National Forest Foundation

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Request for Quotes
Fremont National Recreation Trail Restoration
Fremont-Winema National Forest

Background and Statement of Work:

The National Forest Foundation in coordination with the United States Forest Service (USFS) seeks proposals to stabilize 14.4 miles of the Fremont National Recreation Trail (#160). The project area lies just over 15 miles outside of the City of Lakeview focusing on the area along the crest of the northern Warner Mountains from Cox Pass to Moss Pass (see map). This project involves the stabilization of Class 3 non-motorized trails destroyed by the 2021 Cougar Peak Fire. Trail stabilization includes logging out, clearing and grubbing, and full tread restoration. The project area is typically snow-free and accessible between May and October, but site accessibility dates can differ based on local weather conditions. This project is not considered public works and prevailing wage would not apply.

Information Requested

If interested in submitting a bid for this project, please provide a quote for the above statement of work by providing:

- technical approach
- work experience
- cost
- capacity for this project
- experience in similar projects

Specific requirements are detailed below.

I. PROJECT OVERVIEW AND REQUIREMENTS

General Specifications

(a) Description of Work – Trail work included in this project is outside of designated Wilderness areas. Use of heavy equipment is permitted on these trails. This Request for Quotes is for restoration services related to trail restoration, including the following:

1. **Logging Out:** This work consists of removing brush, logs, and down trees from the clearing limits.
2. **Clearing and Grubbing:** This work consists of clearing, grubbing, trimming, removing, and treating trees, logs, limbs, branches, brush, plants, and other vegetation within the clearing limits. Work 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.

3. **Full Tread Restoration:** This work consists of fully restoring the original trail template, including clearing, removing slough and berm, borrow, filling ruts and troughs, reshaping backslopes, excavation, reshaping trail tread, restoring drainage and other trail structures, constructing check dams, and removing protruding rocks, roots, stumps, slough, and berms.

Additional specifications and details regarding the work are found in the following appendices:

- Appendix A – Maps (Georeferenced Map Here)
- Appendix B – Standard Specifications for Construction of Trails and Trail Bridges on Forest Service Projects

The Contractor shall identify what they can supply in terms of materials, labor, equipment, supplies, supervision, quality control, and incidentals required to complete the work described. The Contractor shall perform all work in a safe and conscientious manner.

(a) Project Location – The project area is approximately 15 miles north of Lakeview, OR, in the Bly Ranger District of the Fremont-Winema National Forest within Lake County in south central Oregon.

(b) Work Schedule – The anticipated site accessibility window for project implementation is May - October. These dates allow for flexibility around seasonal weather shifts that can occur in the high elevation mountainous terrain of the project area while ensuring enough time for project completion. All trail work shall be completed with final inspection and acceptance by September 15, 2027.

Other Project Requirements and Specifications

(a) Utilities – In many locations there will be no or limited sanitation, water, electrical or housing services available. The Contractor shall make its own arrangements for temporary facilities if needed.

(b) Specifications – Project work shall be accomplished in accordance with the following:

Project work shall be accomplished in accordance with the USFS Standard Specifications for Trails (see Appendix B – Standard Specifications of Trails and Trail Bridges, for further details).

(c) In accordance with the terms of the Services Agreement, prior to the start of any work, the successful Bidder (the "Contractor") will be required to maintain, and ensure that its subcontractors performing work described in the proposal (Subcontractors) maintain, the minimum coverages and comply with the insurance requirements indicated below.

1. Coverage Requirements

i. Commercial General Liability Insurance ("CGL"). Commercial general liability insurance, including bodily injury, property damage, personal injury, advertising injury, products and completed operations and contractual liability in the amount no less than:

- $1,000,000 each occurrence;
- $1,000,000 products/completed operations limit;

- $1,000,000 advertising injury and personal injury limit; and
- $2,000,000 general aggregate.

ii. Business Automobile Liability Insurance. If using motor vehicles (owned, hired, or borrowed) to deliver or perform the work described in the proposal, business automobile liability insurance with a minimum limit of $1,000,000 combined single limit each accident for bodily injury and property damage for all owned, rented leased or hired vehicles used in conjunction with the performance of the services.

iii. Workers' Compensation Insurance. Statutory workers' compensation insurance in accordance with all state and local requirements of the state(s) in which services will be performed.

2. Waiver of Subrogation. All insurance policies shall include a waiver of any and all rights of subrogation or recovery of the insurers thereunder against, inter alia, the NFF, and its assigns, successors, undertakings and their subsidiaries, affiliates, employees, insurers and underwriters, and of any right of the insurers to any set-off or counterclaim or any other deduction, whether by attachment or otherwise, in respect of any liability of any such person insured under any such policy or in any way connected with any loss, liability or obligation covered by such policies of insurance.

3. Primary and non-contributory. With the exception of Workers' Compensation and Professional Liability insurance (if applicable), all insurance required to be maintained by Contractor shall be primary with respect to all claims arising out of Contractor's performance and/or activities under this Agreement, and any insurance or self-insurance maintained by the NFF shall be excess only and not be required to contribute with it.

4. "Claims Made" Coverage. Any liability insurance purchased on a "claims made" basis must be continuously maintained for a period equal to the applicable statute of repose, but in any case, not less than 3 years, following final performance or termination of Services, either through the continued purchase of insurance or the purchase of an extended reporting period. The retroactive date applicable to such "claims made" insurance, if any, must precede the first date on which Services are to be performed.

5. Verification of Coverage. Contractor will have furnished to the NFF original certificates of insurance and amendatory endorsements or copies of the applicable policy language effecting coverage required herein prior to or at the time of execution of the Agreement, and shall further provide evidence that the foregoing is in place and will not be cancelled or reduced during the term of the agreement. Contractor's and any Subcontractors' certificates of insurance will list "The National Forest Foundation" as an Additional Insured on its or their commercial general liability policy and business automobile liability policy (as applicable). Contractor will submit updated certificates of insurance upon expiration of the required policies.

(d) Additional Insurance Requirements. In addition to the minimum insurances set-forth above, the NFF reserves the right to request additional coverage as reasonably necessary based on the scope, nature, and risks associated with the services to be performed, including, but not limited to:

1. Commercial/Contractor's Pollution Liability Insurance covering clean-up costs, legal fees, and third-party damages from environmental contamination.

2. Loggers Broad Form Endorsement restoring liability protection for specific property damage and operational risk inherent to forestry operations to Contractor's CGL policy.
3. Umbrella/Excess Liability Insurance raising the limit on existing primary policies if the primary insurance limits are reasonably considered insufficient.

(e) Payment/Performance Security. If selected, Bidder(s) shall be required to provide security in the form of cash, a letter of credit, bond, or other financial security that is easily convertible into cash in a form acceptable to the NFF, in its sole determination. The security will be used to ensure completion of the work required under any subsequent agreement and payment of all amounts lawfully due to all persons. All persons shall include, but not be limited to, those supplying or furnishing to the Bidder or Bidder's Subcontractors with labor, laborers, materials, rental machinery, tools or equipment used or to perform the work. Bidders may incorporate required associated costs into mobilization costs or other approved expenses. Payment or Performance Security will be required in the following amounts, as applicable:

1. For work that is classified as construction in accordance with the Miller Act or Little Miller Act or if required per conditions of the funding source, payment and performance bonding will be required in the full amount of the Agreement. For the purposes of this Request for Proposal, construction is defined as "any contract greater than $100,000 for the construction, alteration, or repair of any public building or public work where the federal government is the owner."
2. If Contractor is subcontracting 15% or more of the total contract value, or if the cost of materials is in excess of the larger of $100,000 or 50% of the contract total, payment and performance bonding will be required in the full amount of the Agreement.
3. If the value of the agreement is in excess of $250,000, Contractor will be required to post financial security in a form acceptable to the NFF in the amount of 5% of the total agreement value up to $250,000 in total financial security.

The NFF will not provide blanket waivers of payment/performance security requirements, though reserves the right to negotiate payment and performance security terms and conditions with a selected Bidder based upon legal requirements and organizational needs and policies.

(f) Prohibited Telecommunications Services and Equipment. If selected, Bidder(s) are responsible for compliance with the prohibition on certain telecommunications and video surveillance services or equipment identified in 2 CFR 200.216.

(g) Flowdown Provisions. NFF funding for projects may vary but will frequently include public funds. As such, any Agreement associated with this RFQ may be subject to flowdown requirements under associated federal or state funding agreements, which are included and made part of by this reference. Flowdown requirements are not negotiable and will not be removed or edited. While flowdown provisions may change depending on funding, the NFF has identified the following flowdown provisions as currently being required for any Work performed under this RFQ and any resulting contract:

Identified Flowdown Provisions

While flowdown provisions may change depending on funding, the NFF has identified the following non-negotiable federal flowdown provisions as currently being required for this work:

Appendix C: Federal Flowdown Provisions for 1593147

Competitive Range

The expected competitive range for bids to this solicitation is $90,000 to $120,000.

II. REQUIRED COMPONENTS

Technical Quote

(a) Minimum Requirements. Bidders shall submit a technical proposal for the work described in this RFQ. Bidders shall consider all relevant factors when submitting proposals for this work. Bidders shall identify in their proposals what they can supply in terms of materials, labor, equipment, supplies, supervision, quality control, and incidentals required to complete the work as described. Proposals should account for the need of the selected contractor to make its own arrangements for temporary utilities and facilities, if required. Proposals shall be sufficient to guarantee that the selected contractor shall be able to perform all work in a safe and conscientious manner and in accordance with all industry standards. At a minimum, each proposal must include the following:

1. An overview and description of the services, materials, supplies, labor, equipment, utilities, and facilities provided by the Bidder that align with the requests in this RFQ.
2. A description of the project management or administration approach that will be followed by the Bidder to ensure that the identified work is completed on time and within budget.
3. A project work plan and schedule that lists in detail the stages of work expected to be completed in this project, all identifiable deliverables, and the dates on which the Bidder would anticipate being able to complete delivery of the work.
4. Any change or risk management approaches utilized by the Bidder when completing projects of the type described in this RFQ.
5. A project personnel overview identifying key personnel to be utilized if selected to perform the work described in this RFQ and any relevant or required credentials or certifications held by the key personnel.

Bidder Qualifications.

Bidders shall submit a statement of their qualifications for the work described in this RFQ. The statement should include the following items in narrative format:

(a) Experience.

1. Please provide a brief explanation of previous work experience with land management agencies, noting specifically any work performed on National Forests or Grasslands.
2. Please provide a listing of relevant projects of similar size, scope, and total value performed by the Bidder within the past 5 years.

(b) References.

1. Please provide three professional references, identifying as applicable any government or conservation nonprofit references.

2. Provide the name, email address, and telephone number for each reference, as well as the dates of the projects during which the Bidder worked with each reference.

UEI.

Successful bidders will be required to provide a Unique Entity Identifier (UEI). If you have a UEI, please provide it in your proposal or quote.

Federal Exclusion Verification.

Bidder(s) will be required to affirm that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

Failed Projects or Legal Actions.

Bidders shall identify any past failed projects and the reasoning behind the failure or incompletion. Bidders shall also identify any and all current or pending legal matters in which the Bidder or any of its principals is involved.

Pricing Schedule.

Bidders shall price work according to the schedule below. If Bidders believe that an alternative method of pricing is more applicable, they may also provide an alternative pricing schedule in addition to the format requested below.

The NFF, in its sole discretion, reserves the right to utilize any alternative pricing schedule proposed by any Bidders.

All quantities and measurements identified in this RFQ are based upon the best knowledge available to the NFF and are subject to change.

Due to the dynamic and changing nature of NFF funding, the NFF reserves the right to negotiate an increased cost with the selected Bidder in the event that prevailing wages become required for the work described in this RFQ.

If the opportunity to add additional funding to the work described in this RFQ arises, the NFF may increase the quantities of work to be performed as part of this project, as agreed upon by the NFF and the selected Bidder.

Task/Item	**Qty**	**Units**	**Unit Cost**	**Extended Cost**
Mobilization	1	LS		
Clearing and Grubbing	14.4	MI		
Logging Out	14.4	MI		
Full Tread Restoration	14.4	MI		
			Total Bid	

Payment Schedule.

Bidders shall submit a proposed payment schedule consistent with their proposed pricing structure. Lump sum proposals should identify invoicing milestones tied to deliverables or project phases, while time-and-materials proposals should identify the anticipated invoicing frequency, cost of materials/supplies, and the applicable rates for invoicing. Proposed payment schedules are for evaluation purposes only. The final payment structure and invoicing terms will be negotiated with the selected Bidder and incorporated into the executed agreement.

Invoice Number	**Milestone/Deliverable**	**Corresponding Cost**
1.		
1.		
2.		
3.		
4.		
	Agreement Total	

Insurance Information.

Bidders must identify the insurance coverage currently in place. If available, please attach sample certificates of insurance.

III. SUBMISSION, EVALUATION, AND CONTACTS

Bidder Selection Process

Bid Submission. Bidders shall submit proposals containing all of the required information described above via email at the address specified below by the stated deadline:

Submission Address: arutledge@nationalforests.org

Submission Deadline: 5:00 pm Pacific Time on November 30, 2026

Proposals submitted after this RFQ closes will not be considered unless approved by the NFF. The NFF will review all proposals determined to be responsive using the evaluation factors listed below. Proposals may be deemed non-responsive for failure to submit any required information or for failure to comply with any terms of this RFQ. Non-responsive proposals may be disqualified from evaluation in the sole discretion of the NFF.

Notification. If a proposal is selected by the NFF to advance to the contracting stage, the NFF will notify the successful Bidder via email. Once the selected Bidder has been notified, the NFF project representative will coordinate the drafting and negotiation of an NFF agreement outlining the terms and conditions of the work to be performed.

Unsuccessful Bidders will be notified via email as soon as possible after the closing date of this RFQ. Please Note: The NFF **will not** share any information about the organizations submitting proposals nor any information regarding the proposals submitted by other organizations. If a Bidder has questions about its proposal, the Bidder may ask the NFF Point of Contact identified below. If an answer can be provided, the NFF will respond via email as soon as it is able to do so.

Request for Quotes Only. This is a Request for Quotes only and bids furnished do not bind the NFF in any way. Selection of a bid will result in the opportunity to contract with the NFF but will not guarantee a resulting contract or any amount of work. The NFF reserves the right to disqualify any incomplete or improper proposal submitted as non-responsive. The NFF may also decide not to select any proposals submitted to this RFQ for advancement to contract negotiations. This request does not commit the National Forest Foundation to pay any costs incurred in the preparation or submission of the proposal or to contract for supplies or services.

Contractor Selection Process

The NFF will use the Evaluation Factors below to review each submitted bid. Based on the outcomes of that selection process, the NFF will notify successful and unsuccessful bidders by December 15, 2026 and will prepare a separate contract document.

- Price
- Previous Work History
- References
- Contractor availability / Project timeline

Point of Contact

Please submit any questions about the project in writing to the Point of Contact.

Aaron Rutledge
National Forest Foundation Fremont-Winema Project Coordinator
arutledge@nationalforests.org

Responses will be shared with known interested parties by email or otherwise posted at https://www.nationalforests.org/rfp.

Bid Submission

Submit bids via email to arutledge@nationalforests.org by November 30, 2026.

Equal Opportunity Provider

In accordance with Federal law and U.S. Department of Agriculture policy, the National Forest Foundation is prohibited from discriminating on the basis of race, color, national origin, sex, age, religion, political beliefs, or disability.

APPENDIX A:

MAPS

https://nff.box.com/s/iezydb19lqsek474xxzyuiouonh4499s

Appendix B

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FOREST SERVICE PROJECTS

U.S. Customary Units

National Technology and Development Program

10/30/2014

Supersedes the 1996 Standard Specification for Construction and Maintenance of Trails

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Section 900
General Specifications

Section 901—Terms, Format, Abbreviations and Definitions

901.01 Meaning of Terms. These specifications are generally written in the imperative mood. In sentences using the imperative mood, the subject "the Contractor," is implied. Also implied in this language is "shall," "shall be," or similar words or phrases. In material specifications, the subject may also be the supplier, fabricator, or manufacturer supplying material, products, or equipment for use on the project.

Wherever *"directed," "required," "prescribed,"* or similar words are used, the *"direction," "requirement,"* or *"order"* of the Contracting Officer is intended. Similarly, wherever *"approved," "acceptable," suitable," "satisfactory,"* or similar words are used, they mean *"approved by," "acceptable to,"* or *"satisfactory to"* the Contracting Officer.

The word *"will"* generally pertains to decisions or actions of the Contracting Officer.

Whenever in these specifications, or in other contract documents, the following terms (or pronouns in place of them) are used, the intent and meaning shall be interpreted as follows: reference to a specific standard, test, testing method, or specification shall mean the latest published edition or amendment that is in effect at the solicitation issue date for the public works contracts.

901.02 Specification Format These specifications are divided into Sections.

Sections 900 through 906, 908 and 909 consist of general contract requirements for which no direct payment is made. The requirements contained in Sections 900 through 906 are applicable to all contracts.

Sections 907, 908, 909 and 910 through 989 consist of construction contract requirements for specific items of work. Work under these Sections is paid for directly or indirectly according to Subsection 906.04 and the Section ordering the work. When there is no pay item in the bid schedule, no direct payment is made.

Sections 990 through 999 contain the material requirements for Sections 910 through 989. No direct payment is made in Sections 990 through 999. Payment for material is included as part of the work required in Sections 910 through 989.

The first three digits of the pay item number identify the Section under which the work is performed.

901.03 Abbreviations. Whenever these abbreviations are used in the specifications, they represent the following:

(a) Acronyms

AASHTO	American Association Of State Highway And Transportation Officials
ABS	Acrylonitrile-Butadiene-Styrene

AITC	American Institute of Timber Construction
ANSI	American National Standards Institute
AQ	Actual Quantities
APA	American Plywood Association
ASTM	American Society For Testing And Material
AWPA	American Wood Protection Association
CO	Contracting Officer
C.F.	Cubic Feet
C.Y.	Cubic Yard
DQ	Design Quantities
EA	Each
FAR	Federal Acquisition Regulation
g	Grams
HDPE	High-Density Polyethylene
hr	Hour
kg	Kilogram
kN	Kilonewtons
lb	Pound
L.F.	Linear Feet
LS	Lump Sum
LSQ	Lump Sum Quantities
m	Meter
m^2	Square Meter
m^3	Cubic Meter
mi	Mile
mm	Millimeter
MPa	Megapascals
MSE	Mechanically Stabilized Earth
N	Newton
NBS	National Bureau Of Standards
NCMA	National Concrete Masonry Association
OSHA	Occupational Safety & Health Administration
Pa	Pascal
PE	Polyethylene
PS	Product Standard Issued By The U.S. Department Of Commerce
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
S.F.	Square Feet
SQ	Staked Quantities
S.Y.	Square Yard
WCLIB	West Coast Lumber Inspection Bureau
WWPA	Western Wood Products Association
WWPI	Western Wood Preservers Institute

Additional abbreviations may be found in Section 101.03 of the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03).

(b) Slope notation (vertical: horizontal). 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.

901.04 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:

Barriers. A fence or other obstacle that prevents movement or access.

Base Course. The layer or layers of specified material of designed thickness placed on a trailbed to support surfacing.

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 be used for embankments and backfilling.

Bridge. A trail structure, including supports, erected over a depression or obstruction such as a body of water, a road, a trail, or a railroad that provides a continuous pathway and that has a deck for carrying traffic or other loads.

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.

Catch Point. The outer limits of a trailway where the excavation and/or embankment intersect with the ground line.

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.

Contracting Officer (CO). An official of the Government with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the CO acting within the limits of their authority as delegated by the CO.

Culvert. Any structure with a bottom, regardless of the fill depth, the depth of invert, or the presence of a horizontal driving surface, or any bottomless (natural

channel) structure with footings that does not have wheel loads in direct contact with the top of the structure.

Curb. A border defining the edge of the trail or trail bridge.

Cushion Material. Native or imported material generally placed over rocky section of unsurfaced trail to provide a usable and maintained traveled way.

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.

Drawings. Design sheets or fabrication, erection, or construction details submitted to the Government by the Contractor according to FAR Clause 52.236-21 Specifications and Drawings for Construction. Also refers to submissions and submittals.

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.

Falsework. Temporary construction work on which a main work is wholly or partly built and supported until the main work is strong enough to support itself.

Ford. A water-level stream crossing constructed to provide a level surface for safe traffic passage.

Full Bench. Trailbed constructed entirely on undisturbed material.

Gabion Basket. Rectangular wire baskets filled with rock used as pervious, semiflexible building blocks for slope and foundation stabilization.

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.

Plans. The contract plans furnished by the Government showing the location, type, dimensions, and details of work.

Retainers. Embedded border of wood or rock used to retain fill and/or surface material.

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.

Slump. Where the trailbed material has moved downward, causing a dip in the trail grade.

Special Contract Requirements. Specifications that detail the conditions and requirements peculiar to an individual project, including additions and revisions to the standard specifications.

Standard Plans. Detailed plans approved for repetitive use and included as part of the plans.

Standard Specifications. The Standard Specifications for Construction of Trails on Federal Projects approved for general application and repetitive use.

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.

Waterbar. A structure used for turning water off the trail, usually made of logs or stones.

Water Courses. Any natural or constructed channel where water naturally flows or will collect and flow during spring runoff, rainstorms, etc.

Additional definitions may be found in Section 101.03 of the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03).

Section 902—Intent of Contract

902.01 Intent of Contract. The intent of the contract is to provide for the construction and completion of the work described. The precise details of performing the work are not stipulated except as considered essential for the successful completion of the work. Furnish all labor, material, equipment, tools, transportation, and supplies necessary to complete the work according to the contract.

Section 903—Control of Work

903.01 Specifications and Drawings. Follow the requirements of FAR Clause 52.236-21 Specifications and Drawings for Construction.

(a) General. Prepare drawings as necessary to construct the work. Drawings include, but are not limited to, layouts that show the relative position (vertical and horizontal as appropriate) of work to be performed, fabrication details for manufactured items and assemblies, installation and erection procedures, details of post-tensioning and other systems, detailed trench and excavation procedures that conform to OSHA requirements, traffic control implementation drawings, and methods for performing work near existing structures or other areas to be protected. Show all the drawing dimensions in United States customary units.

Drawings shall be a minimum size of 11 by 17 inches and a maximum size of 24 by 36 inches. All text should have a minimum height of 1/8 inch for 24 by 36 inch drawings (D size sheets). Include on each drawing and calculation sheet, the project number, name, and other identification as shown in the contract.

Furnish 5 sets of drawings and supporting calculations for acceptance before performing work covered by the drawings. If drawings are returned for revision, correct and resubmit for acceptance. Allow 40 days per submission for railroad structures and 30 days per submission for all other structures. The review time as specified is applied separately to each drawing submitted. The CO may request additional specific drawings for unique situations in order to clarify layout, construction details, or methodology. If drawings must be resubmitted, the time for acceptance starts over. Obtain written approval before changing or deviating from the accepted drawings.

(b) Specific requirements for concrete and miscellaneous structures.

(1) Furnish drawings for the following:

(a) Site-specific layouts for all wall types and gabion installations;

(b) Gabion and revet mattress details and installation procedures;

(c) Forms and falsework for reinforced concrete box culverts less than or equal to 6 feet in height;

(d) Fabrication drawings for bridge railings and parapets;

(e) Fabrication drawings for prestressed members;

(f) Fabrication and installation drawings for expansion joint assemblies;

(g) Fabrication drawings for bearing assemblies;

(h) Construction joint location and concrete deck placement sequences not shown on the plans;

(i) Erection diagrams for Soil-Corrugated Metal Structure interaction systems (multi-plate structures);

(j) Structural steel fabrication drawings;

(k) Utility hangar details; and

(l) Fabrication and installation drawings for precast items.

(2) Furnish drawings that bear the seal and signature of a professional engineer proficient in the pertinent design field for the following:

(a) Erection plans;

(b) Reinforced soil slopes details;

(c) MSE wall and crib wall details;

(d) Details and installation procedures for proprietary wall systems;

(e) Temporary bridge structures for public use;

(f) All bridge forms except for railings, parapets, and components less than 6 feet in height;

(g) Shoring systems and cofferdams greater than 6 feet in height;

(h) All shoring systems that support traffic loadings;

(i) Forms and falsework for all structures greater than 6 feet in height;

(j) Post-tensioning systems;

(k) Ground anchors, soil nail, and rock bolt assembly details, layout, and installation and testing procedures;

(l) Tie back wall details; and

(m) Alternate retaining wall details.

(3) Furnish drawings that bear the seal and signature of a professional engineer who is proficient in forms and falsework

design and licensed in the state where the project will be constructed for the following:

(a) Falsework for any structure with a span exceeding 16 feet;

(b) Falsework for any structure with a height exceeding 14 feet; and

(c) Falsework for structures where traffic, other than workers involved in constructing the structure, will travel under the structure.

Section 904—Control of Materials

904.01 Handling Materials. Transport and handle all materials to preserve their quality and fitness for the work. Stockpile, load, and transport aggregates in a manner that will preserve specified gradation and avoid contamination.

Store materials to assure the preservation of their quality and fitness for the work. Locate stored materials to facilitate their prompt inspection. Sites on Government-administered land that are not already designated may be used for storage purposes and for placing of equipment only when approved in advance by the CO. Restore all storage sites in accordance with requirements SHOWN ON THE PLANS or as otherwise specified. Arrangements for storage on other than designated sites are the responsibility of the contractor.

904.02 Material Sources

(a) Designated Sources. Sources for materials such as, but not limited to, soil, rock, or logs that are not available from trailway excavation or clearing operations will be designated. Sources of local materials designated in the SPECIAL CONTRACT REQUIREMENTS or SHOWN ON THE PLANS are guaranteed by the Government for the quality and quantity of material in the source.

Use all needed suitable material from the source. The designation of a source includes the right to use areas SHOWN ON THE PLANS for the purposes designated (such as plant sites, stockpiles, and haul roads). Operations are restricted to the confines of the area(s) designated.

Comply with the requirements of 30 CFR 56, subparts B and H. When required, re-establish vegetation in disturbed areas according to section 981.

(b) Contractor-Furnished Sources. Furnish material that produces an end product equivalent in performance to that specified.

904.03 Restoration. Shape and grade borrow areas on Government-administered land to make them stable and to minimize future erosion. Dispose of debris resulting from development of material sources by scattering, unless otherwise specified. Do not scatter debris within the clearing limits of trails or within roadsides. Cut off stumps to less than 12 inches above the ground as measured on the uphill side of the stump.

Section 905—Quality Assurance and Quantity Measurement

Description

905.01 This work consists of providing certification that the quality and quantity of construction conform to the plans, specifications, and requirements of the contract.

Construction

905.02 Certification and Measurements

(a) Offsite-Produced Materials. Furnish signed certificates executed by the manufacturer, supplier, or vendor, stipulating that all offsite-produced materials incorporated in the work meet applicable requirements SHOWN ON THE PLANS or stated in the specifications. Furnish a certificate for each commodity or invoice.

(b) Quantity Measurements. Submit quantities to the CO for periodic progress payments, and the CO will compute payments. Quantities are subject to verification.

905.03 Records. Maintain a set of contract plans depicting as-built conditions resulting from approved changes. Maintain the plans in a current condition and indicate changes from the original contract plans in red. Give the plans to the CO upon the completion of the contract work.

Measurement

905.04 Method. There will be no separate measurement for this item.

Payment

905.05 Payment will be considered incidental to other pay items in this contract.

Section 906—Measurement and Payment

906.01 General. Measurement and payment for contract work will be made only for and under those pay items included in the SCHEDULE OF ITEMS. All other work and materials will be considered incidental and included in the payment of the PAY ITEMS in the SCHEDULE OF ITEMS.

When more than one class, size, or thickness is specified in the SCHEDULE OF ITEMS for any PAY ITEM, suffixes will be added to the item number to differentiate between the items.

906.02 Determination of Quantities. The following measurements and calculations are to be used to determine contract quantities for payment:

Make measurements for seeding, geotextiles, and erosion control blankets along slope lines.

For retaining walls, measure by the square foot of front wall face.

Measure structures according to neat lines SHOWN ON THE PLANS or as altered by the CO in writing to fit field conditions. Make measurements along the centerline and parallel to the specified grade or foundation or as SHOWN ON THE PLANS.

Deduct lengths for stairways, turnpike, puncheon, retaining walls, wire baskets, switchbacks, bridges, and bridge approaches from the measurement of excavation in Section 911 unless these items are specified as incidental to excavation in Section 911.

For standard manufactured items, such as fence, wire, plates, rolled shapes, and pipe conduits identified by gage, weight, section dimensions, and the like, such identification shall be considered the nominal weights or dimensions. Manufacturer's tolerances will be accepted unless controlled by tolerances in the cited specifications.

906.03 Units of Measurement. Payment will be made by units defined and determined according to U.S. Customary measure and by the following:

(a) Cubic Yard. A measurement computed by one of the following methods:

(1) Excavation, embankment, or borrow. The measurement computed by the average-end-area method from measurements made longitudinally along a centerline or other reference line.

(2) Material in place or stockpiled. The measurement computed with the dimensions of the in-place material using average-end-area method or prismodial formula.

(3) Material in the Delivery Vehicle. The measurement computed using measurements of material in the hauling vehicles at the point of delivery.

Vehicles shall be loaded to at least their water-level capacity. Leveling of the loads may be required when vehicles arrive at the delivery point.

(b) Each (EA). One complete unit, which may consist of one or more parts.

(c) Lump Sum (LS). The quantities that denote one complete unit of work as required by or described in the contract, including necessary materials, equipment, and labor to complete the job.

906.04 Methods of Measurement. One of the following methods of measurement for determining final payment is DESIGNATED ON THE SCHEDULE OF ITEMS for each PAY ITEM:

(a) Designed Quantities. These quantities denote the final number of units to be paid for under the terms of the contract. They are based upon the original design data available prior to advertising the project. Original design data include the preliminary survey information, design assumptions, calculations, and plans. Changes in the number of units DESIGNATED IN THE SCHEDULE OF ITEMS may be authorized under the following conditions:

(1) As a result of changes in the work approved by the CO.

(2) As a result of the CO determining that errors exist in the original design that cause a PAY ITEM quantity to change by 15 percent or more.

(3) As a result of the contractor submitting to the CO a written request showing evidence of errors in the original design that cause a PAY ITEM quantity to change by 15 percent or more. The evidence must be verifiable and consist of calculations, plans, or other data that show how the designed quantity is believed to be in error.

(b) Staked Quantities (SQ). These quantities are determined from staked measurements prior to the construction.

(c) Actual Quantities (AQ). These quantities are determined from measurement of completed work.

(d) Vehicle Quantities. These quantities are measured or weighed in hauling vehicles.

(e) Lump Sum Quantities (LSQ). These quantities denote one complete unit of work as required by or described in the contract, including necessary materials, equipment, and labor to complete the job.

906.05 Government-Furnished Materials. When materials are furnished by the Forest Service, the note “Government-Furnished Materials” will be added to the description of the PAY ITEM.

Section 907—Mobilization

Description

907.01 This work consists of moving personnel, equipment, material, and incidentals to the project and performing all work necessary before beginning work at the project site. Mobilization includes the costs associated with obtaining permits, insurance, and bonds. Mobilization is not intended to pay for the costs of materials before they are used on the project site.

Payment

907.02 The accepted quantity, measured as provided in Subsection 906.02, will be paid at the contract price per unit of measurement for the Section 907 pay item shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section.

Progress payments for mobilization lump sum will be paid as follows:

(a) Bond premiums will be reimbursed according to FAR Clause 52.232-5, Payments Under Fixed-Price Construction Contracts, after receipt of the evidence of payment. Reimburse for bond premiums before issuing the Notice to Proceed if evidence of payment is received.

(b) When 5 percent of the original contract amount is earned from other bid items, 50 percent of the mobilization item, or 5 percent of the original contract amount, whichever is less, will be paid.

(c) When 10 percent of the original contract amount is earned from other bid items, 100 percent of the mobilization item, or 10 percent of the original contract amount, whichever is less, will be paid.

(d) Any portion of the mobilization item in excess of 10 percent of the original contract amount will be paid after final acceptance. Pay any unpaid amount for mobilization upon final acceptance of all work items.

Section 908—Construction Staking, Flagging, and Cleanup

Description

908.01 This work consists of 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.

Construction

908.02 General. The Government 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.

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 CO. Uniformly contour alignment and construct grade from control point to control point.

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 Government-administered lands unless otherwise designated.

Measurement

908.03 There will be no separate measurement for this item.

Payment

908.04 Trail staking, flagging, and cleanup will be considered incidental to other pay items in this contract, and additional payment will not be made.

Section 909— Maintenance for Traffic and Temporary Construction Access

Description

909.00.01 This work consists of maintaining existing trails that are undergoing improvements open and maintained in such a condition as to safely accommodate traffic and providing temporary construction access to the site. Maintaining the trail for traffic and temporary access may be covered by subsection:

909.10	Maintenance for Traffic
909.20	Temporary Construction Access

Measurement

909.00.02 There will be no separate measurement for these items.

Payment

909.00.03 Maintaining the trail for public access and providing temporary construction access will be considered incidental to other pay items in this contract, and additional payment will not be made.

909.10 - Maintenance for Traffic

Description

909.10.01 Keep existing trails that are undergoing improvements open and maintained in such a condition as to safely accommodate traffic. Provide and maintain temporary detours, approaches, or crossings and intersections with trails, roads, businesses, parking lots, and campgrounds in a safe and passable condition. Perform no work that interferes or conflicts with traffic until a plan for handling traffic has been submitted and approved. Specific requirements for detours or closures are SHOWN ON THE PLANS or in the SPECIAL CONTRACT REQUIREMENTS.

Before any suspension of work, take precautions necessary to prevent damage to the project, such as temporary detours, approaches, crossings, or intersections, and make provisions for normal drainage and to minimize erosion. Leave all trailways in a condition suitable for traffic unless otherwise specified.

The Government may permit use of portions of the project during periods when operations are shut down. All maintenance attributable to permitted use during periods of work suspension will be provided by the Government. The contractor is responsible for any maintenance that is not attributable to use or that is necessary during suspensions resulting from fault or negligence of the contractor.

909.20 - Temporary Construction Access

Description

909.20.01 The government may provide temporary access for the contractor from another route or trail other than the trail being constructed. The contractor will be responsible for maintaining the temporary access, removing and rehabilitating the temporary access route and any damaged area after construction is completed.

Section 910—Trailways

Section 911 - Trail and Prism

Description

911.00.01 This work consists of constructing trails, restoration of existing trails or obliteration of abandoned trails. The earthwork and associated trail tread and prism work may be covered by one or more of the following subsections:

911.10.	Excavation and Embankment
911.20.	Borrow
911.30.	Existing Trail Restoration
911.40.	Slide Maintenance
911.50.	Slough and Berm Removal
911.60.	Obliteration of Abandoned Trails
911.70.	Retainers

Measurement

911.00.02 Measure the section 911 items listed in the bid schedule according to subsection 906.

Payment

911.00.03 The accepted quantities will be paid at the contract price per unit of measurement for the section 911 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

911.10 - Excavation and Embankment

Description

911.10.01 This work consists of the excavation and placement of excavated material, regardless of its nature, from within the trailway or from other sources, except for material included under other pay items SHOWN IN THE SCHEDULE OF ITEMS.

Includes excavation, embankment, and backfill construction required to shape and finish the trailbed, ditches, backslopes, fill slopes, drainage dips, trail passing sections, and turnouts. Also includes excavation and embankment work required to construct culverts, trail bridges, shallow stream fords and gully crossings, talus and rubble rock sections, and climbing turns.

Materials

911.10.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

911.10.03 Use and Disposal of Excavated Material. Conserve and use all suitable material for specified work. Conserve excess excavated rock suitable for specified project work and use in place of materials from designated sources.

Remove all duff and debris from within trailway limits and uniformly spread outside the clearing limits, not more than 4 inches in depth (unless otherwise SHOWN ON THE PLANS). Do not obstruct drainage or create piles, berms, or windrows of debris.

Place excess and unsuitable excavation beyond the downslope edge of the trail bed. Do not obstruct drainage and spread to a depth not exceeding 4 inches. This includes any material removed in the grubbing operation and deposited in the same area.

Place rocks over 4 inches in greatest dimension not used in construction beyond the hinge point on the downslope side. Place rocks so that the tops are at least 6 inches lower than the trailbed surface. Ensure that no blockage of drainage or creation of a windrow effect occurs.

911.10.04 Trailway Excavation and Embankment. Minor deviations of ± 12 inches in vertical alignment and 36 inches in horizontal alignment with smooth transitions of at least 30 feet on each side of the deviation are acceptable unless otherwise SHOWN ON THE PLANS.

Construct embankments with suitable compacted material. Compact all disturbed soil within the trailbed area.

Remove any rock within or above the backslopes that is unstable. Use or dispose of rock in accordance with Subsection 912.03.

Leave the finished slope in a uniform and roughened condition.

Make necessary adjustments of horizontal or vertical alignment, within the tolerances specified in this subsection, to produce the designed trailway section and balance earthwork. Such adjustments shall not be considered as changes.

911.10.05 Trailbed Finish. Fill holes with suitable material, compact, and cut high points to provide a uniform trailbed finish.

911.10.07 Ditches. Construct ditches to be free of loose rocks, roots, sticks, and other obstructions.

911.10.08 Geosynthetics. Where SHOWN ON THE PLANS, place geosynthetics flat and parallel to centerline of the trail before placing embankment. Overlap geosynthetics a minimum of 24 inches. Install anchors or fasteners as recommended by the geosynthetic manufacturer.

911.20 - Borrow

Description

911.20.01 This work consists of placing select borrow material on the trailbed.

Materials

911.20.02 Requirements. Obtain borrow materials from locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Obtain CO's approval before using borrow from other locations. Suitable material from slough and berm removal may also be used as borrow material. Use suitable borrow material and aggregate under 2 inches in the greatest dimension.

Construction

911.20.03 General. On sideslopes where water can drain away from the trailbed, provide a sufficient depth of borrow material to obtain the outslope as SHOWN ON THE PLANS.

Across meadows and on turnpike sections, provide a sufficient depth of borrow material to produce a crowned trailbed as SHOWN ON THE PLANS.

Compact all material placed. Compact borrow material placed on the approaches of bridges and puncheon to provide a smooth surface and a smooth transition from the structure to the adjoining trail tread surface.

Cover any culvert surfaces that have become exposed with a minimum depth of 6 inches of suitable material over the full length of the exposed culvert and of sufficient length along the trail to present a uniform trail grade.

Provide free-draining borrow sites and backslopes no steeper than 1 1/3:1.

911.30-Existing Trail Restoration

Description

911.30.01 This work consists of restoring the original trail template, including clearing, removing slough and berm, borrow, filling ruts and troughs, reshaping backslopes, excavation, reshaping trail tread, restoring drainage and other trail structures, constructing check dams, and removing protruding rocks, roots, stumps, slough, and berms.

Construction

911.30.03 Clearing and Grubbing. Clear and grub in accordance with the requirements of section 912 and as SHOWN ON THE PLANS.

911.30.04 Excavation and Embankment. Excavate and place all excavated material in accordance with the requirements of section 911.10.04 and as SHOWN ON THE PLANS.

911.30.05 Rock and Root Removal. Uniformly scatter the removed rocks and roots below the trailway and distribute to ensure no blockage of watercourses or creation of a windrow. Fill holes with suitable material and compact.

911.30.06 Slough and Berm Removal and Excess Material. Use suitable slough and berm material within the trailway to restore the trailbed as SHOWN ON THE PLANS. Place all unsuitable and excess material beyond the downslope edge of the trailbed and uniformly spread to a depth not exceeding 4 inches and so as not to obstruct drainage or interfere with the drainage of outsloped tread.

Remove berm when daylight can be obtained within a distance of 5 feet from the outslope edge of finished tread unless otherwise DESIGNATED ON THE GROUND or SHOWN ON THE PLANS.

911.30.07 Fill Material and Borrow. Use suitable material to fill ruts, troughs, and potholes in the tread that cannot be leveled and outsloped through performance of work in Subsection 915.06. Compact and shape as SHOWN ON THE PLANS.

Obtain borrow from areas SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

911.30.08 Drainage. Restore drainage dips and ditches to reestablish drainage as SHOWN ON THE PLANS by removing obstructions such as rocks, roots, and sticks to make ditches and culverts free draining.

Restore rock spillways in accordance with section 923 and as SHOWN ON THE PLANS.

911.30.09 Stream Channel Cleaning. Clean channel of obstructions in areas SHOWN ON THE PLANS. Remove debris and rocks from the stream channel and scatter outside of the side slopes of the stream channel and beyond the clearing limits.

911.30.10 Check Dams. When constructing check dams for gullies, use dimensional lumber, sound peeled logs, or a row of stones placed across the gully in the subgrade with the ends securely embedded in the banks as SHOWN ON THE PLANS and at locations STAKED ON THE GROUND.

Use suitable material for backfill as SHOWN ON THE PLANS. Place and compact backfill to meet the density of the existing trailbed and to form a smooth tread.

911.30.11 Switchbacks. Restore switchbacks in accordance with section 914 and as SHOWN ON THE PLANS.

911.30.12 Waterbars. Restore waterbars in accordance with section 922 and as SHOWN ON THE PLANS. Reestablish drainage by removing accumulated material and replacing loose or missing rocks, unsuitable logs, and deteriorated rubber belting.

911.30.13 Turnpikes. Restore turnpikes in accordance with section 913 and as SHOWN ON THE PLANS by replacing missing, rotten, or loose retainer logs and stakes, or missing or loose retainer rocks. Backfill with suitable material.

911.30.14 Trail Structures. Restore all trail structures at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

911.30.15 Reshaping and Finishing Trailbed and Backslopes. Provide a firm and uniformly finished trailbed in accordance with cross-sections SHOWN ON THE PLANS.

Provide a uniform and roughened surface on disturbed backslopes in accordance with cross-sections SHOWN ON THE PLANS. Cut all roots flush.

911.40 - Slide Maintenance

Description

911.40.01 This work consists of the removal and disposal of slide material from the trailbed and the restoration of all sections of trail that have been damaged.

Maintenance

911.40.02 General. Conserve and use suitable material from the slide on the trailbed for tread surfacing. Spread this material at a maximum depth of 3 inches for a distance not exceeding 100 feet in each direction from the site of the slide unless otherwise SHOWN ON THE PLANS.

Place all excess and unsuitable material beyond the downslope edge of the trailbed. Uniformly spread unsuitable material to a depth not exceeding 4 inches and do not obstruct drainage.

Reshape the backslope that contributed to the slide to reduce future sloughing and to conform to adjacent undamaged sections unless otherwise SHOWN ON THE PLANS.

Re-grade sections of trailbed that have been damaged to a width and finish that conform to adjacent undamaged sections unless otherwise SHOWN ON THE PLANS.

911.50 - Slough and Berm Removal

Description

911.50.01 This work consists of the removal and disposal of slough and berm material that has accumulated on the trailway.

Construction

911.50.02 Slough and Berm Removal and Excess Material. Remove all slough material within the trailway. Remove all material from the trailbed when daylight can be obtained within a distance of 4 feet from the outsloped edge of the finished tread unless otherwise DESIGNATED ON THE GROUND or SHOWN ON THE PLANS. Conserve and use suitable material to restore the trail tread as SHOWN ON THE PLANS.

Place all excess and unsuitable material beyond the downslope edge of the trailbed. Uniformly spread to a depth not exceeding 4 inches and do not obstruct drainage or interfere with the drainage of outsloped tread.

911.60 - Obliteration of Abandoned Trails

Description

911.60.01 This work consists of removal and disposal of existing structures, including turnpikes, walkways, bridges, culverts, signs and posts, and other material within the trailway, above or below ground. Work also includes salvaging DESIGNATED materials and backfilling the resulting trenches, holes, and pits.

Construction

911.60.02 Removal of Culverts and Bridges. Remove existing culverts within embankment areas at locations SHOWN ON THE PLANS.

Remove existing structures down to the natural stream bottom, and remove parts outside the water course to at least 12 inches below natural ground surface or finish ground surface, whichever is lower. Where portions of an existing structure lie wholly, or in part, within the limits of a new structure, remove parts to accommodate the installation of the proposed structure.

Avoid damage to bridges being dismantled for salvage. Match mark steel and/or wood members and prepare drawings showing the structural location of each member.

911.60.03 Signs and Posts. Remove signs, posts, and associated hardware at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Backfill post hole, compact, and contour area to match existing ground.

911.60.04 Removal of Other Obstructions. Remove other obstructions at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

911.60.05 Disposal. Dispose of native log and rock material by scattering below the trailway and outside clearing limits. Do not place debris in water courses, snow ponds, lakes, meadows, or locations where it could impede the flow to, through, or from the drainage structures. Dispose of metal, treated timber, and other manufactured products by removing from Government-administered lands and placing in approved waste disposal sites.

911.70 - Retainers

Description

911.70.01 This work consists of furnishing and installing log, sawn timber and rock retainers, including excavation and backfill, wood stakes and/or metal anchors and selecting and hauling of retainer materials.

Materials

911.70.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Construction

911.70.03 General. Place log, sawn timber, or rock retainers in continuous rows. Bed retainers along their entire length and so they are stable. When retainers are constructed of logs or sawn timber use lengths greater than or equal to 10 feet.

Section 912 - Clearing Limits

Description

912.00.01 This work consists of 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. Clearing and removal of trees, vegetation and rocks may be covered by one or more of the following subsections:

912.10.	Clearing and Grubbing
912.20.	Brush Cutting
912.30.	Logging Out
912.40.	Hazard Tree Removal
912.50.	Loose Rock Removal
912.60.	Rock and Root Removal

Measurement

912.00.02 Measure the section 912 items listed in the bid schedule according to subsection 906.

Payment

912.00.03 The accepted quantities will be paid at the contract price per unit of measurement for the section 911 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

912.10 - Clearing and Grubbing

Description

912.10.01 This work consists of clearing, grubbing, trimming, removing, and treating trees, logs, limbs, branches, brush, plants, and other vegetation within the clearing limits. Work 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.

Construction

912.10.02 Clearing Limits. Clear to the dimensions SHOWN ON THE PLANS or 12 inches beyond the fill and backslope catch points, whichever is greater.

912.10.03 Material to Be Cleared. Remove and dispose of trees, logs, limbs, branches, brush, herbaceous plants, and other vegetation within the clearing limits, except for the following:

a) Live, sound, and firmly rooted trees of the size SHOWN ON THE PLANS.

b) Live brush, herbaceous plants, and trees between the trailway and the clearing limits that are less than 12 inches in height and less than ½ inch in diameter at ground line.

Except as provided above, cut all limbs and branches more than ½ inch in diameter that extend into the clearing limits. Cut limbs flush with the tree trunks or stems or cut at the ground surface as SHOWN ON THE PLANS.

Fall and limb designated trees.

912.10.04 Damaged Trees. When felling, cutting, or trimming, do not cause bark damage to standing timber. If damage does occur to standing trees, treat the injured trees as SHOWN ON THE PLANS. Remove and dispose of trees with major roots exposed by construction that are rendered unstable.

912.10.05 Removal of Stumps. Remove all stumps within the trailbed. 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.

912.20 - Brush Cutting

Description

912.20.01 This work consists of removing brush, trees less than 4 inches in diameter, and shrubs within the clearing limits.

Construction

912.20.02 General. Remove all limbs of shrubs and trees that extend across or into the clearing limits as SHOWN ON THE PLANS. Saw or cut limbs flush with the tree trunk. Make cuts in a manner that will not tear or strip bark from the trees.

Cut and remove from the clearing limits all woody plants exceeding ½ inch in stem diameter or 12 inches in height. The maximum size material to be cut under this specification is 4 inches in diameter when measured at a height of 6 inches above the ground on the uphill side of the stump.

Cut all brush and small, woody plants as near flush to the ground surface as possible. When impractical to cut plants flush, the maximum stem length shall be 2 inches.

Remove all woody material for a minimum of 3 inches below the trail tread surface. Fill holes in the trail tread caused by removing woody material with suitable material.

Scatter the clearing debris removed from the clearing limits outside and below the clearing limits. Do not place materials in stream channels, drainage ways, ditches, culvert inlets, or other locations where they would prevent the free flow of water away from the trailbed.

912.30 - Logging Out

Description

912.30.01 This work consists of removing brush, logs, and down trees from the clearing limits.

Construction

912.30.02 Clearing Out. 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.

Fell all trees over 4 inches in diameter that are leaning into the clearing limits and that are within 10 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. Disposal and payment for the leaning trees described above will be the same as for down logs and trees. Remove roots and stumps from trees within the trailway that have been uprooted.

Rerouting the trail around windfalls, uprooted trees, and other obstacles will not be permitted. Ramp or reroute sections of the trail tread that have been damaged by uprooted stumps as necessary to provide safe passage on the trail. Payment for such work will be incidental to the specified work item, and no extra payment will be made.

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

Scatter the down trees on the lower side of the trailway outside the clearing limits. 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.

912.40 - Hazard Tree Removal

Description

912.40.01 This work consists of felling, bucking, and limbing trees and scattering slash.

Construction

912.40.02 Hazard Trees. Remove trees and snags that are broken off or that are in a leaning, unstable position over the trailway to designated areas as SHOWN ON THE PLANS. Cut designated danger trees so that stump heights do not exceed 12 inches as measured on the uphill side of the stump. Maximum stump height of designated trees within 4 feet of the trail centerline is 4 inches. 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.

912.50 - Loose Rock Removal

Description

912.50.01 This work consists of removal and disposal of loose rock from the trail tread.

Construction

912.50.02 General. Remove loose rocks that are larger than 2 inches at their greatest dimension from the trailbed. Remove any loose rock in drainage dips or ditches that may impede water flow off the trail. Loose rocks are rocks that are not firmly embedded in the trail and can be removed by hand. Where the trailbed consists predominantly of rock with little or no soil present, remove all loose rock larger than 3 inches.

Fill any holes remaining from rock removal with suitable material and compact. If the rock removed is not needed for other items of maintenance work, 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 water courses.

912.60 - Rock and Root Removal

Description

912.60.01 This work consists of removal and disposal of rocks and roots from the tread.

Construction

912.60.02 Rock Removal. Remove surface rocks that are larger than 2 inches at their greatest dimension, 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. Where the trailbed consists predominantly of rock with little or no soil present, remove loose rock in excess of 3 inches.

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. If rock removed is not needed for other items of maintenance work, scatter the rock by side-casting to the lower side of the trailway and beyond the clearing limits and distribute rock to ensure that no blockage of drainage

or creation of windrow occurs. Do not dispose any waste material in water courses.

912.60.03 Root Removal. Remove exposed tree roots on or in the trail tread that are greater than 1 inch in diameter. Cut embedded roots that project more than 2 inches above the trail tread flush with the trail tread. Scatter removed roots on the lower side of the trailway beyond the clearing limits and outside of water courses.

Fill holes caused by rock and root removal with suitable material and compact to form a smooth trail tread.

Maintain trail tread to the width as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Section 913 – Surfacing

Description

913.00.01 This work consists of furnishing, hauling, watering, placing, and compacting surfacing and other associated work. Trail surfacing may be covered by one or more of the following subsections:

913.10.	Aggregate Surfacing and Base Course
913.20.	Hot Asphalt Plant Mix Trail Surfacing
913.30.	Cold Asphalt Mix Trail Surfacing
913.40.	Grid Unit Surfacing
913.50.	Riprap Surfacing
913.60.	Chunk Wood Surfacing
913.70.	Imported Clay Surfacing
913.80.	Geosynthetic Surfacing
913.90.	Surface Maintenance

Materials

913.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

913.00.02 Preparation of Subgrade. Prepare and finish trailbed as required under section 911. Obtain written approval of the CO before placing aggregate.

913.00.03 Retainers. Construct retainers in accordance with Section 911.70 and as SHOWN ON THE PLANS.

Measurement

913.00.04 Measure the section 913 items listed in the bid schedule according to subsection 906.

Payment

913.00.05 The accepted quantities will be paid at the contract price per unit of measurement for the section 913 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

913.10 - Aggregate Surfacing and Base Course

Description

913.10.01 This work consists of furnishing, hauling, watering, placing, and compacting aggregate surfacing or base course; furnishing and installing retainers; and geosynthetics.

Materials

913.10.02 Materials. Produce aggregate by pit run, screening, or crushing. Obtain materials from sources SHOWN ON THE PLANS or other sources approved by the CO in writing.

913.10.03 Handling Materials. Stockpile, remove, transport, and spread aggregates in a manner that will preserve specified gradation and avoid contamination. Do not intermingle stockpiles of aggregate having different gradations.

913.10.04 Sampling Aggregate. Submit test results and a Certificate of Compliance verifying that aggregate gradation meets contract requirements.

Sample the material before incorporation into the work as follows:

(a) for onsite-produced materials at crushing or screening plants, after additions of any necessary blending material.

(b) for commercially produced aggregates, at the producer's plant or stockpile.

The sampling will not be considered a final acceptance and will not preclude later sampling and testing after final processing of the material. Such sampling does not relieve the contractor of responsibility of providing quality control measures to ensure compliance with contract requirements.

Construction

913.10.05 Preparation of Subgrade. Prepare and finish trailbed as required under section 912. Obtain written approval of the CO before placing aggregate.

913.10.06 Spreading and Compacting. Use aggregate that is uniformly mixed at optimum moisture content and spread and compact in layers to the final thickness and width SHOWN ON THE PLANS. The maximum thickness of any one layer shall be 3 inches. Obtain compaction by one of the following methods as SHOWN IN THE SCHEDULE OF ITEMS:

(a) by hand, using non-mechanized compaction tools over the full area of each layer until visual displacement ceases;

(b) by mechanical vibratory compactors over the full area of each layer until visual displacement ceases, but not fewer than three complete passes;

(c) by using a roller or mechanical hand tamper until the density is at least 90 percent of the maximum density, as determined by AASHTO T 99, Method C or D.

Immediately following final spreading, smoothing, and compacting, correct any irregularities or depressions that develop by adding or removing material until the surface is smooth, uniform, and compacted.

913.10.07 Acceptance, Testing, Sampling, and Tolerances. Do not vary the total compacted thickness of the aggregate by more or less than ¾ inch from the specified thickness or place it consistently below or above the specified depth.

Do not vary the aggregate width by more than ± 3 inches from the specified width or place it consistently narrower or wider than the specified width.

913.20 - Hot Asphalt Plant Mix Trail Surfacing

Description

913.20.01 This work consists of constructing a single course of hot asphalt plant mix on a prepared base course or trailbed and furnishing or installing retainers and geosynthetics.

Materials

913.20.02 Materials. Use hot plant mix design that is currently in use by the local State department of transportation, the county, or city, and submit a certificate of compliance that the mix meets their requirements. Certify the locations of past projects for the CO's inspection prior to approval.

Construction

913.20.03 Weather Limitations. Do not place the asphalt mixture when weather conditions prevent the proper compaction of the mixture, the base course is frozen, or the average temperature of the underlying surface upon

which the asphalt mixture is to be placed is less than 55°F. Do not place when it is raining or snowing.

913.20.04 Mixing. Do not allow the temperature of the mix to exceed 320°F when discharging from the mixer.

913.20.05 Surface Preparation. Remove loose aggregate, soil, or other deleterious materials from the surface to be paved. Prepare base or trailbed by shaping, watering, and compacting before placing plant mix. Obtain the CO's approval before placing plant mix on prepared base.

913.20.06 Placement and Compaction. Place and compact plant mix to meet the lines, grades, and thicknesses SHOWN ON THE PLANS. Avoid segregation of the mix. Hand or small machine placement of mix is permitted, except where the use of asphalt paving machines is required for areas SHOWN ON THE PLANS. Use only self-contained, power-propelled paving machine units, provided with an adjustable activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing courses of asphalt plant mix to the required widths and thicknesses.

Start compaction when the mix is above 230°F. Compact the mix with at least three passes over the entire trail surface. Use a steel wheel power roller that is of a minimum weight of 1 ton. Use vibratory plate compactors in areas that are not accessible to rollers. Continue compaction over the full width of the layer until visible deformation of the layer ceases.

913.20.07 Thickness. Do not vary the thickness of the compacted hot mix by more or less than 15 percent from the thickness SHOWN ON THE PLANS and not consistently above or below the specified thickness.

913.30 - Cold Asphalt Mix Trail Surfacing

Description

913.30.01 This work consists of constructing a single course of cold bituminous mix on a prepared base course or trailbed and furnishing and installing retainers.

Materials

913.30.02 Requirements. Use cold bituminous mix design that is currently in use by the local State department of transportation, the county, or city, and submit a certificate of compliance that the mix meets their requirements. Certify the locations of past projects for the CO's inspection prior to approval.

Use either MC250 liquid asphalt that conforms to AASHTO M 82 or CMS-2 emulsion that conforms to AASHTO M 208.

For the cold bituminous mix, use aggregate with a maximum size of ¾ inch and no more than 10 percent by weight passing the No. 200 sieve.

Construction

913.30.03 Weather Limitations. Place cold asphalt concrete on an unfrozen, reasonably dry surface. Place when the air temperature in the shade is above 50°F, the temperature of the road surface is above 40°F, and it is not raining or snowing or predicted to rain or snow within 24 hours after placement.

913.30.04 Surface Preparation. Clean the surface to be paved of all loose aggregate, soil, or other deleterious materials. Shape, water, and compact the base course or trailbed with a compactor to prepare the base and subgrade just before placing cold mix. Obtain the CO's approval before placing mix on prepared bases.

913.30.05 Mixing. If liquid asphalt is used, use aggregate that contains no more than 3 percent moisture and is at a temperature between 60 and 220°F during mixing. If emulsified asphalt is used, use aggregate that is at a temperature between 60 and 175°F during mixing.

Mix the aggregate and bituminous material until the aggregates are thoroughly coated and the mass is a uniform color.

913.30.06 Placement and Compaction. Place and compact the mix to meet the lines, grades, and cross-section SHOWN ON THE PLANS. Avoid segregation of the mix. Hand or small machine placement of mix is permitted, except where the use of bituminous paving machines is required for areas SHOWN ON THE PLANS. Use self-contained, power-propelled paving machine units, provided with an adjustable activated screed or strike off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix to the required widths and thicknesses.

Compact the mix with at least three passes over the entire trail surface. Use a steel wheel power roller that is of a minimum weight of 1 ton. Use vibratory plate compactors in areas that are not accessible to rollers. Continue compaction over the full width of the layer until visible deformation of the layer ceases.

913.30.07 Thickness. Do not vary the thickness of the compacted hot mix by more or less than 15 percent from the thickness SHOWN ON THE PLANS and not consistently above or below the specified thickness.

913.40 - Grid Unit Surfacing

Description

913.40.01 This work consists of furnishing and installing grid pavement units, including excavation, backfilling, and geosynthetics.

Construction

913.40.02 Excavation and Embankment. Perform excavation and embankment in accordance with section 911 and as SHOWN ON THE PLANS.

Excavate to the depth of the grid pavement units to be installed after first removing all duff and debris.

Stockpile all excavated suitable material adjacent to the trail for later use as backfill.

Obtain approval before placing grid pavement units.

913.40.03 Laying Grid Block. Place and bed blocks so they rest firmly against adjacent blocks, are stable, and form a smooth and uniform tread surface. Blocks designed to be interlocked must be interconnected. Fill void areas to full depth with fractured or cut pieces of block on curves or where needed to establish the grid pavement units in which native surface areas are no larger than 6 inches in greatest dimension. Bury beginning and ending blocks at a 30° angle to the tread.

Dispose of unused block material by removing from Government-administered lands to an appropriate site or by burying it at a location DESIGNATED ON THE GROUND.

913.40.04 Backfilling. After approval of the grid block installation by the CO, place and compact suitable material into holes between and around grid pavement units. For block surfacing used in shallow stream fords and gully crossings, substitute native gravels for suitable materials.

913.50 - Riprap Surfacing

Description

913.50.01 This work consists of construction of riprap surfacing, including excavation, furnishing, hauling, and placing rock and aggregate, compacting surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

913.50.02 Construct riprap surfacing as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

913.60 - Chunk Wood Surfacing

Description

913.60.01 This work consists of construction of chunk wood surfacing, including excavation, furnishing, hauling, and placing chuck wood, compacting surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

913.60.02 Construct chunk wood surfacing as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

913.70 - Imported Clay Surfacing

Description

913.70.01 This work consists of construction of imported clay surfacing, including excavation, furnishing, hauling, and placing clay, compacting surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

913.70.02 Construct imported clay surfacing as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

913.80 - Geosynthetic Surfacing

Description

913.80.01 This work consists of construction of geosynthetic surfacing, including excavation, furnishing, hauling, and placing geosynthetics and aggregate, compacting surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

913.80.02 Construct geosynthetic surfacing as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

913.90 – Surface Maintenance

Description

913.90.01 This work consists of maintenance of surfacing, including excavation, furnishing, hauling, and placing rock, aggregate and other surfacing, compacting surfacing, and associated barriers, ditches, and retaining walls to bring surface up to good condition.

Maintenance

913.90.02 Perform maintenance of surfacing as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

914 - Climbing Turn

Description

914.00.01 This work consists of construction or maintenance of climbing turns, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections. Construction or maintenance of the climbing turn may be covered by one or more of the following subsections:

914.10.	Climbing Turn
914.20.	Climbing Turn Maintenance

Materials

914.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

914.00.03 Preparation of Subgrade. Prepare and finish trailbed as required under section 911 and/or as SHOWN ON THE PLANS. Obtain written approval of the CO before placing aggregate.

914.00.04 Retaining Walls. When SHOWN ON THE PLANS, construct retaining walls in accordance with section 935.

914.00.05 Barriers. When SHOWN ON THE PLANS, construct barriers at each climbing turn in accordance with section 933.

914.00.06 Ditches. When SHOWN ON THE PLANS, construct ditches in accordance with section 925.

Measurement

914.00.07 Measure the section 914 items listed in the bid schedule according to subsection 906.

Payment

914.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the section 914 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

914.10 - Climbing Turn

Description

914.10.01 This work consists of construction of climbing turns, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

914.10.02 Construct climbing turn as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

914.20 - Climbing Turn Maintenance

Description

914.20.01 This work consists of maintenance of climbing turns, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections to bring the climbing turn up to good condition.

Maintenance

914.20.02 Perform maintenance of climbing turn as required under the construction section of 914.00. and/or as SHOWN ON THE PLANS.

915 - Talus Section

Description

915.00.01 This work consists of furnishing, hauling, and placing rock and aggregate, and compacting aggregate surfacing and through talus or rubble rock sections of trail. Construction or maintenance of the talus section may be covered by one or more of the following subsections:

915.10.	Talus Section
915.20.	Talus Section Maintenance

Materials

915.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

915.00.03 Preparation of Subgrade. Prepare and finish trailbed as required under section 911. Obtain written approval of the CO before placing aggregate

915.00.04 Talus or Rubble Rock Sections. Through talus or rubble rock slide areas, fill all voids with suitable material to the depth SHOWN ON THE PLANS. Use cap rocks that weigh a minimum of 130 lbs and have a length of at least twice their width. At least 50 percent of all hand-placed outer rocks should weigh a minimum of 130 lbs. Construct tread by building out rather than by removing material from the inner bank.

Measurement

915.00.05 Measure the section 915 items listed in the bid schedule according to subsection 906.

Payment

915.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the section 915 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

915.10 - Talus Section

Description

915.10.01 This work consists of construction of talus section, including furnishing, hauling, and placing rock and aggregate, and compacting aggregate surfacing and through talus or rubble rock sections of trail.

Construction

915.10.02 Construct talus section as required under the construction section 915.00., and and/or as SHOWN ON THE PLANS.

915.20 - Talus Section Maintenance

Description

915.10.01 This work consists of maintenance of talus section, including furnishing, hauling, and placing rock and aggregate, and compacting aggregate surfacing and through talus or rubble rock sections of trail.

Maintenance

915.10.02 Perform maintenance of talus section as required under the construction section 915.00., and/or as SHOWN ON THE PLANS.

916 - Turnout and Passing Section

Description

916.00.01 This work consists of construction or maintenance of turnout and passing sections, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections. Construction or maintenance of the turnout and passing section may be covered by one or more of the following subsections:

916.10.	Turnout and Passing Section
916.20.	Turnout and Passing Section Maintenance

Materials

916.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

916.00.03 Preparation of Subgrade. Prepare and finish trailbed as required under section 911 and/or as SHOWN ON THE PLANS. Obtain written approval of the CO before placing aggregate.

916.00.04 Retaining Walls. When SHOWN ON THE PLANS, construct retaining walls in accordance with section 935.

916.00.05 Barriers. When SHOWN ON THE PLANS, construct barriers at each switchback in accordance with section 933.

916.00.06 Ditches. When SHOWN ON THE PLANS, construct ditches in accordance with section 925.

Measurement

916.00.07 Measure the section 916 items listed in the bid schedule according to subsection 906.

Payment

916.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the section 916 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

916.10 - Turnout and Passing Area

Description

916.10.01 This work consists of construction of turnout and passing sections, including furnishing, hauling, and placing rock and aggregate, and compacting aggregate surfacing and through talus or rubble rock sections of trail.

Construction

916.10.02 Construct turnout and passing sections as required under the construction section 916.00., and/or as SHOWN ON THE PLANS.

916.20 - Turnout and Passing Area Maintenance

Description

916.10.01 This work consists of maintenance of turnout and passing sections, including furnishing, hauling, and placing rock and aggregate, and compacting aggregate surfacing and through talus or rubble rock sections of trail.

Maintenance

916.10.02 Perform maintenance of turnout and passing sections as required under the construction section 916.00., and /or as SHOWN ON THE PLANS.

917 – Fords

Description

917.00.01 This work consists of construction or maintenance of fords or stepping stones, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections. Construction or maintenance of the ford or stepping stones may be covered by one or more of the following subsections:

917.10.	Natural Ford
917.20.	Constructed Ford
917.30.	Stepping Stones
917.40.	Ford Maintenance

Materials

917.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

917.00.03 Preparation of Subgrade. Prepare and finish trailbed as required under section 911 and 912 and/or as SHOWN ON THE PLANS. Obtain written approval of the CO before placing aggregate.

917.00.04 Retaining Walls. When SHOWN ON THE PLANS, construct retaining walls in accordance with section 935.

917.00.05 Barriers. When SHOWN ON THE PLANS, construct barriers at each ford in accordance with section 933.

917.00.06 Ditches. When SHOWN ON THE PLANS, construct ditches in accordance with section 925.

Measurement

917.00.07 Measure the section 917 items listed in the bid schedule according to subsection 906.

Payment

917.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 917 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

917.10 - Natural Ford

Description

917.10.01 This work consists of construction of natural ford, approaches and surfacing, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

917.10.02 Construct natural ford, approaches and surfacing as required under the construction section 917.00., and/or as SHOWN ON THE PLANS.

917.20 - Constructed Ford

Description

917.20.01 This work consists of construction of ford, approaches and surfacing, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

917.20.02 Construct ford, approaches and surfacing as required under the construction section 917.00., and/or as SHOWN ON THE PLANS.

917.30 - Stepping Stones

Description

917.30.01 This work consists of construction of stepping stones and approaches, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, ditches, retaining walls, and approach sections.

Construction

917.30.02 Construct stepping stones and approaches as required under the construction section 917.00., and/or as SHOWN ON THE PLANS.

917.40 – Ford Maintenance

Description

917.40.01 This work consists of maintenance of fords and approaches, including excavation, furnishing, hauling, and placing rock and aggregate, compacting aggregate surfacing, and associated barriers, retaining walls, and approach sections to bring the ford up to good condition.

Maintenance

917.40.02 Maintain stream fords and gully crossings as SHOWN ON THE PLANS. Remove debris and loose rocks over 3 inches from existing stream crossings to provide the tread width. Maintain and replace missing or rotted log or rock barriers that form the dam at fords and gully crossings. Level and smooth the stream bottom with gravel or rock less than 3 inches in greatest dimension to provide a crossing.

Re-grade or fill the approaches to the stream fords and gully crossings to provide for safe use. Replace missing stepping stones.

918.00. – Foundations

Description

918.00.01 This work consists of construction or maintenance of foundations for trailways, including excavation, furnishing, hauling, placing and compacting rock, aggregate, geosynthetics, wire baskets and timber materials, and associated barriers, ditches, retaining walls, and approach sections. Construction or maintenance of the foundations may be covered by one or more of the following subsections:

918.10.	Rock
918.20.	Geosynthetics
918.30.	Gabion Basket
918.40.	Crib Foundation
918.50.	Corduroy Foundation
918.60.	Foundation Maintenance

Materials

918.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995
Wire Basket Materials	996

Construction

918.00.03 Preparation of Subgrade. Prepare and finish subgrade as required under section 911 and/or as SHOWN ON THE PLANS. Obtain written approval of the CO before placing rock, geosynthetics, gabion baskets or crib foundations.

918.00.03 Foundation Construction. Construction foundation as SHOWN ON THE PLANS, construct with approved backfill material in accordance with section 911 and 912.

918.00.04 Retaining Walls. When SHOWN ON THE PLANS, construct retaining walls in accordance with section 935.

918.00.05 Barriers. When SHOWN ON THE PLANS, construct barriers at each switchback in accordance with section 933.

918.00.06 Ditches. When SHOWN ON THE PLANS, construct ditches in accordance with section 925.

Measurement

918.00.07 Measure the section 918 items listed in the bid schedule according to subsection 906.

Payment

918.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 918 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 906.04.

918.10. – Rock

Description

918.10.01 This work consists of construction of rock foundation for trailways, including excavation, furnishing, hauling, and placing rock, aggregate, and geosynthetics.

Construction

918.10.02 Construct foundation as required under the construction section 918.00. and/or as SHOWN ON THE PLANS.

918.20. – Geosynthetics

Description

918.20.01 This work consists of utilizing geosynthetics for foundation construction for trailways, including excavation, furnishing, hauling, and placing rock, aggregate, and geosynthetics.

Construction

918.20.02 Construct foundation as required under the construction section 918.00. and/or as SHOWN ON THE PLANS.

918.30. - Gabion Basket

Description

918.30.01 This work consists of utilizing wire baskets for foundation construction for trailways, including excavation, furnishing, hauling, and placing rock, aggregate and wire baskets.

Construction

918.30.02 Construct foundation as required under the construction section 918.00. and/or as SHOWN ON THE PLANS.

918.40. - Crib Foundation

Description

918.40.01 This work consists of utilizing timber cribs for foundation construction for trailways, including excavation, furnishing, hauling, and placing rock, aggregate and timber cribs.

Construction

918.40.02 Construct foundation as required under the construction section 918.00. and/or as SHOWN ON THE PLANS.

918.50. – Corduroy Foundation

Description

918.50.01 This work consists of utilizing corduroy for foundation construction for trailways, including excavation, furnishing, hauling, and placing logs, aggregate and geosynthetics.

Construction

918.50.02 Construct foundation as required under the construction section 918.00. and/or as SHOWN ON THE PLANS.

918.60. - Foundation Maintenance

Description

918.60.01 This work consists of maintenance of foundation for trailways, including excavation, furnishing, hauling, placing and compacting rock, aggregate, geosynthetics, wire baskets and timber materials, and associated barriers, ditches, retaining walls, and approach sections.

Maintenance

918.60.02 Perform maintenance on foundation as required under the construction section 918.00. and/or as SHOWN ON THE PLANS.

Section 920—Drainage Structures

921 – Culverts

Description

921.00.01. This work consists of furnishing and installing culverts, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins, and headwalls. Construction of culverts may be covered by one or more of the following subsections:

921.10.	Standard Culvert
921.20.	Standard Culvert with Headwall
921.30.	Rock Culvert
921.40.	Treated Timber Box Culvert
921.50.	Open-Top Drain
921.60.	Bottomless Arch Culvert
921.70.	Culvert Maintenance

Materials

921.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Drainage Pipe	992
Geosynthetics	994
Material for Timber Structures	995

Construction

921.00.03 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

921.00.04 Placement. Place culverts to provide for unobstructed inlet and outlet flow. Remove logs, debris, soil, rock, and other obstructions above and below the culvert that would impede flow into the culvert or away from the trailway. Minimize disturbance to streambeds.

Construct a catch basin to facilitate flow from trail ditches into the culvert.

921.00.05 Installation. Install culverts of the types and at the locations SHOWN ON THE PLANS or as DESIGNATED ON THE GROUND.

(a) Placing. Skew ditch relief culverts as staked to provide a downgrade equal to or greater than the uphill ditch. Place culverts at stream crossings in the natural streambed on stream grade.

Attach end sections to the pipe by connecting bands or other means as recommended by the manufacturer.

(b) Bedding. Excavate and remove all unsuitable material and rocks over 3 inches to a minimum depth of 6 inches below the pipe invert and to a minimum width of 1.5 pipe diameters. Bed pipe with compacted suitable material free of

rocks larger than 3 inches and in a stable foundation of undisturbed or compacted soil. Make the bed shaped to fit the lower quadrant of the pipe exterior and provide uniform continuous support along the entire length of the pipe.

921.00.06 Backfilling. Backfill and compact around culverts with suitable material that is free of rocks over 3 inches. Provide for the cover height as SHOWN ON THE PLANS.

Measurement

921.00.07 Measure the section 921 items listed in the bid schedule according to section 906.

Payment

921.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 921 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

921.10 - Standard Culvert

Description

921.10.01 This work consists of furnishing and installing culverts without headwalls, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins.

Construction

921.10.02 Install culverts as required under construction section 921.00 and/or as SHOWN ON THE PLANS.

921.20 - Standard Culvert with Headwalls

Description

921.20.01 This work consists of furnishing and installing culverts with headwalls, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins.

Construction

921.20.02 Install culverts and headwalls as required under construction section 921.00 and/or as SHOWN ON THE PLANS.

921.20.03 Headwalls. Install headwalls at the locations SHOWN ON THE PLANS or as DESIGNATED ON THE GROUND.

Provide a compacted bench as a foundation for the wall.

Select rocks that have a general rectangular shape with flat top and bottom faces. Place the largest rocks on the bottom. Lay each rock stable on the course that supports it, interlocking with surrounding rocks. Do not break, jar, or displace rocks already set. Place the exposed face of each rock parallel to the face of the wall. Stagger vertical joints a minimum of 4 inches horizontally from vertical joints in adjoining courses.

921.30 - Rock Culvert

Description

921.30.01 This work consists of furnishing and installing rock culverts, including excavation and backfill, selecting and hauling of rock material, and constructing catch basins.

Construction

921.30.02 Install culverts as required under construction section 921.00 and/or as SHOWN ON THE PLANS.

921.30.03 Rock Culverts. Install rock culverts at the locations SHOWN ON THE PLANS or as DESIGNATED ON THE GROUND.

Firmly embed selected sidewall rocks below the natural ground or streambed as SHOWN ON THE PLANS. Use flat cover rocks long enough to bridge between outside faces of the sidewalls. Select and place rocks so as to fit snugly with firm bearing on underlying rocks. Fill voids with small rock to prevent entry of soil into the culvert.

921.40 – Treated Timber Box Culvert

Description

921.40.01 This work consists of furnishing and installing treated timber box culverts, including excavation and backfill, and constructing catch basins.

Construction

921.40.02 Install culverts as required under construction section 921.00 and/or as SHOWN ON THE PLANS.

921.40.03 Treated Timber Box Culverts. Install treated timber box culverts at the locations SHOWN IN THE PLANS or as DESIGNATED ON THE GROUND.

Place the box culvert walls on a firm foundation of undisturbed or compacted suitable material shaped to fit the bottom of the culvert walls and free of rocks larger than 3 inches in size.

921.50 - Open-Top Drain

Description

921.50.01 This work consists of furnishing and installing open-top drains, including excavation and backfill, and constructing catch basins.

Construction

921.50.02 Install open-top drains as required under construction section 921.00 and/or as SHOWN ON THE PLANS.

921.60 - Bottomless Arch Culvert

Description

921.50.01 This work consists of furnishing and installing bottomless arch culverts, including excavation and backfill, selecting and hauling of log and rock materials for headwalls, and constructing catch basins.

Construction

921.50.02 Install culverts as required under construction section 921.00 and as SHOWN ON THE PLANS.

921.70. - Culvert Maintenance

Description

921.50.01 This work consists of maintenance of culverts, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins, and headwalls.

Maintenance

921.50.02 General. Where trail drainage facilities have been plugged and the water has been diverted from the intended channel, remove the debris causing the diversion and return the drainage to the channel. Divert water off and away from the trailbed. If washing or ponding of water has been or is occurring, dig a shallow ditch sloped 2 percent to 5 percent to the downstream side of the trail and 3 inches minimum deep and 12 inches minimum wide across the trail at the point where water enters the trail.

Clean ditches to permit the free flow of water into culverts and away from the trail.

Scatter all unusable or unneeded material that is cleared from the drainage structures 3 feet or more beyond and below the trail or drainage facility and out of water courses.

921.50.03 Remove debris and soil from catch basins and inlet and outlet ditches and inside culverts to permit the unobstructed flow of water into, through and away from the culvert. Replace any missing or loose rocks or logs in culvert headwalls. Fit replacement rocks for rock culverts so that they have a firm bearing on adjacent and underlying rocks. Place rocks snugly and fill voids with small rocks to prevent material from sifting into the drain. Fill and compact with suitable material all disturbed areas in the trail tread over or adjacent to rock culverts.

922 - Waterbars

Description

922.00.01 This work consists of installing and maintaining waterbars, including excavation and backfill; selecting and hauling of log and rock materials; and furnishing treated timber, belting, and other materials. Construction and maintenance of waterbars may be covered by one or more of the following subsections:

922.10.	Rock Waterbar
922.20.	Log or Treated Timber Waterbars
922.30.	Belted Waterbar
922.40.	Waterbar Maintenance

Materials

922.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Drainage Pipe	992
Geosynthetics	994
Material for Timber Structures	995

Use rubber belting that is single-ply, non-reinforced material 3/8 inch to 1/2 inch thick.

Construction

922.00.03 General. Install waterbars of the types and at the locations SHOWN ON THE PLANS or as DESIGNATED ON THE GROUND.

922.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911. Around waterbars, backfill and compact suitable material that is free of rocks larger than 3 inches in size. Compact material on the downgrade side of rock, log, and treated timber waterbars, flush with the top of waterbars.

Outslope the trailbed on the upgrade side of the waterbar with a slope equal to or greater than the trail grade leading into the waterbar. Provide a uniform outsloped plane that forms a gutter against the waterbar.

Measurement

922.00.05 Measure the Section 922 items listed in the bid schedule according to section 906.

Payment

922.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 922 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

922.10 - Rock Waterbar

Description

922.10.01 This work consists of installing rock waterbars, including excavation and backfill; selecting and hauling of rock materials; and other materials.

Construction

922.10.02 Install rock waterbars as required under construction section 922.00 and/or as SHOWN ON THE PLANS.

922.10.03 Rock Waterbar. Tightly embed selected rocks into the trailbed. Place waterbar rocks with tops relatively even, with no sharp points. Use rocks with lengths greater than or equal to 1.5 times the width.

922.20 - Log or Treated Timber Waterbars

Description

922.20.01 This work consists of installing log or treated timber waterbars, including excavation and backfill; selecting and hauling of log materials or furnishing treated timbers and other materials.

Construction

922.20.02 Install waterbars per as required under construction section 922.00 and/or as SHOWN ON THE PLANS.

922.20.03 Log or Treated Timber Waterbars. Embed peeled native logs or treated timbers into the trailbed to form a waterbar across the trail. Use anchor methods as SHOWN ON THE PLANS at log or treated timber ends outside the trail tread. Pre-drill pilot holes (for steel pins) through timbers prior to treatment. Anchor stakes firmly in the ground, and tightly nail to the log without splitting. In the absence of a backslope, anchor the upgrade end of the log or timber waterbar in the same manner as the downgrade end.

922.30 - Belted Waterbar

Description

922.30.01 This work consists of installing belted waterbars, including excavation and backfill; furnishing treated timbers and other materials.

Construction

922.30.02 Install waterbars as required under construction section 922.00 and/or as SHOWN ON THE PLANS.

922.30.03 Rubber Belting Waterbars. Tightly secure one continuous piece of rubber belting between treated timbers as SHOWN ON THE PLANS.

922.40. - Waterbar Maintenance

Description

922.40.01 This work consists of maintenance of waterbars, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins, and headwalls.

Maintenance

922.40.02 General. Where trail drainage facilities have been plugged and the water has been diverted from the intended channel, remove the debris causing the diversion and return the drainage to the channel. Divert water off and away from the trailbed. If washing or ponding of water has been or is occurring, dig a shallow ditch sloped 2 percent to 5 percent to the downstream side of the trail and 3 inches minimum deep and 12 inches minimum wide across the trail at the point where water enters the trail.

Clean ditches to permit the free flow of water into culverts and away from the trail.

Scatter all unusable or unneeded material that is cleared from the drainage structures 3 feet or more beyond and below the trail or drainage facility and out of water courses.

922.40.03. Clean the upgrade side of all existing waterbars and maintain them as SHOWN ON THE PLANS. Remove material accumulated against rubber belting waterbars. Use and compact suitable material removed from the upgrade side of all waterbars to bring the trail tread flush with the top of those waterbars on the downgrade side. Remove all debris from the lead-off area of all waterbars that restricts the free flow of water away from the trail. Firmly embed replacement rocks for rock waterbars into the trailbed and fit the rocks together. Make the tops of the rocks even, with no sharp points. Peel native replacement logs before using them. Anchor stakes tightly in the ground without splits and nail tightly to the log.

923 – Rock Spillways

Description

923.01 This work consists of constructing or maintenance of spillways, including selecting, excavating, and placing geotextile and rock material. Construction and maintenance of spillways may be covered by one or more of the following subsections:

923.10.	Rock Spillway
923.20.	Rock Spillway Maintenance

Materials

923.02 Requirements. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Drainage Pipe	992
Geosynthetics	994
Material for Timber Structures	995

Construction

923.03 General. Construct rock spillways at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Construct spillways so the flow of water from the facility being drained is centered on and flows down the full length of the spillway.

923.04 Excavation. Excavate for the spillway in accordance with Section 911. Construct a horizontal bench into undisturbed material and compact it as a foundation for the toe of the rock spillway.

923.05 Geotextile Placement. Place geotextile under the rock as required or as SHOWN ON THE PLANS.

923.06 Rock Placement. Construct the spillway by hand-placing rock, with the larger rock in the bottom layers. Place each rock to provide a stable course. Interlock each rock with adjacent rocks, and minimize voids. Use small rocks to fill voids. Do not break, jar, or displace rocks already set.

Measurement

923.06 Measure the Section 923 items listed in the bid schedule according to section 906.

Payment

923.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 923 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

923.10. – Rock Spillway

Description

923.10.01 This work consists of constructing or maintenance of spillways, including selecting, excavating, and placing rock material.

Construction

923.10.02 Install rock spillway as required under construction section 923.00 and/or as SHOWN ON THE PLANS.

923.20. – Rock Spillway Maintenance

Description

923.20.01 This work consists of maintenance of spillways, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins, and headwalls.

Maintenance

923.20.02 General. Where trail drainage facilities have been plugged and the water has been diverted from the intended channel, remove the debris causing the diversion and return the drainage to the channel. Divert water off and away from the trailbed. If washing or ponding of water has been or is occurring, dig a shallow ditch sloped 2 percent to 5 percent to the downstream side of the trail and 3 inches minimum deep and 12 inches minimum wide across the trail at the point where water enters the trail.

Clean ditches to permit the free flow of water into culverts and away from the trail.

Scatter all unusable or unneeded material that is cleared from the drainage structures 3 feet or more beyond and below the trail or drainage facility and out of water courses.

923.20.03. Maintain rock spillways to conform as SHOWN ON THE PLANS. Replace missing rocks, interlocking each rock with adjacent rocks. Place the rocks to ensure that the water flows down the spillway and away from the facility being drained. Use small rocks to fill voids. Clean all material from the spillway that restricts the flow of water away from the trail.

924 – Underdrains

Description

924.00.01 This work consists of constructing or maintaining underdrains, including excavation and backfill and obtaining and installing filter rock, geosynthetics, and drainpipe with necessary fittings. Construction and maintenance of underdrains may be covered by one or more of the following subsections:

924.10.	Rock Underdrain
924.20.	Sheet Underdrain
924.30.	Underdrain Maintenance

Materials

924.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Drainage Pipe	992
Geosynthetics	994
Material for Timber Structures	995

Construction

924.00.03 General. Construct underdrains at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

924.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

924.00.05 Trench Construction. Grade underdrain trenches to provide complete drainage of the underdrain system. Obtain CO approval of the trench system prior to placement of underdrain materials.

924.00.06 Pipe Installation. Ensure positive drainage from the underdrain pipes and drainage system. Place pipe in the trench with the perforations down.

Measurement

924.00.07 Measure the Section 924 items listed in the bid schedule according to section 906.

Payment

924.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 924 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

924.10 - Rock Underdrain

Description

924.10.01 This work consists of constructing rock underdrains and associated drainage ditches, including excavation and backfill and obtaining and installing filter rock, geosynthetics, and drainpipe with necessary fittings.

Construction

924.10.02 Install underdrain as required under construction section 924.00 and/or as SHOWN ON THE PLANS.

924.20 - Sheet Underdrain

Description

924.20.01 This work consists of constructing sheet underdrains or sheet drains, including excavation and backfill and obtaining and installing filter rock, geosynthetics, and drain pipe with necessary fittings.

Construction

924.20.02 Install underdrain as required under construction section 924.00 and/or as SHOWN ON THE PLANS.

924.30. - Underdrain Maintenance

Description

924.30.01 This work consists of maintenance of rock and sheet underdrains and associated drainage ditches, including excavation and backfill and obtaining and installing filter rock, geosynthetics, and drainpipe with necessary fittings.

Maintenance

924.30.02 Perform maintenance on underdrains and associated ditches as required under construction section 924.00 and/or as SHOWN ON THE PLANS.

Where ditches have been plugged and the water has been diverted from the intended underdrain, remove the debris causing the diversion and return the drainage to the ditch.

925 – Ditches

Description

925.00.01 This work consists of construction and maintenance of ditches, including excavation and backfill. Construction and maintenance of ditches may be covered by one or more of the following subsections:

925.10. Side Ditch
925.20. Leadoff Ditch
925.30. Ditch Maintenance

Construction

925.00.02 General. Construct ditches at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

925.00.03 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

Measurement

925.00.04 Measure the Section 925 items listed in the bid schedule according to section 906.

Payment

925.00.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 925 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

925.10. - Side Ditch

Description

925.10.01 This work consists of construction of side ditches, including excavation and backfill.

Construction

925.10.02 Construct side ditches as required under construction section 925.00 and/or as SHOWN ON THE PLANS.

925.20. - Leadoff Ditch

Description

925.20.01 This work consists of construction of leadoff ditches, including excavation and backfill.

Construction

925.20.02 Construct leadoff ditches as required under construction section 925.00 and/or as SHOWN ON THE PLANS.

925.30. - Ditch Maintenance

Description

925.30.01 This work consists of maintenance of leadoff ditches, including excavation and backfill.

Maintenance

925.30.02 General. Where ditches have been plugged and the water has been diverted from the intended ditch, remove the debris causing the diversion and return the drainage to the ditch. Clean deposited material and restore ditches as SHOWN ON THE PLANS. Remove all debris from the lead-off ditches that restricts the free flow of water away from the trail.

Clean ditches to permit the free flow of water into culverts and away from the trail.

Scatter all unusable or unneeded material that is cleared from the drainage structures 3 feet or more beyond and below the trail or drainage facility and out of water courses.

926 – Berms

Description

926.00.01 This work consists of construction and maintenance of berms and associated drainage ditches, including excavation and backfill. Construction of berms may be covered by one or more of the following subsections:

926.10. Berms
926.20. Berm Maintenance

Construction

926.00.02 General. Construct berms at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

926.00.03 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

Measurement

926.00.04 Measure the Section 926 items listed in the bid schedule according to section 906.

Payment

926.00.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 926 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

926.10. – Berms

Description

926.10.01 This work consists of constructing berms and associated drainage ditches, including excavation and backfill.

Construction

926.10.02 Construct berms as required under construction section 926.00 and/or as SHOWN ON THE PLANS.

926.20. - Berm Maintenance

Description

926.10.01 This work consists of maintaining berms, including excavation and backfill.

Maintenance

926.10.02 Perform maintenance of berms as required under construction section 926.00 and/or as SHOWN ON THE PLANS.

927 - Drain Dips

Description

927.00.01 This work consists of construction and maintenance of drainage dips, including excavation and backfill. Construction and maintenance of drainage dips may be covered by one or more of the following subsections:

924.10.	Drain Dip
924.20.	Drain Dip Maintenance

Materials

927.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

927.00.03 General. Construct drainage dips at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

927.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

Measurement

927.00.05 Measure the Section 924 items listed in the bid schedule according to section 906.

Payment

927.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 924 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

927.10. - Drain Dip

Description

926.10.01 This work consists of constructing drain dips and associated drainage ditches, including excavation and backfill.

Construction

926.10.02 Construct drain dips as required under construction section 927.00 and/or as SHOWN ON THE PLANS.

927.20. - Drain Dip Maintenance

Description

927.20.01 This work consists of maintenance of drain dips, including excavation and backfill, selecting and hauling of log and rock materials, and constructing catch basins, and headwalls.

Maintenance

927.20.02 General. Where trail drainage facilities have been plugged and the water has been diverted from the intended channel, remove the debris causing the diversion and return the drainage to the channel. Divert water off and away from the trailbed. If washing or ponding of water has been or is occurring, dig a shallow ditch sloped 2 percent to 5 percent to the downstream side of the trail and 3 inches minimum deep and 12 inches minimum wide across the trail at the point where water enters the trail.

Clean ditches to permit the free flow of water into culverts and away from the trail.

Scatter all unusable or unneeded material that is cleared from the drainage structures 3 feet or more beyond and below the trail or drainage facility and out of water courses.

927.20.03 Clean deposited material and restore drainage dips as SHOWN ON THE PLANS. Remove all debris from the lead-off area of dips that restricts the free flow of water away from the trail. Use suitable material obtained by cleaning dips for fill on the downgrade side, removing rock more than 3 inches at its greatest dimension. Compact all material placed in the trail tread.

928 - Check Dams

Description

928.00.01 This work consists of construction and maintenance of check dams, including excavation and backfill, and obtaining and installing of log and rock materials. Construction and maintenance of check dam may be covered by one or more of the following subsections:

928.10.	Check Dam
928.20.	Check Dam Maintenance

Materials

928.00.02 Materials. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics	994
Material for Timber Structures	995

Construction

928.00.03 General. Construct check dams at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

928.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

Measurement

928.00.05 Measure the Section 928 items listed in the bid schedule according to section 906.

Payment

928.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 928 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

928.10. - Check Dams

Description

928.00.01 This work consists of construction of check dams, including excavation and backfill and obtaining and installing rocks.

Construction

928.10.02 Construct check dams as required under construction section 928.00 and/or as SHOWN ON THE PLANS.

928.20. - Check Dam Maintenance

Description

928.20.01 This work consists of maintenance of check dams, including excavation and backfill and obtaining and installing rocks.

Maintenance

928.20.02 General. Where check dams have been plugged and the water has been diverted from the intended channel, remove the debris causing the diversion and return the drainage to the channel. Divert water off and away from the trailbed. If washing or ponding of water has been or is occurring, dig a shallow ditch sloped 2 percent to 5 percent to the downstream side of the trail and 3 inches minimum deep and 12 inches minimum wide across the trail at the point where water enters the trail.

Clean ditches to permit the free flow of water into culverts and away from the trail.

Scatter all unusable or unneeded material that is cleared from the drainage structures 3 feet or more beyond and below the trail or drainage facility and out of water courses.

928.20.03 Clean deposited material and restore check dams as SHOWN ON THE PLANS. Remove all debris from the lead-off area of dips that restricts the free flow of water away from the trail. Use suitable material obtained by cleaning dips for fill on the downgrade side, removing rock more than 3 inches at its greatest dimension. Compact all material placed in the trail tread.

Section 930 – Trail Structures

Section 931 – Switchbacks

Description

931.00.01 This work consists of construction and maintenance of switchbacks, including excavation, associated barriers, ditches, retaining walls, and approach sections. Construction and maintenance of switchbacks may be covered by one or more of the following subsections:

931.10.	Type 1 – Radius Switchback
931.20.	Type 2 – Circular Landing Switchback
931.30.	Type 3 – Rectangular Landing Switchback
931.40.	Switchback Maintenance

Materials

931.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Construction

931.00.03 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

931.00.04 Retaining Walls. When SHOWN ON THE PLANS, construct retaining walls in accordance with Section 935.

931.00.05 Barriers. When SHOWN ON THE PLANS, construct barriers at each switchback in accordance with Section 933.

931.00.06 Ditches. When SHOWN ON THE PLANS, construct ditches in accordance with Section 925.

931.00.07 Limits of Switchback. Beginning and ending of switchback will be as SHOWN ON THE PLAN or as DESIGNATED ON THE GROUND.

Measurement

931.00.08 Measure the Section 931 items listed in the bid schedule according to section 906.

Payment

931.00.09 The accepted quantities will be paid at the contract price per unit of measurement for the Section 931 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

931.10 - Type 1 – Radius Switchbacks

Description

931.10.01 This work consists of construction of radius switchbacks, including excavation, associated barriers, ditches, retaining walls, and approach sections.

Construction

931.10.02 Construct radius switchback as required under construction section 931.00 and/or as SHOWN ON THE PLANS.

931.20 - Type 2 – Circular Landing Switchbacks

Description

931.20.01 This work consists of construction of circular landing switchbacks, including excavation, associated barriers, ditches, retaining walls, and approach sections.

Construction

931.20.02 Construct circular landing switchback as required under construction section 931.00 and/or as SHOWN ON THE PLANS.

931.30 - Type 3 – Rectangular Landing Switchbacks

Description

931.30.01 This work consists of construction of rectangular landing switchbacks, including excavation, associated barriers, ditches, retaining walls, and approach sections.

Construction

931.30.02 Construct rectangular landing switchback as required under construction section 931.00 and/or as SHOWN ON THE PLANS.

931.40 - Switchback Maintenance

Description

931.40.01 This work consists of replacing or maintaining retaining walls, trail tread, barriers, and drain ditches on existing switchbacks.

Maintenance

931.40.02 General. Perform maintenance on switchbacks as required under construction section 931.00 and/or as SHOWN ON THE PLANS.

931.40.03 Retaining Walls. When needed in rock retaining wall maintenance, use replacement rock that is sound, durable, and free from rifts, seams, laminations, and minerals that could cause deterioration through weathering.

931.40.04 Barriers. Perform barrier maintenance where needed. Use the same type of materials as in the original construction.

931.40.05 Ditches. Clear switchback ditches to permit the free flow of water. Construct ditches as SHOWN ON THE PLANS.

931.40.06 Tread. Maintain trail tread to the original designed tread width.

Section 932 – Turnpikes

Description

932.00.01 This work consists of construction and maintenance of turnpike sections, including excavation, embankment, retainers, geosynthetics, backfill, and drainage features. Construction and maintenance of turnpike sections may be covered by one or more of the following subsections:

932.10.	Type 1 – Standard Turnpike
932.20.	Type 2 – Standard Turnpike with Foundation
932.30.	Turnpike Maintenance

Materials

932.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics materials	994
Material for Timber Structures	995

Construction

932.00.03 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

932.00.04 Retainers. Construct retainers in accordance with Section 911.70 and as SHOWN ON THE PLANS. Place retainers in a continuous row along each shoulder of the turnpike section as SHOWN ON THE PLANS. Bed the parallel retainers so they are stable and at approximately the same top elevation.

932.00.05 Geosynthetics. Where SHOWN ON THE PLANS, place geosynthetics flat and parallel to centerline of the trail before placing embankment. Overlap geosynthetics a minimum of 2 feet. Install anchors or fasteners as recommended by the geosynthetic manufacturer.

932.00.06 Backfill. Backfill and compact with suitable material.

932.00.07 Drainage. Construct side ditches, cross-drainage, and culverts at locations SHOWN ON THE PLANS and/or DESIGNATED ON THE GROUND. Provide leadoff ditches from side ditches on the lower side of trail at points DESIGNATED ON THE GROUND or SHOWN ON THE PLANS.

Measurement

932.00.08 Measure the Section 932 items listed in the bid schedule according to section 906.

Payment

932.00.09 The accepted quantities will be paid at the contract price per unit of measurement for the Section 932 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

932.10 - Type 1 – Standard Turnpikes

Description

932.10.01 This work consists of construction of standard turnpike sections, including excavation, embankment, retainers, geosynthetics, backfill, and drainage features.

Construction

932.10.02 Construct standard turnpike sections as required under construction section 932.00. and/or as SHOWN ON THE PLANS.

932.20 - Type 2 – Standard Turnpikes with Foundation

Description

932.20.01 This work consists of construction of standard turnpike sections with foundation, including excavation, embankment, retainers, geosynthetics, rocks, backfill, and drainage features.

Construction

932.20.02 Standard turnpike sections with foundation as required under construction section 932.00. and/or as SHOWN ON THE PLANS.

932.30 - Turnpike Maintenance

Description

932.30.01 This work consists of maintaining turnpike sections.

Maintenance

932.30.02 General. Perform maintenance on turnpikes as required under construction section 932.00. and/or as SHOWN ON THE PLANS.

932.30.03 Obtain logs, staking material, and suitable material for backfill from locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

932.30.04 Replace missing rocks, or missing or decayed retaining logs or lumber, with rocks, logs, or dimensional lumber as SHOWN ON THE

PLANS. Secure loose or dislocated retainers. Drive stakes 2-3 inches in diameter and 18-24 inches in length along the outside edge of each log or lumber retainer to hold them in place at a maximum of 3 feet.

932.30.05 Clear all drainage structures of obstructions, silt, and debris so as to permit the free flow of water away from the trail.

932.30.06 If necessary, use suitable material removed from the drainage structures to build up the crown. Shape the tread with suitable material to provide a 2 inch crown measured from the top of the crown at the centerline to the top of the retainers.

Section 933 – Side Barriers

Description

933.00.01 This work consists of construction and maintenance of side barriers, including excavation, embankment, widening, debris disposal and backfill. Construction and maintenance of side barriers may be covered by one or more of the following subsections:

933.10.	Stacked Rock Barrier
933.20.	Masonry Rock Barrier
933.30.	Barrier Rail on Grade
933.40.	Barrier Rail on Posts
933.50.	Curb
933.60.	Guardrail

Materials

933.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Construction

933.00.03 General. Construct barriers of the type and at the locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Use logs in which the true centerline deviates no more than 2 inches from the line between the centers of the ends of the log.

933.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

933.00.05 Backfill. Backfill and compact with suitable material.

Measurement

933.00.06 Measure the Section 933 items listed in the bid schedule according to section 906.

Payment

933.00.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 933 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

933.10. – Stacked Rock Barrier

Description

933.10.01 This work consists of construction of stacked rock barrier, including excavation, embankment, widening, debris disposal and backfill.

Construction

933.10.02 Construct stacked rock barrier as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.20. – Masonry Rock Barrier

Description

933.20.01 This work consists of construction of masonry rock barrier, including excavation, embankment, widening, debris disposal and backfill.

Construction

933.20.02 Construct masonry rock barrier as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.30. – Barrier Rail on Grade

Description

933.30.01 This work consists of construction of barrier rail on grade, including excavation, embankment, widening, debris disposal and backfill.

Construction

933.30.02 Construct barrier rail on grade as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.40. – Barrier Rail on Posts

Description

933.40.01 This work consists of construction of barrier rail on posts, including excavation, embankment, widening, debris disposal and backfill.

Construction

933.40.02 Construct barrier rail on posts as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.50. – Curb

Description

933.50.01 This work consists of construction of curbing, including excavation, embankment, debris disposal and backfill.

Construction

933.50.02 Construct curbing as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.60. – Guardrail

Description

933.60.01 This work consists of construction of guardrail, including excavation, embankment, widening, debris disposal and backfill.

Construction

933.60.02 Construct guard as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.70 – Side Barrier Maintenance

Description

933.70.01 Work consists of maintaining rock, log, and timber barriers.

Maintenance

933.70.02 General. Perform maintenance on barriers as required under construction section 933.00. and/or as SHOWN ON THE PLANS.

933.70.03 Restore rock, log, and timber barriers to their original lines and grades unless otherwise SHOWN ON THE PLANS.

933.70.04 Rock Barriers. Replace missing rocks, using rocks of general rectangular shape between 45 lbs and 120 lbs, with the larger rocks placed on the bottom. Use rock chips to wedge larger rocks in place to form a stable wall. Stagger all vertical joints.

Stabilize and reset loose rocks.

Form a continuous grade with the top of the restored barrier consistent with adjacent segments of the barrier.

933.70.05 Log or Timber Barriers. Replace missing, damaged, and unsound logs or timbers using material similar to that used in the original barrier unless otherwise SHOWN ON THE PLANS. The location of trees for native timber materials will be DESIGNATED ON THE GROUND.

Stabilize and re-attach loose logs or timbers that are in sound condition.

Section 934 – Puncheons

Description

934.00.01 This work consists of construction and maintenance of puncheon, including excavation, embankment, backfill, and drainage features. Construction and maintenance of puncheon may be covered by one or more of the following subsections:

934.10.	Standard Puncheon
934.20.	No Deck Puncheon
934.30.	Puncheon Maintenance

Materials

934.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

The location of trees for native timber materials will be SHOWN ON THE PLANS and DESIGNATED ON THE GROUND.

Construction

934.00.03 General. Construct puncheon at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Pre-drill holes for fasteners when necessary to prevent splitting and drive spikes flush.

934.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with the requirements of Section 911 and as SHOWN ON THE PLANS.

934.00.05 Mud Sills. Bury mud sills to a depth that provides a finished walking surface that is less than or equal to 3 feet above the surrounding ground. Hew sill logs to provide a bearing surface for the log stringers and to provide the log stringers with a level top surface. Do not hew sill logs more than one-third their diameter. Do not level the top surfaces of the log stringers by shimming or notching their ends.

934.00.06 Log Stringers. Use logs greater than or equal to 10 feet in length. Use logs greater than or equal to 8 inches in diameter before the top is flattened. Fasten each stringer to each mud sill with drift pins that penetrate a minimum of 4 inches into the mud sill unless otherwise SHOWN ON THE PLANS.

When plank decking is used, hew the top surfaces of log stringers up to 2 inches deep, as necessary, to provide bearing surfaces for deck planks.

934.00.07 Sawn Timber Stringers. Use sawn timber greater than or equal to 10 feet in length. Fasten each stringer to each mud sill with drift pins that penetrate a minimum of 4 inches into the mud sill unless otherwise SHOWN ON THE PLANS.

934.00.08 Finished Walkway. Construct abutting ends of sections of log or plank puncheon flush with each other. Do not slope the surface of the completed walkway to either side. Construct the puncheon with a grade that does not exceed 5 percent and where no change in grade exceeds 6 percent unless otherwise SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Construct the finished walking surface of the puncheon flush with the trail grade at each end of the structure.

934.00.09 Decking. Spike decking evenly at right angles to each stringer.

Lay split log decking alternately flat side down first, then round side down, ending with a flat side down. When round side is down, notch round log decking to provide 2 inches wide bearing surface.

Lay split and sawn deck planks on the stringer to provide bearing for the full width of the plank.

Trim protruding ends of the decking to give a straight-line appearance to the edges of the structure or as SHOWN ON THE PLANS.

934.00.10 Curbs. Construct curbs with logs or sawn timber as SHOWN ON THE PLANS. Use lengths greater than or equal to 10 feet and splice with a 6 inches half-lap joint at a spacer location. Match diameters of logs at lap joints and trim excess to provide a smooth transition between logs.

Counter bore lag screws in curbs so that heads are flush with the surface.

Finish curbs smooth and free from splinters and sharp projections.

934.00.11 Approach Fills. Construct the approach fills with compacted suitable material.

Measurement

934.00.12 Measure the Section 934 items listed in the bid schedule according to section 906.

Payment

934.00.13 The accepted quantities will be paid at the contract price per unit of measurement for the Section 934 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

934.10. – Standard Puncheon

Description

934.10.01 This work consists of construction of standard puncheon, including excavation, embankment, backfill, and drainage features.

Construction

934.10.02 Construct standard puncheon as required under construction section 934.00. and/or as SHOWN ON THE PLANS.

934.20. – No Deck Puncheon

Description

934.20.01 This work consists of construction of no deck puncheon, including excavation, embankment, backfill, and drainage features.

Construction

934.20.02 Construct no deck puncheon as required under construction section 934.00. and/or as SHOWN ON THE PLANS.

934.30. – Puncheon Maintenance

Description

934.30.01 This work consists of maintaining puncheon sections.

Maintenance

934.30.02 General. Perform maintenance on puncheon as required under construction section 934.00. and/or as SHOWN ON THE PLANS.

934.30.03 Obtain logs, staking material, and suitable material for backfill from locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

934.30.04 Replace missing rocks, or missing or decayed retaining logs or lumber, with rocks, logs, or dimensional lumber as SHOWN ON THE PLANS. Secure loose or dislocated retainers. Drive stakes 2-3 inches in diameter and 18-24 inches in length along the outside edge of each log or lumber retainer to hold them in place at a maximum of 3 feet.

934.30.05 Clear all drainage structures of obstructions, silt, and debris so as to permit the free flow of water away from the trail.

934.30.06 If necessary, use suitable material removed from the drainage structures to build up the crown. Shape the tread with suitable material to provide a 2 inch crown measured from the top of the crown at the centerline to the top of the retainers.

935 - Retaining Walls

Description

935.00.01 Work consists of construction or maintenance of retaining walls, including excavating, placing borrow, backfilling, geosynthetics, trailbed construction and slope finishing. Construction and maintenance of retaining walls may be covered by one or more of the following subsections:

935.10.	Log Crib
935.20.	Stacked Rock Retaining Wall
935.30.	Wire Basket Retaining Wall
935.40.	Masonry Rock Retaining Wall
935.50.	Cast-in-place Concrete Retaining Wall
935.60.	Post and Plank Retaining Wall (Soldier Pile)
935.70.	Retaining Wall Maintenance

Materials

935.00.02 Requirements. Use materials meeting the requirements of the following section:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics Materials	994
Material for Timber Structures	995
Wire Basket Material	996

The location of trees for native timber materials is SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Construction

935.00.03 Installation. Install retaining walls of the types and at the locations SHOWN ON THE PLANS or as DESIGNATED ON THE GROUND.

935.00.04 Excavation. Excavate in accordance with Section 911 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.

935.00.05 Backfill. Place geosynthetics before backfilling and compaction. Backfill and compact with suitable material.

Measurement

935.00.06 Measure the Section 935 items listed in the bid schedule according to section 906.

Payment

935.00.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 935 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

935.10 - Log Crib

Description

935.10.01 This work consists of constructing log or split timber retaining walls. Work includes excavation, notching, pre-drilling, pinning, borrow, backfilling, tread and slope finishing.

Construction

935.10.02 Install retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.10.03 Log Notching. Notch logs only on bottom side.

Do not notch sill and filler logs. Individually notch all face, rear, and header logs to fit as the wall construction proceeds vertically. Do not pre-notch.

Provide a notch depth between one-fourth and one-third the log diameter. Vary notching depth and width as required to obtain a snug fit between interlocking logs of varying diameter. Do not exceed 1/2 inch of space between filler and face logs.

935.20 - Stacked Rock Retaining Wall

Description

935.20.01 This work consists of constructing stacked rock retaining walls, including excavating, placing borrow, backfilling, tread and slope finishing.

Construction

935.20.02 Install retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.20.03 Wall Construction. Construct rock retaining walls at locations SHOWN ON THE PLANS and DESIGNATED ON THE GROUND. Stagger vertical joints a minimum of 4 inches horizontally from vertical joints in adjoining courses.

Use uniformly distributed header rocks for at least 25 percent of the rocks in the front and rear faces of the wall each having a length at least 2.5 times its width. Place all header rocks with the greatest dimension extending into the wall (at right angle to trail centerline), except at corners. At corners, lay alternating courses containing headers with greatest dimension parallel with wall.

Place the exposed face of each rock parallel to the face of the wall in which it is set.

Stabilize each rock on the course that supports it. Do not break, loosen, or displace rocks already set.

Use rocks of a general rectangular shape. Fill voids with small rock fragments or fine aggregate.

935.30 - Wire Basket Retaining Wall

Description

935.30.01 Work consists of furnishing and constructing wire basket structures, including excavating, placing borrow, backfilling, tread and slope finishing.

Construction

935.30.02 Install retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.30.03 Basket Assembly. Do not damage wire coatings during basket assembly, structure erection, cell filling, or backfilling. Rotate the basket panels into position and join the vertical edges with fasteners. Where lacing wire is used, wrap the wire with alternating single and double loops every other mesh opening. Where spiral binders are used, crimp the ends to secure the binders in place. Where alternate fasteners are used, space the fasteners in every other mesh opening.

Rotate the diaphragms into position and join the vertical edges with fasteners, lacing wire, or spiral binders as specified above.

935.30.04 Structure Erection. Place the empty baskets on the foundation and interconnect the adjacent baskets along the top and vertical edges using fasteners.

Where lacing wire is used, wrap the wire with alternating single and double loops every other mesh opening. Install the other fasteners according to Subsection 935.30.03, but space alternate fasteners in every other mesh opening.

In the same manner, interconnect each horizontal layer of baskets to the underlying layer of baskets along the front, back, and sides. Stagger the vertical joints between the baskets of adjacent rows and layers by at least one cell length.

935.30.05 Cell Filling. Remove all kinks and folds in the wire mesh and properly align all the baskets. Place rock carefully in the basket cells to prevent the baskets from bulging and to minimize voids in the rock fill.

Maintain the basket alignment and shape by placing the basket in tension during the filling operation.

Place internal connecting wires in each unrestrained exterior basket cell greater than 12 inches in height. This includes interior basket cells left temporarily unrestrained. Place internal connecting wires concurrently with rock placement.

Fill the cells in any row or layer so that no cell is filled more than 12 inches above an adjacent cell. Repeat this process until the basket is full and the lid bears on the final rock layer.

Secure the lid to the sides, ends, and diaphragms according to Subsection 935.00.04. Make all exposed basket surfaces smooth and neat, with no sharp rock edges projecting through the wire mesh.

935.30.06 Geotextile Installation. Place the geotextile as SHOWN ON THE PLANS. Ensure that the surfaces upon which geotextile is to be placed have a uniform slope and are reasonably smooth and free of obstructions, depressions, and debris that could damage the geotextile. Have the surface approved by the CO before placing geotextile.

Loosely lay the geotextile without wrinkles or creases. Sew or overlap adjacent strips a minimum of 12 inches at joints.

Insert securing pins through both strips of overlapped geotextile at maximum intervals of 36 inches, but no closer than 2 inches to each edge, to prevent the geotextile from being displaced.

935.30.07 Basket Mattresses. Construct wire baskets for mattresses less than 12 inches thick according to Subsections 935.30.03 through 935.30.05. Note that alternate fasteners for basket assembly may be used for structure erection. Anchor the mattress in place as SHOWN ON THE PLANS. Place geotextile against the vertical edges of the mattress and backfill against the geotextile, using structural backfill material or other approved material.

935.40. – Masonry Rock Retaining Wall

Description

935.40.01 This work consists of constructing masonry rock retaining walls. Work includes excavation, borrow, backfilling, tread and slope finishing.

Construction

935.40.02 Install masonry rock retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.50. – Cast-in-place Concrete Retaining Wall

Description

935.50.01 This work consists of constructing cast-in-place concrete retaining walls. Work includes excavation, borrow, backfilling, tread and slope finishing.

Construction

935.50.02 Construct cast-in-place concrete retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.60. – Post and Plank Retaining Wall (Soldier Pile)

Description

935.60.01 This work consists of constructing post and plank retaining walls. Work includes excavation, borrow, backfilling, tread and slope finishing.

Construction

935.60.02 Install post and plank retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.70 - Retaining Wall Maintenance

Description

935.70.01 This work consists of maintenance and repair of retaining wall sections.

Maintenance

935.70.02 General. Perform maintenance on retaining walls as required under construction section 935.00. and/or as SHOWN ON THE PLANS.

935.70.03 Obtain logs, rocks, and suitable material for backfill from locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

935.70.04 Replace missing rocks, or missing or decayed logs or lumber, with rocks, logs, or dimensional lumber as SHOWN ON THE PLANS. Secure loose or dislocated rocks and logs.

935.70.05 Repair walls back to a height that will provide a uniform grade consistent with segments of trail adjacent to each side of the damaged wall.

Section 936 – Trail Stairways

Description

936.00.01 This work consists of construction and maintenance of stairways, including excavation and placing embankment and constructing rock, log and treated timber riser, crib-ladder, stairways and railing systems. Construction and maintenance of stairways may be covered by one or more of the following subsections:

936.10.	Individual Steps
936.20.	Overlapping Steps
936.30.	Crib Ladder
936.40.	Staircase
936.50.	Ladder
936.60.	Stairway Maintenance

Materials

936.00.02 Requirements. Use materials meeting the requirements of the following sections:

Rock, Grid Pavement Units, and Aggregate	991
Geosynthetics Materials	994
Material for Timber Structures	995

Construction

936.00.03 General. Construct stairways of the type and at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

936.00.04 Excavation and Embankment. Excavate and place embankment in accordance with Section 911. Backfill with suitable compacted material after stairs are constructed.

Measurement

936.00.05 Measure the Section 936 items listed in the bid schedule according to section 906.

Payment

936.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 936 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

936.10. – Individual Steps

Description

936.10.01 This work consists of construction of individual steps, including excavation and placing embankment and constructing rock, log and treated timber steps.

Construction

936.10.02 Install steps as required under construction section 936.00. and/or as SHOWN ON THE PLANS.

936.10.03 Log or Treated Timber Steps. Use single logs or timbers for the entire riser.

936.10.04 Rock Steps. Lay rock with the greatest dimension horizontally and embed a minimum of one-third the height of the rock. Use single rocks to form the entire riser, unless otherwise DESIGNATED ON THE GROUND.

936.10.05 Pinned Steps. Provide a rock base clean of loose materials, roots, soil, and other obstructions.

Drill two 3/4 inch holes into the treads from the bottom side to match the positions of the holes in the rock and provide for the correct position of the step. Do not allow holes to penetrate the top of the tread. Hew the bottom of the tread to provide a firm, solid contact with the rock base. This contact does not need to be continuous but must provide a firm solid bearing.

Place the timber tread on the reinforcing bars and drive the tread down to its solid position.

936.20. – Overlapping Steps

Description

936.20.01 This work consists of construction of overlapping steps, including excavation and placing embankment and constructing rock steps.

Construction

936.20.02 Install overlapping steps as required under construction section 936.00. and/or as SHOWN ON THE PLANS.

936.20.03 Overlapping Rock Stairways. Construct steps starting with the bottom rock. Form the entire tread and riser with single rocks and provide two or more contact points for stability.

936.30. – Crib Ladder

Description

936.30.01 This work consists of construction of crib ladders, including excavation and placing embankment and constructing log and treated timber risers.

Construction

936.30.02 Install crib ladder as required under construction section 936.00. and/or as SHOWN ON THE PLANS.

936.30.03 Crib Ladder Stairway. Construct by laying two carriages parallel to each other. Construct sills and risers between carriages. Excavate location for crib ladder so that the ladder is firmly supported for their entire length. Backfill around carriages and behind the risers with suitable compacted material.

936.40. – Staircase

Description

936.40.01 This work consists of construction of staircases, including excavation and placing embankment and constructing log and treated timber riser.

Construction

936.40.02 Install staircase as required under construction section 936.00. and/or as SHOWN ON THE PLANS.

936.40.03 Plank Staircase. Construct plank staircase by laying two continuous and parallel carriages. Firmly embed the bottom of each carriage in the ground. Support each carriage by a sill at each end. Construct carriages and steps as SHOWN ON THE PLANS.

936.50. – Ladder

Description

936.50.01 This work consists of construction of ladders, including excavation and placing embankment and constructing log and treated timber riser.

Construction

936.50.02 Install ladders as required under construction section 936.00. and/or as SHOWN ON THE PLANS.

936.60. – Stairway Maintenance

Description

936.60.01 This work consists of maintaining stairways and ladders.

Maintenance

936.60.02 Perform maintenance on stairways and ladders as required under construction section 936.00. and/or as SHOWN ON THE PLANS.

Replace missing, broken or decayed logs or lumber with logs or dimensional lumber as SHOWN ON THE PLANS. Secure loose or dislocated stairs and steps.

Section 937— Railing System

Description

937.00.01 This work consists of construction and maintenance of railing system, including fasteners, posts and railing. Construction and maintenance of railing systems may be covered by one or more of the following subsections:

937.10.	Site-built Railing System
937.20.	Modular Railing System
937.30.	Railing System Maintenance

Materials

937.00.02 Materials. Conform to the following Sections and Subsections:

Material for Timber Structures	995
Steel	FP-03, Section 555

Construction

937.00.03 General. Construct Railing Systems at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

937.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with the requirements of Section 911 and as SHOWN ON THE PLANS.

937.00.05 Log Rails and Posts. Use logs greater than or equal to 10 feet in length. Use logs greater than or equal to 4 inches in diameter for rails and posts. Fasten each rail to posts with spikes that penetrate a minimum of 4 inches into the posts unless otherwise SHOWN ON THE PLANS.

937.00.06 Sawn Timber Rails and Posts. Use sawn timber rails greater than or equal to 10 feet in length. Use posts greater than or equal to 4 inches x 4 inches and rails greater than 2 inches by 4 inches. Fasten each rail to posts with spikes or fasteners as SHOWN ON THE PLANS that penetrate a minimum of 3 inches into the posts unless otherwise SHOWN ON THE PLANS. Pre-drill holes for fasteners to prevent splitting and drive spikes flush.

937.00.07 Metal Rails and Posts. Construct metal railing systems as SHOWN ON THE PLANS.

937.00.08 Finish railing systems smooth and free from splinters and sharp projections.

Measurement

937.00.09 Measure the Section 937 items listed in the bid schedule according to section 906.

Payment

937.00.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 937 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

937.10. — Site-Built Railing System

Description

937.10.01 This work consists of construction of site–built railing system, including fasteners, posts and rails.

Construction

937.10.02 Construct site-built railing system as required under construction section 937.00 and/or as SHOWN ON THE PLANS.

937.20. — Modular Railing System

Description

937.20.01 This work consists of installation of modular railing systems, including fasteners, and modular railing systems.

Construction

937.20.02 Install modular railing systems as required under construction section 937.00 and/or as SHOWN ON THE PLANS.

937.30. — Railing System Maintenance

Description

937.30.01 This work consists of maintaining railing systems.

Maintenance

937.30.02 General. Perform maintenance on railing systems as required under construction section 937.00 and/or as SHOWN ON THE PLANS.

Replace missing, broken or decayed logs or lumber with logs or dimensional lumber as SHOWN ON THE PLANS. Secure loose or dislocated curbing and railing systems.

Section 938—Boardwalks

Description

938.00.01 This work consists of construction and maintenance of boardwalks, including excavation, embankment, backfill, curbs and railing systems. Construction and maintenance of boardwalks may be covered by one or more of the following subsections:

938.10.	Standard Boardwalk
938.20.	Elevated Boardwalk
938.30.	Step and Run
938.40.	Boardwalk Maintenance

Materials

938.00.02 Materials. Conform to the following Sections and Subsections:

Material for Timber Structures	995

Construction

938.00.03 General. Construct boardwalks of the type and at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

938.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with the requirements of Section 911 and as SHOWN ON THE PLANS.

938.00.05 Mud Sills. Bury mud sills to a depth that provides a uniform walking surface as SHOWN ON THE PLANS.

938.00.06 Piers. Construct piers as SHOWN ON THE PLANS.

938.00.06 Approach Fills. Construct the approach fills with compacted suitable material.

Measurement

938.00.07 Measure the Section 938 items listed in the bid schedule according to section 906.

Payment

938.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 938 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

938.10.—Standard Boardwalk

Description

938.10.01 This work consists of construction of standard boardwalks, including excavation, embankment, backfill, curbs and/or railing system.

Construction

938.10.02 Construct standard boardwalks as required under construction section 938.00 and/or as SHOWN ON THE PLANS.

938.10.03 Sawn Timber Stringers. Use sawn timbers that are continuous over 2 or more spans. Fasten each stringer to each mud sill with fasteners as SHOWN ON THE PLANS that penetrate a minimum of 4 inches into the mud sill unless otherwise SHOWN ON THE PLANS. Pre-drill holes for fasteners to prevent splitting and drive spikes flush.

938.10.04 Finished Walkway. Construct abutting ends of sections of boardwalk flush with each other. Do not slope the surface of the completed walkway to either side. Construct the boardwalk with a grade that does not exceed 5 percent and where no change in grade exceeds 5 percent unless otherwise SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Construct the finished walking surface of the boardwalk flush with the trail grade at each end of the structure.

938.10.05 Decking. Lay sawn deck planks on the stringer to provide bearing for the full width of the plank. Fasten decking evenly at right angles to each stringer. Trim protruding ends of the decking to give a straight-line appearance to the edges of the structure or as SHOWN ON THE PLANS.

938.10.06 Curbs and Railing Systems. Construct curbs and railing systems with sawn timber as SHOWN ON THE PLANS. Use lengths greater than or equal to 10 feet and splice with a 6 inch half-lap joint at a spacer location. Finish curbs and railing systems smooth and free from splinters and sharp projections.

938.20.—Elevated Boardwalk

Description

938.20.01 This work consists of construction of elevated boardwalks, including excavation, embankment, backfill, curbs and/or railing system.

Construction

938.20.02 Construct elevated boardwalks as required under construction section 938.00 and/or as SHOWN ON THE PLANS.

938.20.03 Sawn Timber Stringers. Use sawn timbers that are continuous over 2 or more spans. Fasten each stringer to each mud sill with fasteners as SHOWN ON THE PLANS that penetrate a minimum of 4 inches into the

mud sill unless otherwise SHOWN ON THE PLANS. Pre-drill holes for fasteners to prevent splitting and drive spikes flush.

938.20.04 Finished Walkway. Construct abutting ends of sections of boardwalk flush with each other. Do not slope the surface of the completed walkway to either side. Construct the boardwalk with a grade that does not exceed 5 percent and where no change in grade exceeds 5 percent unless otherwise SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Construct the finished walking surface of the boardwalk flush with the trail grade at each end of the structure.

938.20.05 Decking. Lay sawn deck planks on the stringer to provide bearing for the full width of the plank. Fasten decking evenly at right angles to each stringer. Trim protruding ends of the decking to give a straight-line appearance to the edges of the structure or as SHOWN ON THE PLANS.

938.20.06 Curbs and Railing Systems. Construct curbs and railing systems with sawn timber as SHOWN ON THE PLANS. Use lengths greater than or equal to 10 feet and splice with a 6 inch half-lap joint at a spacer location. Finish curbs and railing systems smooth and free from splinters and sharp projections.

938.30.—Step and Run

Description

938.30.01 This work consists of construction of step and runs, including excavation, embankment, and backfill.

Construction

938.30.02 Construct standard step and runs as required under construction section 938.00 and/or as SHOWN ON THE PLANS.

938.40.—Boardwalk Maintenance

Description

938.40.01 This work consists of maintaining boardwalks.

Maintenance

938.40.02 General. Perform maintenance on boardwalks as required under construction section 938.00 and/or as SHOWN ON THE PLANS.

Replace missing, broken or decayed lumber with dimensional lumber as SHOWN ON THE PLANS. Secure loose or dislocated decking, curbing and railing systems.

Clear boardwalk of obstructions, silt, and debris so as to permit the free flow of water away under the boardwalk. Clean decking of all dirt and debris.

940 – Restriction Devices

Section 941 – Fences

Description

941.00.01 This work consists of construction and maintenance of fences, including excavation, backfill, and associated hardware. Construction and maintenance of fences may be covered by one or more of the following subsections:

941.10.	Post and Wire Fence
941.20.	Post and Rail Fence
941.30.	Woven Wire Fence
941.40.	Jackleg Fence
941.50.	Stacked Rail (Worm) Fence
941.60.	Remove and Reset Fence
941.70.	Fence Maintenance

Material

941.00.02 Conform to the following Sections and Subsections:

Concrete	FP-03, Section 601
Fence Material	993

Construction Requirements

941.00.03 General. Clear along the fence line. Remove and dispose of trees, brush, logs, upturned stumps, roots of downed trees, rubbish, and debris according to section 912. Clear a 3 feet width for wire fence.

Grubbing is not required except where short and abrupt changes in the ground contour require removal of stumps to properly grade the fence line. Remove or close cut stumps within the clearing limits.

Perform clearing and leveling with minimum disturbance to the terrain outside the fence line.

Schedule the fence installation, provide temporary fence, or other adequate means to prevent livestock from entering the project right-of-way, easements, or adjoining properties.

At bridges, cattle underpasses, and culverts, connect new fence to structure to permit free passage of livestock under or through the structure.

941.00.04 Posts. Excavate holes for posts, footings, and anchors as SHOWN ON THE PLANS. Space posts at intervals SHOWN ON THE PLANS for the type of fence being installed. Measure post spacing interval parallel to the existing ground slope. Set posts in a vertical position. Backfill post holes in 6 inch lifts. Tamp and compact each lift.

Wood posts may be driven in place if the method of driving does not damage the

post. Metal posts may be driven. Set metal corner, gate, end, and pull posts in concrete.

Where solid rock is encountered without overburden, drill line post holes at least 14 inches deep, and end, corner, gate, and pull posts at least 20 inches deep in the solid rock. Make the hole width or diameter at least 1 inch greater than the post width or diameter. Cut the post to the required length before installation or drill the hole deep enough to set the post at the required height. Set and plumb the post and fill the hole with grout. Thoroughly work the grout into the hole to eliminate voids. Crown the grout to drain water away from the post. Metal posts set in this manner do not require anchor plates and concrete footings.

Where solid rock is covered with soil or loose rock overburden, set posts to the plan depth or to the minimum depth into the solid rock as specified above, whichever is less. When the depth of overburden is greater than 12 inches, use an anchor plate on steel line posts and backfill steel end, corner, gate, and pull posts with concrete from the solid rock to top of the ground. When the depth of overburden is 12 inches or less, anchor plates and concrete backfill are not required. Grout the portion of the post in solid rock.

Install corner posts at changes in alignment of 30 degrees or more. Where new fence joins an existing fence, set end or corner posts, as necessary, and attach in a manner satisfactory to the CO.

941.00.05 Braces. Limit fence runs to no more than 650 feet between adjacent corner braces, gate braces, end braces, or line braces. Install line braces at uniform intervals so the distance between any two braces is 650 feet or less. Construct braces before placing the fence fabric and wires on posts.

> *(a) Metal braces.* Provide corner posts and pull posts with two braces, one each direction from the post in the main fence line. Provide end posts and gate posts with one brace in the line of the fence. Attach metal braces to the metal end, corner, pull, and gate posts and set in concrete as SHOWN ON THE PLANS.
>
> *(b) Wood braces.* Tap the posts to receive the braces. Anchor the brace to the post with three 16d nails or a 3/8 inch by 4 inches dowel. Install brace wires as SHOWN ON THE PLANS and twist together until the entire assembly is taut and firm. Lightly notch the posts to position the brace wire. Drive three staples at each notch to secure wire.

Measurement

941.00.06 Measure the Section 941 items listed in the bid schedule according to section 906.

Payment

941.00.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 941 pay items listed in the bid schedule. Payment will

be full compensation for the work prescribed in this Section. See Subsection 906.04.

941.10. - Post and Wire Fence

Description

941.10.01 This work consists of furnishing and installing post and wire fence, including excavation, backfill, and any associated materials.

Construction

941.10.02 General. Construct post and wire fence as required under construction section 911 and 941.00 and/or as SHOWN ON THE PLANS.

941.10.03 Placement. Place barbed wire on the side of the post face away from the trail. On curved alignment, place the barbed wire on the post face on the outside of the curve. Tightly stretch and fasten barbed wire to the posts.

Apply tension according to the manufacturer's recommendations using a mechanical stretcher or other device designed for such use. Do not use a motor vehicle to stretch the wire.

Splicing of barbed wire between posts is permitted provided not more than two splices, spaced a minimum of 50 feet apart, occur in any one run of fence. Use wrap or telephone type splices for barbed wire with each end wrapped around the other wire for not less than six complete turns.

941.10.04 Fastening. Terminate the barbed wire at each end, corner, gate, and pull post. Wrap each line of barbed around the post and then itself with at least four turns. Where wood posts are used, staple the wires tightly to the posts.

Fasten each strand of barbed wire to each line post. Use wire ties or clamps to fasten the wires to metal posts. Securely splice tie wires to the fence on both sides of the post so there are two loops behind the post and one loop in front. On wood line posts, drive U-shaped staples diagonally across the wood grain so that both points do not enter between the same grain. In depressions where wire uplift occurs, drive staples with points slightly upward. On level ground and over knolls, slope the points slightly downward. Drive the staples just short of actual contact with the wires to permit free longitudinal movement of those lines and to prevent damage to the protective coating.

At grade depressions, alignment angles, and other locations where stresses tending to pull posts from the ground or out of alignment are created, snub or guy the wire fence. Attach the guy wire to each strand of barbed wire in a manner to maintain the entire fence in its normal shape. Attach the guy wire to a deadman anchor buried not less than 24 inches in the ground or to an approved anchor at a point that best serves to resist the pull of the wire

fence. If necessary to guy the fence in solid rock, grout the guy wire in a hole 2 inches in diameter and 10 inches deep. Deadman may also be fastened to posts. Place the deadman anchors at locations as directed.

Where required, install vertical cinch stays as SHOWN ON THE PLANS. Twist the wire to permit weaving into the horizontal fence wires to provide rigid spacing. Weave barbed wires and the top, middle, and bottom wire of the woven wire, as applicable, into the cinch stay.

Where existing fence intersects the new fence, cut the existing fence materials or, splice in kind, new material as necessary, and fasten each strand of the barbed wire to a new end post in line with or immediately adjacent to the new fence line.

941.20. – Post and Rail Fence

Description

941. 20.01 This work consists of furnishing and installing post and rail fence, including any associated materials.

Construction

941. 20.02 General. Construct post and rail fence as required under construction section 911 and 941.00 and/or as SHOWN ON THE PLANS.

941.30. – Woven Wire Fence

Description

941.30.01 This work consists of furnishing and installing woven wire fence including any associated materials.

Construction

941.30.02 General. Construct woven wire fence as required under construction section 911 and 941.00 and/or as SHOWN ON THE PLANS.

941.40. – Jackleg Fence

Description

941.40.01 This work consists of furnishing and installing jackleg fence including any associated materials.

Construction

941.40.02 General. Construct jackleg fence as required under construction section 911 and 941.00 and/or as SHOWN ON THE PLANS.

941.50. – Stacked Rail (Worm) Fence

Description

941.50.01 This work consists of furnishing and installing stacked rail (worm) fence including any associated materials.

Construction

941.50.02 General. Construct stacked rail (worm) fence as required under construction section 911 and 941.00 and/or as SHOWN ON THE PLANS.

941.60. – Remove and Reset Fences

Description

941.60.01 This work consists of removing and resetting of fencing, including excavation and backfill, including any associated materials.

Construction

941.60.02 General. Remove and reset fencing at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

941.60.03 Remove and Reset Fence. Remove existing fence and reset to approximately the same condition as the original fence. Salvage material in the existing fence and incorporate the material into the reset fence. When posts are set in concrete, remove concrete from old post and reset in concrete. Replace fence material damaged beyond reuse. Firmly reset posts on new alignment. Space posts and attach the horizontal members or wires to posts the same as the original fence. Furnish and use new material to fasten members or wires to posts.

941.70. – Fence Maintenance

Description

941.70.01 This work consists of maintenance of fences including any associated materials.

Maintenance

941.70.02 General. Perform maintenance on fences as required under construction section 911 and 941.00 and/or as SHOWN ON THE PLANS.

Section 942 – Gates

Description

942.00.01 This work consists of construction and maintenance of gates, including excavation, embankment, backfill and rails. Construction and maintenance of gates may be covered by one or more of the following subsections:

942.10.	Wire Gate
942.20.	Swing Gate
942.30.	Loose Rail Gate
942.40.	Accessible Gate – Kissing Gate
942.50.	Accessible Gate - Chicane
942.60.	Gate Maintenance

Material

942.00.02 Conform to the following Sections and Subsections:

Concrete	FP-03, Section 601
Fence Material	993

Construction Requirements

942.00.03 General. Construct gates at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Provide minimum 10 feet clear width along the fence line for gate construction and operation.

Remove and dispose of trees, brush, logs, roots of downed trees, rubbish, and debris according to section 912. All stumps and roots shall be removed to allow for unhindered operation of the gate.

Schedule the gate installation, provide temporary fence, or other adequate means to prevent livestock from entering the project right-of-way, easements, or adjoining properties.

942.00.04 Posts. Excavate holes for posts and install posts at locations as SHOWN ON PLANS. Set posts in a vertical position. Backfill post holes in 6 inch lifts. Tamp and compact each lift.

Wood posts may be driven in place if the method of driving does not damage the post. Metal posts may be driven.

Where solid rock is encountered without overburden, drill gate post holes at least 20 inches deep in the solid rock. Make the hole width or diameter at least 1 inch greater than the post width or diameter. Cut the post to the required length before installation or drill the hole deep enough to set the post at the required height. Set and plumb the post and fill the hole with grout. Thoroughly work the grout into the hole to eliminate voids. Crown the grout to drain water away from the post. Metal posts set in this manner do not require anchor plates and concrete footings.

Where solid rock is covered with soil or loose rock overburden, set posts to the

plan depth or to the minimum depth into the solid rock as specified above, whichever is less. When the depth of overburden is greater than 12 inches, use an anchor plate on steel line posts and backfill steel end, corner, gate, and pull posts with concrete from the solid rock to top of the ground. When the depth of overburden is 12 inches or less, anchor plates and concrete backfill are not required. Grout the portion of the post in solid rock.

Measurement

942.00.06 Measure the Section 942 items listed in the bid schedule according to section 906.

Payment

942.00.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 942 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

942.10 – Wire Gates

Description

942.10.01 This work consists of furnishing and installing gates, including any associated hardware and materials.

Material

942.10.02 Wire gates to be constructed of the same material as the fence.

Construction

942.10.03 Construct gates as required under construction section 911 and 942.00 and/or as SHOWN ON THE PLANS.

Provide a taut and well-aligned closure of the opening, capable of being readily opened and closed by hand.

942.20 – Swing Gates

Description

942.20.01 This work consists of furnishing and installing gates, including any associated hardware and materials.

Material

942.20.02 Swing gates to be constructed from the material SHOWN ON THE PLANS.

Construction

942.20.03 Construct gates as required under construction section 911 and 942.00 and/or as SHOWN ON THE PLANS.

Install metal gates and fittings to gate posts previously set as SHOWN ON THE PLANS. Firmly attach the fittings to the posts and gates. Hinge each single gate to prevent removal of the gate without tools. Set the gate in an approximately horizontal plane. Set the gate so it swings freely inward and outward and fastens securely in its latch holder, or in the case of double gates, in its latch holder and gate stops. Set gates to swing open at least 90 degrees in each direction.

Install wood gates similar to metal gates and as SHOWN ON THE PLANS.

942.30 – Loose Rail Gates

Description

942.30.01 This work consists of furnishing and installing gates, including any associated hardware and materials.

Material

942.30.02 Loose rail gates to be constructed of the same material as the fence.

Construction

942.30.03 Construct gates as required under construction section 911 and 942.00 and/or as SHOWN ON THE PLANS.

942.40 – Accessible Gate – Kissing Gate

Description

942.40.01 This work consists of furnishing and installing gates, including any associated hardware and materials.

Material

942.40.02 Gates to be constructed from the material SHOWN ON THE PLANS.

Construction

942.40.03 Construct kissing gates as required under construction section 911 and 942.00 and/or as SHOWN ON THE PLANS.

942.50 – Accessible Gate – Chicanes

Description

942.50.01 This work consists of furnishing and installing gates, including any associated hardware and materials.

Material

942.50.02 Gates to be constructed from the material SHOWN ON THE PLANS.

Construction

942.50.03 Construct chicanes as required under construction section 911 and 942.00 and/or as SHOWN ON THE PLANS.

942.60 – Gate Maintenance

Description

942.60.01 This work consists of maintenance of gates and latches including any associated materials.

Maintenance

942.60.02 Perform maintenance on gates and latches as required under construction section 911 and 942.00 and/or as SHOWN ON THE PLANS.

Replace missing, broken or decayed logs or lumber as SHOWN ON THE PLANS. Adjust gate hinges to allow gate to open and close and gate latches to function properly.

Section 943 - Cattle Guard

Description

943.00.01 This work consists of construction and maintenance of cattle guards, including excavation, embankment, and backfill. Construction and maintenance of cattle guards may be covered by one or more of the following subsections:

943.10. Standard Cattle Guard
943.20. Above Ground Cattle Guard
943.30. Cattle Guard Maintenance

Materials

943.00.02 Materials. Conform to the following Sections and Subsections:

Steel	FP-03, Section 555
Material for Timber Structures	995

Construction

943.00.03 General. Construct cattle guards at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

943.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with the requirements of Section 911 and as SHOWN ON THE PLANS. Excavate foundation to depth with sufficient space for proper installation of formwork.

When the cattle guard is to be installed on new embankment, complete and compact the embankment according to Section 911 before excavating for footing.

943.00.05 Concrete foundation. Construct concrete foundations according to FP-03, Section 601. Concrete units may be cast-in-place or precast.

Finish stringer bearings to allow full bearing under each stringer. The cattle guard shall rest on the concrete without rocking.

943.00.06 Cattle guard. Fabricate cattle guard as SHOWN ON THE PLANS. Assemble and place guards as shown on the plans. Securely fasten the cattle guard to the foundation. Fasten the metal wings to the cattle guard as shown on the plans. Connect fences and gates according to the plans. Weld according to ANSI/AASHTO/AWS D1.5.

Standard manufactured cattle guards may be used if approved. Designs shall provide for AASHTO loading H-10. Provide suitable cleanouts. Prepare and submit drawings according to Subsection 903.01. Acceptance of the drawings covers the requirements for strength and detail only. No responsibility is assumed for errors in dimensions.

943.00.07 Painting. All metal parts shall receive one shop coat. Two additional coats are required and may be applied in the shop or in the field. Paint according to FP-03, Section 563.

943.00.08 Approach Fills. Construct the approach fills with compacted suitable material.

Measurement

943.00.09 Measure the Section 943 items listed in the bid schedule according to section 906.

Payment

943.00.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 943 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

943.10. - Standard Cattle Guard

Description

943.10.01 This work consists of furnishing and installing cattle guards, including excavation, embankment, backfill, and any associated materials.

Construction

943.10.02 Construct standard cattle guards as required under construction section 943.00 and/or as SHOWN ON THE PLANS.

943.20. – Above Ground Cattle Guard

Description

943.20.01 This work consists of furnishing and installing cattle guards, including excavation, embankment, backfill, and any associated materials.

Construction

943.20.02 Construct standard cattle guards as required under construction section 943.00 and/or as SHOWN ON THE PLANS.

943.30.—Cattle Guard Maintenance

Description

943.30.01 This work consists of maintaining cattle guards.

Maintenance

943.30.02 Perform maintenance on cattle guards as required under construction section 943.00 and/or as SHOWN ON THE PLANS.

Replace missing, broken or decayed rails as SHOWN ON THE PLANS. Secure loose or dislocated rails.

944.00. – Stiles

Description

944.00.01 This work consists of construction and maintenance of stiles, including excavation, embankment, backfill and rails. Construction and maintenance of stiles may be covered by one or more of the following subsections:

944.10. Stile
944.20. Stile Maintenance

Materials

944.00.02 Materials. Conform to the following Sections and Subsections:

Material for Timber Structures	995

Construction

944.00.03 General. Construct stiles at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

944.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with the requirements of Section 911 and as SHOWN ON THE PLANS.

Measurement

944.00.05 Measure the Section 944 items listed in the bid schedule according to section 906.

Payment

944.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 944 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

944.10. – Stiles

Description

944.10.01 This work consists of furnishing and installing stile, including excavation, embankment, backfill, timbers and any associated hardware materials.

Construction

944.10.02 Construct stile as required under construction section 944.00. and/or as SHOWN ON THE PLANS.

944.20. – Stiles Maintenance

Description

944.20.01 This work consists of maintaining stiles.

Maintenance

944.20.02 General. Perform maintenance on stiles as required under construction section 944.00. and/or as SHOWN ON THE PLANS.

Replace missing or broken steps and rails as SHOWN ON THE PLANS. Secure loose or dislocated steps and rails.

Section 945 – Bollards

Description

945.00.01 This work consists of construction and maintenance of bollards, including excavation, embankment, and backfill. Construction and maintenance of bollards may be covered by one or more of the following subsections:

945.10.	Bollards
945.20.	Bollard Maintenance

Materials

945.00.02 Materials. Conform to the following Sections and Subsections:

Material for Timber Structures	995
Steel	555

Construction

945.00.03 General. Construct bollards of the type and at locations as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

945.00.04 Bollards. Drill holes for bollards. Set posts plumb, backfill with approved material, and compact or as SHOWN ON THE PLANS.

Measurement

945.00.05 Measure the Section 945 items listed in the bid schedule according to section 906.

Payment

945.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 945 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

945.10. – Bollards

Description

945.10.01 This work consists of furnishing and installing bollards, including excavation, embankment, backfill, and any associated hardware materials.

Construction

945.10.02 Construct bollards as required under construction section 945.00 and/or as SHOWN ON THE PLANS.

945.20. – Bollard Maintenance

Description

945.20.01 This work consists of maintaining bollards.

Maintenance

945.20.02 General. Perform maintenance on bollards as required under construction section 945.00 and/or as SHOWN ON THE PLANS.

Replace missing, broken or decayed bollards as SHOWN ON THE PLANS. Secure loose or dislocated bollards as SHOWN ON THE PLANS.

Section 949 – Reserved for Restriction Devices Special Project Specifications

950. Signs and Markers

Section 951 - Signs

Description

951.00.01 This work consists of furnishing and installing or maintaining signs and posts, including excavation, backfill, and associated materials and hardware. Construction and maintenance of signs and posts may be covered by one or more of the following subsections:

951.10.	Signs
951.20.	Sign Repair and Replacement Maintenance

Material

951.00.02 All materials shall conform to Forest Service EM-7100-15, *Sign and Poster Guidelines for the Forest Service* or as SHOWN ON THE PLANS.

Construction

951.00.03 General. Erect signs and posts of the type and at the locations as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

951.00.04 Post Installation. Excavate post hole to the depth as SHOWN ON THE PLANS. The hole width should not be more than three times the width of the post. If necessary because of obstacles, the post hole may be moved within the tolerances as SHOWN ON THE PLANS.

Set posts in a plumb position. Backfill the post holes with suitable material in 6 inch layers and compact material to produce a solid installation. Stabilize the post with concrete or rock mounds built in accordance with rock cairn specifications when approved by the CO.

951.00.05 Sign Installation. Pre-drill signs before mounting. Tighten hardware snug, but do not damage the sign panel surface.

For signs mounted on trees, remove obstructing limbs and notch the outer bark to provide a flat surface at the sign mounting position as necessary. Avoid removing the inner bark or cutting the cambium. Use 50-penny galvanized nails or spikes to fasten signs to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the sign.

Measurement

951.00.06 Measure the Section 951 items listed in the bid schedule according to section 906.

Rock cairns built to support posts will be considered incidental to the PAY ITEM for signs, and separate payment will not be made.

Payment

951.00.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 951 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

951.10 – Signs

Description

951.10.01 This work consists of furnishing and installing signs and posts, including excavation, backfill, and associated materials and hardware.

Construction

951.10.02 Install signs and posts as required under construction section 911 and 951.00 and/or as SHOWN ON THE PLANS.

951.20 – Sign Repair and Replacement Maintenance

Description

951.20.01 This work consists of repairing existing damaged signs, refastening existing signs to existing sign posts and resetting existing sign posts and furnishing and installing new replacement signs and new sign posts.

Maintenance

951.20.02 General. Repair signs at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Reattach designated signs that are out of their original position so that the lines of the sign legend are horizontal. Reset sign support posts to a plumb position and firmly tamp in place. Set sign posts designated for replacement in the ground to a depth as SHOWN ON THE PLANS at the approximate location of the original post.

Reset existing posts that are out of plumb and firmly tamp in place. Set posts that need to be reset and new replacement posts in a plumb position and to a depth of as SHOWN ON THE PLANS. Backfill and tamp holes from which posts are removed.

Pre-drill replacement signs before mounting. Tighten sign mounting bolts or lag screws to hold the sign snugly in place. Do not damage sign surface.

For signs mounted on trees, remove obstructing limbs and notch the outer bark to provide a flat surface at the sign mounting position as necessary. Avoid removing the inner bark or cutting the cambium. Use 50-penny galvanized nails or spikes to refasten signs to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the sign.

Section 952 – Route Markers

Description

952.00.01 This work consists of furnishing and installing or maintaining route markers or route markers on supports, including excavation, backfill, and associated materials and hardware. Construction and maintenance of route markers may be covered by one or more of the following subsections:

952.10.	Route Markers
952.20.	Route Marker Maintenance

Material

952.00.02 All materials shall conform to Forest Service EM 7100-15, *Sign and Poster Guidelines for the Forest Service* or as SHOWN ON THE PLANS.

Construction

952.00.03 General. Erect route markers of the type and at the locations as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Measurement

952.00.04 Measure the Section 952 items listed in the bid schedule according to section 906.

Rock cairns built to support route marker posts will be considered incidental to the PAY ITEM for route markers, and separate payment will not be made.

Payment

952.00.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 952 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

952.10 – Route Markers

Description

952.10.01 This work consists of furnishing and installing route markers or route markers on supports, including associated materials and hardware.

Construction

952.10.02 Construct route markers as required under construction section 952.00 and/or as SHOWN ON THE PLANS.

952.10.03 Post Installation. Excavate post hole to the depth as SHOWN ON THE PLANS. The hole width should not be more than three times the width of the post. If necessary because of obstacles, the post hole may be moved within the tolerances as SHOWN ON THE PLANS.

Set posts in a plumb position. Backfill the post holes with suitable material in 6 inch layers and compact material to produce a solid installation. Stabilize the post with concrete or rock mounds built in accordance with rock cairn specifications when approved by the CO.

952.10.04 Tree Installation. Remove obstructing limbs and notch the outer bark to provide a flat surface at the manufactured blaze mounting position as necessary. Avoid removing the inner bark or cutting the cambium.

952.10.05 Route Marker Installation. Pre-drill route markers before mounting. Tighten hardware snug, but do not damage the route marker surface. Use 50-penny galvanized nails or spikes to fasten route markers to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the markers.

952.20 – Route Marker Maintenance

Description

952.20.01 This work consists of refastening existing route markers to existing marker supports, resetting existing marker support posts, and furnishing and installing new replacement route markers and new route marker supports.

Maintenance

952.20.02 General. Repair route markers at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Reattach designated route markers that are out of their original position so that the lines of the marker legend are vertical. Reset route marker support posts to a plumb position and firmly tamp in place. Set route marker posts designated for replacement in the ground to a depth as SHOWN ON THE PLANS at the approximate location of the original post.

Reset existing supports that are out of plumb and firmly tamp in place. Set supports that need to be reset and new replacement supports in a plumb position and to a depth as SHOWN ON THE PLANS. Backfill and tamp holes from which posts are removed.

Tighten route marker mounting bolts or lag screws to hold the marker snugly in place. Do not damage route marker surface.

For route markers mounted on trees, remove obstructing limbs and notch the outer bark to provide a flat surface at the marker mounting position as necessary. Avoid removing the inner bark or cutting the cambium. Use 50-penny galvanized nails or spikes to refasten markers to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the marker.

Section 953 – Reassurance Markers

Description

953.00.01 This work consists of blazing trees, furnishing and installing manufactured blazers on supports, or maintaining blazed trees, manufactured blazers and/or supports, including excavation, backfill, and associated materials and hardware. Construction and maintenance of reassurance markers may be covered by one or more of the following subsections:

953.10. Standard Forest Service Blaze
953.20. Manufactured Blazer
953.30. Reassurance Marker Maintenance

Material

953.00.02 All materials shall conform to Forest Service EM-7100-15, *Sign and Poster Guidelines for the Forest Service* or AS SHOWN ON THE PLANS.

Construction

953.00.03 General. Construct a reassurance marker of the type and at the locations as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Measurement

953.00.04 Measure the Section 953 items listed in the bid schedule according to section 906.

Rock cairns built to reassurance marker posts will be considered incidental to the PAY ITEM for markers, and separate payment will not be made.

Payment

953.00.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 953 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

953.10 – Standard Forest Service Blaze

Description

953.10.01 This work consists of cutting, painting, branding or routing and/or scorching blazes on trees or rocks.

Construction

953.10.02 Cut, paint, brand or router and/or scorch blazes on trees or rocks as required under construction section 953.00 and/or as SHOWN ON THE PLANS.

953.20 – Manufactured Blazer

Description

953.20.01 This work consists of furnishing and installing manufactured blazers on supports.

Construction

953.20.02 Install the manufactured blazer on supports as required under construction section 953.00 and/or as SHOWN ON THE PLANS.

953.20.03 Tree Installation. Remove obstructing limbs and notch the outer bark to provide a flat surface at the manufactured blazer mounting position as necessary. Avoid removing the inner bark or cutting the cambium.

953.20.04 Post Installation. Excavate post hole to the depth as SHOWN ON THE PLANS. The hole width should not be more than three times the width of the post. If necessary because of obstacles, the post hole may be moved within the tolerances as SHOWN ON THE PLANS.

Backfill the post holes with suitable material in 6 inch layers and compact material to produce a solid and plumb installation. Stabilize the post with concrete or rock mounds built in accordance with rock cairn specifications when approved by the CO.

953.20.05 Blazer Installation. Pre-drill blazers before mounting manufactured blazers on supports. Use 50-penny galvanized nails or spikes to fasten manufactured blazers to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the manufactured blazers. Tighten hardware snug for posts, but do not damage the manufactured blazer surface.

953.30 – Reassurance Marker Maintenance

Description

953.30.01 This work consists of maintaining manufactured blazers or blazed trees, including resetting supports, refastening or replacing manufactured blazers or re-blazing trees with an axe or paint.

Maintenance

953.30.02 General. Repair reassurance markers at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND and as required under construction section 953.

Reattach designated reassurance markers that are out of their original position so that the marker is vertical. Reset reassurance markers support posts to a plumb position and firmly tamp in place. Set reassurance marker supports designated for replacement in the ground to a depth as SHOWN ON THE PLANS at the approximate location of the original post.

Reset existing supports that are out of plumb and firmly tamp in place. Set supports that need to be reset and new replacement supports in a plumb position and to a depth as SHOWN ON THE PLANS. Backfill and tamp holes from which posts are removed.

Tighten route marker mounting bolts or lag screws to hold the marker snugly in place. Do not damage route marker surface.

For reassurance markers mounted on trees, remove obstructing limbs and notch the outer bark to provide a flat surface at the marker mounting position as necessary. Avoid removing the inner bark or cutting the cambium. Use 50-penny galvanized nails or spikes to refasten markers to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the marker.

Section 954 – Mileage Markers

Description

954.00.01 This work consists of furnishing and installing or maintaining mileage markers or mileage markers on supports, including excavation, backfill, and associated materials and hardware. Construction and maintenance of mileage markers may be covered by one or more of the following subsections:

954.10	Mileage Markers
954.20	Mileage Marker Maintenance

Material

954.00.02 All materials shall conform to Forest Service EM 7100-15, *Sign and Poster Guidelines for the Forest Service* or as SHOWN ON THE PLANS.

Construction

954.00.03 General. Erect mileage markers of the type and at the locations as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Measurement

954.00.04 Method. Measure the Section 954 items listed in the bid schedule according to section 906.

Rock cairns built to support mileage marker posts will be considered incidental to the PAY ITEM for markers, and separate payment will not be made.

Payment

954.00.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 954 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

954.10 – Mileage Markers

Description

954.10.01 This work consists of furnishing and installing mileage markers or mileage markers on supports, including associated materials and hardware.

Construction

954.10.02 Construct mileage markers as required under construction section 954.00 and/or as SHOWN ON THE PLANS.

954.10.03 Post Installation. Excavate post hole to the depth as SHOWN ON THE PLANS. The hole width should not be more than three times the width of the post. If necessary because of obstacles, the post hole may be moved within the tolerances as SHOWN ON THE PLANS.

Set posts in a plumb position. Backfill the post holes with suitable material in 6 inch layers and compact material to produce a solid installation. Stabilize the post with concrete or rock mounds built in accordance with rock cairn specifications when approved by the CO.

954.10.04 Tree Installation. Remove obstructing limbs and notch the outer bark to provide a flat surface at the mileage marker mounting position as necessary. Avoid removing the inner bark or cutting the cambium.

954.10.05 Mileage Marker Installation. Pre-drill mileage markers before mounting. Tighten hardware snug, but do not damage the route marker surface. Use 50-penny galvanized nails or spikes to fasten mileage markers to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the markers.

954.20 – Mileage Marker Maintenance

Description

954.20.01 This work consists of refastening existing mileage markers to existing marker supports, resetting existing marker supports, and furnishing and installing new replacement mileage markers and new mileage marker supports.

Maintenance

954.20.02 General. Repair mileage markers at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Reattach designated mileage markers that are out of their original position so that the lines of the marker legend are vertical. Reset route marker support posts to a plumb position and firmly tamp in place. Set route marker posts designated for replacement in the ground to a depth as SHOWN ON THE PLANS at the approximate location of the original post.

Reset existing supports that are out of plumb and firmly tamp in place. Set supports that need to be reset and new replacement supports in a plumb position and to a depth as SHOWN ON THE PLANS. Backfill and tamp holes from which posts are removed.

Tighten route marker mounting bolts or lag screws to hold the marker snugly in place. Do not damage marker surface.

For mileage markers mounted on trees, remove obstructing limbs and notch the outer bark to provide a flat surface at the marker mounting position as necessary. Avoid removing the inner bark or cutting the cambium. Use 50-penny galvanized nails or spikes to refasten markers to trees and leave 1 inch of nail exposed to allow for tree to grow without impacting the marker.

Section 955 – Cairns

Description

955.00.01 This work consists of furnishing and installing or maintaining cairns. Construction and maintenance of cairns may be covered by one or more of the following subsections:

955.10.	Cairns
955.20.	Cairn Maintenance

Material

955.00.02 Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991

Construction

955.00.03 General. Erect cairns of the type and at the locations as SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

955.00.04 Rock Cairn Construction. Slope each rock layer toward the center. Place each rock with at least three points of contact. Do not wedge small rocks into cracks between large rocks to stabilize the large rocks.

Measurement

955.00.05 Measure the Section 955 items listed in the bid schedule according to section 906.

Payment

955.00.06 The accepted quantities will be paid at the contract price per unit of measurement for the Section 955 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

955.10 – Cairns

Description

955.10.01 This work consists of furnishing and installing cairns.

Construction

955.10.02 Construct cairns as required under construction section 955.00 and/or as SHOWN ON THE PLANS.

955.20 – Cairn Maintenance

Description

955.20.01 This work consists of maintenance of cairns.

Maintenance

955.20.02 Perform maintenance on cairns as required under construction section 955.00 and/or as SHOWN ON THE PLANS.

Section 959 – Reserved for Route Markers and Signs Special Project Specifications

960. Trail Bridges

Section 961- Native Log Stringer Trail Bridge

Description

961.00.01 This work consists of constructing native log stringer bridges, including mud sills, bulkheads, rail systems, curbs, decking, excavation, backfill, and approach fills as SHOWN ON THE PLANS. Construction of native log stringer trail bridges may be covered by one or more of the following subsections:

961.10. Single Log Stringer Trail Bridge
961.20. Multiple Log Stringer Trail Bridge

Materials

961.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

The location of trees for native timber materials will be SHOWN ON THE PLANS and DESIGNATED ON THE GROUND.

Construction

961.00.03 General. Construct native log stringer trail bridges at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Pre-drill holes for fasteners when necessary to prevent splitting and drive spikes flush. Use washers with lag screws and bolts.

961.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

961.00.05 Hardware. Furnish and install hardware as SHOWN ON THE PLANS.

961.00.06 Mud Sills. Construct mud sills at each end of the span in the location staked on the ground. Construct mud sills to be level, bedded evenly, and buried to the depth necessary for the bottom of the log stringers to clear the ground surface by a minimum of 6 inches.

Hew sill logs to provide a bearing surface for the log stringers and to provide the log stringers with a level top surface. Do not hew sill logs more than one-third their diameter. Do not level the top surfaces of the log stringers by shimming or notching their ends.

961.00.07 Stringers. Fasten log stringer to each mud sill with a drift pin that penetrates a minimum of 8 inches into the mud sill.

When plank decking is used, hew the top surfaces of log stringers up to 2 inches deep, as necessary, to provide bearing surfaces for deck planks.

961.00.08 Decking. Spike decking evenly at right angles to each stringer, unless otherwise SHOWN ON THE PLANS.

Lay split log decking alternately flat side down first, then round side down, ending with a flat side down. When the round side is down, provide a bearing surface that is between 1½ inches and 2 inches wide.

Lay split and sawn deck planks on the stringer to provide bearing for the full width of the plank.

Trim protruding ends of the decking to give a straight-line appearance to the edges of the structure, except for decking that extends out to provide handrail support.

961.00.09 Curbs. Construct curbs with logs or sawn timber as SHOWN ON THE PLANS. Use lengths greater than or equal to 10 feet and splice with a 24 inch half-lap joint at a curb block location. Match diameters of logs at lap joints and trim excess to provide a smooth transition between logs.

Finish curbs smooth and free from splinters and sharp projections.

961.00.10 Rail Systems. Construct rail systems with logs or sawn timber as SHOWN ON THE PLANS and use lengths greater than or equal to 10 feet.

When rail systems are constructed of logs, splice them with a 6 inch half-lap joint at a post location. Notch surfaces of posts and rails 5/8 inch at connections. Match diameters of rails at lap joints and trim excess to provide a smooth transition between rails. Use timber bolts for fastening rails to posts as SHOWN ON THE PLANS.

When rail systems are constructed of sawn timber, splice them with a diagonal butt joint at a post location. Use S4S sawn timber, for all rails, posts, and top caps. Fasten each rail and top rail to each post with wood screws as SHOWN ON THE PLANS. Finish handrails and posts smooth and free from splinters and sharp projections.

961.00.11 Approach Fills. Construct the approach fills with compacted suitable material.

Measurement

961.00.12 Measure the Section 961 items listed in the bid schedule according to section 906.

Payment

961.00.13 The accepted quantities will be paid at the contract price per unit of measurement for the Section 961 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

961.10 – Single Log Stringer Trail Bridge

Description

961.10.01 This work consists of construction of a single log stringer bridge, including excavation, embankment, backfill, curbs and/or railing system.

Construction

961.10.02 Construct single log stringer bridge as required under construction section 961.00 and as SHOWN ON THE PLANS.

961.20 – Multiple Log Stringer Trail Bridge

Description

961.20.01 This work consists of construction of a multiple log stringer bridge, including excavation, embankment, backfill, curbs and/or railing system.

Construction

961.20.02 Construct multiple log stringer bridge as required under construction section 961.00 and as SHOWN ON THE PLANS.

Section 962 - Sawn Timber Trail Bridge

Description

962.00.01 This work consists of furnishing, fabricating, constructing sawn timber trail bridges, including all required lumber, hardware, sills, backwalls, rail systems, curbs, decking, excavation, backfill, and approach fills as SHOWN ON THE PLANS. Construction of sawn timber trail bridges may be covered by one or more of the following subsections:

962.10. Sawn Timber Stringer Trail Bridge
962.20. Longitudinal Nail-Laminated Trail Bridge

Materials

962.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Furnish the following compliance certificates to the CO upon delivery of the materials to the jobsite:

(a) Verification of compliance with grading rules and species of timber and lumber. Provide certification by an agency accepted as competent by the American Lumber Standards Committee (ALSC).

(b) Lot certification of each charge for preservative, penetration in inches, and retention in pounds per cubic foot (assay method) by a qualified independent inspection and testing agency. In addition, have the producer of the treated products provide written certification that Best Management Practices (BMP's) in accordance with "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservers Institute (WWPI) and Canadian Institute of Treated Wood, were followed, including a description and appropriate documentation of the applicable BMP's used.

(c) Such other certifications as SHOWN ON THE PLANS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Provide shop drawings in accordance with section 903 for all timber bridges 30 days in advance of fabrication when SHOWN ON THE PLANS or in the SPECIAL PROJECT SPECIFICATIONS. Show all dimensions and fabrication details for all cut, framed, or bored timbers.

Construction

962.00.03 General. Construct sawn timber trail bridges at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Furnish structural lumber and timber of the required stress grade as SHOWN ON THE PLANS.

Clear stacks of weeds, rubbish, or other objectionable material from the ground under and in the vicinity of all stored material. Place the bottom layer of material at least 8 inches above the ground level. Provide sufficient support to prevent sagging.

Open-stack untreated material to shed water. Stack material in layers on spacers (stickers) that extend across the full width of the stack to allow for free air circulation. Align all stickers vertically and space them at regular intervals.

Close-stack treated material to shed water.

Protect material from the weather. If covered, used sheet material such as water-resistant paper or opaque polyethylene film. Do not cover with impervious membranes, such as polyethylene film, during dry weather. Slit individual wrappings full length or puncture on the lower side to permit drainage of water.

Use slings or other devices to protect corners of heavy construction timbers and banded packages of heavy construction timber

962.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

962.00.05 Hardware. Furnish and install hardware as SHOWN ON THE PLANS

962.00.06 Workmanship. 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. Construct all joints to be closed. Drive nails and spikes to set the heads flush with the wood surface. Use the same end, face, and edge of the timber member for all layout dimensions. Bore all holes from mating faces.

962.00.06 Mud Sills. Construct mud sills at each end of the span in the location staked on the ground. Construct mud sills to be level, bedded evenly, and buried to the depth necessary for the bottom of the log stringers to clear the ground surface by a minimum of 6 inches.

962.00.07 Stringers. Stringers shall be size matched at bearings and shall be positioned so that knots near the edge will be in the top portion of the stringers. Bridging between stringers shall be neatly and accurately framed and securely fastened.

962.00.08 Curbs. Construct curbs with logs or sawn timber as SHOWN ON THE PLANS. Use lengths greater than or equal to 10 feet and splice with a 24 inch half-lap joint at a curb block location. Match diameters of logs at lap joints and trim excess to provide a smooth transition between logs.

Finish curbs smooth and free from splinters and sharp projections.

962.00.09 Rail Systems. Construct rail systems with logs or sawn timber as SHOWN ON THE PLANS and use lengths greater than or equal to 10 feet.

When rail systems are constructed of logs, splice them with a 6 inch half-lap joint at a post location. Notch surfaces of posts and rails 5/8 inch at connections. Match

diameters of rails at lap joints and trim excess to provide a smooth transition between rails. Use timber bolts for fastening rails to posts as SHOWN ON THE PLANS.

When rail systems are constructed of sawn timber, splice them with a diagonal butt joint at a post location. Use S4S sawn timber, for all rails, posts, and top caps. Fasten each rail and top rail to each post with wood screws as SHOWN ON THE PLANS. Finish handrails and posts smooth and free from splinters and sharp projections.

962.00.10 Approach Fills. Construct the approach fills with compacted suitable material.

Measurement

962.00.11 Measure the Section 962 items listed in the bid schedule according to section 906.

Payment

962.00.12 The accepted quantities will be paid at the contract price per unit of measurement for the Section 962 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

962.10 – Sawn Timber Stringer Trail Bridge

Description

962.10.01 This work consists of construction of a sawn timber stringer trail bridge, including excavation, embankment, backfill, curbs and/or railing system.

Construction

962.10.02 Construct a sawn timber stringer trail bridge as required under construction section 962.00 and as SHOWN ON THE PLANS.

962.20 – Longitudinal Nail-Laminated Trail Bridge

Description

962.20.01 This work consists of construction of a longitudinal nail-laminated trail bridge, including excavation, embankment, backfill, curbs and/or railing system.

Construction

962.20.02 Construct a longitudinal nail-laminated trail bridge as required under construction section 962.00 and as SHOWN ON THE PLANS.

Section 963 - Glulam Trail Bridge

Description

963.00.01 Work. This work consists of furnishing, fabricating, constructing glulam trail bridges, including all required lumber, hardware, sills, backwalls, rail systems, curbs, decking, excavation, backfill, and approach fills as SHOWN ON THE PLANS. Construction of glulam trail bridges may be covered by one or more of the following subsections:

963.10. Glulam Stringer Trail Bridge
963.20. Longitudinal Glulam Deck Panel Trail Bridge

Materials

963.00.02 Materials. Conform to the following Sections and Subsections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Furnish the following compliance certificates to the CO upon delivery of the materials to the jobsite:

(a) Verification of compliance with grading rules and species of timber and lumber. Provide certification by an agency accepted as competent by the American Lumber Standards Committee (ALSC).

(b) Lot certification of each charge for preservative, penetration in inches, and retention in pounds per cubic foot (assay method) by a qualified independent inspection and testing agency. In addition, have the producer of the treated products provide written certification that Best Management Practices (BMP's) in accordance with "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservers Institute (WWPI) and Canadian Institute of Treated Wood, were followed, including a description and appropriate documentation of the applicable BMP's used.

(c) Certification from a qualified inspection and testing agency indicating that all glued laminated members are in accordance with the requirements of American National Standard, "Standard for Wood Products - Structural Glued Laminated Timber" (ANSI A190.1) modified as SHOWN ON THE PLANS.

(d) Such other certifications as SHOWN ON THE PLANS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Provide shop drawings in accordance with section 903 for all timber bridges 30 days in advance of fabrication when SHOWN ON THE PLANS or in the SPECIAL PROJECT SPECIFICATIONS. Show all dimensions and fabrication details for all cut, framed, or bored timbers.

Construction

963.00.03 General. Construct glulam trail bridges at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Furnish glulams and lumber of the required stress grade.

Clear stacks of weeds, rubbish, or other objectionable material from the ground under and in the vicinity of all stored material. Place the bottom layer of material at least 8 inches above the ground level. Provide sufficient support to prevent sagging.

Store and protect glued laminated timber in accordance with the recommendations for Loading and Handling, Job Site Storage, and Erection in "Recommended Practice for Protection of Structural Glued Laminated Timber During Transit, Storage, and Erection," published by the American Institute of Timber Construction, AITC 111.

Open-stack untreated material to shed water. Stack material in layers on spacers (stickers) that extend across the full width of the stack to allow for free air circulation. Align all stickers vertically and space them at regular intervals.

Close-stack treated material to shed water.

Protect material from the weather. If covered, used sheet material such as water-resistant paper or opaque polyethylene film. Do not cover with impervious membranes, such as polyethylene film, during dry weather. Slit individual wrappings full length or puncture on the lower side to permit drainage of water.

Use slings or other devices to protect corners of heavy construction timbers and banded packages of heavy construction timber.

963.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

963.00.05 Hardware. Furnish and install hardware as SHOWN ON THE PLANS.

963.00.06 Workmanship. 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. Construct all joints to be closed. Drive nails and spikes to set the heads flush with the wood surface. Use the same end, face, and edge of the timber member for all layout dimensions. Bore all holes from mating faces.

963.00.07 Mud Sills. Construct mud sills at each end of the span in the location staked on the ground. Construct mud sills to be level, bedded evenly, and buried to the depth necessary for the bottom of the log stringers to clear the ground surface by a minimum of 6 inches.

963.00.08 Glulam Stringers. Do not drag or skid stringers. Stringers shall be size matched at bearings and shall be positioned so that the camber is up. Bridging between stringers shall be neatly and accurately framed and securely fastened.

963.00.09 Glued Laminated Panel Decks. Do not drag or skid panels. When lifted, support panels in the weak-moment plane at a sufficient number of points to avoid overstressing, and protect the edges from damage.

When dowels are SHOWN ON THE PLANS between deck panels, use a template or drilling jig to ensure that dowel holes are accurately spaced and drilled parallel to one another and to the horizontal surfaces of the panel. Drill holes to a depth 1/4 inch greater than one-half the dowel length, and a diameter that is 3/32 greater than the dowel, unless otherwise SHOWN ON THE PLANS. Use a temporary dowel as a check for snug fit prior to production drilling. Use dowels of the size SHOWN ON THE PLANS, with the tips slightly tapered or rounded. Use an approved lubricant to facilitate the connection process.

Start the tips of all dowels partially and equally into the holes of the two panels being joined. Draw the panels together keeping the edges parallel, until the panels abut tightly. Securely fasten each panel to each stringer as SHOWN ON THE PLANS.

Assemble and match-mark panels prior to delivery to the construction site when SHOWN ON THE PLANS or called for in the SPECIAL PROJECT SPECIFICATIONS. Follow erection procedures given in FPL-263, Forest Service, Forest Products Laboratory (FPL), Madison, Wisconsin.

963.00.010 Curbs. Construct curbs with sawn timber as SHOWN ON THE PLANS. Use lengths greater than or equal to 10 feet and splice with a 24 inches half-lap joint at a curb block location. Match diameters of logs at lap joints and trim excess to provide a smooth transition between logs.

Finish curbs smooth and free from splinters and sharp projections.

963.00.11 Rail Systems. Construct rail systems with sawn timber as SHOWN ON THE PLANS and use lengths greater than or equal to 10 feet.

When rail systems are constructed of sawn timber, splice them with a diagonal butt joint at a post location. Use S4S sawn timber, for all rails, posts, and top caps. Fasten each rail and top rail to each post with wood screws as SHOWN ON THE PLANS. Finish handrails and posts smooth and free from splinters and sharp projections.

963.00.12 Approach Fills. Construct the approach fills with compacted suitable material.

Measurement

963.00.13 Measure the Section 963 items listed in the bid schedule according to section 906.

Payment

963.00.14 The accepted quantities will be paid at the contract price per unit of measurement for the Section 963 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

963.10 – Glulam Stringer Trail Bridge

Description

963.10.01 This work consists of construction of a glulam stringer trail bridge, including excavation, embankment, backfill, curbs and/or railing system.

Construction

963.10.02 Construct a glulam stringer trail bridge as required under construction section 963.00 and as SHOWN ON THE PLANS.

963.20 – Longitudinal Glulam Deck Panel Trail Bridge

Description

963.20.01 This work consists of construction of a longitudinal glulam deck panel trail bridge, including excavation, embankment, backfill, curbs and/or railing system.

Construction

963.20.02 Construct a longitudinal glulam deck panel trail bridge as required under construction section 963.00 and as SHOWN ON THE PLANS.

Section 964 - Prefabricated Steel Trail Bridges

964.00.01 This work consists of designing, furnishing, fabricating, and constructing prefabricated steel trail bridges, including all required materials, hardware, sills, backwalls, rail systems, curbs, decking, excavation, backfill, and approach fills as SHOWN ON THE PLANS. Work includes all other incidental work necessary to complete the bridge installation. These specifications are for a fully engineered clear span bridge and shall be regarded as minimum standards for design and construction.

Design

964.00.02 Engineering Requirements. Structural design of the bridge structure(s) shall be performed by or under the direct supervision of a licensed professional engineer and done in accordance with recognized engineering practices and principles. The engineer shall be licensed to practice in the State in which the bridge is fabricated. The design shall be in accordance with AASHTO LRFD Bridge Design Specifications, Current Edition and as recommended in AASHTO's LRFD Guide Specifications for Design of Pedestrian Bridges, Current Edition.The design shall meet the following requirements unless otherwise SHOWN ON THE PLANS:

1. Pedestrian Load – Main supporting members shall be designed for a pedestrian live load of 90 psf.

2. Vehicle Load – When the clear deck width between railings is greater than 7 ft and less than 10 ft the bridge shall be designed for an occasional single maintenance vehicle of 10,000 lbs (H5 Design Vehicle). When clear deck width is greater than 10 feet, the bridge shall be designed for an occasional single maintenance vehicle of 20,000 lbs (H10 Design Vehicle). The vehicle load shall not be placed in combination with the pedestrian live load or snow load. A vehicle impact allowance is not required.

3. Other Loads– Other loads such as snow, equestrian, wind and fatigue loads and load combinations shall be designed for as specified in AASHTO LRFD and as SHOWN ON THE PLANS. When a snow load greater than the 90 psf pedestrian load is SHOWN ON THE PLANS the bridge shall be analyzed and designed for the controlling load.

4. Deflection – Pedestrian live load deflection shall not exceed L/360 for steel or as SHOWN ON THE PLANS.

5. Vibration – The fundamental frequency of the pedestrian bridge without live load shall be greater than 3.0 hertz in the vertical direction and 1.3 hertz in the lateral direction for steel bridges. The minimum fundamental frequency for loads other than pedestrian loads, such as equestrian and mule trains shall be determined by the design engineer.

6. Camber - The bridge shall have a vertical camber dimension at midspan equal to 100% of the full dead load deflection plus 1% of the full length of the bridge or as SHOWN ON THE PLANS.

964.00.03 General Features of Design. The following are the required minimum design features unless otherwise SHOWN ON THE PLANS.

1. Span -The required bridge span shall be as SHOWN ON THE PLANS.

2. Deck Width -The required bridge width between railing elements as SHOWN ON THE PLANS.

3. Truss Type - Bridge(s) shall be designed as a through (or box) "Pratt" truss with one (1) diagonal per panel and square end vertical members.

4. Through truss bridges will be designed utilizing underhung floor beams.

5. The top of the top chord shall not be less than 42 inches above the deck (measured from the high point of the riding surface) unless otherwise SHOWN ON THE PLANS.

6. Safety Rails - Horizontal safety rails shall be placed on the structure so as to prevent a 4 inch sphere from passing through the truss or as SHOWN ON THE PLANS. The safety rail system shall be designed for 50 pounds per linear foot transversely and vertically, acting simultaneously on each rail.

964.00.04 Design Drawings and Calculations. Provide design drawings and calculations for the prefabricated bridge including wind, seismic and bearing forces. The Contractor is responsible for preparing all shop drawings necessary for erection of the bridge. All design drawings and calculations shall have the signature and seal of a registered professional engineer.

The Contractor shall submit all design drawings and calculations in accordance with section 903 at least 30 days in advance of the start of fabrication to allow time for review by the CO and correction of any changes. Include plan, elevation, and section views of the pedestrian bridge superstructure, dimensions of all components, connection details, and general and specific notes regarding design and construction.

The Contractor and COR shall be provided with detailed installation instructions.

Materials

964.00.05 Materials. Conform to the following Sections:

Steel Structures	FP-03, Section 555
Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Furnish materials that meet the following requirements:

1. Unpainted Steel - Bridges which are not to be painted shall be fabricated from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing and/or ASTM A588, or ASTM A242, ASTM A606 plate and structural steel shapes (F_y = 50,000 psi). The minimum corrosion index of atmospheric corrosion resistant steel, as determined in accordance with ASTM G101, shall be 5.8.

2. Minimum Metal Thickness – The minimum nominal metal thickness of closed structural tubular metal members shall 0.25 inches.

3. 3/8 inch weep holes are required at all low points for bottom and top chords, verticals, and diagonals for closed structural tubular metal members.

4. Hardware – All fasteners and hardware shall be in compliance with FP-03, Section 717 and as SHOWN ON THE PLANS.

5. Wood Decking - Wood decking shall be West Coast Regional Douglas Fir or Southern Pine as SHOWN ON THE PLANS. Treated wood shall meet the requirements as SHOWN ON THE PLANS.

964.00.06 Welding

1. Welding Process - Welding and weld qualification tests shall conform to the provisions of the ANSI/AWS D1.5 Structural Welding Code.

2. Welders - Welders shall be properly accredited experienced operators, each of whom shall submit certification of satisfactorily passing AWS standard qualification tests for all positions, satisfactory evidence of experience and skill in welding structural steel with the kind of welding to be used in the work, and who has demonstrated the ability to make uniform, sound welds of the type required.

964.00.07 Submittals

1. Welder certifications showing compliance with Section 964.00.06(2)

2. Welding procedures in compliance with Section 964.00.06(1)

3. Steel Certification - All certified mill test reports shall be furnished upon request. Mill test reports shall show the chemical analysis and physical test results for each heat of steel used in the work. All steel shall be produced in the United States of America and be AISC certified.

4. Bolt Certification - All certified mill test reports shall be furnished upon request. Mill test reports shall show the chemical analysis and physical test results for each heat of steel used in the work. All bolts shall be produced in the United States of America.

5. Wood Certifications - Furnish the following compliance certificates to the CO upon delivery of the wood materials to the jobsite:

(a) Verification of compliance with grading rules and species of timber and lumber. Provide certification by an agency accepted as competent by the American Lumber Standards Committee (ALSC).

(b) Lot certification of each charge for preservative, penetration in inches, and retention in pounds per cubic foot (assay method) by a qualified independent inspection and testing agency. In addition, have the producer of the treated products provide written certification that Best Management Practices (BMP's) in accordance with "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservers Institute (WWPI) and Canadian Institute of Treated Wood, were followed, including a description and appropriate documentation of the applicable BMP's used.

(c) Such other certifications as SHOWN ON THE PLANS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Provide shop drawings in accordance with section 903 for all bridges 30 days in advance of fabrication when SHOWN ON THE PLANS or in the SPECIAL PROJECT SPECIFICATIONS. Show all dimensions and fabrication details for all cut, framed, or bored timbers.

Construction

964.00.08 General Construct a prefabricated steel trail bridge as required under construction section 964.00. and as SHOWN ON THE PLANS.

964.00.09 Excavation and Embankment. Perform all excavation and embankment work in accordance with Section 911.

964.00.10 Installation. All construction and installation shall be performed in conformance with manufacturer's recommendations and the approved shop drawings. Unprotected steel chains shall not be used as a sling for installation.

964.00.11 Performance. Provide 14 day notice prior to delivery and/or installation of prefabricated bridge.

If the prefabricated superstructure is not installed immediately upon delivery to the project site, provide appropriate equipment and labor to unload and stack, support, and store all material at the delivery point designated by the COR. Support and stack all components to prevent damage. Furnish and install blocking such that all components are supported at least 8 inches above the ground.

Measurement

964.00.12 Measure the section 964 items listed in the bid schedule according to section 906.

Payment

964.00.13 The accepted quantities will be paid at the contract price per unit of measurement for the Section 964 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

Section 965 – Trail Bridge Substructures

Description

965.00.01 This work consists of furnishing, fabricating, constructing trail bridge substructures, including all required geosynthetics, gabion baskets, concrete, lumber, hardware, excavation, and backfill as SHOWN ON THE PLANS. Construction of trail bridge substructure may be covered by one or more of the following subsections:

965.10.	Timber Sill on Geocell Pad
965.20.	Timber Sill on Gabion Baskets
965.30.	Timber Sill on Timber Cribbing
965.40.	Concrete Leveling Pad on Bedrock

Materials

965.00.02 Materials. Conform to the following Sections:

Concrete	FP-03, Section 552
Reinforcing Steel	FP-03, Section 554
Rock, Grid Pavement Units, and Aggregate	991
Geosynthetic Materials	994
Material for Timber Structures	995
Wire Basket Materials (Gabion Baskets)	996

Furnish the following compliance certificates to the CO upon delivery of the materials to the jobsite:

(a) Verification of compliance with grading rules and species of timber and lumber. Provide certification by an agency accepted as competent by the American Lumber Standards Committee (ALSC).

(b) Lot certification of each charge for preservative, penetration in inches, and retention in pounds per cubic foot (assay method) by a qualified independent inspection and testing agency. In addition, have the producer of the treated products provide written certification that Best Management Practices (BMP's) in accordance with "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservers Institute (WWPI) and Canadian Institute of Treated Wood, were followed, including a description and appropriate documentation of the applicable BMP's used.

(c) Such other certifications as SHOWN ON THE PLANS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Provide shop drawings in accordance with section 903 for all timber bridge substructures 30 days in advance of fabrication when SHOWN ON THE PLANS or in the SPECIAL PROJECT SPECIFICATIONS. Show all dimensions and fabrication details for all cut, framed, or bored timbers.

Construction

965.00.03 General. Construct trail bridge substructure at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

Furnish structural lumber and timber of the required stress grade as SHOWN ON THE PLANS.

Clear stacks of weeds, rubbish, or other objectionable material from the ground under and in the vicinity of all stored material. Place the bottom layer of material at least 8 inches above the ground level. Provide sufficient support to prevent sagging.

Open-stack untreated material to shed water. Stack material in layers on spacers (stickers) that extend across the full width of the stack to allow for free air circulation. Align all stickers vertically and space them at regular intervals.

Close-stack treated material to shed water.

Protect material from the weather. If covered, used sheet material such as water-resistant paper or opaque polyethylene film. Do not cover with impervious membranes, such as polyethylene film, during dry weather. Slit individual wrappings full length or puncture on the lower side to permit drainage of water.

Use slings or other devices to protect corners of heavy construction timbers and banded packages of heavy construction timber

965.00.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

965.00.05 Hardware. Furnish and install hardware as SHOWN ON THE PLANS.

965.00.06 Workmanship. 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. Construct all joints to be closed. Drive nails and spikes to set the heads flush with the wood surface. Use the same end, face, and edge of the timber member for all layout dimensions. Bore all holes from mating faces.

Measurement

965.00.07 Measure the Section 965 items listed in the bid schedule according to section 906.

Payment

965.00.08 The accepted quantities will be paid at the contract price per unit of measurement for the Section 965 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

965.10 – Timber Sill on Geocell Pad

Description

965.10.01 This work consists of construction of a timber sill on geocell pad including excavation, embankment, backfill, curbs and/or railing system.

Construction

965.10.02 Construct a timber sill on geocell pad as required under construction section 965.00 and as SHOWN ON THE PLANS.

965.20 – Timber Sill on Gabion Baskets

Description

965.20.01 This work consists of construction of a timber sill on gabion baskets including excavation, embankment, backfilling.

Construction

965.20.02 Construct a timber sill on gabion baskets as required under construction section 965.00 and as SHOWN ON THE PLANS.

965.30 – Timber Sill on Timber Cribbing

Description

965.30.01 This work consists of construction of a timber sill on timber cribbing including excavation, embankment, and backfilling.

Construction

965.30.02 Construct a timber sill on timber cribbing as required under construction section 965.00 and as SHOWN ON THE PLANS.

965.40 – Concrete Leveling Pad on Bedrock

Description

965.40.01 This work consists of construction of a concrete leveling pad on bedrock including rock excavation, embankment and backfilling.

Construction

965.40.02 Construct a concrete leveling pad on bedrock as required under construction section 965.00 and as SHOWN ON THE PLANS.

Section 966 - Trail Bridge Maintenance

Description

966.01 This work consists of maintenance of trail bridges, including replacing or reconstructing rail systems, curbs, decking, sills, stringers and approach fills as SHOWN ON THE PLANS.

Materials

966.02 Materials. Conform to the following Sections:

Rock, Grid Pavement Units, and Aggregate	991
Material for Timber Structures	995

Furnish the following compliance certificates to the CO upon delivery of the materials to the jobsite:

(a) Verification of compliance with grading rules and species of timber and lumber. Provide certification by an agency accepted as competent by the American Lumber Standards Committee (ALSC).

(b) Lot certification of each charge for preservative, penetration in inches, and retention in pounds per cubic foot (assay method) by a qualified independent inspection and testing agency. In addition, have the producer of the treated products provide written certification that Best Management Practices (BMP's) in accordance with "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservers Institute (WWPI) and Canadian Institute of Treated Wood, were followed, including a description and appropriate documentation of the applicable BMP's used.

(c) Certification from a qualified inspection and testing agency indicating that all glued laminated members are in accordance with the requirements of American National Standard, "Standard for Wood Products - Structural Glued Laminated Timber" (ANSI A190.1) modified as SHOWN ON THE PLANS.

(d) Such other certifications as SHOWN ON THE PLANS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Maintenance

966.03 General. Maintenance of trail bridges at locations SHOWN ON THE PLANS.

Furnish structural lumber and timber of the required stress grade as SHOWN ON THE PLANS.

Clear stacks of weeds, rubbish, or other objectionable material from the ground under and in the vicinity of all stored material. Place the bottom layer of material at least 8 inches above the ground level. Provide sufficient support to prevent sagging.

Open-stack untreated material to shed water. Stack material in layers on spacers (stickers) that extend across the full width of the stack to allow for free air circulation. Align all stickers vertically and space them at regular intervals.

Close-stack treated material to shed water.

Protect material from the weather. If covered, used sheet material such as water-resistant paper or opaque polyethylene film. Do not cover with impervious membranes, such as polyethylene film, during dry weather. Slit individual wrappings full length or puncture on the lower side to permit drainage of water.

Use slings or other devices to protect corners of heavy construction timbers and banded packages of heavy construction timber

966.04 Excavation and Embankment. Perform excavation and embankment in accordance with Section 911.

963.05 Hardware. Furnish and install hardware as SHOWN ON THE PLANS.

966.06 Workmanship. 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. Construct all joints to be closed. Drive nails and spikes to set the heads flush with the wood surface. Use the same end, face, and edge of the timber member for all layout dimensions. Bore all holes from mating faces.

966.07 Stringers. Stringers shall be size matched at bearings and shall be positioned so that the camber is up and if possible, so that knots near the edge will be in the top portion of the stringers. Bridging between stringers shall be neatly and accurately framed and securely fastened.

Measurement

966.08 Measure the Section 966 items listed in the bid schedule according to section 906.

Payment

966.09 The accepted quantities will be paid at the contract price per unit of measurement for the Section 966 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

970. Specialty Specifications

Section 971 – Reserved for Snow Shed

Section 972 – Reserved for Tunnels

Section 979 – Reserved for Specialty Structures Special Project Specifications

980. Incidentals

Section 981 – Seeding, Fertilizing and Mulching

Description

981.01 This work consists of preparing seedbeds and furnishing and placing required seed, fertilizer, and mulch.

Materials

981.02 Seed. Conform to the Federal Seed Act, the Federal Noxious Weed Act, and applicable State and local seed and noxious weed laws. Do not use wet, moldy, or otherwise contaminated or damaged seed. Furnish each seed type in separate sealed container. Clearly label each container with the following:

(a) Name and type of seed

(b) Lot number

(c) Net mass

(d) Percent of purity, germination, and hard seed

(e) Percent of maximum weed seed content

(f) Seed Origin

(g) Noxious weeds present

(h) Other crop seed

(i) Inert matter

(j) Name and address of seed distributor

(k) Mixture percent of each component

Inoculate legume seed with approved cultures according to the manufacturer's instructions.

Certify that seed meets the type as SHOWN ON THE PLANS. Furnish the CO with duplicate copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of the date of delivery.

Include in the certificate:

(1) Name and address of the laboratory

(2) Date of test

(3) Lot number for each kind of seed

(4) Percent of purity and germination for each kind of seed

(5) Percent of weed seed content for each kind of seed

(6) Mixture percent of each component

981.03 Fertilizer. Furnish standard commercial grade dry formulated fertilizer conforming to the standards of the Association of Official Analytical Chemists International, applicable State and Federal regulations, and required minimum percentages of available nutrients. Supply fertilizer in new, clean, sealed, and properly labeled containers with name, mass, and guaranteed analysis of contents clearly marked. Use fertilizer with the minimum percentage of available nutrients as SHOWN ON THE PLANS.

981.04 Mulch. Use commercially produced mulch as SHOWN ON THE PLANS.

(a) Straw. Furnish certified weed free straw from oats, wheat, rye, or other grain crops that is free from mold or other objectionable material. Furnish straw in an air-dry condition suitable for placing with mulch blower equipment.

(b) Wood fiber. Furnish processed wood fiber from wood chips conforming to the following:

(1) Colored with a green dye noninjurious to plant growth

(2) Readily dispersible in water

(3) Nontoxic to seed or other plant material

(4) Free of growth or germination inhibiting substances

(5) Free of weed seed

(6) Air dried to an equilibrium moisture content of 12±3 percent

(7) Packaged in new labeled containers

(8) Packaged in a condition appropriate for mixing in a homogeneous slurry suitable for application with power spray equipment

(c) Grass straw cellulose fiber. Furnish processed grass straw fiber conforming to the following:

(1) Colored with a green dye noninjurious to plant growth

(2) Readily dispersible in water

(3) Nontoxic to seed or other plant material

(4) Free of growth or germination inhibiting substances

(5) Free of weed seed

(6) Air dried to a moisture content of 10±0.2 percent

(7) Air dried to a uniform mass of ±5 percent

(8) Packaged in new containers labeled with the manufacturer's name and air-dry mass

(9) Packaged in a condition appropriate for mixing in a homogeneous slurry suitable for application with power spray equipment

Construction

981.05 Seeding Seasons. Seed during the seeding dates as SHOWN ON THE PLANS. Do not apply seeding materials during windy weather or when the ground is excessively wet or frozen.

981.06 Soil Preparation. Shape and finish cut slopes, fill slopes, embankments, or other areas to be seeded as required by other applicable sections or as SHOWN ON THE PLANS. Prepare soil as specified in other sections.

981.07 Mulch. Spread mulch immediately after seeding, or after seeding and fertilizing, to a loose depth of 1 1/2 inches to 3 inches at locations SHOWN ON THE PLANS.

Measurement

981.08 Measure the section 981 items listed in the bid schedule according to subsection 906.

Payment

981.09 The accepted quantities will be paid at the contract price per unit of measurement for the Section 981 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

Section 982 – Erosion Control Blankets

Description

982.01 This work consists of furnishing and installing erosion control blankets.

Material

982.02 Erosion Control Blanket. Use erosion control materials of the type and in the locations SHOWN ON THE PLANS.

> **(a) Burlap**. Use burlap of standard weave with a weight of 4, ±1/2 oz/SY.
>
> **(b) Excelsior Blanket.** Use excelsior blanket consisting of a machine-produced mat or curled wood excelsior of 80-percent, 8 inches or longer fiber length with consistent thickness and the fiber evenly distributed over the entire area of the blanket. Use blanket with mesh dimensions of 1 inch by 2 inches ±25 percent. Provide blanket with average weight of 8 oz/SY ±10 percent at time of manufacture.

Construction

982.03 General. Install erosion control blankets in accordance with manufacturer's recommendations at locations SHOWN ON THE PLANS.

Make the soil surface stable, firm, and free of rocks and other obstructions. Install erosion control blankets to the following minimum guidelines.

(a) Slope Installations. At the top of slope, anchor the erosion control blankets by one of the following methods:

(1) Staples. Install the erosion control blankets 3 feet over the shoulder of the slope onto flat final grade. Secure with a single row of staples on 1 foot centers.

(2) Anchor trench. Construct a 6 inch by 6 inch trench. Extend the upslope terminal end of the erosion control blankets 10 feet past the trench. Use staples on 1 foot centers to fasten the erosion control blankets into the trench. Backfill the trench and compact the soil. Secure the terminal end with a single row of staples on 1 foot centers and cover the end with soil. Apply turf establishment.

(3) Check slot. Install two rows of staples 4 inch apart on 4 inch centers across the top edge of the erosion control blankets. Drive all staple heads flush with soil surface.

Securely fasten all erosion control blankets to the soil by installing staples at a minimum rate of 1.5 per square yard.

(b) Channel Installations. At the beginning of the channel, construct a full width anchor trench according to paragraph (a)(2) above. Construct additional anchor trenches or check slots at intervals along the channel reach and at the channel end according to paragraph (a)(2) or (a)(3) and the manufacturer's installation guidelines.

Securely fasten all erosion control blankets to the soil by installing staples at a minimum rate of 2.0 per square yard. Significantly higher anchor rates may be necessary in sandy, loose, or wet soils and in severe applications.

Repair all damaged areas immediately by restoring soil to finished grade, re-applying turf establishment, and replacing the erosion control blankets.

Measurement

982.04 Measure the section 982 items listed in the bid schedule according to subsection 906.

Payment

982.05 The accepted quantities will be paid at the contract price per unit of measurement for the Section 982 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

Section 983 – Removal of Structures and Obstructions

Description

983.01 Work. Work consists of removal and disposal of existing structures, including turnpikes, walkways, bridges, culverts, signs and posts, and other material within the trailway, above or below ground. Work also includes salvaging DESIGNATED materials and backfilling the resulting trenches, holes, and pits.

Construction

983.02 Removal of Culverts and Bridges. Remove existing culverts within embankment areas at locations SHOWN ON THE PLANS.

Remove existing structures down to the natural stream bottom, and remove parts outside the water course to at least 1inch below natural ground surface or finish ground surface, whichever is lower. Where portions of an existing structure lie wholly, or in part, within the limits of a new structure, remove parts to accommodate the installation of the proposed structure.

Avoid damage to bridges being dismantled for salvage. Match mark steel and/or wood members and prepare drawings showing the structural location of each member.

983.03 Removal of Signs and Posts. Remove signs, posts, and associated hardware at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND. Backfill post hole, compact, and contour area to match existing ground.

983.04 Removal of Other Obstructions. Remove other obstructions at locations SHOWN ON THE PLANS or DESIGNATED ON THE GROUND.

983.05 Disposal. Dispose of native log and rock material by scattering below the trailway and outside clearing limits. Do not place debris in water courses, snow ponds, lakes, meadows, or locations where it could impede the flow to, through, or from the drainage structures. Dispose of metal, treated timber, and other manufactured products by removing from Government-administered lands and placing in approved waste disposal sites.

Measurement

983.06 Measure the section 983 items listed in the bid schedule according to subsection 906.

Payment

983.07 The accepted quantities will be paid at the contract price per unit of measurement for the Section 983 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 906.04.

Section 989 – Reserved for Incidentals Special Project Specifications

990. Materials

Section 990 - Materials

990.01 General. Materials specification not found in this section will be covered by the most current version of *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects*, U.S. Department of Transportation, Federal Highway Administration.

Section 991 - Rock, Grid Pavement Units, Aggregate and Asphalt

991.01 Rock. Use sound, durable rock free of rifts, seams, laminations, and minerals that could deteriorate as a result of weathering. Dress rock to remove thin or weak portions before use.

Furnish rock of the size, shape, weight, and face area necessary to produce the general characteristics and appearance SHOWN ON THE PLANS.

991.02 Gabion and Revet Mattress Rock. Ensure that rock conforms to the requirements of Section 991.01 and the following specifications.

(a) Coarse durability index, AASHTO T 210 52 min.

(b) Unit weight of a filled basket 100 pounds per cubic foot min.

(c) Gradation:

(1) Baskets 12 inches or greater in the vertical dimension:

Maximum dimension of rock .....…. 8 inch

Minimum dimension of rock ..... 4 inch

(d) (2) Baskets less than 12 inches in the vertical dimension:

Maximum dimension of rock ..... 6 inch

Minimum dimension of rock ..... 3 inch

991.03 Grid Pavement Units. Use concrete grid pavement units with a minimum compressive strength of 4495 lbs/in^2 that meet the National Concrete Masonry Association (NCMA) Designation: A-15-82: Specifications for Grid Pavers.

991.04 Pit-Run Aggregate. Use pit-run aggregates consisting of native materials that can be placed on the trail without crushing or screening. No gradation, other than a maximum size, will be required. Provide pit-run aggregate with a maximum size as SHOWN IN THE SCHEDULE OF ITEMS.

991.05 Screened Aggregate. Use screened material consisting of gravel, talus, rock, sand, shale, or other suitable material that is reasonably hard, durable, and free of organic material, mica, clay lumps, or other deleterious material. Use screened aggregate meeting the gradation requirements shown in table 961-1 and of the grading SHOWN IN THE SCHEDULE OF ITEMS.

991.06 Crushed Aggregate for Base or Surface Course. Use crushed aggregate meeting the requirements of tables 991-1 and 991-2 and SHOWN IN THE SCHEDULE OF ITEMS.

At least 50 percent, by weight, of the aggregate retained on the No.4 sieve is to have one fractured face. Naturally fractured faces may be included in the 50-percent requirement.

The CO may approve other gradations if they are similar to those specified Grade aggregate from coarse to fine within the gradation band.

Table 991-1-Crushed and screened aggregate grading requirements for base or surface courses.

	Percent Passing (AASHTO T 11 and T 27)			
Sieve	Grading A	Grading B	Grading C	Grading D
1"				
¾"	100	100		
½"	50-90	70-100		
3/8"			100	100
No.4	30-65	45-75	60-85	70-90
No.8	25-55	30-60	35-70	45-70
No.30		15-40		20-40
No.200	6-12	6-20	5-20	5-20

Table 991-2.-Crushed Aggregate Quality Requirements

Description	AASHTO Test Method	Requirement
Percent Wear	T 96	40 Max.
Durability Index, Coarse and Fine	T 211	35 Min.
Liquid Limit	T 89	35 Max.
Plasticity Index	T 91	2-11

991.07 – Asphalt. Asphalt material for trail construction shall conform to requirements of the U.S. Department of Transportation, Federal Highway Administration, Standard Specifications for Construction or Roads and Bridges on Federal Highway Projects, most current edition, Section 702 – Asphalt Material.

991.08 – Cement. Cement material for trail construction shall conform to requirements of the U.S. Department of Transportation, Federal Highway Administration, Standard Specifications for Construction or Roads and Bridges on Federal Highway Projects, most current edition, Section 701 – Cement.

Section 992 – Pipe Material

992.01 General. Use pipe, coupling bands, and special sections such as elbows, tees, and wyes made of the same material and of the same thickness as the conduit to which they are joined, unless otherwise specified.

992.02 Corrugated Steel Pipe, Pipe Arches and Underdrains

(a) Riveted Pipe and Pipe Arches. Use pipes meeting the requirements of AASHTO M 36.

(b) Welded Pipe and Pipe Arches. Use corrugated metal pipe and pipe arches fabricated by resistance spot welding meeting the applicable requirements of AASHTO M 36.

(c) Helical Pipe. Use un-perforated helically corrugated pipe with continuous lock or welded seams meeting the applicable requirements of AASHTO M 36.

(d) Coupling Bands. Use coupling bands meeting the requirements of AASHTO M 36.

(e) Special Sections. Use special sections such as elbows, tees, and wyes meeting the same thickness as the conduit to which they are joined and meeting the applicable requirements of AASHTO M 36.

(f) Flared-End Sections. Use flared-end sections for inlet and outlet ends of pipe and pipe arch culverts meeting the applicable requirements of AASHTO M 36.

(g) Corrugated Steel Pipe for Underdrains. Use perforated galvanized pipe meeting the requirements of AASHTO M 36. Use polymer-precoated perforated underdrains meeting the requirements of AASHTO M 245

992.03 Corrugated Aluminum Alloy Culvert Pipe, Pipe Arches, and Underdrains. Use pipe meeting the requirements of AASHTO M 196.

992.05 Aluminum-Coated (Aluminized Type 2). Use pipe and coupling bands meeting the requirements of AASHTO M 36 except that they must be made from material meeting the requirements of AASHTO M 274.

992.06 Concrete Pipe and Pipe Arches

(a) Non-Reinforced Concrete Pipe. Conform to AASHTO M 86M for the diameters and strength classes specified.

(b) Reinforced Concrete Pipe. Conform to AASHTO M 170M for the diameters and strength classes specified. For precast reinforced concrete end sections, conform to cited specifications to the extent they apply.

(c) Perforated Concrete Pipe. Conform to AASHTO M 175M type 1 or 2 and AASHTO M 86M for the diameters and strength classes specified.

(d) Reinforced Arch-Shaped Concrete Pipe. Conform to AASHTO M 206M for the diameters and strength classes specified.

(e) Reinforced Elliptically-Shaped Concrete Pipe. Conform to AASHTO M 207M for the diameters, placement design (horizontal or vertical), and strength classes specified.

992.07 Precast Reinforced Concrete Box Sections. Conform to AASHTO M 259M or M 273M, as applicable, for dimensions and loading conditions specified.

992.08 Plastic Pipe. Furnish perforated and non-perforated plastic pipe conforming to the following for the sizes and types specified. For watertight joints, conform to ASTM D 3212.

(a) Smooth wall polyethylene pipe. Furnish 12 to 42-inch diameter pipe conforming to ASTM F 714 and minimum cell class, ASTM D 3350, 335434C.

(b) Corrugated polyethylene pipe. Furnish 12 to 42-inch diameter pipe conforming to AASHTO M 294M. For sanitary sewer applications, furnish AASHTO M 294M type S pipe with watertight joints.

(c) Profile wall (ribbed) polyethylene pipe. Furnish 18 to 48-inch diameter pipe conforming to ASTM F 894 and minimum cell class, ASTM D 3350, 334433C or 335434C.

(d) Corrugated polyethylene drainage tubing. Furnish 3 to 10-inch diameter tubing conforming to AASHTO M 252M.

(e) Smooth wall polyvinyl chloride pipe. Furnish 4 to 15-inch diameter pipe conforming to AASHTO M 278 and minimum cell class, ASTM D 1784, 12454B or 12364C. For sanitary sewer applications, conform to ASTM D 3034.

(f) Profile wall (ribbed) polyvinyl chloride pipe. Furnish 4 to 48-inch diameter pipe conforming to AASHTO M 304M and minimum cell class, ASTM D 1784, 12454C or 12364C. For sanitary sewer applications, conform to ASTM F 794 or F 949.

(g) Acrylonitrile-butadiene-styrene (ABS) pipe. Conform to AASHTO M 264. For perforations, conform to AASHTO M 278.

Section 993 - Fence Material

993.01 Barbed Wire. Furnish galvanized wire conforming to AASHTO M 280 or aluminum coated wire conforming to AASHTO M 305 type I.

993.02 Woven Wire. Furnish galvanized fabric conforming to AASHTO M 279 or aluminum coated fabric conforming to ASTM A 584.

993.04 Fence Posts.

(a) Wood. Conform to AASHTO M 168 and as SHOWN ON THE PLANS.

Peel all bark, except for red cedar posts and bracing which do not require peeling. Trim all knots flush with the surface and season the wood.

For dimension lumber for fences or gates, use timber that is sound, straight, and reasonably free from knots, splits, and shakes. Provide S4S finish.

(b) Concrete. Conform to FP-03, Section 601.

(c) Steel. For line fence posts, conform to AASHTO M 281.

993.05 Fence Gates. Furnish wood gates conforming to conforming to AASHTO M 168 and as SHOWN ON THE PLANS. For dimension lumber for gates, use timber that is sound, straight, and reasonably free from knots, splits, and shakes. Provide S4S finish.

993.06 Metal Beam Rail. Conform to AASHTO-AGC-ARTBA *A Guide to Standardized Highway Barrier Hardware*.

(a) Galvanized steel rail. Furnish W-beam or thrie beam rail elements fabricated from corrugated sheet steel conforming to AASHTO M 180 for the designated shape, class, type, and mass of coating specified.

(b) Corrosion resistant steel rail. Furnish W-beam or thrie beam rail elements and associated weathering steel hardware conforming to the following:

(1) Shapes and plates	ASTM A 242
(2) Rail elements	AASHTO M 180
(3) Fasteners	AASHTO M 180

993.07 Guardrail Posts. Conform to AASHTO-AGC-ARTBA "A Guide to Standardized Highway Barrier Hardware."

Do not use a wood guardrail post that has a thorough check, shake, or end slit in the same plane as, or a plane parallel to the bolt hole and extending from the top of the post to within 3 inches or the bolt hole.

For steel-backed timber rail posts, furnish 10 by 12-inch posts conforming to Subsection 710.08.

993.08 Guardrail Hardware. Conform to the AASHTO-AGC-ARTBA *A Guide to Standardized Highway Barrier Hardware*.

For angles, channels, wide flanges, and plates not contained in the above standard, conform to ASTM A 36M. For structural tubing for short steel posts, conform to ASTM A 500 or ASTM A 513 grade 1008. Galvanize soil plates and structural tubing according to AASHTO M 111. Do not punch, drill, cut, or weld the metal after galvanizing.

993.09 Temporary Plastic Fence. Furnish plastic noncorrosive fence fabricated from polyethylene (HDPE) and UV stabilized for outdoor weathering. Conform to the following:

(a) Height	48 inch min.
(b) Mesh openings	3 to 3.5 inches
(c) Color	International orange
(d) Mass	0.168 lb/ft min.

Section 994 - Geosynthetics

994.01 Geotextiles

(a) Use geotextiles, alone or in combination with other geosynthetics that meet the following Class B requirements for subsurface drainage as specified in AASHTO M288.

(1) Grab Strength at 50 percent elongation
ASTM D4632-91 .....…….. 355 N min.
(2) Seam Strength,
ASTM D 4632 .....……... 310 N min.
(3) Puncture Strength,
ASTM D4833-88 .....…….. 110 N min.
(4) Mullen Burst,
ASTM D 3786-87 ..... 900 kPa min.
(5) Trap Tear Strength,
ASTM D4533-91 .....…….. 110 N min.

(b) Use geotextile meeting the following critical physical properties, unless otherwise SHOWN ON THE PLANS.

(1) Material Structure .....…….. Nonwoven (all purposes) or Slit Film (for reinforcement or separation)
(2) Polymer Composition .....……. Polypropylene
(3) Apparent Opening,
ASTM D 4751-87 .....……. .30 mm max.
(4) Permittivity, ASTM
D4491-92 .....…….. 4060 liters/minute/m^2 min.
(5) Ultraviolet Degradation .....…….. 70 at150 hours

994.02 Geonet. Use geonet meeting the following critical physical proper-ties unless otherwise SHOWN ON THE PLANS.

(a) Polymer Composition of Core
(Net or Mesh).....…….. Medium PE or HDPE
(b) Permeability……... 0.001cm/second min.
(c) Geotextile .....……..……..…. Must meet all Section 994.01 requirements
(d) Compressive Strength
of Core, ASTM D1621.....……. 500 kPa min.
(e) Transmissivity with Gradient
at 0.1, Pressure at 10 kPa.....……..... 0.0009 m^2/second min.

994.03 Geogrids. Use geogrids made from polypropylene or coated polyester that meets the following critical physical properties.

(a) Polymer Type .....……	HDPE, Polypropylene, or Polyester with Acrylic or PVC coating
(b) Mass per Unit Area, ASTM D5261-92...	175 g/m^2 min.
(c) Maximum Aperture Size	
(1) Direction (MD) ....……	100 mm
(2) Cross-Direction (XD) .....……	75 mm
(d) Wide-Width Strip Tensile Strength at 5 percent Strain, ASTM D4595-86	
(1) Machine Direction (MD) ....……	8 kN/m min.
(2) Cross-Direction (XD) .....……	6 kN/m max.

994.04 Geocells. Use geocells meeting the following physical properties.

(a) Composition .....…….	PE or HDPE
(b) Geocell Weight expanded: .....…..	1.70 kg/m^2 min.
(c) Minimum Cell Seam Peel Strength, U.S. Army Corps of Engineers Technical Report G:-86-19, Appendix A .....……	800 N min.
(d) Expanded Dimensional Properties…...	AS SHOWN ON PLANS

994.05 Sheet Drains. Use sheet drains meeting the following critical physical properties.

(a) Core Polymer Composition ....……	Polystyrene, HDPE, or polypropylene attached
(b) Geotextile .....……	Nonwoven on one side if core solid; on both sides if core perforated. Must meet all Section 994.01 requirements
(c) Core Thickness, ASTM D5199 …….	10 mm min.
(d) Core Compressive Strength at Yield, ASTM D1621 .....……	650 kPa max.

994.06 Fasteners. Use anchors or fasteners of the design recommended by the manufacturer, and install per manufacturer's specifications.

994.07 Certification. Furnish a certificate or affidavit signed by an official from the company manufacturing the geosynthetic, verifying that the geosynthetic meets specifications.

994.08 Delivery, Storage, and Handling. During shipment and storage, wrap all geosynthetics to protect them from sunlight. When storing geosynthetics, protect them from mud, soil, dust, and debris. If materials are not installed immediately after delivery to site, do not store them in direct sunlight.

Section 995 - Material for Timber Structures

995.01 Untreated Structural Timber and Lumber. Conform to AASHTO M 168. Furnish an inspection certification from an agency accredited by the American Lumber Standards Committee for the species and grade. Mark all pieces with the inspection service, grade designation, species, and inspector identity.

Season and dry all structural timber and lumber before fabrication. Do not use material that is twisted, curved, or otherwise distorted.

Do not use boxed-heart pieces of Douglas fir or redwood in outside stringers, floor beams, caps, posts, sills, or rail posts. Boxed-heart pieces are defined as timber so sawed that at any point in the length of a sawed piece the pith lies entirely inside the four faces.

Select native log stringers from designated sites on Government-administered land. Select the species and sizes of materials as SHOWN ON THE PLANS. Select native log stringers that are straight, sound, and free of defects. Obtain CO approval of logs and trees before felling or moving them to the site. Fell trees to prevent damage to standing timber and to minimize breakage of trees to be used. Buck logs from felled trees in such a way to minimize waste and to obtain the required length and diameter.

Peel logs, square the ends, and trim the knots and limbs flush unless otherwise SHOWN ON THE PLANS. Scatter the debris from the processing of timber away from the trail and so it will not block the trail or plug water courses.

Field treat the following untreated timber surfaces in accordance with AWPA standard M4.

(a) All ends and tops, and all contact surfaces of posts, sills, and caps.

(b) All ends, joints, and contact surfaces of bracing and truss members.

(c) All surfaces of timber bumpers and the back faces of bulkheads.

(d) All other timber that will be in contact with earth.

(e) All ends of log stringers.

995.02 Holes for Bolts, Dowels, Rods & Lag Screws. Bore all holes before preservative treating the wood.

Bore holes for round drift bolts and dowels 1/16 inch smaller in diameter than that of the bolt or dowel to be used. Ensure that the diameter of holes for square drift bolts or dowels is equal to the side dimension of the bolt or dowel.

Bore holes for machine bolts 1/16 inch larger than the diameter, except when galvanized bolts are specified. In this case, drill all holes 1/8 inch greater than the bolt size.

Bore holes for lag screws 1/16 inch larger for the shank portion of the lag screw and drill the remainder of the hole approximately 75 percent of the shank diameter to a depth of 1 inch less than the length of the screw.

995.03 Hardware. Use nails of standard form (ASTM F 1667), wood screws (ANSI/ASME B 18.6.1), hex headed bolts and nuts (ASTM A307), lag screws (ASTM A307 and ANSI/ASME B18.2.1), carriage bolts (ASTM A307), and drift pins and dowels (ASTM A307) as SHOWN ON THE PLANS.

Fabricate washers from gray iron or malleable iron castings unless structural washers are specified. Use malleable iron washers with a diameter approximately four times the bolt diameter under all bolt heads or nuts in contact with wood, unless otherwise SHOWN ON THE PLANS.

Galvanize all hardware according to AASHTO M 232 or cadmium plate all hardware according to ASTM B 766 class 12, type III, unless otherwise SHOWN ON THE PLANS, except for the glued laminated deck panel dowels. Ensure that all fasteners, including nails, spikes, bolts, washers, and timber connectors, other than malleable iron, are galvanized.

Final tighten all nuts to provide proper bearing and snug tight condition. Snug tight is defined as sufficient tightness to bring faces of members into firm contact with each other. Cut off excess bolt lengths of more than 1 inch. After final tightening, check or burr all bolts effectively with a pointing tool to prevent loosening of the nuts.

995.04 Treated Structural Timber and Lumber. Furnish wood according to Subsection 995.01. Incise all wood and make all dimensional cuts and holes in the wood before pressure treatment. Use wood preservative treatment methods meeting the requirements of AASHTO M 133 as SHOWN ON THE PLANS. Treat dimensional lumber, sawn timber and glued laminated timber members according to AWPA Standards as SHOWN ON THE PLANS.

All treated stringers, decking, running planks, and handrails shall be treated after fabrication in accordance with AWPA U1, *Use Category System,* using Pentachlorophenol or Copper Naphthenate (CuN) in Light Oil, (Type C Solvent) for Use Category UC3B.

All treated substructures (sills, backing planks, cribs, timber walls, etc.) shall be treated after fabrication in accordance with AWPA U1 *Use Category System,* using Pentachlorophenol or Copper Naphthenate (CuN) in Heavy Oil (Type A Solvent) for Use Category UC4B.

Treat timber members shall comply with the requirements of the current edition of WWPI's *Best Management Practices for the Use of Treated Wood in Aquatic Environments.*

Except for pine, incise before treatment all surfaces greater than 2 inches in width and all Douglas fir and western larch surfaces. Field treat all cuts, abrasions, drilled

holes, and recesses that occur after initial preservative treatment in accordance with the requirements specified in AWPA standard M4, *Standard for the Care of Pressure-Treated Wood Products*. Plug all unused holes with preservative-treated plugs. Perform all field-applied preservation treatment with necessary precautions so as to prevent soil and/or water contamination.

All treated timber members must have an approved American Lumber Standards Committee quality mark, individually or sealed pallets, assuring that treatment conforms to the appropriate AWPA standards.

Submit a certified copy of the lot certification, by a qualified independent inspection and testing agency, to the CO for each charge of preservative, stating penetration in inches and retention in pounds per cubic foot (assay method). In addition, provide a written certification from the producer of the treated products that "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservers Institute and Canadian Institute of Treated Wood, were utilized. Include a description and appropriate documentation of the Best Management Practices used.

Handle treated timber according to the Consumer Information Sheet published by AWPA. Do not cut, frame, or bore treated timber after treatment unless approved by the CO. Handle treated timbers carefully and do not drop, damage outer fibers, or penetrate the surface with tools. Do not use cant dogs, hooks or pike poles. In coastal waters, do not cut or bore timber below the highwater mark.

995.05 Structural Glued Laminated Timber. Furnish structural glued laminated timber according to American National Standard, "Standard Specifications for Structural Glued Laminated Timber of Softwood Species" (ANSI 117). Fabricate according to the combination and grade as indicated in the contract. Fabricate structural glued laminated members according to American National Standard, "Standard for Wood Products - Structural Glued Laminated Timber" (ANSI A190.1).

Manufacture members as industrial appearance grade for wet use conditions, using a phenol-resorcinol resin type of adhesive throughout. Use only single- or multiple-piece laminations with bonded edge joints.

Section 996 - Gabion and Revet Mattress Material.

996.01 Basket Mesh. Twist or weld the mesh from galvanized steel wire conforming to ASTM A 641, class 3 or aluminized steel wire conforming to ASTM A 809. Use wire with a minimum tensile strength of 60,000 pounds per square inch when tested according to AASHTO T 244. The galvanized or aluminized coating may be applied after mesh fabrication. Make the mesh openings with a maximum dimension less than 4½ inches, an area less than 10 square inches, and a size less than the gabion or revet mattress rock to be used with the mesh.

(a) Gabion baskets (1 foot or greater in the vertical dimension). Fabricate the mesh for galvanized or aluminized coated baskets from nominal-sized 0.12-inch or greater diameter wire and fabricate the mesh for polyvinyl chloride coated baskets from nominal-sized 0.11-inch or greater diameter wire.

(1) Twisted wire mesh. Form the mesh in a uniform hexagonal pattern with non-raveling double twists. For galvanized or aluminized coated baskets, tie the perimeter edges of the mesh for each panel to a 0.15-inch or greater diameter selvedge wire. For polyvinyl chloride coated baskets, tie the perimeter edges of the mesh for each panel to a 0.13-inch or greater diameter selvedge wire. Make the selvedge at least the same strength as the body of the mesh. Furnish selvedge wire from the same type of material used for the wire mesh.

(2) Welded wire mesh. For galvanized or aluminized coated baskets, weld each connection to obtain minimum average weld shear strength of 585 pounds with no value less than 450 pounds. For polyvinyl chloride coated baskets, weld each connection to obtain minimum average weld shear strength of 472 pounds with no value less than 360 pounds.

Fabricate gabion baskets in the dimensions required with a dimension tolerance of ±5 percent. Where the length of the basket exceeds 1.5 times its width, equally divide the basket into cells less than or equal to the basket width using diaphragms of the same type and size mesh as the basket panels. Prefabricate each basket with the necessary panels and diaphragms secured so they rotate into place.

(b) Revet mattresses (less than 1 foot in the vertical dimension). Fabricate the mesh from nominal-sized 0.086-inch or greater diameter wire.

(1) Twisted wire mesh. Form the mesh in a uniform hexagonal pattern with non-raveling double twists. Tie the perimeter edges of the mesh for each panel to a 0.11-inch or greater diameter selvedge wire. Make the selvedge at least the same strength as the body of the mesh. Furnish selvedge wire from the same type of material used for the wire mesh.

(2) Welded wire mesh. Weld each connection to obtain minimum average weld shear strength of 292 pounds with no value less than 225 pounds.

Fabricate revet baskets in the dimensions required with a dimension tolerance of ±5 percent in length and width and ±10 percent in height. Where the length of the basket exceeds 0.5 times its width, equally divide the basket into cells less than or equal to 0.5 times the basket width using diaphragms of the same type and size mesh as the mattress panels. Prefabricate each basket with the necessary panels and diaphragms secured so they rotate into place.

(c) Epoxy or Polyvinyl chloride coated baskets. Use either a fusion bonded or extruded coating to coat the galvanized or aluminized mesh.

Make the coating at least 0.0625 inches in thickness for epoxy and 0.125 inch thickness for PVC. Make the color black or gray and conform to the following:

(1) For epoxy coating meet:

- Abrasion resistance, ASTM D 1242, maximum weight loss 0.19 g.
- Salt crock, ASTM G 8, maximum disbondment diameter 1.75 inch, and at 90 days, 1.5 volts, and 3 percent solution.
- Chemical resistance, ASTM G 20, with 45 days at 70°F, 3 molar CaCl, 3 molar NaOH, saturate $Ca(OH)^2$, and no coating loss.
- Weatherometer, ASTM G 23, with a surface chalk and 2,000 hours.

(2) For polyvinyl coating meet:

▪ Specific gravity, ASTM D 792	1.20 to 1.40
▪ Tensile strength, ASTM D 638 per square inch min.	2,300 pounds
▪ Modulus of elasticity, ASTM D 638 per square inch min.	2,000 pounds at 100 strain
▪ Hardness — shore "A", ASTM D 2240	75 min.
▪ Brittleness temperature, ASTM D 746	16 ºF max.
▪ Abrasion resistance, ASTM D 1242, method B at 200 cycles, CSI-A abrader tape, 80 grit	12% max. mass loss
▪ Salt spray (ASTM B 117) and ultraviolet light exposure (ASTM D 1499 and G 23 using apparatus type E and 145 ºF)	No visual effect *(c)* Δ< 6% *(d)* Δ< 25% *(e)* Δ< 25%

for 3000 hours	*(h)* Δ< 10%
▪ Mandrel bend, 360º bend at 0 ºF around a mandrel 10 times the wire diameter	No breaks or cracks in coating

996.02 Permanent fasteners.

(1) Lacing wire. Furnish nominal-sized 0.086-inch diameter wire of the same type, strength, and coating as the basket mesh.

(2) Spiral binders. Form with wire having at least the same diameter, type, strength, and coating as the basket mesh.

(3) Alternate fasteners. Furnish fasteners according to the basket manufacturer's specification that remain closed when subjected to a 585-pound tensile force while confining the maximum number of wires to be confined in the gabion structure or revet mattress. Submit installation procedures and fastener test results.

996.03 Internal connecting wire. Furnish lacing wire as described in (b)(1) above or alternate stiffeners according to the basket manufacturer's specification.

Appendix C
Flowdown Provisions

NFF Funding Code: 1593147
NFF Funding Name: CCS Fremont-Winema Sustainable Trails and Rec

Funder Agreement ID: 24-CS-11060200-265

U.S. FOREST SERVICE ACKNOWLEDGED IN PUBLICATIONS, AUDIOVISUALS AND ELECTRONIC MEDIA.

Award Recipient or Contractor shall acknowledge U.S. Forest Service support in any publications, audiovisuals, and electronic media developed as a result of this agreement.

TRAINING, EVALUATION, AND CERTIFICATION OF SAWYERS USED BY COOPERATORS.

Any employee, contractor, or volunteer of the cooperator who will use chain saws or crosscut saws on National Forest System lands under this agreement must be trained, evaluated, and certified in accordance with Forest Service Manual 2358. The cooperator is responsible for providing sawyer training, evaluation, and certification for the cooperator's employees, contractors, and volunteers, unless the U.S. Forest Service and the cooperator determine it is not in the best interest of the partnership for the cooperator to provide sawyer training and evaluation. In these circumstances, the U.S. Forest Service, upon request and upon availability of Agency resources, may assist with conducting sawyer training and evaluation for the cooperator's employees, contractors, and volunteers. Cooperator employees, contractors, and volunteers who will use chain saws and/or crosscut saws on National Forest System lands must be certified by the cooperator. Only those cooperator organizations with an approved sawyer training, evaluation, and certification program may conduct sawyer training, evaluation, and certification. Any employee, contractor, or volunteer of the cooperator who will use other types of saws, such as handsaws to cut small diameter material, brush saws, and pole saws, must be trained in accordance with Forest Service Handbook 6709.12, Chapter 40, section 41.3. The cooperator is responsible for providing that training.

PROHIBITION AGAINST INTERNAL CONFIDENTIAL AGREEMENTS.

All non federal government entities working on this agreement will adhere to the below provisions found in the Consolidated Appropriations Act, 2016, Pub. L. 114-113, relating to reporting fraud, waste and abuse to authorities:

1. The recipient may not require its employees, contractors, or subrecipients seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting them from lawfully reporting that waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

2. The recipient must notify its employees, contractors, or subrecipients that the prohibitions and restrictions of any internal confidentiality agreements inconsistent with paragraph (a) of this award provision are no longer in effect.

3. The prohibition in paragraph (a) of this award provision does not contravene requirements applicable to any other form issued by a Federal department or agency governing the nondisclosure of classified information.

4. If the Government determines that the recipient is not in compliance with this award provision, it:

    a. Will prohibit the recipient's use of funds under this award, in accordance with sections 743, 744 of Division E of the Consolidated Appropriations Act, 2016, (Pub. L. 114-113) or any successor provision of law; and

    b. May pursue other remedies available for the recipient's material failure to comply with award terms and conditions.