupt apparent changes in grades or cross slopes, low spots or hazardous conditions.

D Spoils shall not be placed in locations with the potential to interrupt or receive concentrated flow. Do not obstruct drainage or create piles, berms, or windrows of debris.

E Apply erosion control measures at spoils locations, as specified on Drawings or in Technical Specifications 015713 TEMPORARY EROSION CONTROL and 015723 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IMPLEMENTATION, or as directed by the Engineer.

2.6 COMPACTED FILL

A Construct embankments with approved compacted fill material. The on-site granular and clayey soil and rock generated from the site is generally suitable for use as compacted fill.

1) Fill material shall be free of highly expansive clay, organic material, and contain no rocks or clods greater than 6 inches in diameter, with no more than 15 percent larger than 4 inches. Soil should also have a Plasticity Index (P.I.) less than 18. Rock fill material shall consist of mixed rock > 4 inches in diameter as approved by the Engineer

B Fill used for trail embankments shall be keyed, benched and compacted into firm native soils and brought up to final grade as specified on Drawing details.

C Unless otherwise specified in Drawings or directed by the Engineer areas to receive compacted fill should be scarified to depth of 4 inches, moisture conditioned and compacted to 85 percent relative compaction (per ASTM D 1557). Compacted fill should be keyed and benched, placed in thin lifts not exceeding 8 inches in loose thickness, moisture conditioned, and compacted to a minimum of 85 percent relative compaction. Fill slopes should be inclined no steeper than 1.5:1 (horizontal to vertical) without approval of the Engineer. Where shown on Drawings at the transitions to existing slopes that are steeper gradients fill slopes may be blended with natural grades.

D If grading is performed in a wet condition, compaction may be difficult, pumping bringing water to the surface may occur. If such conditions are encountered soils shall not be used until reconditioned to conform to specifications outlined here and as approved by the Engineer.

2.7 BORROW SITES

A Obtain borrow materials from locations shown on Drawings, designated on ground, or approved by Engineer.

2.8 TRAILBED FINISH

A Fill holes with suitable material, compact, and cut high points to provide a uniform trailbed finish. Includes trail drainage

2.9 TRAIL DRAINAGE FEATURES

A The trail tread shall be constructed in a manner to positively shed water and prevent channeling, ponding, and pooling at all times. This includes inslope/outslope of the trail tread and installation of drainage dips (See 312000.0010 TRAIL DRAINAGE)

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

A New trail construction: All work associated with the rough and final grading of the new trail will be measured for payment on a linear foot of trail basis as shown on Drawings and in tabular format on Schedule of Construction. Where the trail location has been modified on approval of the Engineer, the length of trail will be based on wheel measurement along the centerline of the trail.

B Road to trail conversion: All work associated with stripping, shaping, and draining of the road to trail conversion will be measured for payment on a linear foot of trail basis as shown on Drawings and in tabular format on Schedule of Construction. Where the trail location has been modified on approval of the Engineer, the length of trail will be based on wheel measurement along the centerline of the trail.

C Rock Excavation. Rock Excavation is incidental to the required work and will not be separately measured for payment.

D Retaining walls and Rock Fill Buttresses: Additional work required for the construction of retaining walls and rock fill buttresses will be measured for payment separately. See 323200 RETAINING WALLS AND ROCK FILL BUTTRESSES.

E Climbing turns. Additional work required for the construction of climbing turns will be measured for payment separately. See 312000.0020 CLIMBING TURNS

F Bridge abutment excavation: Measurement and payment for bridge abutment excavation will be made separately. See 333400 TRAIL BRIDGES.

G Trail drainage (inslope, outslope, drain dips, ditches, etc): Work required for trail drainage improvements is incidental to the required work and will not be separately measured.

H Borrow and Other Miscellaneous Excavations. All other excavations will not be measured for payment.

3.2 PAYMENT

A Payment will be made under:

Pay Item	**Pay Unit**
Cut, Fill or Partial bench trail <50% slopes	LF
Cut or Partial bench trail 50% to 65% slopes	LF
Cut bench trail >65% slopes	LF
Road to trail conversion	LF

END OF SECTION

SECTIONS 312000.0010
TRAIL DRAINAGE

SECTIONS 312000.0010
TRAIL DRAINAGE

1 GENERAL

1.1 DESCRIPTION

A The work covered by this section consists of furnishing all labor, equipment, materials, and performing all operations pertaining to the drainage of the trail tread. This includes insloping/outsloping of the trail tread and construction of drain dips (reverse grade dips, knicks, and waterbars) and ditches.

1.2 RELATED SECTIONS

015000	FIELD ENGINEERING
015713	TEMPORARY EROSION CONTROL
312000.0020	CLIMBING TURNS

1.3 REFERENCE STANDARDS – NOT USED

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS – NOT USED

1.6 QUALITY ASSURANCE

A Install to satisfaction of Engineer.

2 EXECUTION

2.1 GENERAL

A Trail shall be constructed and upgraded to cause minimal disruption of natural drainage patterns. As a rule of thumb: runoff should not be allowed to concentrate from one catchment to another.

B Trail shall be drained by outslope/inslope, drainage dips (reverse grade dips and knicks) and ditches, as specified on Drawings, in the Technical Specifications, or as directed by the Engineer.

2.2 TRAIL DRAINAGE FEATURES

A Inslope / Outslope

1) Unless otherwise specified or directed by the Engineer the trail shall be outsloped a minimum 8%.

B Drainage Dips

1) Drain Dips shall consist of reverse grade dips (rolling dips) and knicks. Drainage dips shall be constructed per standard details and to the satisfaction of the Engineer.

Reverse grade dips shall be installed where trail gradients are less than 12%; Knicks to be installed where the trail gradient is greater than 12% and only as approved by the Engineer.

C Ditches

1) Ditches shall be constructed per Drawings, standard details and to the satisfaction of the Engineer.

2.3 MEASUREMENT AND PAYMENT

Trail drainage will be considered incidental to other pay items in this contract, and additional payment will not be made. There will be no separate measurement for this item.

END OF SECTION

SECTION 312000.0020:
CLIMBING TURNS

SECTION: 312000.0020
CLIMBING TURNS

1 GENERAL

1.1 DESCRIPTION

A The work covered by this section consists of the additional work outside of basic trail construction already covered under earthwork. The work covered by here consists of furnishing all additional labor, equipment, materials, and performing all additional operations pertaining to the construction of climbing turns, including layout, excavation, fill placement, furnishing, hauling, and placing rock, compacting tread, and associated retaining walls, approach sections and drainage.

1.2 RELATED SECTIONS

017123	TRAIL LAYOUT
311100	CLEARING AND GRUBBING
312000	EARTHWORK
312000.0010	TRAIL DRAINAGE
323200	RETAINING WALLS AND ROCK FILL BUTTRESSES

1.3 REFERENCE STANDARDS – NOT USED

1.4 SUBMITTALS – NOT USED

1.5 MATERIALS – NOT USED

1.6 QUALITY ASSURANCE

A Install to satisfaction of Engineer.

2 EXECUTION

2.1 CONSTRUCTION

A Construct climbing turns of the types, locations and dimensions as shown on Drawings, designated on the ground, and/or directed by Engineer. The Contractor shall consult with the Engineer as to climbing turn location and dimensions.

B When shown on plans, construct retaining walls and rock fill buttresses in accordance with standard details or as directed by engineer.

C Modification in climbing turn location, dimension and construction may be made based on site conditions encountered during construction. The Contractor shall consult with the engineer and obtain written approval for any modification of a climbing turn prior to construction.

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

A Work under this section is for <u>additional</u> work required to construct each climbing turn. This work will be measured by the unit per the bid form.

1) It does not include work associated with standard trail construction will be measured by

linear foot of trail per Section 312000 Earthwork and shown on the Bid Form

2) It does not include work associated with retaining walls or rock fill buttresses, will be measured by square foot per Section 312000 Retaining Walls and Rock Fill Buttresses as shown on the Bid Form

3.2 PAYMENT

A Work under this section will be measured for payment based on lump sum price for the related climbing turn, as shown.

Pay Item	Pay Unit
Climbing Turn: 0 – 30% sideslope	EACH
Climbing Turn: 30 – 50% sideslope	EACH
Climbing Turn: 50 –65% sideslope	EACH

…

SECTION 323200:
RETAINING WALLS AND ROCK FILL BUTTRESSES

SECTION 323200:
RETAINING WALLS AND ROCK FILL BUTTRESSES

1 GENERAL

1.1 DESCRIPTION

A The work covered by this section consists of furnishing all labor, equipment, materials, and performing all operations for construction of retaining walls and rock fill buttresses, including excavating, backfilling, geosynthetics, and slope finishing. Typical trail-related construction adjacent to the proposed retaining walls will be separately measured and paid for under Section 312000.

1.2 RELATED SECTIONS

017123	TRAIL LAYOUT
311100	CLEARING AND GRUBBING
312000	EARTHWORK
312000.0010	TRAIL DRAINAGE
312000.0020	CLIMBING TURNS

1.3 REFERENCE STANDARDS

1) As specified elsewhere in this specification

1.4 SUBMITTALS

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

1) Rock Data

   a) Certified weights of the rock delivered to the site.
   b) Certificate(s) and other material testing data as necessary to validate the source of the Rock Materials and their conformance with the Standard Specifications and these Technical Specifications. Include all applicable test results for grading, specific gravity, resistance to degradation, absorption, durability index, and soundness (as described elsewhere in these Technical Specifications).

2) Product Data:

   a) Manufacturer's data sheets on each product to be used.
   b) Preparation instructions and recommendations.
   c) Typical installation methods.

1.5 MATERIALS

1) As specified elsewhere in this specification and/or on Drawings

1.6 QUALITY ASSURANCE

A The contractor shall notify the engineer prior to construction of any retaining walls. The engineer shall verify the location, type and dimensions of all retaining walls and rock fill buttresses prior to construction.

B Foundation soil shall be examined by the Engineer to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength

shall be removed and replaced with acceptable material at the discretion of the Engineer.

2 EXECUTION

2.1 GENERAL

A Location

1) Construct retaining walls of the types, locations and dimensions as shown on Drawings, designated on the ground, and/or directed by Engineer. The Contractor shall consult with the engineer as to final wall design, location and dimensions. Modifications to wall location, type and dimensions may be required based on conditions encountered during construction.

2) The Contractor shall notify the Engineer of any required or proposed modifications and obtain written approval prior to construction.

B Excavation

1) Excavate to the lines and grades shown on the drawings, in accordance with Earthwork Specifications, and to satisfaction of Engineer to provide a full bench foundation of stable undisturbed soil or compacted suitable material. Construct the finished foundation grade parallel with the trail profile grade.

2.2 STACKED ROCK RETAINING WALL

A Work consists of constructing stacked rock retaining walls, including excavating, placing, backfilling, and slope finishing.

B Materials

1) Rock shall consist of subrounded to angular, sound, durable rock free of fractures or joint planes and conforming to latest Caltrans standards, unless otherwise approved by the Engineer. Rock shall be a 12” to 18” in diameter with a minimum of 50% of the rock greater than 18” in diameter. All structural pieces shall be greater than 10 inches. Use rocks of a general rectangular shape. Smaller stones may be used to fill voids.

2) Salvaged Rock Material. Salvaged rock obtained onsite may used subject to compliance with the material requirements, and subject to the approval and sole discretion of the Engineer. The Engineer may require the Contractor to provide testing to ensure that materials are suitable for reuse.

3) Approved native soils may be used for compacted backfill upon approval of the Engineer.

C Execution

1) Construct stacked rock retaining walls per details and notes on the Drawings and to satisfaction of engineer.

2) Rock wall shall be constructed to form a smooth uniform alignment and batter with less than 4” in horizontal or vertical variance along the length and top of the wall, as measured along a 6 foot straight edge.

2.3 TIMBER CRIBWALL

A Work consists of constructing timber crib retaining walls, including excavating, placing

borrow, placement of timbers, backfilling, tread and slope finishing.

B Materials

1) Refer to detail and notes on Drawings

C Execution

1) Construct timber crib retaining walls per details and notes on the Drawings and to satisfaction of engineer.

2) Exterior dimensions shall be uniform and consistent. Maximum dimensional deviations on the height of any two units shall be 0.25 in.

2.4 WOOD LAG RETAINING WALL

A Work consists of constructing wood lag retaining walls, including excavating, placing borrow, backfilling, tread and slope finishing.

B Materials

1) Refer to detail and notes on Drawings

C Execution

1) Construct wood lag retaining walls per details and notes on the Drawings and to satisfaction of engineer.

2) Exterior dimensions shall be uniform and consistent. Maximum dimensional deviations on the height of any two units shall be 0.25 in.

2.5 SEGMENTAL BLOCK RETAINING WALLS

A This work consists of constructing segmental retaining walls including layout, excavating, placement of blocks, geogrid, and compacted soil, and sloping finishing.

B Reference Standards

1) ASTM C1372 Standard Specification for Segmental Retaining Wall Units.

2) ASTM D698 Moisture Density Relationship for Soils, Standard Method

3) ASTM D422 Gradation of Soils

4) ASTM C140 Sample and Testing concrete Masonry Units

C Delivery, Storage, and Handling

1) Contractor shall check the materials upon delivery to assure proper material has been received.

2) Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the project (ASTM C1372).

D Materials

1) Segmental Wall Units

a) Wall units shall be Allan Block Retaining Wall (“AB Wall” 12 degrees batter, or approved equal) units or approved equal as produced by a licensed manufacturer.
b) Wall units shall have minimum 28 day compressive strength of 3000 psi (20.7 MPa) in accordance with ASTM C1372.

c) Wall units shall provide a minimum of 75 lbs total weight per square foot of wall face area. Fill contained within the units may be considered 80% effective weight.
d) Exterior face shall be textured. Color as specified by owner.

2) Geogrid

a) Conform to manufactures guidelines and to satisfaction of engineer.

E Execution

1) Construct stacked rock retaining walls per details and notes on the Drawings and to satisfaction of engineer.

2) Walls exceeding 3 feet in height shall incorporate geogrid reinforcement per manufactures guidelines and to satisfaction of engineer.

3) Exterior dimensions shall be uniform and consistent. Maximum dimensional deviations on the height of any two units shall be 0.125 in. (3 mm).

2.6 ROCK FILL BUTTRESS

A This work consists of constructing rock fill buttress, including excavating, transfer and placement of rock fill, backfilling, tread and slope finishing. The intent of this work is to construct a stable rock fill embankment to support the trail tread with 1:1 embankment face.

B Materials

1) Rock shall consist of approved uniformly mixed rock with a minimum of 75% of the rock by volume between 4” and 18” in diameter. A maximum of 25% of the material may be native soil. Modifications of the rock size above may be made with written approval of the engineer.

2) Salvaged Rock Material. It is anticipated that native rock salvaged onsite will be used for the rock fill buttresses, subject to compliance with the material requirements outlined above.

3) The engineer shall approve all rock used for construction prior to placement.

C Execution

1) Construct rock fill buttresses per details and notes on the Drawings and to satisfaction of engineer.

2) Paved rock shall not be segregated (no lenses). Backfill any voids with smaller rock.

3) The Contractor shall assume 500 feet maximum transport distance for salvaged rock.

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

A Work under this section will be measured by wall length multiplied by height (SF) of type of retaining wall constructed. Wall/Buttress height is as shown on details and will include the depth of embedment. Length measured in field along top of retaining wall.

B Wall type, location and height shown on plans is approximate. Final location, type, and dimensions of installed retaining walls may vary from Drawings based on site conditions

encountered. The type and location of retaining walls may be substituted from what is shown on plans at the sole discretion of the engineer.

C Any modifications will need to be approved by the Engineer in writing.

3.2 PAYMENT

A Payment for retaining walls will be made under:

Pay Item	**Pay Unit**
Stacked Rock Retaining Wall - Import Rock (offsite derived)	SF
Stacked Rock Retaining – Salvaged Rock (onsite derived)	SF
Timber Cribwall	SF
Wood lag retaining Wall	SF
Segmental Block Retaining Wall	SF
Rock fill buttress – Salvaged Rock (onsite derived)	SF

END OF SECTION

SECTION 333400

PEDESTRIAN BRIDGES

SECTION 333400
PEDESTRIAN BRIDGES

1 GENERAL

1.1 DESCRIPTION

A The work covered by this section consists of furnishing all labor, equipment, materials, and performing all operations for construction of trail bridges, including but not limited to excavating, backfilling, transport of materials, construction of bridge and mudsill abutments, bridge assembly, trail approach construction, erosion control, and slope finishing as shown on Drawings. Work includes all other incidental work necessary to complete the bridge installation.

1.2 RELATED SECTIONS

017123	TRAIL LAYOUT
311100	CLEARING AND GRUBBING
312000	EARTHWORK

1.3 REFERENCE STANDARDS

A 2015 INTERNATIONAL BUILDING CODE AS AMENDED BY 2016 CALIFORNIA BUILDING CODE.

B 2015 UNIFORM MECHANICAL CODE AS AMENDED BY 2016 CALIFORNIA MECHANICAL CODE.

C 2015 UNIFORM PLU M BING CODE AS AMENDED BY 2016 CALIFORNIA PLU M BING CODE.

D 2014 NATIONAL ELECTRICAL CODE AS AMENDED BY 2016 CALIFORNIA ELECTRICAL CODE.

E 2016 CALIFORNIA ENERGY CODE (2016 BUILDING ENERGY EFFICIENCY STANDARDS)

F 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE.

G WEST COAST LUMBER INSPECTION BUREAU (WCLIB).

H As specified elsewhere on Structural Drawings

1.4 SUBMITTALS

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

1) Steel Certification - Certificate of steel grades shall be furnished upon request.

2) Bolt Certification - Certificate of bolt grades shall be furnished upon request.

3) Shop drawings for steel bridge members 30 days in advance of fabrication.

1.5 MATERIALS

1) As specified elsewhere in this specification and/or on Structural Drawings.

1.6 QUALITY ASSURANCE

A Conform to Structural Tests and Inspection Schedule as shown on Drawings.

B Foundation soil shall be examined by the Engineer to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable material at the discretion of the Engineer.

C The bridge fabricator shall preassemble the steel bridge girders to ensure proper fit meets tolerances specified on drawings.

2 EXECUTION

2.1 GENERAL

A Construct bridges of the types, locations and dimensions as shown on the Drawings.

B Refer to Structural Drawings for additional requirements.

C Perform excavation and embankment in accordance with Section 312000 EARTHWORK

D Perform Cast-in-Place concrete in accordance with Structural Engineer Notes on drawings.

E The Install temporary construction and safety scaffolding as required. Contractor shall be responsible for design and construction of all scaffolding. Scaffolding shall conform to CAL OSHA

F Place fabric drop cloth below bridge under the area where the bridge will be assembled. The drop cloth is installed to catch any debris that falls from the bridge as it is being assembled.

2.2 TRANSPORTATION

A Protect material during transport to site. Use slings or other devices to protect corners of heavy construction timbers, steel and banded packages of heavy construction material.

2.3 SPLICED BRIDGE GIRDERS

A The bridge fabricator shall preassemble the steel bridge girders to ensure proper fit meets tolerances specified on drawings.

B The Contractor shall be responsible for the method of connecting bridge girder splices and setting the girder on the bridge abutment.

C Bridge girders can be either spliced together either in place or spliced together adjacent to the crossing then moved into place.

D The Contractor shall take all necessary precautions to ensure the proper fit of the bridge splices. We recommend that the bridge girders should be along a level and flat surface with the girders supported at each splice.

E The Contactor shall take necessary measures to brace the assembled girders at the splices to prevent lateral bending of splice plate during construction.

F A bridge reamer should be on hand to aid in splicing the bridge girders.

G Bridge girders need to be plumb (vertical and at a right angle to the abutments).

2.4 SKYLINE RIGGING.

A The contractor may need to use skyline rigging to move and set the bridge girders during assembly. If used, the contractor shall have previous experienced in skyline rigging.

B Contractor shall be responsible for safe implantation of the skyline rigging. Skyline rigging shall conform to pertinent CAL OSHA requirements.

C The use of any trees for skyline rigging shall be approved by the engineer prior to bridge construction. Any trees used in the rigging shall be protected from damage.

D Following bridge assembly, all scaffolding, skyline rigging, drop cloths, and any other material shall be removed from the site.

2.5 WOOD WORK

A Cut and form all lumber and construction timbers so all joints will have even bearing over the entire contact surface. Do not use shims in making joints. Set screws and head of spikes flush with the wood surface.

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

A Measurement will be lump sum for each bridge structure.

B Where excavation and placement of cast-in-place concrete exceeds the dimensions shown on the Drawings the cost for additional excavation and cast-in-place concrete will be measured by cubic yard.

3.2 PAYMENT

A Payment will be made under:

Pay Item	Pay Unit
Bridge 1: 35 Foot	Lump Sum
Bridge 2: 70 Foot	Lump Sum
Bridge 3: 50 foot	Lump Sum
Bridge 4: 20 foot	Lump Sum
Additional abutment excavation and cast-in-place concrete	CY

END OF SECTION

SECTION 334100:
STORM DRAINAGE SYSTEMS - CULVERTS

SECTION 334100:
STORM DRAINAGE SYSTEMS - CULVERTS

1 GENERAL

1.1 DESCRIPTION

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

a. Culverts
b. Rock Energy Dissipators
c. Headwalls
d. Trenching and backfill for culverts

B Furnish and install all storm drain pipes, headwalls, inlets, grates, cleanout boxes, inlet protection and outlet energy dissipaters, and perform associated structural excavation, backfill, and compaction.

1.2 RELATED SECTIONS

017123	TRAIL LAYOUT
311100	CLEARING AND GRUBBING
312000	EARTHWORK
312319	DEWATERING
312000.0010	TRAIL DRAINAGE

1.3 REFERENCE STANDARDS

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

1.4 SUBMITTALS

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

1) HDPE Pipe. Manufacturer's catalog data and installation instructions for pipe materials, including angles, fittings, and anchorage assemblies. 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 testing for each pipe diameter furnished and its conformance with AASHTO minimum requirements.

1.5 PRODUCTS

A Pipe. Pipe shall be dual-walled high-density polyethylene (HDPE) pipe with a smooth (non-corrugated) interior surface and a corrugated outer layer, and shall have a Manning's roughness coefficient of 0.012, conforming to the notes and details on the Drawings. ADS N12 WT pipe conforms to this specification.

B Energy dissipater. Comply with the notes and details on the Drawings.

C Headwall. Comply with the notes and details on the Drawings.

1.6 QUALITY ASSURANCE

A The contractor shall comply with inspection schedule on Drawings.

B Foundation soil shall be examined by the Engineer to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable material at the discretion of the Engineer.

2 EXECUTION

2.1 PLASTIC PIPE

A Exercise care to prevent damage to pipe during handling, transportation and storage. Damaged sections of pipe shall be repaired or replaced at the Subcontractor's expense. Store polyvinyl pipe under opaque covers which will not transmit ultraviolet light. Place polyvinyl pipe within the installation area at least 24 hours prior to installation to permit thermal equalization.

B Pipes shall be laid to the lines and grade shown on the Drawings or as approved by the Engineer.

C Excavation

1) Conform to Technical Specification 312000 EARTHWORK unless otherwise specified

2) Culvert trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The final project Drawings and Specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

D Culvert Bed

1) The width of trenches shall permit satisfactory joining and thorough tamping of the backfill material.

2) The culvert bed shall be clean and free of large woody debris and large rocks. Unsuitable material shall be replaced with selected granular drainage material and compacted to obtain uniform bed.

3) Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the culvert grade for a depth of at least 1 foot and a width of at least 2 feet plus the culvert diameter. This material shall be replaced with selected compacted fill.

4) Culvert trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The final project plans and specifications should direct the attention of the CONTRACTOR to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

E Laying Pipe

1) Culvert shall be laid in center of trench on uniform grade line. The entire length of pipe shall be in contact with the culvert bedding.

2) Culverts distorted more than 10% of normal dimension, ruptured, or broken shall be replaced.

3) Culvert shall be joined and anchored per manufacturer's guidelines.

4) CONTRACTOR shall secure culvert to avoid separating or migrating downhill during construction.

F Backfill

1) Select mineral soil shall be used for culvert backfill. The backfill shall have no rocks greater than 3 inches in any dimensions placed closer than 1 foot to the culvert.

2) Trenches shall be backfilled with granular-type material and uniformly compacted by mechanical means to not less than 90 percent. The relative compaction will be based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Test Designation D1557. During placement and compaction of fill, the moisture content of the materials being placed shall be maintained.

3) Fill shall be brought up to grade at a 1.5:1 slope unless otherwise specified.

G Rock Energy Dissipators

1) Discharge culverts onto Rock Energy Dissipator as shown on Drawings and as directed by the Engineer. Dimension of rock shown on Drawings.

2) Rock shall be keyed into native bed and banks a minimum of 1.5 times maximum rock diameter; subexcavate bed and banks in areas to receive rock

3) Rock shall be carefully placed to optimize strength (Caltrans Method A) and form a dense, well-graded mass of stone with a minimum of voids. Backfill and chink where voids between rocks are greater than 6 inches

4) Compact loose soils adjacent to rock riprap

H Rock Headwall

1) Construct rock headwall at culvert inlet as shown on Drawings and as directed by the Engineer. Dimension of rock shown on Drawings.

2) Rock shall be carefully placed to optimize strength (Caltrans Method A) and form a dense, well-graded mass of stone with a minimum of voids. Backfill and chink where voids between rocks are greater than 6 inches

3 MEASUREMENT AND PAYMENT

3.1 MEASUREMENT

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

3.2 PAYMENT

A The lump sum contract price for Storm Drainage Systems - Culverts**,** will include full compensation for the furnishing of all labor, materials, tools, equipment, administrative costs, and incidentals for Storm Drainage Systems - Culverts.

B Payment will be made under:

Pay Item	**Pay Unit**
Storm Drainage Systems - Culverts	Lump Sum

END OF SECTION