

Section C - Description/Specifications/Statement of Work
GENERAL SPECIFICATIONS
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
Final – 01/11/2022

1.1 SCOPE OF CONTRACT

- A. The Guinavah-Malibu Campground was constructed in the area of a CCC Camp. The current campground was constructed in the 1960's and is need of major renovations to bring the campground and the amenities up to current standards. The Guinavah-Malibu site includes a campground, group sites, trailhead, day-use area with picnic sites and a historical amphitheater. Special care to protect and retain existing CCC Historical features throughout the site is required. The work associated with this project includes:
- B. Base Bid:
1. Demolition:
 - a. Obliterating existing roads that are to be removed.
 - b. Removal of Crack Willow and Marked Hazard trees and existing exposed tree stumps throughout the site.
 - c. Removal existing site furnishings (tables, concrete slabs, fire rings, water hydrants).
 - d. Removal of 1 Slump Block toilet building.
 2. Guinavah-Malibu Campground:
 - a. Constructing a new campground "loop", including new road, spurs, restrooms, family units and site furniture.
 - b. Constructing a new entrance road and central intersection, with pull-out and kiosk
 - c. Realigning existing roads and intersections.
 - d. Installing new road signs and campsite unit numbers
 - e. Construct Right Turn Lane on US HWY 89.
 - f. Install CXT Toilets
 3. Day-Use Area, Group Sites, Crimson Trailhead:
 - a. Constructing a new road, day-use parking area, surfaces will be a mix of aggregate and asphalt.
 - b. Install a new bulletin board.
 - c. Constructing a new picnic area, including a pathway system, signs and site furniture.
 - d. Construction pavilions with site furnishings
 - e. Install CXT Toilets
- C. Optional Bid Items:
1. Option #1: Asphalt Paving

- a. Place 3" asphalt pavement on Roads, Parking Areas, and Spurs.
 - 2. Option #2: Pavilions
 - a. Erect pavilions at group sites.
 - 3. Option #3: Amphitheater Restoration
 - a. Removal of existing amphitheater seating planks and posts.
 - b. Installing new wood plan benches and supports,
 - c. Constructing accessible pathway
 - d. Constructing new wood stairs
 - e. Installing pathway lighting
 - f. Construct pavilion with site furnishings
 - D. Quantities associated with these options are identified in the Schedule of Items.
- 1.2 PROJECT LOCATION
- A. The project is located on the Uinta-Wasatch-Cache National Forest on the Logan Ranger District, Cache County, Utah. The site is accessed via US Highway 89 and is located approximately 5 miles East of Logan, Utah. Campground is on the south side of the highway.
- 1.3 SITE INFORMATION AND LIMITATIONS
- A. The following site conditions are considered incidental to the contract and the contractor will not be paid directly for any of the following items:
- 1. Construction sites will be closed to the public during construction. The Forest Service will issue a closure order to the public. The Contractor will be responsible for signing and limiting public access.
 - 2. Contractor will provide all materials and labor necessary to protect streams, wet or dry, during construction activities. The Contractor will be required to submit a stream protection plan and receive approval from the COR, in writing, prior to the beginning of construction.
 - 3. All construction equipment shall be pressure washed before entering National Forest System lands. The removal of mud and debris from treads, tracks and undercarriage, with emphasis on axles, frame, cross-members, motor mounts, and underneath steps, running boards, and front bumper/brushguard assemblies will be required. The purpose is to reduce or eliminate the transportation of noxious weeds, which is required by Federal and State regulations.
 - 4. Water is not available at the site for construction purposes.
 - 5. Power may be available upon request.
 - 6. Toilet facilities are not available at the site.
- 1.4 TRAFFIC CONTROL AND CONSTRUCTION SIGNING
- A. No work that endangers, interferes, or conflicts with traffic or access to work sites shall be performed until a plan for satisfactory warning and handling of traffic has been

submitted by the contractor and approved by the COR and Utah Department of Transportation. Construction signing for traffic control shall conform to the Manual of Uniform Traffic Control Devices (MUTCD). All traffic control signs will be placed in areas adequate for a truck pulling a fifth wheel trailer to be turned around. Contractor shall not be paid directly for this item, rather it will be considered incidental to other items of work listed in the Schedule of Items. The contractor is responsible for obtaining a Right Of Way Encroachment permit through UDOT for all work to be performed within the UDOT ROW including the removal of some trees near US-89. Coordination and any permits from Rocky Mountain Power shall be the responsibility of the contractor.

1.5 Earthwork Disturbance Permits

- A. The contractor will be responsible to obtain a Utah Pollution Discharge Elimination Systems permit for the project and is responsible to adhering to best management practices throughout construction. The Forest Service will obtain and hold the necessary 404 Permits for work within the riparian and wetland areas, the contractor will be responsible to follow the requirements of the 404 permit.

1.6 WORK CAMPS, STAGING AND STORAGE AREAS

- A. Areas for staging operations and storage of materials shall be approved by the CO. The Contractor must request in writing for approval from the CO to stage work trailers on site.
- B. Overnight camping may be allowed on site with prior approval.

1.7 INSPECTION OF WORKSITE

- A. The contractor acknowledges they have taken the necessary steps to ascertain the nature and location of work, and have investigated and satisfied themselves as to the general and local conditions that can affect the work or its cost. Any failure of the contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from the responsibility of estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expenses to the government.

1.8 START DATE

- A. Fall 2023/Spring 2024.

1.9 CONTRACT TIME

- A. Base Bid: 365 Calendar Days
- B. Optional Items: 365 Calendar Days (within Base Contract Time)

1.10 SPECIFICATIONS

- A. The following specifications are attached. Some sections in the schedule of items refer to other sections not listed and are subsidiary to, or are included in payment for other pay

items in this contract. These items are considered incidental and no additional compensation will be made.

Section 000501 - Rehab Historic Toilet/ Storage Buildings
Section 010250 - Construction Staking
Section 011250 - Measurement And Payment
Section 011900 - Mobilization
Section 013300 - Submittal Procedures
Section 014100 - Quality Control
Section 017320 - Selective Demolition
Section 022340 - Obliteration Of Old Roadways And Parking Spurs
Section 023701 - Sediment And Erosion Control Measures
Section 024100 - Waste Material Disposal
Section 024102 - Removal And Disposal Of Structures And Obstructions
Section 024134 - Lead Waste Practices And Disposal
Section 026460 - Dumpster Pad And Screen Wall Enclosures
Section 033000 - Cast-In-Place Concrete
Section 033020 - Concrete From Packaged Dry Mix For Minor Structures
Section 044313.16 - Adhered Stone Masonry Veneer
Section 048100 - Unit Masonry Assemblies
Section 048101 - Prefabricated Firebox And Chimney Assemblies
Section 049020 - Stone Restoration And Cleaning
Section 061000 - Rough Carpentry
Section 061600 - Sheathing
Section 070150.19 - Preparation For Reroofing
Section 073113 - Asphalt Shingles
Section 073129 - Wood Shingles
Section 076200 - Sheet Metal Flashing And Trim
Section 079200 - Joint Sealants
Section 090190.52 - Maintenance Repainting
Section 092900 - Gypsum Board
Section 099123 - Interior Painting
Section 099300 - Preparation And Application Of Transparent Finishes For Shingles
Section 099600 - High-Performance Coatings
Section 101110 - Bulletin Boards
Section 101400 - Signs
Section 101415 - Site Identification Sign Fabrication (Wood)
Section 129400 - Family Unit And Site Furnishings
Section 129410 - Site Furnishings At Group Sites
Section 129700 - Fee Tube
Section 132700 - Precast Concrete Vault Restrooms
Section 133442 - Pre-Manufactured Shelter
Section 133450 - Precast Vault Toilet Installation
Section 136100 - Amphitheater Renovation
Section 221100 - Water Distribution Systems
Section 221102 - Curb Valves And Boxes

Section 221105 - Water Hydrants
Section 221310 - Sewage Holding Tank
Section 231126 - Facility Liquefied-Petroleum Gas Piping
Section 260500 - Common Work Results For Electrical
Section 260519 - Low-Voltage Electrical Power Conductors And Cables
Section 260526 - Grounding And Bonding For Electrical Systems
Section 260533 - Raceways And Boxes For Electrical Systems
Section 260553 - Identification For Electrical Systems
Section 262726 - Wiring Devices
Section 311000 - Clearing And Grubbing
Section 312000 - Earthwork
Section 312010 - Select Borrow
Section 312100 - Project Site Preparation And Grading
Section 312225 - Excavation & Embankment
Section 321200 - Hot-Mix Asphalt Paving
Section 321204 - Crushed Aggregate Base Or Surface Course
Section 322100 - Tent Pads
Section 322205 - Barrier Rocks
Section 322622 - Precast Concrete Curb Stops
Section 322640 - Pavement Marking
Section 322706 - Asphalt Pavement Pulverizing
Section 323116 - Gates For Roads
Section 329206 - Seeding
Section 332228 - Culvert Pipe And Pipe Arches

END OF SECTION C
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 000501 - REHAB HISTORIC TOILET/ STORAGE BUILDINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This work includes the upgrades for existing toilet buildings. The contract will be bid with a base bid and additive bid items

1.2 REFERENCE CODES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 2018 International Building Code
 - 2018 International Existing Building Code
 - 2017 National Electrical Code

1.3 MEASUREMENT AND PAYMENT

- 1. Bid Item: Measurement and Payment shall be Lump Sum Quantity (LSQ) as shown in the Schedule of Items for the Historic Building repairs.
- 2. Repair 2 historic toilets buildings and convert them into storage buildings. Work is described in the following specifications and drawings and includes but is not limited to: Demolition of concrete, plumbing fixtures and lines, removal of toilet partitions, toilet accessories, wood base, door hardware roofing, flashing, fiberboard, and trim. Repair work includes concrete patching, wall patching, work involving lead based paint, fiber board repair, roof preparation and wood shingle roofing, door hardware, wood base, hose bibb installation, interior repainting, exterior wood prep and repainting, screen repair.
- 3. DRAWINGS: The list of drawings includes the following:
 - a. DA1: Selective Demolition Historic Amphitheater Toilet
 - b. DA2: Selective Demolition Historic Group Area Toilet
 - c. A9: Historic Amphitheater Toilet to Storage Re Plan
 - d. A10: Historic Amphitheater Toilet to Storage Rehab Elevations
 - e. A11: Historic Group Area Toilet to Storage Rehab Plan
 - f. A12: Historic Group Area Toilet to Storage Rehab Elevations
 - g. A13: Architectural Details

1.4 REFERENCE SPECIFICATIONS

- a. Section 000501: Repair Historic Toilet/Storage Buildings
- b. Section 011250 - Measurement And Payment With Asphalt
- c. Section 013300 - Submittal Procedures
- d. Section 014130 - Contractor's Quality Control

- e. Section 017419 - Construction Waste Management And Disposal
- f. Section 017320 – Selective Demolition
- g. Section 024100- Waste Material Disposal
- h. Section 024134- Lead Waste Disposal
- i. Section 033000 - Cast-In-Place Concrete
- j. Section 061000 - Rough Carpentry
- k. Section 061600 - Sheathing
- l. Section 070150.19 – Preparation for Reroofing
- m. Section 073129 – Wood Shingles
- n. Section 076200 - Sheet Metal Flashing And Trim
- o. Section 079200 - Joint Sealants
- p. Section 087100 - Door Hardware
- q. Section 090190.52- Maintenance Repainting
- r. Section 092900 - Gypsum Board
- s. Section 099123 - Interior Painting

1.5 RELATED WORK

- A. The work shall be in accordance with the contract documents.
- B. The work shall be in accordance with the following specifications. The subsidiary specifications are referred to in the text by the Section designation only.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION

3.1 GENERAL

- A. Work shall be completed in accordance with the contract drawings and specifications.

END OF SECTION 000501
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 010250 - CONSTRUCTION STAKING

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of the construction staking of roads, parking lots, parking spurs, family units, tent pads, paths, stairways, culverts, buildings, and utilities in accordance with the Drawings and Specifications. The work includes the furnishing of all labor, equipment, instruments, materials, transportation and other incidentals necessary to complete the construction staking in accordance with these specifications and acceptable engineering practice.

1.2 QUALITY CONTROL

- A. Construction staking shall be accomplished under the direction of a Civil Engineer, Engineering Technician, or Land Surveyor closely associated and familiar with construction staking; periodic visits to the project site are required.

1.3 MEASUREMENT AND PAYMENT

- A. Measurement shall be lump sum for surveying and staking the project through all phases of construction.

PART 2 - PRODUCTS

2.1 GOVERNMENT-FURNISHED SURVEY CONTROL SHEETS

- A. The Government will provide the contractor with a set of survey control sheets showing horizontal and vertical control for site to be staked. The Government will provide the Contractor with layout information that will include:
 - 1. Control Points - Northing, Easting, Existing Elevations.
 - 2. Roads, Spurs, Parking Areas - Northing, Easting, and Finish Elevations for centerline and edge of roads, spurs, parking areas.
 - 3. Pathways and Trailways - Northing, Easting, and Finish Elevations for subgrade centerline.
 - 4. Buildings and Other Structures - Northing, Easting, and Finish Elevations for corners of buildings, other structures (septic tanks, fencing, etc).
 - 5. Camp Sites, Picnic Sites, and Tent Pads - Northing, Easting, and Finish Elevations for corners of Camp Picnic Sites.
 - 6. Utility Lines - Northing, Easting, and Existing Ground Elevations for centerline of utilities (Water Line, Sewer Line, Electrical Lines).

2.2 STAKES

- A. Identification stakes and hubs shall be of sufficient length and width to provide a solid set in the ground and to provide space for marking above ground when applicable. Other dimensions and materials may be used, such as steel reinforcing bars, wire flagging and markers, and metal pins, if approved in writing by the Contracting Officer (CO). The top 2 inches of all slope, guard, reference, clearing, and structure stakes shall be painted or marked with plastic flagging. Colors used on stakes or for flagging shall be as follows:

- | | |
|---|---------------------|
| 1. Roads, parking lots, and parking spurs | -Orange |
| 2. Waterlines, utilities, and culverts | -Blue |
| 3. Family Units, group units, stairs, and paths | -Red |
| 4. Buildings, excavation and grading | -Yellow |
| 5. Tent pads | -Blue/White Striped |

2.3 SURVEY NOTE PAPER AND BOOKS

- A. Paper for survey notes shall be moisture-resistant paper. Notes shall be contained in books with covers that will protect the contents and retain the pages in numerical sequence during field use. Field notebooks or note paper shall be furnished by the contractor.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall be required to provide all necessary staking and control for all phases of construction. The contractor shall use the data and information shown on the project drawings to establish the location of all facilities to be constructed under this contract. The Contractor may choose any method of establishing horizontal and vertical controls provided the following minimum precision and accuracy requirements are met.
- B. Accuracy requirements:
1. Minimum position close; 1/1000
 2. Vertical closure: 0.05 ft (vertical)/station (100 feet horizontal)
 3. Cross section and slope stake precision:
 - a. Allowable deviation of cross section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves: ± 3 degrees.
 - b. Cross section topography measurements shall be taken so that variations in ground form a straight line connecting the cross section points will not exceed: 1.0 ft.
 - c. Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits. In feet or percentage of horizontal distance measured from centerline or reference stake, whichever is greater. Slope reference stakes and slope stakes: 0.15 ft or 0.6%. Clearing limits: 1.0 ft.

3.2 ESTABLISHING AND REFERENCING IMPROVEMENT LOCATIONS

A. Access Roads, Parking Spurs, and Parking lots:

1. Slope stakes (cut and fill catch points), clearing limits, and slope stake references shall be established on both sides of the centerline at each station established. Slope stakes and slope stake references shall be located on a line at right angles to tangents and on radial lines or curves. Slope stake catch points shall be located by using the grading plans and/or profiles, typical road section templates, as shown on the drawings and the information provided with staking points.
2. Slope stakes shall be set at 50-foot intervals, at significant breaks in the ground profile, culvert locations, and widening transition points. Slope stakes shall be set at 25 foot intervals around curves having a radius less than 100 feet.

B. Group Units, Family Units and tent Pads

1. Slope stakes shall be established at the corners of family units. Slope stakes shall be written to reference the finish grade of the unit or pad being staked.

C. Paths and Trails

1. Slope stakes (cut and fill catch points), clearing limits, and slope stake references shall be established on both sides of the centerline at each station established. Slope stakes and slope stake references shall be located on a line at right angles to tangents and on radial lines or curves. Slope stake catch points shall be located by using the grading plans and/or profiles, and typical path and trail section templates as shown on the drawings.
2. Slope stakes shall be set at 10-foot intervals, at significant breaks in the ground profile, culvert locations, and widening transition points.

D. Culverts

1. Slope stakes and slope reference stakes shall be set at all culvert locations. A culvert reference stake and hub shall be set on the centerline of the culvert 10 feet from each end or beyond the clearing limit, whichever is greater. The following shall be recorded on these stakes:
 - a. The actual field measured length
 - b. The vertical and horizontal distance from hubs to the invert at the ends of the culvert.

E. Waterline, Sewerline, & other Utilities

1. Waterline, Sewerline, & other Utilities shall be staked at the locations shown on the drawings with the specified minimum burial depth. Waterline and sewerline elevations shall be accurately staked to provide for drainage as indicated on the drawings. Grade stakes shall be established as necessary to provide the control for the construction work.

F. Buildings

1. Slope stakes and slope stake references shall be established at each corner and as necessary to provide adequate construction control.

3.3 DISCREPANCIES

- A. The contractor shall compare the staked centerline horizontal and vertical alignment with the design data. Differences between previously recorded and observed elevations of bench marks shall be referred to the Contracting Officer. Differences in centerline profile elevations exceeding 1 foot at any two or more consecutive points shall be reported to the contracting Officer for evaluation and possible revision. Staking of these areas shall be deferred until the Contracting Officer resolves these differences.

3.4 VERTICAL CONTROL

- A. Vertical control for construction shall be as referenced on the Drawings.

3.5 MARKING STAKES

- A. All stakes shall be legibly marked, in the format agreed upon with the Contracting Officer, with a stake pencil that leaves an imprinted or with waterproof ink. Marking shall conform to the nomenclature below;

PI	Point of Intersection of tangents
PC	Point of curvature
POC	Point on curve
Pt	Point of tangency
POT	Point on tangent
RP	Reference point
P	P-line (preliminary location line)
L	L-line (final location line)
BM	Bench mark
TBM	Temporary bench mark
BT	Begin taper (any)
ET	End taper (any)
C	Cut
F	Fill
L	Centerline
D	Ditch
W	Width

3.6 SURVEY NOTES

- A. All survey data shall be neatly recorded in survey books. All survey notes shall become the property of the Forest Service. Errors shall be deleted by lining out. Date, crew names and positions, instrumentation, and weather shall be recorded in the notes at the beginning of each day's work. The party chief shall sign or initial each page of the notes immediately after the last entry for each day's work.
- B. Electronically recorded survey notes shall be consecutively numbered and headed to identify the contents. The notes shall be supported and accompanied by a bound book that records the project name and for each day identifies date, crew names and positions, instrumentation, weather, type of survey, stationing of sections between which survey

was performed, and survey data or sketched that cannot be electronically recorded. The party chief shall sign or initial the electronically recorded notes and Day Book immediately after the last entry for each day's work.

END OF SECTION 010250

January 2022

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 011250 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. 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, labor, materials, equipment, and incidentals necessary to successfully complete the project will be considered as included in the payment for items shown. This section defines the method of measurements and basis of payment for work items listed in the Schedule of Items.
- B. When more than one class, size, type, thickness, etc. is specified in the Schedule of Items for any pay item, suffixes will be added to the item number to differentiate between the pay items.

1.2 DETERMINATION OF QUANTITIES

- A. The following measurements and calculations shall be used to determine contract quantities for payment.
 - 1. For individual construction items, longitudinal and lateral measurements for area computations shall be made horizontally or corrected to horizontal measurement unless otherwise specified. Measurements for geotextiles, netting and erosion control blankets shall be along slope lines.
 - 2. For excavation or embankment volumes, the average end area method shall be used to compute volumes. However, if in the judgment of the Contracting Officer (CO), the average end area method is impractical, measurement shall be made by volume in hauling vehicles or by other three-dimensional methods.
 - 3. For Structures, they shall be measured according to neat lines shown on the drawings or as altered by the CO, in writing, to fit field conditions.
 - 4. For items that are measured by the linear foot, such as pipe culverts, fencing, guardrail, piping, utilities, and underdrains, measurements shall be made parallel to the base or foundation upon which the structures are placed.
 - 5. For aggregates weighed for payment, the tonnage shall not be adjusted for moisture content, unless otherwise provided for.
 - 6. For standard manufactured items (such as fence, wire, plates, rolled shapes, pipe conduits) identified by gauge, weight, section dimensions, and so forth, such identifications shall be considered the nominal weights or dimensions. Unless controlled by tolerances in cited specifications, manufacturer's tolerances shall be accepted.
- B. Earthwork Tolerances - Adjustments of horizontal or vertical alignment, within the tolerances specified in this contract, or shifts of balance points up to 100 feet shall be made by the contractor as necessary to produce the designed sections and to balance earthwork. Such adjustments shall not be considered as "Changes."

1.3 UNITS OF MEASUREMENT

- A. Payment shall be by units defined and determined according to U.S. Standard measure and by the following:
1. Acre: Make longitudinal and transverse measurements for area computations horizontally.
 2. 50lb Bag: Measurement will be for the actual number of 50lb bags of standard bentonite grout.
 3. 94lb Bag: Measurement will be for the actual number of 94lb bags of standard cement or grout.
 4. Cubic Yard (CY): A measurement computed by one of the following methods:
 - a. Excavation, Embankment, or Borrow. The measurement computed by the average end area method from measurements made longitudinally along a centerline or reference line.
 - b. Material in Place or Stockpile. The measurement computed using the dimensions of the in-place material.
 - c. 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.
 5. Each (EA): One complete unit, which may consist of one or more parts.
 6. Gallons (GAL): The quantity shall be measured by any of the following methods:
 - a. Measured volume in container.
 - b. Metered volume by approved metering system.
 - c. Commercially package volume.
 7. Hour (HR): Measurement will be for the actual number of hours (or fraction thereof) ordered by the Contracting Officer and performed by the contractor.
 8. Linear Foot (LF): Measurement of work along its length from point-to-point; parallel to the base or foundation. Do not measure overlaps.
 9. Lump Sum (LS): One complete unit.
 10. Mile: Measured horizontally along the centerline of each roadway, approach, or ramp.
 11. Pound (LB): For sacked or packaged material, measurement will be the net weight as packed by the manufacturer.
 12. Square Foot (SF): Measured on a plane parallel to the surface being measured.
 13. Square Yard (SY): Measured on a plane parallel to the surface being measured.
 14. Ton: Measured as a short ton consisting of 2,000 pounds.

1.4 METHOD OF MEASUREMENT

- A. One of the following methods of measurement for determining final payment is designated on the Schedule of Items for each pay item:
1. **ACTUAL QUANTITIES (AQ)** - These quantities are determined from actual measurements of completed work.

2. **DESIGNED QUANTITIES (DQ)** - These quantities denote the final number or units to be paid for under the terms of the contract. They are based upon the original design data available prior to advertising the project. Original design data include the preliminary survey information, design assumptions, calculations, drawings, and the presentation in the contract. Changes in the number of units shown in the Schedule of Items may be authorized under any of the following conditions:
 - a. As a result of changes in the work authorized by the CO.
 - b. 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.
 - c. 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, drawings, or other data that show how the designed quantity is believed to be in error.
3. **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. They shall not be measured.
4. **STAKED QUANTITIES (SQ)** - These quantities are determined from staked measurements prior to construction.
5. **VEHICLE QUANTITIES (VQ)** - These quantities are measured or weighed in hauling vehicles.

1.5 **PRICE ADJUSTMENT (for Out-of-Specification Bituminous Materials)**

- A. Bituminous materials are defined as all types and grades of asphalt cement, liquid asphalt, emulsified asphalt, and dust oil.
- B. If bituminous material fails one or more test requirements, and the Contracting Officer determines it is in the public interest to accept the material at a reduced price, the price reduction shall be based on the test results giving the largest percent price adjustment. The contractor may remove and replace the defective material or accept the adjustment.
- C. The price reduction shall apply to all pay items affected.
- D. Price adjustment will be based on samples taken in duplicate in accordance with AASHTO T40 under the supervision of the Contracting Officer. Samples shall be sent to an authorized laboratory. The laboratory shall test one of each duplicate sample and retain the other. When any test result is not within the specification limits, the laboratory shall immediately notify the Contractor, the supplier, and the Contracting Officer. The Contractor, after notifying the Contracting Officer, may check test the retained sample.
- E. If the retained sample tests satisfactorily, the material will be accepted. If the retained sample also fails, the following schedule of price adjustments shall apply. The average of test values for the two samples will determine the basis for price adjustment, except when test results on the samples differ by more than the applicable AASHTO or ASTM Repeatability Unit; then, the test result numerically nearest the specification requirement

will be used. (A repeatability unit is defined as D2S or D2S% limit for single operator precision described in ASTM C670.)

- F. The schedule of price adjustments shall not apply to the following tests:

Test	AASHTO Test Method
Spot Test	T102
Particle Charge	T59
Ductility	T51

- G. Bituminous materials failing to meet specifications for these tests shall be removed and replaced.
- H. See Table 011250-1 for the schedule of price adjustments for bituminous materials that do not meet specifications.

Table 011250-1				
Schedule of Price Adjustments for Out-of-Specification Bituminous Materials.				
Application	Deviation from Specification Limit Measured in Reproducibility Units*.			
	Less than 1	1 but less than 2	2 but less than 3	3 or more
Price reduction applicable to bituminous base course and pavement mixture or to seal coat and bituminous material paid for as a separate item.	0%	5%	25%	Remove & Replace
Price reduction applicable to bituminous material paid for as a separate item.	0%	10%	25%	Remove & Replace
* A reproducibility unit is defined as D2S or D2S% limit for multi-laboratory precision described in ASTM recommended practice C670.				

The Sieve Test (AASHTO T59) results may be exempt from the Schedule of Price Adjustments provided the contractor's quality assurance program includes checking the uniformity of bituminous spread rates in increments no greater than 1 foot over the width of the spray bar and variation between increments is no greater than 5 percent.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 011250

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 011900 - MOBILIZATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This item is intended to compensate the Contractor for operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for payment of premiums for bonds and insurance for the project; and for any other work and operations which must be performed or costs that must be incurred incident to the initiation of meaningful work at the site and for which payment is not otherwise provided for under the contract.

1.2 MEASUREMENT AND PAYMENT

- A. The measurement shall be lump sum for mobilization. Payment shall be as follows:
 - 1. Bond premiums will be reimbursed after receipt of the evidence of payment.
 - 2. 50% of the lump sum, not to exceed 5% of the original contract amount, will be paid following completion of 5% of the original contract amount not including mobilization and bond premiums.
 - 3. Payment of the remaining portion of the lump sum, up to 10% of the original contract amount, will be paid following completion of 10% of the original contract amount not including mobilization and bond premiums.
 - 4. Any portion of the lump sum in excess of 10% of the original contract amount will be paid after final acceptance.
 - 5. Progress payments for mobilization and preparatory work shall be subject to retainage.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011900
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals. See Table 013300-1 for a summary of required submittals.
- B. See other specification section within this package for additional requirements on submittal.

1.2 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. The Contracting Officer (CO) reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on CO's receipt of submittal.
 - 1. Initial Review: Allow 14 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. CO will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Allow 14 days for processing each re-submittal.
 - 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- C. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space on label or beside title block to record Contractor's review and approval markings and action taken by CO.
 - 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.

- c. Name and address of Contractor.
 - d. Name of manufacturer.
 - e. Unique identifier, including revision number.
 - f. Number and title of appropriate Specification Section.
 - g. Drawing number and detail references, as appropriate.
 - h. If more than one item is shown on submittal sheet, identify item.
- D. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- E. Additional Copies: Unless additional copies are required for final submittal, and unless CO observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
- F. Use for Construction: Use only final submittals with mark indicating action taken by CO in connection with construction.

1.3 MEASUREMENT AND PAYMENT

- A. No separate measurement and/or payment will be made for this section. Payment shall be included with work shown in the schedule of items.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS – (Submittals requiring CO approval)

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- 1. Number of Copies: Submit A PDF copy of each submittal, unless otherwise indicated. CO will return two copies. Mark up and retain one returned copy as a Project Record Document.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
- 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Compliance with recognized trade association standards.
 - g. Compliance with recognized testing agency standards.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Notation of dimensions established by field measurement.
 - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
- D. Contractor's Construction Schedule: The contractor shall submit a Construction Schedule, for approval by CO, in accordance with the contract provisions within 5 day of commencement of work.
- E. Samples: Prepare physical units of materials or products, including the following:
 - 1. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

2.2 INFORMATIONAL SUBMITTALS – (Submittals NOT requiring CO approval)

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit a PDF copy of each submittal, unless otherwise indicated. CO will not return copies.
 - 2. Certificates and Certifications: Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - 3. Test and Inspection Reports: Comply with requirements in Section 014100 "Quality Control."
- B. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- C. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- D. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment.

- E. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

PART 3 - EXECUTION

3.1 GENERAL

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to CO.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
- C. CO will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.
- E. Substitutions – Whenever materials, products, and equipment are listed by name or brand in the specifications and/or on the drawings, it is used as a measure of quality, utility, or standard. If the Contractor prefers to use any other brand or manufacturer of same quality, appearance and utility to that specified, he shall request substitution as provided below, not less than 30 days before the planned installation of the item. The Contracting Officer will approve or disapprove the request for substitution.
- F. Requests for substitutions will only be considered if contractor submits the following:
 - 1. Complete technical data including drawings, complete performance specifications, test data, samples and performance tests of the article proposed for substitution. Submit additional information if required by Contracting Officer. All items in the above information shall be circled, tagged, or marked in some way to indicate all deviations or differences which the proposed item differs from the originally specified item.
 - 2. Similar data as above for item originally specified. All items shall be marked to identify where/how the proposed substitution will differ.
 - 3. A statement by the Contractor that the proposed substitution is in full compliance with the contract documents, applicable codes, and laws.
 - 4. The Contractor shall be responsible for any effect upon related work in the project for any substitution and shall pay any additional costs generated by any substitutions.

- 3.2 SUBMITTAL SCHEDULE – Submittals shall be made as required by and called for in the drawings and specifications. The following table is a summary of the required

submittals for the project - the table is to assist the Contractor and may not be all inclusive
– additional submittals may be required by specific specifications:

TABLE 013000-1

Spec. Section	Section Title	Sub-section	Required Submittal
C	General Specifications	1.3A	Stream Protection Plan
C	General Specifications	1.4A	Traffic Control Plan
010250	Construction Staking	3.6 A	Survey Notes
013300	Submittal Procedures	2.1D	Construction Schedule
014100	Quality Control	1.3 A	Contractor quality control plan
014100	Quality Control	1.3 B	Permits, Licenses, and Certificates
014100	Quality Control	1.3 C	Test and inspection reports
014100	Quality Control	1.3 D	As-Built drawings
017320	Selective Demolition	1.4A	Schedule
023701	Sediment & Erosion Control Measures	1.2A	Sediment & Erosion Control Plan
024134	Lead Waste Practices and Disposal	1.5A	Documentation/ Certified Renno- vator
024134	Lead Waste Practices and Disposal	1.5A	Disposal certificates
024134	Lead Waste Practices and Disposal	1.5A	Health and Safety Plan
033000	Cast-in-Place Concrete	1.3A	Product Data
033000	Cast-in-Place Concrete	1.3B	Design Mix
033000	Cast-in-Place Concrete	1.3C	Shop Drawings
033000	Cast-in-Place Concrete	1.3D	Test Reports
044313 .16	Adhered Stone Masonry	1.2A	Product Data
044313 .16	Adhered Stone Masonry	1.2B	Samples
048100	Unit Masonry	1.2A	Product Data
048100	Unit Masonry	1.2B	Certificates
048100	Unit Masonry	1.2C	Mix Designs
048101	Prefabricated Firebox and Chimney Assemblies	1.2A	Product Data
048101	Prefabricated Firebox and Chimney Assemblies	1.2B	Shop Drawings
048101	Prefabricated Firebox and Chimney Assemblies	1.2C	Certificates
061600	Sheathing	1.2A	Product Data
073113	Asphalt Shingles	1.3A	Product Data
073113	Asphalt Shingles	1.3B	Samples
073113	Asphalt Shingles	1.4A	Test Reports
073113	Asphalt Shingles	1.4B	Research Reports
073113	Asphalt Shingles	1.4C	Warranty
073113	Asphalt Shingles	1.5A	Maintenance Data

Spec. Section	Section Title	Sub-section	Required Submittal
073129	Wood Shingles	1.3A	Product Data
073129	Wood Shingles	1.3B	Qualification Data
073129	Wood Shingles	1.3C	Maintenance Data
073129	Wood Shingles	1.3D	Warranty
073129	Wood Shingles	1.3E	Mockup
076200	Sheet Metal Flashing and Trim	1.3A	Product Data
076200	Sheet Metal Flashing and Trim	1.3B	Samples
079200	Joint Sealants	1.2A	Product Data
079200	Joint Sealants	1.2B	Schedule
087100	Door Hardware	1.2A	Product Data
090190 .52	Maintenance Repainting	1.4A	Product Data
090190 .52	Maintenance Repainting	1.4B	Samples
092900	Gypsum Board	1.2A	Product Data
099123	Interior Painting	1.3A	Product Data
099123	Interior Painting	1.3B	Samples
099600	High Performance Coatings	1.3A	Product Data
099600	High Performance Coatings	1.3B	Samples
101400	Signs	1.2A	Sign List Submittal
101415	Site Identification Sign (HDPE)	1.3A	Sample Sign Mock-Up
101420	Minor Site Identification Sign (HDPE)	1.3A	Sample Sign Mock-Up
129400	Family Unit Furnishings	1.2A	Product Data
129400	Family Unit Furnishings	1.2B	Color Samples
129410	Group Site Furnishings	1.2A	Product Data
129410	Group Site Furnishings	1.2B	Color Samples
132700	Precast Concrete Vault Restrooms	1.3A	Manufacturer's Literature
132700	Precast Concrete Vault Restrooms	1.3B	Shop Drawings
132700	Precast Concrete Vault Restrooms	1.3C	Design Calculations
132700	Precast Concrete Vault Restrooms	1.3D	Concrete Delivery Certificates
133442	Pre-Manufactured Shelter	1.4A	Shelter Design and Shop Drawings
221100	Water Distribution Systems	1.3A	Product Data
221100	Water Distribution Systems	1.3B	Water Disposal Plan
221100	Water Distribution Systems	1.3C	Operation and Maintenance Data
221105	Water Hydrants	1.3A	Manufacturer's Literature and Maintenance Data
221105	Water Hydrants	1.3B	Washed Rock Certification
221105	Water Hydrants	1.3C	Maintenance Data
221105	Water Hydrants	1.3D	Color Sample
221300	Onsite Wastewater Treatment System	1.3A	Product Data

Spec. Section	Section Title	Sub- sec- tion	Required Submittal
221300	Onsite Wastewater Treatment System	1.3B	Coordination Drawings
231126	Fac. Liquefied-Petroleum Gas Piping	1.4A	Product Data
231126	Fac. Liquefied-Petroleum Gas Piping	1.4B	Shop Drawings
231126	Fac. Liquefied-Petroleum Gas Piping	1.4C	Pipe Sizing Calculations
231126	Fac. Liquefied-Petroleum Gas Piping	1.4D	Field Quality Control Reports
231126	Fac. Liquefied-Petroleum Gas Piping	1.4E	Operation and Maintenance Data
260500	Common Work Results for Electrical	1.2A	Product Data
262726	Wiring Devices	1.2A	Product Data
262726	Wiring Devices	1.2B	Operation and Maintenance Data
312000	Earthwork	1.3A	Bedding and Backfill Certification
312000	Earthwork	1.3A	Sieve Analysis
312225	Excavation and Embankment	1.3A	Density Test Results
321204	Crushed Aggregate Base or Surface Course	1.2A	Compaction Test Results and Proctor
322622	Precast Concrete Wheel Stops	1.3A	Certificate of Compliance
332228	Culvert Pipe and Pipe Arches	1.3A	Shop Drawings
332228	Culvert Pipe and Pipe Arches	1.3B	Fabricator's Certification

END OF SECTION 013300
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 014100 - QUALITY CONTROL

PART 1 - GENERAL

- 1.1 This work shall consist of providing quality control in conformance with the inspection, testing, and product certification requirements of this contract to ensure compliance with the drawings and specifications. The Contractor shall provide all personnel, equipment, tests, and reports necessary to meet the requirements of the contract.
- 1.2 QUALITY CONTROL
- A. The Contractor shall provide and maintain a quality control system that will ensure all services, supplies, and construction work required under this contract conforms to the contract requirements. The Contractor shall perform, or cause to be performed, the sampling, inspection, and testing required to substantiate that all services, supplies, and construction conform to the contract requirements.
 - B. Special Tests and Inspections: Contractor will engage a testing agency to conduct required special tests and inspections. The Contractor shall authorize the testing agency to perform the required testing and inspections on the work completed. The authority shall include:
 - 1. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 2. Testing agency will re-test and re-inspect corrected work.
 - C. Retesting/Reinspecting: Contractor shall provide quality-control services for retesting and reinspection for replaced construction work or for work that failed to comply with the requirements under the contract.
- 1.3 SUBMITTALS
- A. Contractor Quality Control Plan
 - B. Permits, Licenses, and Certificates
 - C. Test and Inspection Reports
 - D. As-Built Drawings
- 1.4 MEASUREMENT AND PAYMENT
- A. No separate payment will be made for the work included under this section; rather payment shall be considered to be included in the items of work listed in the Schedule of Items.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 QUALITY CONTROL SYSTEM

- A. General: Perform required testing, inspections, sampling, and similar services per direction specified in the contract drawings and specifications and in accordance with established industry standards.

3.2 CONTRACTOR QUALITY CONTROL PLAN

- A. At the time of the preconstruction conference, the Contractor shall submit for approval a written Contractor Quality Control Plan.
 - 1. If the plan requires any revisions or corrections, the Contractor shall resubmit the plan within 10 days.
 - 2. The Government reserves the right to require changes in the plan during the contract period as necessary.
 - 3. No change in the approved plan may be made without written concurrence by the Contracting Officer.
 - 4. At a minimum, the plan shall include the following:
 - a. A list of personnel responsible for quality control and assigned duties. Include each person's qualifications.
 - b. A copy of a letter of direction to the Contractor's Quality Control Supervisor outlining assigned duties.
 - c. Names, qualifications, and descriptions of laboratories to perform sampling and testing, and samples of proposed report forms.
 - d. Methods of performing, documenting, and enforcing quality control of all work.
 - e. Methods of monitoring and controlling environmental pollution and contamination as required by all applicable regulations and laws.

3.3 TEST AND INSPECTION REPORTS

- A. Submit three copies of complete test results no later than three calendar days after the test was performed.
- B. Submit failing test results and proposed remedial actions within four hours of noted deficiency.
- C. Testing and Inspection Reports shall include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples, tests, or inspections.
 - 5. Names of individuals performing tests and inspections.
 - 6. Reference Specification Section(s).
 - 7. Complete test or inspection data.

8. Test and inspection results and an interpretation of test results.
9. Ambient conditions at time sample was taken, tested, or inspected.
10. Comments or professional opinion on whether tested or inspected work complies with the Contract Document requirements.
11. Name and signature of laboratory inspector.
12. Recommendations on retesting and reinspecting.

3.4 PERMITS, LICENSES, AND CERTIFICATES

- A. For Contracting Officer's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations relevant to the on performance of the work.

3.5 AS-BUILT DRAWINGS

- A. The Contractor shall maintain a set of the contract drawings depicting as-built conditions. These drawings shall be maintained in a current condition and shall be available for review. All variations from the original contract drawings shall be indicated in red on the drawings. Upon completion of the contract work, as-built drawings shall be submitted to the Contracting Officer.

3.6 SAMPLING, TESTING, AND CERTIFICATION REQUIREMENTS

- A. Sampling, testing, and Certification requirements and frequency for specific items shall be as specified in the drawings and specification. The following table is a summary of the required sampling, testing, and certification for the project - the table is to assist the Contractor, but may not be all inclusive – additional submittals may be required by specific specification section:

TABLE 014100-1			
Item	Subsection	Certification or Test Required	Frequency
033000	2.13	Mixing and Delivery	Each Truck
033000	3.13	Concrete – Slump, Air, Temperature	1 composite per truck load delivered
033000	3.13	Concrete - Compression Test Specimens	at 7 days and 28 days (see spec)
221100	3.2N	HDPE Pipe - Bent Strap Test	Once Daily
221100	3.5A	Hydrostatic Testing of Water System	See Spec.
221100	3.5B	Pressure and Leakage Test – Water Line	See Spec.
221100	3.6A	Bacteriological Examination	After disinfection, before use
221300	3.8A	Leak Test	Prior to Backfill
312000	3.14C	Compaction Test – at Pipe Zone	One per 600 Feet of Trench

TABLE 014100-1			
Item	Subsection	Certification or Test Required	Frequency
312000	3.14C	Compaction Test – at Pipe Zone	One test – at each road crossing
312000	3.14D	Compaction Test – above Pipe Zone	One per 600 Feet of Trench
312000	3.14D	Compaction Test – above Pipe Zone	One test every other lift – at each road crossing
312000	3.14I	Tracer Wire Conductivity Test	Until Passing
312000	3.17A	Compaction Test – Backfill/Fills	One per Vault Toilet
312000	3.17A	Compaction Test – Backfill/Fills	1 per slab
312225	3.12B	Moisture-Density Relationship	One Test for Each Soil Type Encountered
312225	3.12B	Compaction – Road Embankment (Method 4)	One test every 300 sq. yd. of embankment per lift
312225	3.12B	Compaction – Subgrade	One test every 1000 sq. yd. of subgrade
321204	3.4A	Compaction Tests – Road Base and Surface Course	One test for every 300 sq. yd. of aggregate
321204	3.4A	Compaction Tests – Aggregate Base for Concrete Slabs	One test for each family unit or group area
321204	3.4A	Compaction Tests – Aggregate Base for Concrete Slabs	One test for each prefabricated building pad
332228	3.7C	Compaction Tests	One test for every 12 inches of lift placed

END OF SECTION 014100
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 017320 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes demolition and removal of the following:
 - 1. Selected portions of the toilet buildings.
 - 2. Repair procedures for selective demolition operations.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Government.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Government property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, including interruption of utility services.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6 and NFPA 241.
- C. Pre-demolition Conference: Conduct conference at Project site with contractor, subcontractors and Contracting Officer's Representative.

1.6 PROJECT CONDITIONS

- A. Conduct selective demolition so Government operations will not be disrupted. Provide not less than 72 hours' notice to CO of activities that will affect Government operations.
- B. Maintain access to existing building amenities, pathways, and other adjacent occupied or used facilities.
 - 1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from the COR.
- C. Government assumes no responsibility for condition of areas to be selectively demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Government as far as practical.
- D. Hazardous Materials: Lead based paint is likely to be encountered. Follow procedures noted in Specification 024134. Other hazardous materials are unknown at this time in buildings to be selectively demolished.
 - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. Storage or sale of removed items or materials on-site will not be permitted.

1.7 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price for items shown on the Schedule of Items.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equal or surpasses that of existing materials.
 - 3. Completely fill holes and depressions in existing siding and wood components with 3M Bondo, 20082, wood filler or similar.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.

- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to CO.

3.2 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct roads, without permission from CO. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
 - 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
 - 3. Protect existing site improvements, appurtenances, and landscaping to remain.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

3.3 POLLUTION CONTROLS

- A. Dust Control: Use temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by CO, items may be removed to a suitable, protected storage location during selective demolition [and cleaned] and reinstalled in their original locations after selective demolition operations are complete.

3.5 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
1. Completely fill holes and depressions in existing siding and wood components with as recommended by the manufacturer of 3M Bondo, 20082, wood filler or similar. Sand surface until patch is not visible.
- C. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.
- D. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
- E. Ceilings: Patch and repair existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Government property and legally dispose of them.

END OF SECTION 017320
JANUARY 2021

DRAFT

USDA FOREST SERVICE, R4

GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT

SECTION 022340 - OBLITERATION OF OLD ROADWAYS AND PARKING SPURS

PART 1 - GENERAL

1.1 This item shall consist of obliteration and work to prevent erosion and encourage revegetation, in accordance with these specifications, of such old roadways or areas as are indicated on the drawings or designated on the ground for obliteration.

1.2 METHOD OF MEASUREMENT

- A. There will be no separate measurement or payment for work in this Section. Payment will be included in the contract unit price as shown on the Schedule of Items.

PART 2 - PRODUCTS

- A. NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL

- A. The obliteration of old roadways shall consist of rough grading when needed, ripping or scarifying, cross ditching, and opening drainages. The work shall not commence until after the designated sections are no longer needed to serve traffic.

3.2 ROUGH GRADING

- A. Rough grading shall consist of filling the existing ditch (if applicable) and rough out sloping of the roadway. The old road shoulder shall be roughly broken down to present a more natural appearance.

3.3 RIPPING

- A. After the rough grading has been completed, the area of the old roadway shall then be ripped, scarified or plowed to a minimum 6 inch depth at maximum 16 inch intervals and left in a condition suitable for reseeding, or to encourage natural revegetation.

3.4 DRAINAGES

- A. Live streams and other drainages shall be opened by removing the old structures and grading the approach fills so that they will in no way impair the flow in the channel. Materials with salvage value shall be carefully removed as directed by the Contracting Officer.

END OF SECTION 022340

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 023701 - SEDIMENT AND EROSION CONTROL MEASURES

PART 1 - GENERAL

1.1 The work under this section consists of furnishing all necessary labor, equipment, materials, and performing all operations in connection with construction sediment and control measures.

A. General

1. All erosion and sediment control measures are to be placed prior to any disturbance caused by grading and or excavation and shall conform to the requirements of the appropriate regulatory agency for the State.
2. The Contractor shall be solely responsible for ensuring that erosion and sediment control measures are implemented and maintained at the site.
3. Soil disturbing activities include but are not limited to: Clearing and grubbing, excavation for utilities and foundations, roadway and parking lot construction, construction or modification of site drainage, grading, and preparation for final seeding.

1.2 SUBMITTALS

- A. The Contractor shall be required to submit a sediment and erosion control plan in accordance with this specification for approval by the Contracting Officer 2 weeks prior to start of work.

1.3 PERMITS

- A. The Contractor shall apply for and pay for a National Pollutant Discharge Elimination System (NPDES) permit from the state of Utah.

1.4 MEASUREMENT AND PAYMENT

- A. No separate measurement and/or payment will be made for this section. Payment shall be included with work shown in the schedule of items.

PART 2 - PRODUCTS

2.1 SYNTHETIC FILTER FABRIC FOR SILT FENCES.

- A. Pervious sheet of polypropylene, nylon, or polyethylene fabric conforming to the following physical and hydraulic characteristics:

Physical Properties (Min.)	Requirement	Test Method
Grab Tensile, lbs.	W120/F100	ASTM-D-4632

Grab Elongation, %	15	ASTM-D-4632
Mullen Burst, psi	275	ASTM-D-3786
Puncture, lbs.	65	ASTM-D-4833
Trapezoidal Tear, lbs.	50	ASTM-D-4533
UV Resistance, %	80	ASTM-D-4355
AOS, US Sieve #	30/40	ASTM-D-4751
Permittivity gal/min-sq. ft.	90	ASTM-D-4491

- B. Filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120 F.
- C. Support Posts: 4 foot - 2 x 2 wood.

2.2 STRAW BALES

- A. Oat or wheat straw, free from weeds, viable weed seeds, foreign matter detrimental to plant life, and dry.
 - 1. Grass hay bales are not acceptable.
 - 2. In order to prevent deterioration of the bindings, all bales shall be either wire-bound or string-tied so that bindings are oriented around the sides rather than along the tops and bottoms of the bales.

2.3 STRAW WATTLES OR ROLLS

- A. Furnish straw wattles or rolls that are manufactured from weed free straw and wrapped in a tubular photodegradable plastic netting made from 85% high density polyethylene, 14% ethyl vinyl acetate and 1% color for UV inhibition. Conform to the following:
 - 1. Diameter 9 inches min.
 - 2. Netting strand thickness 0.030 inches
 - 3. Netting knot thickness 0.055 inches
 - 4. Mass of netting 0.315 to 0.385 ounces per foot

PART 3 - EXECUTION

3.1 CONSTRUCTION

- A. Install straw bales at local drainage ways to prevent silt intrusion upon adjacent drainage courses. Remove straw bales following establishment of vegetation cover and utilize as mulch at swales or on steep slopes.
- B. Prior to construction, install silt fence along the downhill construction limits to prevent silt intrusion upon adjacent land.
- C. Install sediment and erosion control measures on the down slope toe of all top soil stock piles.
- D. Maintain and remove all erosion controls as specified.

- E. Temporary seeding shall be placed on exposed surfaces that will not be brought to final grading or permanent cover treatment within 30 days of the exposure to reduce erosion and sedimentation by stabilizing exposed soils. Seeded areas shall be checked regularly for bare spots, washouts, and healthy growth to assure that a good stand of grass is being maintained. Reseed areas that fail to establish vegetation cover as soon as such areas are identified.

3.2 DUST CONTROL

- A. In areas subject to surface and air movement of dust, where on-site or off-site damage is likely to occur, one or more of the following preventive measures shall be taken for dust control:
 - 1. Minimize the period of soil exposure through the use of temporary ground cover and other temporary stabilization practices.
 - 2. Sprinkle the site with water until surface is wet. Repeat as needed.

3.3 SILT FENCE

- A. Silt fences are appropriate for the following general locations:
 - 1. Immediately upstream of the point(s) of runoff discharge from a site before flow becomes concentrated. Below disturbed areas where runoff may occur in the form of overland flow.
 - 2. Along the down slope toe of all top soil stock piles.
- B. Materials.
 - 1. Utilize standard strength synthetic filter fabric for sediment barriers. The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6 inch overlap, and securely sealed.
 - 2. The standard strength filter fabric shall be stapled or wired to the fence and 6 inches of the fabric shall be extended into the ground. Filter fabric shall not be stapled to existing trees.
 - 3. Support posts shall be spaced at a maximum 6 feet and driven securely into the ground a minimum of 24 inches.
 - 4. Filter fabric shall be buried a minimum of 12 inches.
 - 5. The height of a silt fence shall not exceed 36 inches. Higher fences may impound volumes of water sufficient to cause failure of the structure.
- C. Maintenance.
 - 1. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
 - 2. Silt fences shall be inspected for depth of sediment, tears, and to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground. Any deficiencies shall be repaired immediately.

3. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
4. Sediment deposits should be removed after each storm event and/or when deposits reach approximately 1/3 the height of the barrier or when the sediments limit or prevent the flow of water through the fabric hydraulic.
5. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared, and seeded.

3.4 STRAW BALE EROSION CONTROL FENCE

- A. Straw bale erosion control fences are appropriate for the following general locations:
 1. Sheet flow applications: Straw bales shall be placed in a single row, lengthwise on the contour with ends of adjacent bales tightly abutting one another.
 2. Channel flow applications: Straw bales shall be placed in a single row, lengthwise and oriented perpendicular to the direction of flow with ends of adjacent bales tightly abutting one another. The barrier shall be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment laden runoff will flow either through or over the barrier but not around it.
- B. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill shall conform to the ground level of the downhill side and shall be built up to 4 inches against the uphill side of the barrier.
- C. Each bale shall be securely anchored by at least 2 stakes or rebar driven through the bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or rebar shall be driven a minimum of 12 inches into the ground or deep enough into the ground to securely anchor the bales, whichever is greater.
- D. The gaps between bales shall be chinked (filled by wedging with straw to prevent water from escaping between the bales). Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency.

3.5 STRAW WATTLE OR ROLL

- A. Straw wattles shall be installed in accordance to manufacturer's installation guidelines.
- B. At a minimum:
 1. The wattle shall be entrenched and backfilled. A trench shall be excavated the width of the straw waddle and the length of the proposed barrier to a depth of 2-3 inches.
 2. Each wattle shall be securely anchored by at least one 18-24 inch stake every 3-4 feet and with a stake on each end. Stakes shall be driven perpendicular to slope

face through the middle of the wattle until 2-3 inches remains exposed above the waddle.

3. After the wattles are staked, compact excavated soil against the uphill side of the barrier.
4. Adjacent wattles should tightly abut.

3.6 MAINTENANCE

- A. Inspection shall be frequent and repair or replacement shall be made promptly as needed. Straw bale carriers shall be removed when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

END OF SECTION 023701

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GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 024100 - WASTE MATERIAL DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the loading, handling, hauling, and placing of excess excavation material, unsuitable excavation material, clearing and grubbing debris, and construction and demolition debris.

1.2 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this Section. Waste material disposal is considered incidental to other items of work shown in the Schedule of Items.

PART 2 - PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.1 WASTE MATERIAL TO BE HAULED TO A DISPOSAL AREA

- A. All excavated material not used in the construction of embankments or backfilling of trenches, or other excess material resulting from the excavation and embankment operation shall be hauled to a disposal area.
- B. All unsuitable excavated material and oversize boulders shall be hauled to a disposal area.
 - 1. Oversized boulders may be broken into sizes small enough to incorporate into the embankment according to Specification 312225.
- C. All stumps, slash and other clearing and grubbing debris shall be hauled to a disposal area.
- D. Disposal Area: All waste material above shall be hauled to the disposal area on Government property as designated by the Contracting Officer.
 - 1. Waste material shall be piled and compacted to form a dense layer.
 - 2. The size and shape of the piled waste material shall be designated by the Contracting Officer.
 - 3. The piled material shall be covered with soil to a uniform depth of six inches minimum and sloped to 2:1 or flatter.
 - 4. The disposal site shall be left suitable for seeding.

3.2 WASTE MATERIAL TO BE HAULED TO A LANDFILL

- A. All demolition materials, garbage, and other refuse generated shall be removed from the project site and legally disposed off of Government property in an approved landfill.
- B. The contractor is responsible for all costs and permits associated with landfill disposal.
- C. The Government is not responsible for waste material upon its departure from the project site.

END OF SECTION 024100
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SECTION 024102 - REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes removal disposal, and backfilling of existing water and sewer lines, water hydrants, site furnishings (picnic tables, fire rings, unit markers, curb stops), signs, utilities and all other items to the extent shown on the Drawings. This item also includes scarifying and regrading the area around features and structures removed.
- B. Related Sections Include the Following:
 - 1. Section 024100 "Waste Material Disposal."
 - 2. Section 329206 "Seeding."

1.2 MEASUREMENT AND PAYMENT

- A. Removal and Disposal of Structures and Obstructions: Payment will be lump sum for removal and disposal of structures and obstructions, including demolition, excavation, backfill, removal, hauling and all incidentals and work required to complete this item.

PART 2 - PRODUCTS

2.1 SELECT BACKFILL

- A. Select backfill shall be native or imported soil, sand, or granular soil free of stones larger than 6 inches in greatest dimension.

PART 3 - EXECUTION

3.1 GENERAL

- A. Topsoil stripping and storage, if required, shall comply with the applicable specification.
- B. The Contractor may use any means he may elect to remove the structure or items shown on the drawings to be removed, as long as he provides for the safety of the public and preservation of the surrounding site and structures.
- C. All of a substructure shall be demolished to a depth of 1 foot below the present ground level. All wood, concrete, and metal materials to be removed shall be broken into sufficiently small pieces to enable handling and disposal. All other structures shall be backfilled and the surrounding ground restored to as near normal conditions as practicable in accordance with these specifications.
- D. Backfill for removed items may be excess material from other excavation or borrow from an approved source.

1. Backfill shall be brought up in 12-inch compacted layers.
 2. Compaction shall be by mechanical tampers, with at least three passes over the entire surface.
 3. Maximum size of rock in backfill shall be 8 inches.
 4. Backfill shall be compacted and rounded 6 inches above the natural ground.
 5. If the backfill is not in an existing roadway or parking area, and at least 20 feet away from any proposed structure, the backfill shall be as specified above, except backfill shall be graded to blend with the natural ground and each layer compacted to **85 percent** of the optimum dry density determined by AASHTO T-99, Method C.
 6. In areas where backfill is in graveled or paved surface roadways, or within 20 feet of a proposed structure, the backfill shall be as specified above, except it shall be terminated at the grade shown on the drawings and each layer compacted to **95 percent** of the optimum dry density determined by AASHTO T-99, Method C. Completion of backfill shall be in accordance with the applicable surfacing specifications.
 7. When topsoil replacement is required, backfill and compaction shall be as specified above, except the backfill shall terminate 6 inches below the natural ground. Placement of topsoil, when required, shall comply with the applicable specification.
- E. Excessive settlement or other evidence of improper backfill shall be corrected by reopening the excavation to the depth required for proper refilling and compaction.

3.2 DISPOSAL

- A. Disposal of debris shall comply with Section 024100 "Waste Material Disposal."

3.3 FINISHING AND CLEANUP

- A. After the area has been backfilled, the disturbed area shall be finish graded to present a natural appearance and cleaned up by removing all debris and materials left from the removal of items in this Section.

3.4 SEEDING

- A. Seeding, if required, shall comply with Section 329206 "Seeding."

END OF SECTION 024102

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 024134 - LEAD WASTE PRACTICES AND DISPOSAL

PART 1 - GENERAL

1.1 SCOPE:

- A. This is a notification that the work under this contract will bring the Contractor into contact with lead-based paint covered materials that will require worker protection.
- B. Though the project is not subject to EPA's Renovation, Repair and Painting Rule (40 CFR 745), specific sections of the Rule shall be followed.
 - 1. Contractor shall comply with the Work Practice Standards requirements (Section 745.85) including, except the following shall not be required: firm certification, project site signage.
 - 2. Contractor shall comply with the Certified Renovator and on-the-job worker training requirements detailed in section 745.90. The training records for on-the-job training of uncertified works (Section 745.86(7)) are not required.
- C. Work under this section includes:
 - 1. Engineering controls which are necessary for surface preparation as part of resurfacing materials coated with lead-based paint and demolition/removal of materials coated with lead-based paint; and
 - 2. Disposal of hazardous and nonhazardous waste generated during the removal of lead-based paint coated materials.
- D. The Contractor shall not place paint debris on unprotected ground and paint debris shall be shielded adequately to prevent dispersion by wind or rainwater.
- E. The Contractor shall remove and dispose of in a legal manner all hazardous and nonhazardous waste generated. Waste (both hazardous and nonhazardous) shall be properly labeled, stored and secured while on site. Waste shall be removed from the project site for proper disposal within one week of project completion. At no time will waste be allowed to accumulate on-site for a period of more than 30 days.
- F. The Contractor shall contact the regional EPA, State, and local authorities to determine current lead-based paint debris disposal requirements. The requirements of the Resource Conservation and Recovery Act (RCRA) shall be complied with as well as applicable State and local solid waste regulations. During the work, the Contractor shall not leave debris in the yard or nearby property, incinerate debris, dump waste by a road or in an unauthorized dumpster, or introduce lead-contaminated water into storm drains or sanitary sewers.

1.2 TESTING

- A. Testing on lead-based paint coated waste materials by use of the Toxicity Characteristic Leaching Procedure (TCLP) will be completed by the Contractor and results supplied to the U.S. Forest Service.

1.3 MATERIALS

- A. The following materials will be tested to determine whether or not they are hazardous.
 - 1. Paint chips.
 - 2. Waste water.
 - 3. Dust from HEPA filters and from damp sweeping.
 - 4. Plastic sheets, duct tape, or tape used to cover floors and other services during work with lead-based paint covered components.
 - 5. Solvents and caustics.
 - 6. Liquid waste, such as wash water used to decontaminate wood after solvents have been used, and liquid waste from exterior water blasting.
 - 7. Rags, sponges, mops, HEPA filters, respirator cartridges, scrapers, and other materials used for testing and cleanup.
 - 8. Disposable work clothes and respirator filters.
 - 9. Any other items contaminated with lead-based paint.
 - 10. Dirt collected from around the site.

1.4 WORKER PROTECTION

- A. OSHA requirements for worker protection shall be followed in accordance with 29 CFR 1926.62, Lead Exposure in Construction.

1.5 SUBMITTALS

- A. A copy of the Contractor or Sub-Contractor's documentation for the project's Certified Renovator(s), as defined by EPA's Renovation, Repair and Painting Rule, shall be submitted to the U.S. Forest Service.
- B. The Contractor shall inform the U.S. Forest Service of the location of the approved waste disposal site and provide a certification after disposal.
- C. Health and Safety Plan
 - 1. The Contractor shall provide a Health and Safety Plan for review and acceptance by the Contracting Officer. No work will commence until acceptance of the plan by the Contracting Officer.
 - 2. The Health and Safety Plan will address, but not be limited to, the health-related standards and protective measures proposed to be utilized by the Contractor during work involving exposure to airborne lead contaminants.
 - 3. The Health and Safety Plan will also identify the engineering and work practice controls proposed to be implemented by the Contractor. Such controls will be identified to assure the Government that there will be no release to the environment of lead contamination for which liability may be imposed on the Government.

1.6 CONTRACTOR'S SUBMITAL RESPONSIBILITIES

- A. Review product data and samples prior to submission to the COR.
- B. Submitted material must bear a statement of Contractor's review.
 - 1. Example: This submission has been reviewed and submitted in accordance with the General Conditions.

Signed Date
(Contractor's name, address, etc.)
- C. Coordinate each submittal with requirements of work and of Contract Documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by the U.S. Forest Service review of submittals.
- E. Contractor's responsibility for deviations in submittals from requirements of contract documents is not relieved by the U.S. Forest Service review of submittals, unless the U.S. Forest Service gives written acceptance of specific deviations.
- F. Notify the U.S. Forest Service in writing at the time of submission of deviations in submittals from requirements of the contract documents.
- G. Begin no work which requires submittal for approval until the U.S. Forest Service has "approved" or "approved as noted" the submittal.

1.7 MEASUREMENT AND PAYMENT

- A. No separate measurement and/or payment will be made for this Section. This work will be included in a line items described in Section 000050, Project Description.

PART 2 - PRODUCTS – SEE PART 3.

PART 3 - EXECUTION

3.1 SITE PREPARATION

- A. The Contractor shall prepare the site in accordance with the Health and Safety Plan accepted by the Contracting Officer.
- B. The Contractor is responsible for establishing and maintaining control measures sufficient to preclude any adverse effects to workers, Forest Service personnel and dependents, the public, and the environment.

3.2 DAILY CLEANUP

- A. Daily cleanup shall be in accordance with the Health and Safety Plan accepted by the Contracting Officer. Any environmental cleanup caused by Contractor's failure to comply with the provisions of law, of this contract, or the accepted Health and Safety Plan shall be at Contractor's sole expense.

- B. Do not allow any paint debris to enter industrial waste, storm drain or sanitary sewer lines.

3.3 HANDLING AND DISPOSAL OF NON-HAZARDOUS WASTE (as determined by testing)

- A. The Contractor shall comply with all Federal, State and local regulations concerning proper disposal of non-hazardous, solid waste.
- B. The Contractor shall place lead-based paint chips, debris, and lead dust in double (4-mil) or single (6-mil) polyethylene bags that are air-tight and puncture-resistant. Pieces of wood or other types of substrates that do not fit into plastic bags will be wrapped and labeled "DANGER, LEAD DUST".
- C. The Contractor will place all disposable cleaning materials, such as sponges, mop heads, filters, disposable clothing, and brooms in double (4-mil) or single (6-mil) plastic bags and seal.
- D. The Contractor shall clean surfaces and equipment and bag large debris. The Contractor shall then remove plastic sheeting and tape from covered surfaces. Prior to removing the plastic sheeting, the Contractor shall lightly mist the sheeting in order to keep dust down and fold inward to form tight small bundles to bag for disposal. The Contractor shall place all plastic sheeting in double (4-mil) or single (6-mil) thick plastic bags and seal.
- E. The contractor shall bag and seal vacuum bags and filters in double (4-mil) or single (6-mil) thick plastic bags.
- F. The Contractor shall place all contaminated clothing or clothing covers used during lead-based paint disturbing activities and during cleanup operations in plastic bags for disposal prior to leaving equipment room.
- G. The Contractor shall place solvent residues and residues from strippers in drums made out of materials that cannot be dissolved or corroded by chemicals. Solvents will be tested by the contractor to determine if they are hazardous.
- H. Solvents, caustic and acid wastes must be segregated and not stored in the same containers.
- I. The Contractor shall contain and properly dispose of all liquid waste, including lead-dust contaminated wash water.
- J. The Contractor shall HEPA vacuum the exterior of all liquid waste containers prior to removing the waste containers from the work area and shall wet wipe the containers to ensure that there is no residual contamination. Containers should then be moved out of the work area into the designated storage area.
- K. The Contractor shall carefully place the containers into the truck or dumpster used for disposal.
- L. The Contractor shall ensure that all waste is transported in covered vehicles to an appropriately permitted landfill which accepts waste containing lead.

- M. If the Contractor subcontracts the removing of the lead-based paint waste, he shall insure that the company removing the waste material adequately covers all loads so as to assure that no dust or debris is released.

3.4 HANDLING AND DISPOSAL OF HAZARDOUS WASTE (as determined by testing)

- A. The Contractor will be required to comply with the hazardous waste disposal regulations of RCRA Subtitle C, Managing Hazardous Waste.
- B. If more than 220 pounds of hazardous waste will be generated from project activities during any calendar month, the Contractor shall apply for an EPA identification number from the appropriate Regional EPA office. If an EPA identification number application is required, it will be submitted on behalf of the US Forest Service; the US Forest Service will be listed as the generator and the generator's address will be the project site address. The U.S. Forest Service will assist the Contractor in contacting the appropriate EPA office to secure the identification.
- C. Waste Containers: The Contractor will comply with EPA and DOT regulations for containers. The Contractor shall contact the state and local authorities to determine their criteria for containers. The more stringent regulation shall apply.
- D. Waste Transportation: If the Contractor is not a certified hazardous waste transporter, a contract shall be entered into with a certified transporter to move the waste. The Contractor shall require the certified hazardous waste transport to follow RCRA regulation.

3.5 FINAL SITE CLEANUP

- A. Clean all surfaces in the project area until no visible paint dust, debris, residue or chips remains.
- B. Remove all dust and debris without dispersal and seal in heavy plastic bags.
- C. Remove protective plastic sheeting and mist before folding it dirty side inward.

3.6 INSPECTION

- A. Contractor shall notify Contracting Officer of readiness for final inspection.
- B. Contractor's Certified Renovator, accompanied by the Contracting officer, shall perform a visual inspection of the entire project area to determine if any visible dust and debris are present in or beyond the boundaries of the project area.
- C. Any visible debris will result in the Contractor recleaning the area at no additional cost to the Government.

END OF SECTION 024134

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 026460 - DUMPSTER PAD AND SCREEN WALL ENCLOSURES

PART 1 - GENERAL

- 1.1 This item shall consist of a dumpster pad and firewood box with free standing enclosure walls constructed of reinforced concrete and crushed aggregate base. The firewood box shall include a double ornamental gate with support poses and locking mechanism. This pad shall be constructed as SHOWN ON THE DRAWINGS at the location (s) and grades staked in the field.
- 1.2 MEASUREMENT AND PAYMENT
- A. The quantity to be measured shall be the number of:
1. Concrete dumpster pads with free standing screen enclosure walls that are faced with cultured veneer stone that are constructed in place and accepted. Payment shall include the reinforced concrete pad, crushed aggregate base material under and around the concrete pad and finish grading.
 - a. Curb Stops shall be paid for under Section 322622 "Precast Concrete Curb Stops."
 2. Free standing screen enclosure walls that are faced with cultured, thin-veneer stone that are constructed in place and accepted. Payment shall include the concrete screen walls and cultured veneer stone facing on the screen walls with capstones.

PART 2 - PRODUCTS

- 2.1 CRUSHED AGGREGATE BASE – Shall be in accordance with Section 321204.
- 2.2 CONCRETE - Concrete shall be in accordance with Section 033000.
- 2.3 REINFORCING STEEL – Shall be in accordance with Section 033000.
- 2.4 FREE STANDING SCREEN ENCLOSURE WALLS – Shall be in accordance with Sections 033000 and 044313.16.

PART 3 - EXECUTION

- 3.1 SITE PREPARATION AND COMPACTION – Clearing, grubbing and the construction of the subgrade shall be completed before work proceeds with the installation of the support post for the recycling array or the placement of the concrete slab. The natural ground, borrow and crushed aggregate base shall be graded and compacted to the elevation shown on the drawings or established by the Contracting Officer.

3.2 CONCRETE PLACEMENT AND FINISH – Concrete walls shall be installed plumb. Placement of the concrete shall be in accordance with Section 033000 to the configuration and dimensions shown on the drawings. The finish shall be as specified in Section 033000.

1. FREE STANDING SCREEN WALL– Walls shall be installed plumb and placement of the concrete shall be in accordance with Section 033000 to the configuration and dimensions shown on the drawings. The screen wall facing shall be as specified in Section 044313.16.

3.3 CLEANUP AND FINISH GRADE APPLICATION – After the concrete has been placed and the initial set has occurred, the site shall be cleaned up by removing all forms of debris, false work and unutilized materials.

END OF SECTION
February 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings when project design requires special consideration.
- D. Field quality-control test reports.

1.4 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price for items shown on the Schedule of Items.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. Structural 1, B-B or better; mill oiled and edge sealed.
 - b. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 , deformed.
- B. Plain-Steel Wire: ASTM A 82, as drawn.
- C. Deformed-Steel Wire: ASTM A 496.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type II.
- B. Normal-Weight Aggregates: ASTM C 33, graded, from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.
- D. Fly ash, ground iron blast-furnace slag, or silica fume may partially replace cement in any mix as follows:
1. Fly Ash:
 - a. Class F – Not more than 20 percent of the minimum mass of portland cement may be replaced with class F fly ash.
 - b. Class C – Not more than 25 percent of the minimum mass of portland cement may be replaced with class C fly ash.
 2. Ground Iron Blast-Furnace Slag: Not more than 25 percent of the minimum mass of portland cement may be replaced with ground iron blast-furnace slag.
 3. Silica Fume (microsilica): Not more than 10 percent of the minimum mass of portland cement may be replaced with silica fume.
 4. Additionally, fly ash, slag, and silica fume will constitute no more than 50 percent of the total replacement weight.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Retarding Admixture: ASTM C 494/C 494M, Type B.
- C. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.

2.6 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E 1745, Class C, or polyethylene sheet, ASTM D 4397, not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.
- B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.7 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating or nondissipating. Liquid Membrane-Forming Compounds. Material shall be certified by curing compound manufacturer to not interfere with bonding of floor covering.

2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.9 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength: 3500 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 3. Slump Limit: 3-5 inch (75-125 mm), plus or minus 1 inch.
 4. Air Content: 4 percent, plus or minus 1 percent at point of delivery for 1-inch nominal maximum aggregate size.
- B. Foundation Walls: Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength: 3500 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 3. Slump Limit: 4 inches, plus or minus 1 inch.
 4. Air Content: 5 percent, plus or minus 1 percent at point of delivery for 1-inch nominal maximum aggregate size.
- C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength: 3500 psi at 28 days.
 2. Minimum Cementitious Materials Content: 540 lb/cu. yd.
 3. Slump Limit: 4 inches, plus or minus 1 inch.
 4. Air Content: 5 percent, plus or minus 1 percent at point of delivery for 1-inch nominal maximum aggregate size.
 5. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.

6. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd, increase mixing time by 15 seconds for each additional 1 cu. yd.
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.

- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer or round exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 48 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Contracting Officer.

3.4 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
1. Lap joints 6 inches and seal with manufacturers recommended tape.

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Contracting Officer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Space vertical joints in walls **as indicated**. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. **No Sawed Joints are allowed on concrete exposed to freezing.**
- D. Expansion Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by the Contracting Officer.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of

vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

- A. As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- B. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
 - 1. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water.

Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane.
 - 2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-foot- (3.05-m-) long straightedge resting on 2 high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm)
- D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
 - 1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.
- E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Contracting Officer before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as

specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

- b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..
- 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

3.12 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Contracting Officer. Remove and replace concrete that cannot be repaired and patched to Contracting Officer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Contracting Officer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Contracting Officer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Contracting Officer's approval.

3.13 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: 1 test per concrete truckload. A composite sample set consists of one slump test, one air entrainment test, and one temperature test.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample. Perform additional tests when concrete consistency appears to change or water is added.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M. Cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 - a. Compressive-Strength Tests: ASTM C 39/C 39M; test one of three laboratory-cured specimens at 7 days and one specimen at 28 days. If either previous tests fail, test third specimen at 28 days.
 - b. Strength of each batch delivered will be satisfactory if 28-day compressive-strength tests equals or exceeds specified compressive strength.
- C. Test results shall be reported in writing to Contracting Officer and Contractor within 48 hours of testing. Reports shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Correct deficiencies in the work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 033000
FEBRUARY 2018

USDA FOREST SERVICE, R4

GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT

SECTION 033020 - CONCRETE FROM PACKAGED DRY MIX FOR MINOR STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes constructing small concrete structures such as thrust blocks, pipe supports, and test hole fillers.

1.2 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this Section. Concrete from packaged dry mix is considered incidental to other items of work shown in the Schedule of Items.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete Dry Mix:
 - 1. Design: ASTM C 387, made using dry pre-portioned, blended and bagged mix.
 - 2. Minimum 28-day Compressive Strength: 4000 psi
 - 3. Product: Sakrete Concrete Mix, as manufactured by US Mix Products Company, or an approved equal.
- B. All reinforcement bars shall be deformed billet steel conforming to the requirement of ASTM A615, Grade 60.
- C. Water: Clean and free from alkali and other deleterious materials.

PART 3 - EXECUTION

3.1 CONCRETE INSTALLATION

- A. Mixing:
 - 1. Mix dry concrete and water thoroughly according to the manufacturer.
 - 2. Mixing Equipment: Mechanical mixer or wheel barrow.
 - 3. Place concrete while fresh; any concrete in which initial set has begun shall be wasted.
- B. Placing: Place the fresh concrete in the forms and work as necessary to remove the air pockets.
- C. Finishing: Apply medium trowel finish to exposed concrete surfaces.

- D. Protection From Cold: Keep the air temperature surrounding the fresh concrete above 40°F for a period of five days after the concrete is placed.
- E. Curing: If determined necessary by the Contracting Officer, cover exposed surfaces with plastic sheeting after the concrete has taken its initial set.

END OF SECTION 033020
January 2022

DRAFT

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 044313.16 - ADHERED STONE MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stone masonry adhered to unit masonry backup for pavilions.
2. Stone Masonry adhered to concrete backup for sign bases.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for concealed flashing.

1.2 ACTION SUBMITTALS

A. Product Data: For each variety of stone, stone accessory, and manufactured product.

B. Samples:

1. For each stone type indicated.
2. For each color of mortar required.

1.3 FIELD CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1.4 MEASUREMENT AND PAYMENT

A. No separate payment will be made for the work included under this section; rather payment shall be considered to be included in the items of work listed in the Schedule of Items.

1. This item is included in the pavilion line item and the major site identification sign base line item.

PART 2 - PRODUCTS

2.1 LIMESTONE

- A. Material Standard: Comply with ASTM C568
 - 1. Classification: I Low Density.
- B. Varieties and Sources: Subject to compliance with requirements, available stone varieties that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Thin Stone Veneer, Glen Rose Limestone or equal by Select Stone, PO Box 6403 Bozeman, MT 59711 (888)237-1000. www.selectstone.com
 - 2. Thin Stone Veneer, Rocky Mountain Moss or equal, Delta Stone, 2276 S Daniels Road, Heber, UT 84032, (435)654-3336, www.deltastone.com

2.2 MORTAR MATERIALS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Holcim (US) Inc.
 - b. Lafarge North America Inc.
 - c. Laticrete International, Inc.
 - d. Lehigh Hanson; Heidelberg Cement Group.
 - e. National Cement Company, Inc.
- B. Polymer Modified Veneer Mortar:
 - 1. Basis of Design Product: Laticrete MVIS Veneer Mortar or approved equal.
 - 2. Veneer Mortar is polymer fortified mortar designed specifically for the installation of adhered, natural stone.
 - a. Compressive Strength: ASTM C270, 2400 psi minimum.
 - b. Shear strength: ASTM C482, 300 psi minimum
 - c. Fiber reinforced.
 - d. Non sag
- C. Colored Masonry Pointing Mortar: Packaged blend of masonry cement and mortar pigments. Mix shall produce color indicated or, if not indicated, as selected from manufacturer's standard colors. Pigments shall not exceed 5 percent of masonry cement by weight.
 - 1. Basis of Design Product: Laticrete MVIS Pointing Mortar
 - a. ASTM C91, Compressive strength, 3,000 psi minimum.
- D. Aggregate: ASTM C144 and as follows:
 - 1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 sieve.
 - 2. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.

2.3 MISCELLANEOUS MASONRY ACCESSORIES

- A. Cementitious Dampproofing for Limestone: Cementitious formulation recommended by ILI and nonstaining to stone, compatible with joint sealants, and noncorrosive to veneer anchors and attachments.
- B. Weep Products: Use one of the following unless otherwise indicated:
 - 1. Wicking Material: Absorbent rope, made from UV-resistant synthetic fiber, 1/4 to 3/8 inch in diameter.
 - 2. Mesh Weep Holes: Free-draining mesh; made from polyethylene strands, full width of head joint and 2 inches high by thickness of stone masonry; in color selected from manufacturer's standard.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) CavClear/Archovations, Inc.
 - 2) Mortar Net Solutions.

2.4 FABRICATION

- A. Select stone to produce pieces of thickness, size, and shape indicated, including details on Drawings and pattern specified in "Setting Stone Masonry" Article.
 - 1. Shape stone specified to be laid in three-course, random range ashlar pattern.
- B. Gage backs of stones for adhered veneer if more than 81 sq. in. in area.
- C. Thickness of Stone: Provide thickness indicated, but not less than the following:
 - 1. Thickness: 1 inch – 1 1/2 inch plus or minus 1/4 inch.
- D. Finish exposed stone faces and edges to comply with requirements indicated for finish and to match approved samples and mockups.
 - 1. Finish: Natural cleft.
 - 2. Finish for Sills: Split face with sand-rubbed washes or as approved by COR.
 - 3. Finish for Lintels: Sand rubbed.

2.5 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride.
 - 2. Use latex modified mortar unless otherwise indicated.
 - 3. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in

small portions until mortar reaches required consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

- B. Latex-Modified Portland Cement Setting Mortar: Proportion and mix portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions.
- C. Mortar for Scratch Coat over Unit Masonry: Laticrete MVIS Veneer mortar or approved equal. Apply as recommended by manufacturer. Add enough water to produce a workable consistency
- D. Cement-Paste Bond Coat: Mix either neat cement and water or cement, sand, and water to a consistency similar to that of thick cream.
 - 1. For latex-modified portland cement, setting-bed mortar, substitute latex admixture for part or all of water, according to latex-additive manufacturer's written instructions.
- E. Pigmented Mortar: Use colored cement product.
 - 1. Pigments shall not exceed 5 percent of masonry cement by weight.

PART 3 - EXECUTION

3.1 SETTING STONE MASONRY

- A. Perform necessary field cutting and trimming as stone is set.
 - 1. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snapping.
 - 2. Use hammer and chisel to split stone that is fabricated with split surfaces. Make edges straight and true, matching similar surfaces that were shop or quarry fabricated.
- B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.
- C. Arrange stones in polygonal (mosaic) pattern with uniform joint widths. Mimic the pattern of the amphitheater rock work, directly east of the pavilions.
- D. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.
- E. Maintain uniform joint widths, except for variations due to different stone sizes and where minor variations are required to maintain bond alignment if any. Lay walls with joints not less than 3/8 inch at narrowest points or more than 1 inch at widest points.
- F. Provide sealant joints of widths and at locations indicated.
 - 1. Keep sealant joints free of mortar and other rigid materials.
 - 2. Sealant joints are specified in Section 079200 "Joint Sealants."

- G. Install embedded flashing and weep holes at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
1. At lintels and shelf angles, extend flashing full length of angles but not less than 6 inches into masonry at each end.
 2. At sills, extend flashing not less than 4 inches at ends.
 3. At ends of head and sill flashing, turn up not less than 2 inches to form end dams.
 4. Extend sheet metal flashing 1/2 inch beyond masonry face at exterior, and turn flashing down to form a drip.
 5. Install metal drip edges beneath flexible flashing at exterior wall face. Stop flexible flashing 1/2 inch back from exterior wall face and adhere flexible flashing to top of metal drip edge.
 6. Install metal flashing termination beneath flexible flashing at exterior wall face. Stop flexible flashing 1/2 inch back from exterior wall face and adhere flexible flashing to top of metal flashing termination.
- H. Coat limestone with cementitious dampproofing as follows:
1. Stone at Grade: Beds, joints, and back surfaces to at least 12 inches above finish-grade elevations.
 2. Stone Extending below Grade: Beds, joints, back surfaces, and face surfaces below grade.
- I. Place weep holes in joints where moisture may accumulate, including above shelf angles and at flashing.
1. Use wicking material mesh, weep holes or open head joints to form weep holes.
 2. Use wicking material to form weep holes above flashing in stone sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
 3. Space weep holes 24 inches o.c.
 4. Trim wicking material used in weep holes flush with exterior wall face after mortar has set.

3.2 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.
- B. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.
- C. Variation of Linear Building Line: For position shown in plan, do not exceed 1/2 inch in 20 feet or 3/4 inch in 40 feet or more.

3.3 INSTALLATION OF ADHERED STONE MASONRY VENEER

- A. Install scratch coat over metal lath 3/8 inch thick to comply with ASTM C926.

- B. Coat backs of stone units and face of masonry backup with cement-paste bond coat, then butter both surfaces with setting mortar. Use sufficient setting mortar, so a slight excess will be forced out the edges of stone units as they are set. Tap units into place, completely filling space between units and masonry backup. Remove any excess material from perimeter of stone.
- C. Rake out joints for pointing with mortar to depth of not less than 1/2 inch before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.

3.4 POINTING

- A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8-inch-deep until a uniform depth is formed.
- B. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch deep. Compact each layer thoroughly and allow to it become thumbprint hard before applying next layer.
- C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
 - 1. Joint Profile: Concave.

3.5 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain COR's approval of sample cleaning before cleaning stone masonry.
 - 3. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
 - 4. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Technical Note No. 20, Revised II, using job-mixed detergent solution.
 - 5. Clean limestone masonry to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.6 EXCESS MATERIALS AND WASTE

- A. Excess Stone: Stack excess stone where directed by COR for Government's use.
- B. Disposal as Fill Material: Dispose of clean masonry waste, including mortar and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

1. Do not dispose of masonry waste as fill within 18 inches of finished grade.

<https://www.youtube.com/watch?v=17o4Yg6YobE>

END OF SECTION 044313.16

JANUARY 2021

DRAFT

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 048100 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes unit masonry assemblies consisting of the following:
 - 1. Concrete masonry units (CMUs).

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.
 - 1. For masonry units include material test reports substantiating compliance with requirements.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1.3 QUALITY ASSURANCE

- A. Preconstruction Testing Service: The Contractor will engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made as part of work in this section per Measurement and Payment below.
 - 1. Concrete Masonry Unit Test: For each type of unit required, per ASTM C 140.
 - 2. Mortar Test (Property Specification): For each mix required, per ASTM C 780.
 - 3. Grout Test (Compressive Strength): For each mix required, per ASTM C 1019.
- B. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

1.4 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.5 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price as shown on the Schedule of Items for the building.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS (CMUs)

- A. Shapes: Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. Concrete Masonry Units: ASTM C 90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of **1900 psi**
 - 2. Weight Classification: Normal weight

2.2 CONCRETE AND MASONRY LINTELS

- A. Concrete Lintels: Precast units matching concrete masonry units and with reinforcing bars indicated or required to support loads indicated.
- B. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Division 3 Section "Cast-in-Place Concrete."
- C. Masonry Lintels: Made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Masonry Cement: ASTM C 91.
 - 1. Available Manufacturers:
 - a. Capital Materials Corporation.
 - b. Essroc, Italcementi Group
 - c. Holcim (US) Inc.;
 - d. Lafarge North America Inc.;
 - e. Lehigh Cement Company;
 - f. National Cement Company, Inc.; Coosa Masonry Cement.
 - g. Buehner Block Company of Salt Lake City, Utah
 - h. Amcor Inc. of Salt Lake City or Ogden, Utah
- D. Mortar Pigments: Iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.

1. Available Products:

- a. Bayer Corporation, Industrial Chemicals Div.; Bayferrox Iron Oxide Pigments.
- b. Davis Colors; True Tone Mortar Colors.
- c. Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.

E. Aggregate for Mortar: ASTM C 144.

- 1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
- 2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

F. Aggregate for Grout: ASTM C 404.

G. Water: Potable.

2.4 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

2.5 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with Division 7 Section "Sheet Metal Flashing and Trim."
- 1. Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
 - 2. Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.
 - 3. Metal Expansion-Joint Strips: Fabricate from stainless steel to shapes indicated.
- B. Solder and Sealants for Sheet Metal Flashings: As specified in Division 7 Section "Sheet Metal Flashing and Trim."
- C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer.

2.6 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains from new masonry without damaging masonry. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
- 1. Available Manufacturers:

- a. Diedrich Technologies, Inc.
- b. EaCo Chem, Inc.
- c. ProSoCo, Inc.

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement and lime.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification.
- C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 - 1. Pigments shall not exceed 10 percent of portland cement by weight.
 - 2. Pigments shall not exceed 5 percent of masonry cement by weight.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/ for dimensions of grout spaces and pour height.
 - 2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
- C. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.
- D. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
 - 1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.
- E. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick and concrete masonry units as follows:
 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.4 COMPOSITE MASONRY

- A. Bond wythes of composite masonry together using one of the following methods:

1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 2.67 sq. ft. (0.25 sq. m) of wall area spaced not to exceed 24 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
 2. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
 - b. Where bed joints of wythes do not align, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties.
- B. Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.
- C. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.
- D. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
1. Provide individual metal ties not more than 8 inches o.c.
 2. Provide continuity with masonry joint reinforcement by using prefabricated T-shaped units.
 3. Provide rigid metal anchors not more than **24 inches** o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.5 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 2. Limit height of vertical grout pours to not more than 60 inches.

3.6 FIELD QUALITY CONTROL

- A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
 - 1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.
- B. Testing Agency: The Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:
 - 1. Payment for these services shall be included in the LSQ for the building. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price as shown on the Schedule of Items for the building.
- C. Testing Frequency: One set of masonry tests is adequate for the entire project.
- D. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.
- E. Mortar Test (Property Specification): For each mix provided, per ASTM C 780. Test mortar for mortar air content and compressive strength.
- F. Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.

3.7 CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
 - 2. Protect adjacent surfaces from contact with cleaner.
 - 3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
 - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.8 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
1. Do not dispose of masonry waste as fill within 18 inches of finished grade.
 2. Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 048100
JANUARY 2021

DRAFT

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 048101 - PREFABRICATED FIREBOX AND CHIMNEY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes unit masonry assemblies consisting of the following:
 - 1. Modular Pre-cast Firebox
 - 2. Masonry Chimney System
 - 3. Firebrick Panel

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Contractor shall submit drawings for firebox construction, and prefabricated chimney stack according to Manufacturer. Drawings shall include directions that indicate manufacturer's recommended placement of firebox within fireplace design, and attachment to CMU masonry stack for firebox and chimney.
- C. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.

1.3 QUALITY ASSURANCE

1.4 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6.

1.5 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price as shown on the Schedule of Items for the fireplace.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide Units by one of the following or approved equal:
 - 1. Masonry Fireplace Industries, LLC
 - a. 315 W 3rd St. Santa Ana, CA 92701, (800) 345-7078
 - 2. Firerock
 - a. 3620 Avenue C, Birmingham, AL 35064 (888) 876-1025

2.2 PRODUCT DESCRIPTION

- A. Modular pre-cast firebox
 - 1. Wood Burning
 - a. Designed for field assembly as a fireplace
 - b. Sized according to drawings
 - c. All Interlocking parts necessary for assembly of a complete firebox and smoke dome
- B. Masonry Chimney System
 - 1. 14" ID masonry chimney
 - 2. Can be installed indoors and outdoors
- C. Firebrick Panel
 - 1. Split Herringbone

2.3 MATERIALS

- A. Lightweight concrete of a proprietary mixture of heat-treated aggregate and Portland cement for pre-cast firebox components
 - 1. Compressive Strength: Firebox 2550 psi
- B. Premixed (dry) Mortar
 - 1. Tensile strength: 875 psi; Compressive Strength: 2740 psi
 - 2. Tested per ASTM C109, ASTM C307, and ANSI 118.4
- C. Standard 1 1/8" high temperature refractory brick to line firebox interior
- D. Standard top mount anchor/damper by chimney manufacturer and per code requirements

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Prefabricated Firebox, Firebrick, and Prefabricated Chimney flue shall be constructed as per manufacturer's recommendations and as indicated in the drawings.

3.2 INSTALLATION

- A. Reference manufacturer's installation instructions for standard configurations, weights, sizes and installation details
- B. Suitable foundation and noncombustible hearth extensions shall be provided. See design drawings.
- C. Unit to be assembled on site per manufacturer's instructions
 - 1. Premixed mortar used at all joints between components
 - 2. Firebox to be lined with a minimum 1 1/8" rated firebrick
- D. Firebox must be listed for 2" clearance to wood framing members
- E. A minimum 2" clearance to combustible materials is required
- F. A 3" minimum clearance to insulation required
- G. 18" clearance to combustibles above opening

END OF SECTION 048101

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 049020 - STONE RESTORATION AND CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Repairing stonework, in limited locations of the Amphitheater as noted on the drawings including replacing damaged units.
 - 2. Repointing mortar joints.
 - 3. Removing plant growth.
 - 4. Cleaning exposed stone surfaces.

1.2 DEFINITIONS

- A. Low-Pressure Spray: 100 to 400 psi at 4 to 6 gpm
- B. Medium-Pressure Spray: 400 to 800 psi at 4 to 6 gpm.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use.
- B. Samples: For each exposed material required for replacing or repairing existing materials.

1.4 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price as shown on the Schedule of Items for the renovation.

PART 2 - PRODUCTS

2.1 STONE MATERIALS

- A. Stone: Provide natural building stone of variety, color, finish, size, and shape to match existing stone.
 - 1. For existing stone that exhibits a range of colors, finishes, sizes, or shapes, provide stone that matches that range.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II.

1. Provide white cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Sand: ASTM C 144, unless otherwise indicated.
 1. Color: Provide natural sand of color necessary to produce required mortar color.
 2. For pointing mortar, provide sand with rounded edges.
 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands, if necessary, to achieve suitable match.
- D. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes.
- E. Water: Potable.

2.3 CLEANING MATERIALS

- A. Water for Cleaning: Potable.
- B. Hot Water: Heat water to a temperature of 140 to 160 deg F (60 to 71 deg C).
- C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate (TSPP), 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.
- D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate (TSPP), 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.
- E. One-Part Limestone Cleaner: Manufacturer's standard one-part acidic formulation for cleaning limestone. Use only after consultation with the COR.
 1. Available Products:
 - a. American Building Restoration Products, Inc.; X-190 Limestone & Concrete Cleaner.
 - b. Hydrochemical Techniques, Inc.; Hydroclean Limestone and Marble Cleaner and Brightener (HT-907).
 - c. Price Research, Ltd.; Price Limestone Restorer.
 - d. ProSoCo; Sure Klean Limestone Restorer.

2.4 MISCELLANEOUS MATERIALS

- A. Stone Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching stone, is vapor- and water permeable, exhibits low shrinkage, and develops high bond strength to all types of stone.
 1. Formulate patching compound to match stone being patched.
 2. Available Products:

- a. Cathedral Stone Products, Inc.; Jahn Restoration Mortar.
- b. Edison Coatings, Inc.; Custom System 45.

2.5 MIXES

- A. Mortar Mixes: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Mix materials in a clean, mechanical batch mixer.
 - 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
 - 2. Mortar Pigments: Do not exceed a pigment-to-cement ratio of 1:10 by weight.
- B. Do not use admixtures of any kind in mortar, unless otherwise indicated.
- C. Pointing Mortar for Stone:
 - 1. 1-5-4 mix , by weight.
 - a. The 1st number is portion of Portland cement
 - b. The 2nd number is the lime
 - c. The 3rd number is sand
 - d. Sand used $\frac{1}{2}$ mason brown sand.
 - e. $\frac{1}{2}$ pea gravel (to get a larger aggregate in the mix)
 - f. The color added is made by Davis Color #5447, Portland at a ratio of 1:10.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from stone restoration work.
- B. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
 - 1. Cover adjacent surfaces with materials that resist chemical cleaners used unless chemical cleaners will not damage surfaces. Use materials that contain only waterproof, UV-resistant adhesives. When no longer needed, promptly remove masking to prevent adhesive staining.
 - 2. Keep wall wet below area being cleaned to prevent streaking from runoff.

3.2 STONE REMOVAL, REPLACEMENT, AND REPAIR

- A. Stone Removal: Carefully remove stone that has deteriorated, shifted, or is damaged beyond repair.

- B. Support and protect remaining stonework that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Remove in an undamaged condition as many whole stone units as possible.
 - 1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
 - 2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
- D. Clean stone surrounding removal areas by removing mortar, dust, and loose particles.
- E. Replace removed stone with other removed stone, where possible, or with new stone matching existing stone, including size. Butter vertical joints for full width before setting and set units in full bed of mortar, unless otherwise indicated.
 - 1. Tool mortar joints to match joints of surrounding existing stonework.
- F. Stone Repair: Carefully remove loose stone fragments in areas indicated to be repaired. Reuse only stone fragments that are in sound condition.
 - 1. Remove soil, loose stone particles, mortar, and other debris or foreign material from fragments and stone from which fragments were removed by cleaning with stiff-fiber brush.
 - 2. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces completely filling all crevices and voids.
 - 3. Fit stone fragments onto building stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured.
 - 4. Clean residual adhesive from exposed surfaces and patch chipped areas as specified in "Stone Patching" Paragraph.
- G. Stone Patching: Cut out deteriorated stone and adjacent stone that has begun to deteriorate. Remove additional material so patch will not have feathered edges and will be at least 1/4 inch thick.
 - 1. Remove loose particles, soil, debris, oil, and other contaminants.
 - 2. Brush-coat surfaces with slurry coat of patching compound.
 - 3. Place patching compound in layers not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
 - 4. Trowel, scrape, or carve surface of patch to match texture and surface plane of surrounding stone.
 - 5. Keep each layer damp for 72 hours or until patching compound has set.

3.3 CLEANING

- A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other.
- B. Use only those cleaning methods indicated for each material and location. Use the least intensive methods before moving to chemical cleaners.

1. Do not use wire brushes.
 2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip.
 3. For chemical cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
 4. For water spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
- C. Removing Plant Growth: Completely remove plant, moss, and shrub growth from stone surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open joints to whatever depth they occur.
- D. Chemical Cleaner Application Methods: Apply chemical cleaners to stone surfaces to comply with chemical cleaner manufacturer's written instructions; use brush or spray application methods, at Contractor's option. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.
- E. Cold-Water Soak: Apply cold water by prolonged spraying until surface encrustation has softened sufficiently to permit its removal by water wash.
1. Remove soil and softened surface encrustation from stone with cold water applied by low-pressure spray.
- F. Detergent Cleaning:
1. Wet stone with hot water applied by low-pressure spray.
 2. Scrub stone with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing.
 3. Rinse with hot water applied by low-pressure spray.
- G. Mold, Mildew, and Algae Removal:
1. Wet stone with cold water applied by low-pressure spray.
 2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
 3. Scrub stone with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing.
 4. Rinse with cold water applied by low-pressure spray.
- H. One-Part Limestone Chemical Cleaning:
1. Wet stone with cold water applied by low-pressure spray.
 2. Apply cleaner to stone by brush. Let cleaner remain on surface for period recommended by manufacturer.
 3. Immediately repeat application of one-part limestone cleaner.
 4. Rinse with cold water applied by medium-pressure spray.

3.4 REPOINTING STONework

- A. Rake out and repoint mortar joints as follows:

1. Remove mortar from joints to depth of joint width plus 1/8 inch but not less than 1/2 inch or not less than that required to expose sound, unweathered mortar. Remove mortar from stone surfaces within raked-out joints to provide reveals with square backs and to expose stone for contact with pointing mortar.
 2. Cut out mortar by hand with chisel and mallet.
 3. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and mallet. Strictly adhere to written quality-control program. Quality-control program shall include provisions for demonstrating ability of operators to use tools without damaging stone, supervising performance, and preventing damage due to worker fatigue.
 4. Rinse stonework-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen stonework-joint surfaces before pointing.
 5. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer. Where existing stone has worn or rounded edges, slightly recess finished mortar surface below face of stone to avoid widened joint faces.
 6. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.
- B. Cure mortar by maintaining in thoroughly damp condition for at least 72 hours including weekends and holidays.
1. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.

3.5 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
1. Do not use metal scrapers or brushes.
 2. Do not use acidic or alkaline cleaners.

END OF SECTION 049020
FEBRUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes specification for minor wood framing repair needed for restroom/
storage conversion:
 - 1. Framing with dimension lumber.
 - 2. Wood blocking, cants, and nailers.
 - 3. Wood furring.
- B. Related Sections include the following:
 - 1. Division 06 Section "Sheathing."

1.2 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal
in least dimension.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the
following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NLGA: National Lumber Grades Authority.
 - 3. RIS: Redwood Inspection Service.
 - 4. WCLIB: West Coast Lumber Inspection Bureau.
 - 5. WWPA: Western Wood Products Association.

1.3 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will
be included in the contract unit price for items shown in the schedule of items.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading
agency is indicated, comply with the applicable rules of any rules-writing agency certified
by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board
of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.

2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece..
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions/ repairs: Standard, Stud, or No. 3 grade.

1. Application: Interior partitions not indicated as load bearing.
2. Species:
 - a. Southern pine or mixed southern pine; SPIB.
 - b. Northern species; NLGA.
 - c. Western woods; WCLIB or WWP A.

B. Exposed Framing: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Cants.
 - 4. Furring.
 - 5. Grounds.
- B. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber of any species.
- C. Concealed Boards: 15 percent maximum moisture content and any of the following species and grades:
 - 1. Northern species; No. 2 Common grade; NLGA.
 - 2. Western woods; Construction or No. 2 Common grade; WCLIB or WWP.

2.5 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel as noted in drawings.
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.
- D. Nails, Brads, and Staples: ASTM F 1667.
- E. Power-Driven Fasteners: NES NER-272.
- F. Wood Screws: ASME B18.6.1.
- G. Lag Bolts: ASME B18.2.1.
- H. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- I. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Do not splice structural members between supports unless otherwise indicated.
- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 1. NES NER-272 for power-driven fasteners.
 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.
 4. Table 2305.2, "Fastening Schedule," in BOCA's BOCA National Building Code.
 5. Table 2306.1, "Fastening Schedule," in SBCCI's Standard Building Code.
 6. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 7. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in ICC's International One- and Two-Family Dwelling Code.
- F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.
- G. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 1. Comply with indicated fastener patterns where applicable.
 2. Use finishing nails, unless otherwise indicated. Indicate locations of other fasteners, such as wood screws, bolts, and lag screws, on Drawings.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
- C. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.3 PROTECTION

- A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Roof sheathing.
- B. Related Sections include the following:
 - 1. Division 06 Section "Rough Carpentry"

1.2 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

1.4 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included in the contract unit price for items shown in the schedule of items.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

- A. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
- B. Oriented Strand Board: DOC PS 2.
- C. Thickness: As needed to comply with requirements specified, but not less than thickness indicated in drawings.
- D. Factory mark panels to indicate compliance with applicable standard.

2.2 ROOF SHEATHING

- A. Plywood Roof Sheathing: APA Rated Sheathing, Exposure 1, Exterior sheathing.
 - 1. Span Rating: Not less than 24/0.
 - 2. Nominal Thickness: as indicated in the drawings.

- B. Oriented-Strand-Board Roof Sheathing: Exposure 1, Structural I sheathing.
 - 1. Span Rating: Not less than 24/16.
 - 2. Nominal Thickness: as indicated in the structural drawings.

2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
- B. Power-Driven Fasteners: NES NER-272.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
- D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Roof Sheathing:
 - a. Nail to wood framing 6" oc on panel edges. Ensure nails do not penetrate below the decking.
 - b. Space panels 1/8 inch apart at edges and ends.

END OF SECTION 061600
JANUARY 2021

DRAFT

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 070150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Full tear-off of entire roof system.

1.2 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.

1.3 FIELD CONDITIONS

- A. Existing Roofing System: Asphalt shingle roofing.
- B. Government will occupy portions of building immediately below reroofing area.
 - 1. Conduct reroofing so Government's operations are not disrupted.
 - 2. Provide Government with not less than 72 hours' written notice of activities that may affect Government's operations.
 - 3. Coordinate work activities daily with Government so Government has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
 - 4. Before working over structurally impaired areas of deck, notify Government to evacuate occupants from below affected area.
 - a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by Government as far as practical.
- F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed.

- G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

1.4 PRODUCTS MEASUREMENT AND PAYMENT

There will be no separate measurement or payment for work in this section. Payment will be included in the contract unit price for items shown in the schedule of items.

This work is a part of an optional bid item.

PART 2 - PRODUCTS

2.1 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- B. Shut off rooftop utilities and service piping before beginning the Work.
- C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

3.2 ROOF TEAR-OFF

- A. Notify Government each day of extent of roof tear-off proposed for that day.
- B. Full Roof Tear-off: Remove existing roofing and other roofing system components down to the existing roof deck.
1. Remove wood shingles.
 2. Remove base flashings and counter flashings.
 3. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
 4. Remove unadhered bitumen, unadhered felts, and wet felts.
 5. Remove fasteners from decking.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify COR.

1. Do not proceed with installation until directed by COR.

3.4 ROOF RE-COVER PREPARATION

- A. Remove blisters, ridges, buckles, and other substrate irregularities from existing roofing that inhibit new recover boards from conforming to substrate.
 1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
 2. Broom clean existing substrate.
 3. Coordinate with Government's inspector to schedule times for tests and inspections.
 4. Verify that existing substrate is dry.
 - a. Spot check substrates with an electrical capacitance moisture-detection meter.
 5. Remove materials that are wet or damp.
 - a. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
- B. Remove blisters, ridges, buckles, and other substrate irregularities from existing roofing that inhibit new roofing from conforming to substrate.
 1. Broom clean existing substrate.
 2. Coordinate with Government's inspector to schedule times for tests and inspections.
 3. Verify that existing substrate is dry before proceeding with installation.

3.5 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. When directed by COR, replace wood blocking and nailers.

END OF SECTION 070150.19
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber-reinforced asphalt shingles.
 - 2. Self-Adhering underlayment materials.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Asphalt shingles.
 - 2. Underlayment materials.
 - 3. Asphalt roofing cement.
 - 4. Elastomeric flashing sealant.
- B. Samples: For each exposed product and for each color and blend specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Research reports for synthetic underlayment.
- C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized installer who is trained and approved by manufacturer.

1.7 WARRANTY

- A. Materials Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.

1. Materials Warranty Period: 40 years minimum from date of Substantial Completion, prorated, with first 10 years non-prorated.
2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 100 mph for 15 years from date of Substantial Completion.
3. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 15 years from date of Substantial Completion.
4. Workmanship Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance in accordance with ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
- B. Wind Resistance: Provide asphalt shingles that comply with requirements of ASTM D3161/D3161M, Class F, and with ASTM D7158/D7158M, Class H.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D3462/D3462M, laminated, multi-ply overlay construction; glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 1. Basis of Design Product: Landmark Pro Shingles by CertainTeed or approved equal.
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation; Saint-Gobain North America.
 - b. GAF.
 - c. Owens Corning.
 3. Butt Edge: Straight cut.
 4. Strip Size: 13 1/4" x 38 3/4"
 5. Weight: 250 lb/SF
 6. Algae Resistance: Granules resist algae discoloration.
 7. Fire resistance Rating: UL Class A: ASTM D3018.
 8. Color and Blends: As selected by the COR from manufacturer's full range.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, Polymer-Modified Bitumen Sheet: ASTM D1970/D1970M, minimum 40-mil- thick sheet; glass-fiber-mat-reinforced, polymer-modified asphalt; with slip-resistant top surface and release backing; cold applied.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation; Saint-Gobain North America.
 - b. GAF.
 - c. Owens Corning.
2. Top Surface: Textured polymer film or Polyester.

2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D4586/D4586M Type II, asbestos free.
- B. Elastomeric Flashing Sealant: ASTM C920, Type S, Grade NS, one-part, non-sag, elastomeric polymer sealant; of class and use classifications required to seal joints and remain watertight; recommended in writing by manufacturer for installation of flashing systems.
- C. Roofing Nails: ASTM F1667, aluminum, stainless steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- diameter, sharp-pointed, with a 3/8- to 7/16-inch- diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through sheathing less than 3/4 inch thick.
 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- D. Underlayment Nails: Aluminum, stainless steel, or hot-dip galvanized-steel wire nails with low-profile metal or plastic caps, 1-inch- minimum diameter.

PART 3 - EXECUTION

3.1 INSTALLATION OF UNDERLAYMENT MATERIALS

- A. Comply with asphalt shingle and underlayment manufacturers' written installation instructions and with recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" applicable to products and applications indicated unless more stringent requirements are specified in this Section or indicated on Drawings.
- B. Self-Adhering, Polymer-Modified Bitumen Sheet: Install, wrinkle free, on roof deck in locations indicated on Drawings.
 1. Comply with low-temperature installation restrictions of underlayment manufacturer.
 2. Install lapped in direction that sheds water.
 - a. Lap sides not less than 4 inches
 - b. Lap ends not less than 6 inches, staggered 24 inches between succeeding courses.
 - c. Roll laps with roller.
 3. Cover underlayment within seven days.

3.2 INSTALLATION OF ASPHALT SHINGLES

- A. Install asphalt shingles in accordance with manufacturer's written instructions and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip at least 7 inches wide with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
 - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of laminated asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Fasten asphalt shingle strips with a minimum of six roofing nails, but not less than the number indicated in manufacturer's written instructions for roof slope and design wind speed indicated on Drawings and for warranty requirements specified in this Section.
 - 1. Locate fasteners in accordance with manufacturer's written instructions.
 - 2. Where roof slope is less than 4:12, hand seal self-sealing asphalt shingles to improve the shingles' positive bond by applying asphalt roofing cement spots between course overlaps after nailing the upper course.
 - 3. When ambient temperature during installation is below 50 deg F, hand seal self-sealing asphalt shingles by applying asphalt roofing cement spots between course overlaps after nailing the upper course.
- E. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing-shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds.
 - 1. Fasten with roofing nails of sufficient length to penetrate sheathing.

END OF SECTION 073113
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 073129 - WOOD SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Wood shingle roofing.
 - 2. Felt underlayment.
 - 3. Self-adhering sheet underlayment
 - 4. Cedar Breather underlayment

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For Grading Agency.
- C. Maintenance Data: For wood shingles to be included in maintenance manuals.
- D. Warranties: Special warranties specified in this Section.
- E. Mockup: Demonstrating nailing pattern and technique for approval of COR.

1.4 QUALITY ASSURANCE

- A. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label wood shingles for compliance with referenced grading rules.
- B. Source Limitations: Obtain wood shingles through one source from a single manufacturer.
- C. Nailing technique and pattern to be approved by Contracting Officer's Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
- B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be performed according to manufacturer's written instructions and warranty requirements.
 1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.7 WARRANTY

- A. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of wood shingle roofing that fail in materials or workmanship within the following warranty period:
 1. Warranty Period: Five years from date of Substantial Completion.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Wood Shingles: 100 sq. ft in unbroken bundles.

1.9 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price as shown on the Schedule of Items for the building.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 ROOF SHINGLES

- A. Ridge Units: Manufactured units of same thickness as roof shingle, 7 inches (180 mm) wide; beveled, alternately overlapped, and nailed.
 - 1. Grade: No. 1.
 - 2. Length: 18 inches (455 mm).
- B. Roof Shingles: Clear heartwood red cedar, No. 1 grade, 18 inches (455 mm) long by 5 inches wide by 1/4-inch nominal thickness.

2.3 UNDERLAYMENT MATERIALS

- A. Roof Felt Underlayment: ASTM D 226 or ASTM D 4869, Type I, (No. 30 asphalt-saturated organic felt).
- B. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40 mils (1.0 mm) thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied.
 - 1. Available Products:
 - a. Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; Dri-Start "A."
 - b. Grace, W. R. & Co.; Grace Ice and Water Shield.
 - c. Henry Company; Perma-Seal PE.
 - d. Johns Manville International, Inc.; Roof Defender.
 - e. NEI Advanced Composite Technology; AC Poly Ice and StormSeal.
 - f. Owens Corning; WeatherLock M.
 - g. Polyguard Products, Inc.; Polyguard Deck Guard.
 - h. Protecto Wrap Company; Rainproof TM.
 - i. SafSeal Innovations; SafSeal 7740.
- C. Cedar Breather Underlayment:
 - 1. Basis of Design: Benjamin Obidyke Incorporated, Cedar Breather Ventilated Underlayment for Wood Shingles or approved equal.

2.4 RIDGE UNITS

- A. Cedar Ridge Cap: Cedar "Certiridge" or approved equal. Tapersawn, clear heartwood red cedar, No. 1 grade. 16"- 18" in length minimum. www.capitolforest.com

2.5 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Drainage Mat: Manufacturer's standard compression-resisting, three-dimensional, nonwoven, entangled filament, nylon mat designed to permit air movement and drain incidental moisture by gravity.
 - 1. Available Products:

- a. Obdyke, Benjamin Incorporated; Cedar Breather.
 - C. Roofing Nails: ASTM F 1667; stainless-steel or hot-dip galvanized steel wire nails, sharp-pointed, and of sufficient length to penetrate a minimum of 3/4 inch (19 mm) into sheathing.
 - 1. Use shingle-type nails for wood shingles.
 - 2. Use box-type nails for wood shakes.
 - 3. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
 - D. Roof Staples: NOT ALLOWED.
 - E. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire nails with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.
- 2.6 METAL FLASHING AND TRIM
- A. Sheet Metal Flashing and Trim: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Sheet Metal: Stainless, steel Zinc-coated (galvanized) steel.
 - B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.
 - 1. Apron Flashings: Fabricate with lower flange a minimum of 6 inches (150 mm) over and beyond each side of downslope wood roofing and 6 inches (150 mm) up the vertical surface.
 - 2. Step Flashings: Fabricate with a head lap of 3 inches (75 mm) and a minimum extension of 5 inches (125 mm) over the underlying wood roofing and up the vertical surface.
 - 3. Cricket Flashings: Fabricate with concealed flange extending a minimum of 18 inches (450 mm) beneath upslope wood roofing and 6 inches (150 mm) beyond each side of chimney and 6 inches (150 mm) above the roof plane.
 - 4. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) with 1-inch- (25-mm-) high, inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm).
 - 5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 6-inch (150-mm) roof-deck flange and 2-inch (50-mm) fascia flange with 1/2-inch (12.5-mm) drip at lower edge.
 - C. Vent-Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches (100 mm) from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through roofing.
 - 3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROOF UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm,) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.
 - 1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.
 - 2. Eaves: Extend from edges of eaves 36 inches (914 mm) beyond interior face of exterior wall.
 - 3. Rakes: Extend from edges of rake 36 inches (914 mm) beyond interior face of exterior wall.
 - 4. Valleys: Extend from lowest to highest point 36 inches (914 mm) on each side.
 - 5. Hips: Extend 18 inches (450 mm) on each side.
 - 6. Ridges: Extend 36 inches (914 mm) on each side without obstructing continuous ridge vent slot.
 - 7. Sidewalls: Extend beyond sidewall 36 inches (914 mm) and return vertically against sidewall not less than 18 inches (450 mm).
 - 8. Dormers, Chimneys, Skylights, and other Roof-Penetrating Elements: Extend beyond penetrating element 18 inches (450 mm) and return vertically against penetrating element not less than 6 inches (150 mm).
 - 9. Roof Slope Transitions: Extend 36 inches (914 mm) on each roof slope.

3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Install metal flashings according to wood roofing recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope wood roofing and up the vertical surface.

- C. Step Flashings: Install with a headlap of 3 inches (75 mm) and extend over the underlying wood roofing and up the vertical surface. Install with lower edge of flashing just upslope of, and concealed by, butt of overlying shingle or shake. Fasten to roof deck only.
- D. Open-Valley Flashings: Install centrally in valleys, lapping ends at least 8 inches (200 mm) in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
 - 1. Secure hemmed flange edges into metal cleats spaced 12 inches (300 mm) apart and fastened to roof deck.
 - 2. Adhere 9-inch- (225-mm-) wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- E. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.
- F. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof deck.
- G. Pipe Flashings: Form flashing around pipe penetrations and wood roofing. Fasten and seal to wood roofing.

3.4 ROOF SHINGLE INSTALLATION

- A. Install wood shingle roofing according to manufacturer's written instructions and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. The contractor shall provide a nailing mockup for the Contracting Officer's Representative's review demonstrating nailing technique, number of nails before beginning work. Overdriven nails will not be allowed.
- C. Install drainage mat perpendicular to roof slope in parallel courses, butting edges and ends to form a continuous layer, and fasten to roof deck.
- D. Install double-layer wood shingle starter course along lowest roof edge. Extend starter course 1 inch (25 mm) over fascia and 1 inch (25 mm) over rake edge.
 - 1. Offset joints of double-layer starter course a minimum of 1-1/2 inches (38 mm).
- E. Install first course of wood shingles directly over starter course and in continuous straight-line courses across roof deck. Install second and succeeding courses of wood shingles in continuous straight-line courses across roof deck. Extend 1 inch (25 mm) over rake edge.
 - 1. Offset joints between shingles in succeeding courses a minimum of 1-1/2 inches (38 mm).
 - 2. Space shingles a minimum of 1/4 inch (6 mm) and a maximum of 3/8 inch (10 mm) apart. Limit alignment of vertical joints in every third course to not exceed 10 percent of joints.
 - 3. Fasten each shingle with 2 nails spaced 3/4 to 1 inch (19 to 25 mm) from edge of shingle and 1-1/2 to 2 inches (38 to 50 mm) above butt line of subsequent course.
Drive fasteners flush with top surface of shingles without crushing wood.

4. Maintain weather exposure of 5 inches (125 mm) for 16-inch- (405-mm-) long shingles.
- F. Shingles: Install one courses of shingles in continuous straight-line courses across roof deck. Center each shingle in succeeding courses between the 2 shingles below with 1/8-inch (3-mm) space between shingles.
1. Maintain weather exposure of 5 inches (125 mm).
- G. Ridge Units: Install units over wood shingles trimmed at apex. Maintain same exposure dimension of units as roof shingle exposure. Lap units at ridges to shed water away from direction of prevailing winds. Alternate overlaps of units and fasten with concealed roofing nails of sufficient length to penetrate sheathing.
1. Install concealed strip of roof felt underlayment over apex shingles and fasten with felt underlayment nails.
 2. Fasten ridge units to cover ridge vent without obstructing airflow.

3.5 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Contractor's **name**> of <**address**>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: USDA Forest Service, Logan Ranger District.
 2. Location: Logan, Utah
 3. Building Name/Type: Guinavah-Malibu Pavilion and storage buildings
 4. Address: Guinavah- Malibu Campgrounds, Logan Canyon Road
 5. Area of Work:
 6. Acceptance Date:
 7. Warranty Period:
 8. Expiration Date:
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding 90 mph ;
 - c. fire;

- d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
- 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 - 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 - 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 - 5. During Warranty Period, if original use of roof is changed, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 - 6. Government shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
 - 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this **<Insert day>** day of **<Insert month>**, **<Insert year>**.

- 1. Authorized Signature: **<Insert signature.>**
- 2. Name: **<Insert name.>**
- 3. Title: **<Insert title.>**

END OF SECTION 073129
FEBRUARY 2021

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following sheet metal flashing and trim:

1. Formed steep-slope roof sheet metal fabrications.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Fabricate and install flashing capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
1. Wind Zone 1: For velocity pressures of 21 to 30 lbf/sq. ft.: 60-lbf/sq. ft. perimeter uplift force, 90-lbf/sq. ft. corner uplift force, and 30-lbf/sq. ft. outward force.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.

1.4 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.6 COORDINATION

- A. Coordinate installation of sheet metal fascia, flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

1.7 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included in the contract unit price for items shown in the schedule of items.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
 - 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; structural quality.
 - 3. Surface: Smooth, flat.
 - 4. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 5. Color: As selected by Contracting Officer from manufacturer's full range.
 - 6. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.2 UNDERLAYMENT MATERIALS (Select from the following as indicated or required)

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
 - 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
 - b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
 - c. Henry Company; Blueskin PE200 HT.
 - d. Metal-Fab Manufacturing, LLC; MetShield.
 - e. Owens Corning; WeatherLock Metal High Temperature Underlayment.
 - f. Approved equal.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
- C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal fascia, flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric butyl sealant concealed within joints.
- F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application but not less than thickness of metal being secured.

2.5 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- B. Counterflashing: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- C. Flashing Receivers: Fabricate from the following materials:

1. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- D. Roof-Penetration Flashing: Fabricate from the following materials:
 1. Prefinished Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

2.6 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings in Frame Construction, where indicated or required: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high, end dams. Fabricate from the following materials:
 1. Prefinished Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing, not provided by Division 15: Fabricate from one of the following material:
 1. Galvanized Steel: 0.0276 inch thick.
 2. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
 3. Prepainted, Metallic-Coated Steel, where exposed to public view: 0.0276 inch thick.

2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
 - 1. Coat side of uncoated aluminum, stainless-steel and lead sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric butyl sealant.
- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
- F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric butyl sealant concealed within joints.
- G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
 - 1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
- H. Seal joints with elastomeric butyl sealant as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting

proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

- I. Soldered Joints, where required: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.

1. Do not solder prepainted, metallic-coated steel and aluminum sheet.
2. Pretinning is not required for lead-coated copper, zinc-tin alloy-coated stainless steel and lead.
3. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
4. Copper Soldering: Tin uncoated copper surfaces at edges of sheets using solder recommended for copper work.
5. Where surfaces to be soldered are lead coated, do not tin edges, but wire brush lead coating before soldering.
6. Lead-Coated Copper Soldering: Wire brush edges of sheets before soldering.
7. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for butyl sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant.
 1. Secure in a waterproof manner by means of snap-in installation and sealant or interlocking folded seam or blind rivets and sealant or anchor and washer at 36-inch centers.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.

2. Seal with butyl sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.4 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.5 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with butyl sealant to equipment support member.

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes the following, where indicated or required:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Latex joint sealants.

1.2 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.3 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.4 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

1.5 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included in the contract unit price for items shown in the schedule of items.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Colors of Exposed Joint Sealants: As selected by Contracting Officer from manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
- B. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint-Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- C. Stain-Test-Response Characteristics: Where elastomeric sealants are specified in the Elastomeric Joint-Sealant Schedule to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Available Products: Subject to compliance with requirements, joint sealant schedule, and manufacturer's recommendations, provide one of the products specified in each category below where needed:
 - 1. Elastomeric Joint Sealant Designation: ES1

- a. Base Polymer: Urethane.
 - b. Type: M (multicomponent).
 - c. Grade: P (pourable).
 - d. Class: 25.
 - e. Additional Movement Capability: 25 percent movement in extension and 25 percent in compression for a total of 50 percent movement.
 - f. Uses Related to Exposure: T (traffic).
 - g. Uses Related to Joint Substrates: M (mortar) and, as applicable to joint substrates indicated, O (other).
 - h. Products:
 - 1) Sikaflex - 2c SL
 - 2) Tremco - THC-900
 - 3) Approved equal
2. Elastomeric Joint Sealant Designation: ES2
- a. Base Polymer: Neutral-curing silicone.
 - b. Type: S (single component).
 - c. Grade: NS (nonsag).
 - d. Class: 25.
 - e. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.
 - f. Uses Related to Exposure: NT (nontraffic).
 - g. Uses Related to Joint Substrates: M (mortar), A (aluminum) and, as applicable to joint substrates indicated, O (other).
 - h. Products:
 - 1) GE Silpruf
 - 2) Tremco Spectrem 2
 - 3) Approved equal
3. Elastomeric Joint Sealant Designation: ES3
- a. Base Polymer: Elastomeric polymers and synthetic resins
 - b. Type: S (single component).
 - c. Solvent based.
 - d. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.
 - e. Uses Related to Exposure: NT (nontraffic).
 - f. Uses Related to Joint Substrates: Siding.
 - g. Products:
 - 1) OSI Quad
 - 2) Approved equal
4. Elastomeric Joint Sealant Designation: ES5
- a. Base Polymer: Acid-curing, mildew-resistant silicone.
 - b. Type: S (single component).

- c. Grade: NS (nonsag).
- d. Class: 25.
- e. Additional Movement Capability: 25 percent movement in extension and 25 percent in compression for a total of 50 percent movement.
- f. Uses Related to Exposure: NT (nontraffic).
- g. Uses Related to Joint Substrates: G (glass), A (aluminum) and, as applicable to joint substrates indicated, O (other).
- h. Products:
 - 1) Dow Corning - Trademate Tile and Ceramic
 - 2) GE - Sanitary 1700
 - 3) Tremco - Tremsil 600
 - 4) Approved equal

2.3 LATEX JOINT SEALANTS

- A. General: For interior locations only and where movement capacity and weathering characteristics are not critical, provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of either acrylic or silicone emulsion formulation indicated that is recommended for exposed applications on interior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
- B. Latex Sealant Standard: Comply with ASTM C 834 for each product of this description indicated in the Latex Joint-Sealant Schedule at the end of Part 3.
- C. Available Products: Subject to compliance with requirements, latex joint sealants that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Latex Joint Sealant Designation: LS1
 - a. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
 - b. Products:
 - 1) "AC-20," Pecora Corp.
 - 2) "Sonolac," Sonneborn Building Products Div., ChemRex, Inc.
 - 3) "Tremco Acrylic Latex 834," Tremco, Inc.
 - 4) Approved equal
 - 2. Latex Joint Sealant Designation: LS2
 - a. Silicone Emulsion Sealant: Provide product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920 that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.
 - b. Products:
 - 1) "Trade Mate Paintable Glazing Sealant," Dow Corning Corp.
 - 2) Approved equal

2.4 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates. Confirm compatibility of cleaners with adjacent surfaces prior to application.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
 3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.
- H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT SEALANT SCHEDULE (Select from the following where indicated or required)

JOINT SEALANT SCHEDULE		
DESIGNATION ON DATA SHEETS	JOINT SEALERS	DESCRIPTION OF JOINT CONSTRUCTION AND LOCATION WHERE SEALANT IS TYPICALLY APPLIED
ES-1	Multi-part Pourable	Exterior and interior horizontal joints subject to traffic such as expansion joints in sidewalks.
ES-2	One-Part Neutral Cure Silicone Sealant	Exterior and interior joints in vertical surfaces of concrete and masonry; between metal and concrete, interior and exterior perimeter joints of metal frames in exterior walls; exterior overhead joints. Joints which are bordered by glass.
ES-3	Elastomeric, Solvent Based Caulking	Cedar siding and trim.
ES-5	One-Part Mildew Resistant Silicone Sealant	Interior joints in vertical surfaces of ceramic tile in toilet rooms.
LS1/LS2	Latex Sealant	Exposed interior applications.
Notes:	1. Install sealant in joints fitting descriptions and locations listed.	

	<ol style="list-style-type: none">2. "LS1 and LS2" are for interior use only and are to be applied only if an "ES" designation is not otherwise indicated and where movement capacity and weathering characteristics are not critical.3. ES3 for siding should be formulated to match final siding stain color.4. If locations are encountered that are not described above, sealant manufacturer's recommendations are to be followed. The issue is to be brought to the attention of the Contracting Officer and General Contractor in writing. The appropriate sealant shall be submitted as part of the submittal process.
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END OF SECTION 079200
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 090190.52 - MAINTENANCE REPAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes maintenance repainting as follows:

1. Removing existing paint.
2. Patching substrates.
3. Repainting.

1.2 DEFINITIONS

- A. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
- B. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
- C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of paint system and each pattern, color, and gloss.
1. Label each Sample for location and application.

1.5 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included in the contract unit price for items shown in the schedule of items.

PART 2 - PRODUCTS

2.1 PREPARATORY CLEANING MATERIALS

- A. Water: Potable.
- B. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent

sodium hypochlorite bleach, and 15 quarts of warm water for every 5 gal. of solution required.

- C. Mildewcide: Commercial proprietary mildewcide or a job-mixed solution prepared by mixing 1/3 cup of household detergent that contains no ammonia, 1 quart of 5 percent sodium hypochlorite bleach, and 3 quarts of warm water.
- D. Abrasives for Ferrous Metal Cleaning: Aluminum oxide paper, emery paper, fine steel wool, steel scrapers, and steel-wire brushes of various sizes.
- E. Rust Remover: Manufacturer's standard phosphoric acid-based gel formulation, also called "naval jelly," for removing corrosion from iron and steel.

2.2 PAINT REMOVERS

- A. Low-Odor, Solvent-Type Paste Paint Remover: Manufacturer's standard low-odor, water-rinsable, solvent-type paste, gel, or foamed emulsion formulation for removing paint from masonry, stone, wood, plaster, or metal as required to suit Project; and containing no methanol or methylene chloride.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Building Restoration Products, Inc.
 - b. Cathedral Stone Products, Inc.
 - c. Diedrich Technologies, Inc.; a Hohmann & Barnard company.
 - d. Dumond Chemicals, Inc.
 - e. EaCo Chem, Inc.
 - f. PROSOCO, Inc.

2.3 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Colors: As selected by the Contracting Officer's Representative from full range of industry colors.

2.4 PAINT MATERIALS, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Transition Coat: Paint manufacturer's recommended coating for use where a residual existing coating is incompatible with the paint system.

2.5 PAINT MATERIALS

A. Metal Primers:

1. Primer, Rust-Inhibitive, Water Based: MPI #107.
 - a. Basis-of-Design Product: Sherwin Williams Pro-Cryl Universal Primer.
 - b. Option: Rustoleum: Zinsser Bullseye 123
 - c. Optional Benjamin Moore: Ultraspec Acrylic Metal Primer

B. Wood Primers:

1. Primer, Latex for Exterior Wood: MPI #6.
 - a. Basis-of-Design Product: Sherwin Williams Exterior Latex Wood Primer.
 - b. Option: Rustoleum: Zinsser Bullseye 2
 - c. Optional Benjamin Moore: Blockout 100% Acrylic Exterior Primer

C. Water-Based Paints: Gloss will be determined by COR.

1. Latex, Exterior Low Sheen (Gloss Levels 3-4): MPI #15.
 - a. Basis-of-Design Product: Sherwin Williams Duration Exterior Latex Satin
 - b. Option: Rustoleum: 5200 System DTM Acrylic Enamel
 - c. Optional Benjamin Moore: Ultra Spec X Exterior Satin
2. Latex, Exterior Semigloss (Gloss Level 5): MPI #11.
 - a. Basis-of-Design Product: Sherwin Williams Duration Exterior Latex Semigloss
 - b. Option: Rustoleum: 5200 System DTM Acrylic Enamel
 - c. Optional Benjamin Moore: Ultra Spec X Exterior Semigloss

2.6 PATCHING MATERIALS

A. Wood-Patching Compound: Two-part, epoxy-resin, wood-patching compound; knife-grade formulation as recommended in writing by manufacturer for type of wood repair indicated, tooling time required for the detail of work, and site conditions. Compound shall be designed for filling voids in damaged wood materials that have deteriorated from weathering and decay. Compound shall be capable of filling deep holes and spreading to feather edge.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Abatron, Inc.
 - b. Advanced Repair Technology, Inc.
 - c. ConServ Epoxy LLC.
 - d. Gougeon Brothers, Inc.
 - e. Polymeric Systems, Inc.
 - f. Protective Coating Company.

g. System Three Resins, Inc.

- B. Metal-Patching Compound: Two-part, polyester-resin, metal-patching compound; knife-grade formulation as recommended in writing by manufacturer for type of metal repair indicated, tooling time required for the detail of work, and site conditions. Compound shall be produced for filling metal that has deteriorated from corrosion. Filler shall be capable of filling deep holes and spreading to feather edge.
- C. Caulking: Butyl-Flex 10.1 oz. White VOC Compliant Gutter and Flashing Sealant.

PART 3 - EXECUTION

3.1 MAINTENANCE REPAINTING, GENERAL

- A. Execution of the Work: In repainting surfaces, disturb them as minimally as possible and as follows:
 - 1. Remove failed coatings and corrosion and repaint.
 - 2. Verify that substrate surface conditions are suitable for repainting.
 - 3. Allow other trades to repair items in place before repainting.
- B. Mechanical Abrasion: Where mechanical abrasion is needed for the work, use gentle methods, such as scraping and lightly hand sanding, that will not abrade softer substrates, reducing clarity of detail.
- C. Heat Processes: Do not use torches, heat guns, or heat plates.

3.2 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of painting work. Comply with paint manufacturer's written instructions for inspection.
- B. Maximum Moisture Content of Substrates: Do not begin application of coatings unless moisture content of exposed surface is below the maximum value recommended in writing by paint manufacturer and not greater than the following maximum values when measured with an electronic moisture meter appropriate to the substrate material:
 - 1. Wood: 15 percent.

3.3 PREPARATORY CLEANING

- A. General: Use the gentlest, appropriate method necessary to clean surfaces in preparation for painting. Clean all surfaces, corners, contours, and interstices.
- B. Detergent Cleaning: Wash surfaces by hand using clean rags, sponges, and bristle brushes. Scrub surface with detergent solution and bristle brush until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet. Rinse with water applied by clean rags or sponges.

- C. Solvent Cleaning: Use solvent cleaning to remove oil, grease, smoke, tar, and asphalt from painted or unpainted surfaces before other preparation work. Wipe surfaces with solvent using clean rags and sponges. If necessary, spot-solvent cleaning may be employed just prior to commencement of paint application, provided enough time is allowed for complete evaporation. Use clean solvent and clean rags for the final wash to ensure that all foreign materials have been removed. Do not use solvents, including primer thinner and turpentine, that leave residue.
- D. Mildew: Clean off existing mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with bristle brush or sponge and detergent solution. Scrub mildewed areas with mildewcide. Rinse with water applied by clean rags or sponges.
- E. Chemical Rust Removal:
 - 1. Remove loose rust scale with specified abrasives for ferrous-metal cleaning.
 - 2. Apply rust remover with brushes or as recommended in writing by manufacturer.
 - 3. Allow rust remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing. Do not allow extended dwell time.
 - 4. Wipe off residue with mineral spirits and either steel wool or soft rags, or clean with method recommended in writing by manufacturer to remove residue.
 - 5. Dry immediately with clean, soft cloths. Follow direction of grain in metal.
 - 6. Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.
- F. Mechanical Rust Removal:
 - 1. Remove rust with specified abrasives for ferrous-metal cleaning. Clean to bright metal.
 - 2. Wipe off residue with mineral spirits and either steel wool or soft rags.
 - 3. Dry immediately with clean, soft cloths. Follow direction of grain in metal.
 - 4. Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.

3.4 PAINT REMOVAL

- A. General: Remove paint where indicated. Where cleaning methods have been attempted and further removal of the paint is required because of incompatible or unsatisfactory surfaces for repainting, remove paint to extent required by conditions.
 - 1. Brushes: Use brushes that are resistant to chemicals being used.
 - a. Metal Substrates: If using wire brushes on metal, use brushes of same metal composition as metal being treated.
 - b. Wood Substrates: Do not use wire brushes.
 - 2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that spray methods do not damage surfaces.
 - a. Equip units with pressure gages.

- b. Unless otherwise indicated, hold spray nozzle at least 6 inches from surface and apply material in horizontal, back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.
 - c. For chemical spray application, use low-pressure tank or chemical pump suitable for chemical indicated, equipped with nozzle having a cone-shaped spray.
 - d. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
- B. Paint Removal with Hand Tools: Remove paint manually using hand-held scrapers, wire brushes, sandpaper, and metallic wool as appropriate for the substrate material.
- C. Paint Removal with Low-Odor, Solvent-Type Paste Paint Remover:
 - 1. Remove loose and peeling paint using water, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
 - 2. Apply thick coating of paint remover to dry, painted surface with natural-fiber cleaning brush, deep-nap roller, or large paintbrush. Apply in one or two coats according to manufacturer's written instructions.
 - 3. Allow paint remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing.
 - 4. Rinse with water applied by low-pressure spray to remove chemicals and paint residue.
 - 5. Use mechanical methods recommended in writing by manufacturer to remove chemicals and paint residue.

3.5 SUBSTRATE REPAIR

- A. General: Repair substrate surface defects that are inconsistent with the surface appearance of adjacent materials and finishes.
- B. Wood Substrate:
 - 1. Repair wood defects including dents and gouges more than 1/4 inch in size and all holes and cracks by filling with wood-patching compound and sanding smooth. Reset or remove protruding fasteners.
 - 2. Where existing paint is allowed to remain, sand irregular buildup of paint, runs, and sags to achieve a uniformly smooth surface.
- C. Metal Substrate:
 - 1. Preparation: Treat repair locations by wire-brushing and solvent cleaning. Use chemical or mechanical rust removal method to clean off rust.
 - 2. Defects in Metal Surfaces: Repair non-load-bearing defects in existing metal surfaces, including dents and gouges more than 1/8 inch deep or 1/2 inch across and all holes and cracks by filling with metal-patching compound and sanding smooth. Remove burrs and protruding fasteners.
 - 3. Priming: Prime iron and steel surfaces immediately after repair to prevent flash rusting. Prime paint corners, crevices, bolts, welds, and sharp edges. Apply two coats to surfaces that are inaccessible after completion of the Work.

3.6 PAINT APPLICATION, GENERAL

- A. Prepare surfaces to be painted according to the Surface-Preparation Schedule and with manufacturer's written instructions for each substrate condition.
- B. Apply a transition coat over incompatible existing coatings.
- C. Metal Substrate: Stripe paint corners, crevices, bolts, welds, and sharp edges before applying full coat. Apply two coats to surfaces that are inaccessible after completion of the Work. Tint stripe coat different than the main coating and apply with brush.
- D. Blending Painted Surfaces: When painting new substrates patched into existing surfaces or touching up missing or damaged finishes, apply coating system specified for the specific substrate. Apply final finish coat over entire surface from edge to edge and corner to corner.

3.7 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by COR, and leave in an undamaged condition.
- C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- D. Install Butyl caulking around all existing fasteners and panel edges.

3.8 SURFACE-PREPARATION SCHEDULE

- A. General: Before painting, prepare surfaces for painting according to applicable requirements specified in this schedule.
 - 1. Examine surfaces to evaluate each surface condition according to paragraphs below.
 - 2. Where existing degree of soiling prevents examination, preclean surface and allow it to dry before making an evaluation.
 - 3. Repair substrate defects according to "Substrate Repair" Article.
- B. Surface Preparation for MPI DSD 2 Degree of Surface Degradation:
 - 1. Surface Condition: Paint film loose, flaking, or peeling.
 - 2. Paint Removal: Remove loose, flaking, or peeling paint film by hand-tool or chemical paint-removal methods.
 - 3. Remove surface rust with mechanical or chemical means before painting.
 - 4. Preparation for Painting: Wash surface by detergent cleaning; use solvent cleaning where needed. Use other cleaning methods for small areas of bare substrate if required. Sand surfaces to smooth remaining paint film edges. Prepare bare cleaned

surface to be painted according to paint manufacturer's written instructions for substrate construction materials.

3.9 EXTERIOR MAINTENANCE REPAINTING SCHEDULE

A. Ferrous Metal Substrates:

1. Latex System:

- a. Prime Coat: For MPI DSD 2 degree of surface degradation, spot prime with Primer, Latex for Exterior Ferrous Surfaces, MPI #107.
- b. Intermediate Coat: Latex, exterior, matching topcoat.
- c. Topcoat: Latex, exterior, low sheen (Gloss Levels 3-4), MPI #15. **or**
- d. Topcoat: Latex, exterior semigloss (Gloss Level 5), MPI #11.

B. Wood Siding and Fascia:

1. Latex System: MPI REX 6.2A system.

- a. Prime Coat: For MPI DSD 2 degree of surface degradation, spot prime with Primer, Latex for Exterior Wood, MPI #6.
- b. Intermediate Coat: Latex, exterior, matching topcoat.
- c. Topcoat: Latex, exterior, low sheen (Gloss Levels 3-4), MPI #15. **or**
- d. Topcoat: Latex, exterior semigloss (Gloss Level 5), MPI #11.

END OF SECTION 090190.52
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum board.
- B. Related Sections include the following:
 - 1. Division 09 painting Sections for primers and finishes applied to gypsum board surfaces.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.5 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included in the contract unit price for items shown in the schedule of items.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BPB America Inc.
 - b. G-P Gypsum.
 - c. USG Corporation.
 - d. Approved equal.
- B. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 - 1. Thickness: 1/2 inch.
 - 2. Long Edges: Tapered.

2.3 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- C. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Single-Layer Application. Install gypsum board patch as needed after removal of toilet building components. Tape, mud, sand and finish patches as needed.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Wood.
 - 2. Gypsum board.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this Section. Payment will be included in the contract unit price as shown on the Schedule of Items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal.
 - 1. Behr Process Corporation.
 - 2. Benjamin Moore & Co.
 - 3. Dunn-Edwards Corporation.
 - 4. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Wood: 15 percent.
 - 2. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 INTERIOR PAINTING SCHEDULE

- A. Wood Substrates: Wood trim.
 - 1. High-Performance Architectural Latex System MPI INT 6.3A:
 - a. Prime Coat: Primer, latex, for interior wood, MPI #39.
 - 1) Sherwin Williams, Prep-Rite ProBlock Primer/ Sealer B51W00620 or approved equal.
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.
 - 1) Sherwin Williams, Pro Industrial, Acrylic Semi-Gloss Coating, B66W00651 or approved equal.
- B. Gypsum Board Substrates Walls and Ceilings:
 - 1. High-Performance Architectural Latex System MPI INT 9.2B:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
 - 1) Sherwin Williams, ProMar 200, Zero, Interior latex Primer, B28W02600 or approved equal.
 - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
 - c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3), MPI #139.

- 1) Sherwin Williams, Pro-Industrial Pre Catalyzed Water-based eggshell finish K45W00151 or approved equal.

END OF SECTION 099123
JANUARY 2021

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT

SECTION 099300 - PREPARATION AND APPLICATION OF TRANSPARENT FINISHES
FOR SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and the application of wood finishes on the following substrates:
 - 1. Exterior Substrates:
 - a. Wood Shingles

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Color Samples for Initial Selection: For each type of product indicated.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.4 PROJECT CONDITIONS

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply exterior finishes in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.5 MEASUREMENT AND PAYMENT:

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price as shown on the Schedule of Items. This spec shall be included in individual roof replacement line items.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

PREPARATION AND APPLICATION OF TRANSPARENT FINISHES FOR SHINGLES

099300-1

A. Material Compatibility:

1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.

B. Stain Colors: Custom mixed stain color to match COR's sample.

2.2 STAIN

A. Exterior, Semi-Transparent-Color Oil Based Stain:

1. Basis of Design Product X-100, Roof Grade Stain, by American Building Restoration Products, 9720 South 60th Street, Franklin WI 1-800-346-7532 or a Government approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes.
 2. Begin finish application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Remove plates, machined surfaces, and similar items already in place that are not to be finished. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
1. After completing finishing operations, reinstall items that were removed; use workers skilled in the trades involved. Remove surface-applied protection if any.
- B. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.

3.3 APPLICATION:

- A. Apply 2 coats of stain to dry shingles, brushing to reach all cracks and uneven areas.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Contracting Officer's Representative, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 EXTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. New Wood Shingle Substrate:
 - 1. Exposed Wood Shingle Substrate
 - a. Brush each shingle with stain, ensuring excess stain is removed from the shingle.

END OF SECTION 099300
August 2015

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:
 - 1. Exterior Substrates:
 - a. Galvanized Metal
 - b. Carbon-Steel
 - c. Vertical Wood surfaces
 - d. Horizontal Wood surfaces (benches)
 - 2. Interior Substrates:
 - a. Steel.
 - b. Galvanized metal.

1.2 DEFINITIONS

- A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- B. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- C. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of coating system and in each color of topcoat indicated.
- C. Mock-ups: As directed by COR. Minimum 10 SF

1.4 MEASUREMENT AND PAYMENT

- A. No separate payment will be made for the work included under this section; rather payment shall be considered to be included in the items of work listed in the Schedule of Items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Benjamin Moore & Co.
 - 2. Devoe Paint Company; Akzo Nobel.
 - 3. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in the Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for the coating category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
 - 3. Products shall be of same manufacturer for each coat in a coating system.
- C. Colors: As selected by COR from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.

- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 EXTERIOR HIGH-PERFORMANCE COATING

- A. Galvanized-Metal and Carbon Steel Substrates:
 - 1. Epoxy System MPI EXT 5.3C:
 - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.
 - b. Intermediate Coat: Epoxy, matching topcoat.
 - c. Topcoat: Epoxy, gloss, MPI #77.
 - 1) Basis of Design product, Primer: Sherwin Williams Duraplate 235 or approved equal.
 - 2) Basis of Design product, Topcoat: Sherwin Williams TileClad Epoxy or approved equal.
- B. Vertical Wood Substrates:
 - 1. Acrylic System:
 - a. Prime Coat: Primer, exterior acrylic.
 - b. Intermediate Coat: Acrylic, matching topcoat.
 - c. Topcoat: Exterior Acrylic, semigloss, MPI #11.
 - 1) Basis of Design product, Primer and topcoat: Sherwin Williams Duration Exterior or approved equal.
- C. Horizontal Wood Substrates:
 - 1. Enamel System:
 - a. Prime Coat: Primer, exterior enamel.

- b. Intermediate Coat: Enamel, matching topcoat.
- c. Topcoat: Exterior Enamel, semigloss,
 - 1) Basis of Design product, Primer: Sherwin Williams Exterior oil based or approved equal.
 - 2) Basis of Design product, Intermediate and topcoat: Sherwin Williams All Surface Enamel or approved equal

3.5 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:

- 1. Epoxy-Modified Latex System MPI INT 5.1K:
 - a. Prime Coat: Primer, rust inhibitive, water based, MPI #107.
 - b. Intermediate Coat: Epoxy-modified latex, interior, matching topcoat.
 - c. Topcoat: Epoxy-modified latex, semi-gloss (MPI Gloss Level 5)
 - 1) Basis of Design product, Primer: Sherwin Williams Procryl or approved equal.
 - 2) Basis of Design product, Primer: Sherwin Williams Pro-Industrial or approved equal.

END OF SECTION 099600
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 101110 - BULLETIN BOARDS

PART 1 - GENERAL

- 1.1 This item shall consist of furnishing and installing single-panel bulletin boards and double-panel bulletin boards, constructed as shown on the drawings at the locations shown on the site plans or as staked in the field, in conformity with the lines and grades established, or as directed by the Contracting Officer.
- 1.2 METHOD OF MEASUREMENT
- A. The quantity to be measured shall be the number of Each (EA) individual "Double-Panel Bulletin Boards" furnished and installed with concrete footers, painted and accepted.
- B. The quantity to be measured shall be the number of Each (EA) individual "Single-Panel Bulletin Boards" furnished and installed with concrete footers, painted and accepted.
- 1.3 REFERENCE SPECIFICATIONS
- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
1. AWPA C1 American Wood Preservers Association (AWPA) Standard for All Timber Products, Pressure Treatment
 2. AWPA P8 Oil-Borne Preservatives
 3. Federal Specification TT-E-489
 4. Redwood Inspection Service Standard Specifications for Grades of California Redwood Lumber
 5. Western Wood Products Association Western Lumber Grading Rules 80
- 1.4 RELATED WORK
- A. The work shall be in accordance with the following subsidiary specifications for bulletin boards. The subsidiary specifications are referred to in the text by the Section designation only.
1. Section 099600 High Performance Coatings
 2. Section 033020 Concrete

PART 2 - PRODUCTS

2.1 Materials for the Single Panel Bulletin Board structure shall be as shown on the drawings and specified in sections referenced in 1.4

2.1 2.1 PAINTING

- A. A. All above grade portions, except the shingles, shall be painted in accordance with Section 099600.
- B. 2.2 CONCRETE
- C. Concrete includes constructing 2-foot diameter x 3-foot deep concrete footers for each bulletin board post. Post shall be centered in each footer. The work shall be installed in accordance with Section 033020.
- D. FINISH AND CLEANUP
- E. A. When backfilling is completed, the site shall be finish graded to match the surrounding natural grade and shall be cleaned up by removing all debris and unutilized materials.

PART 3 - EXECUTION

3.1 FINISH CARPENTRY

- A. General - Joints shall be closely fitted, butted and fastened as shown or required to provide substantial construction and a neat, finished appearance and to conceal shrinkage. Exposed wood surfaces shall be without surface imperfections which cannot be concealed readily by paint finishes. Use finishing nails set for puttying.

3.2 CONCRETE

- A. Concrete shall be in accordance with Section 033020.

3.3 PREPARATION OF SURFACES

- A. Surfaces to be painted shall be clean and free of dirt, dust and any other substance which might interfere with the functioning of the painting system. All surfaces to be painted shall be in proper condition to accept and assure the proper adhesion and functioning of the particular painting system or coating specified.
- B. Wood surfaces shall be hand sandpapered and dusted clean. All knots, pitch pockets, or sappy portions shall be sealed with clear shellac or knot sealer. Putty all nail holes, cracks, etc., after first or prime coat. Do not seal wood surfaces to receive stain or natural finish. Do not sandpaper saw textured or re-sawn surfaces.

3.4 WORKMANSHIP AND APPLICATION

- A. All above grade portions, shall be stained with two coats of stain (max. spread rate - 350 sq. ft./gallon).
- B. Stain shall be applied in accordance with manufacturer's instructions.
- C. Work shall be protected against spatters, stains, or soiling, and each type of finish shall be protected against similar defacement by other finish and shall be left clean.

- D. Each coat of stain shall be evenly spread and allowed to dry before any subsequent coat is applied or rubbing done.
- E. The finish work shall be free from runs and sags, defective brushing, and clogging of lines or angles.

3.5 TOUCHING UP

- A. At the completion of all construction activities, all painted and finished work shall be touched up and restored where damaged or defaced, and the entire work left free from blemished.

3.6 FINISH

- A. The completed bulletin board shall be installed at the location(s) indicated on the site plan or staked in the field to the line and grade established. When the completed structure is plumb it shall be backfilled in lifts not to exceed 6 inches, watered if necessary, and compacted to the density of the surrounding natural material. When backfilling is completed, the site shall be finish graded to match the surrounding natural grade and shall be cleaned up by removing all debris and unutilized materials.

END OF SECTION 101110

February 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 101400 - SIGNS

PART 1 - GENERAL

- 1.1 This item shall consist of furnishing and installing signs as shown on the Drawings. The location for sign installations shall be as shown on the Drawings and as staked by the Contracting Officer in the field. The contractor shall furnish all posts, concrete, signs, and hardware required to complete the full installation.
- 1.2 SUBMITTAL
- A. Sign List Submittal: The contractor shall submit a list of signs proposed for the project. The list shall include detailed drawings showing the size of the sign, size of letters, colors, materials, sign texts, and location for installation. The Contracting Officer shall approve the submitted list, prior to the Contractor ordering the signs.
- 1.3 METHOD OF MEASUREMENT
- A. The quantity to be measured shall be the number of signs furnished, installed and accepted as shown in the Schedule of Items.
- B. Double signs on single-post installation will be considered as one installation. Signs that require more than one post to be considered as one installation.

PART 2 - PRODUCTS

- 2.1 SIGN PANELS
- A. General:
1. Sign panels shall be panels of one-piece construction.
 2. Signs shall conform to current editions of the Manual of Uniform Traffic Control Devices (MUTCD) and the Forest Service Manual - EM 7100-15, Sign and Poster Guidelines for the Forest Service.
- B. Sheeting
1. 100% heat activated retro-reflective sheeting material that conforms to AASHTO M 268 and ASTM D4956.
 2. Sheeting shall be High Intensity Type III or Type IV.
- C. HDO Plywood Panels:
1. Shall be fabricated using 100% heat activated retro-reflectorized material applied to 3/4-inch thick 7-ply HDO plywood meeting the requirements of the current edition of the National Bureau of Standards PS 1.
 2. Shall be edge tape with clear vinyl film.

3. Shall be furnished with predrilled holes for installation.

D. Aluminum Panels:

1. Shall be fabricated using 100% heat activated retro-reflectorized material.
2. Shall be furnished with predrilled holes for installation.
3. All sign sheets and plates shall meet the requirements of ASTM B 209, alloy 6061-T6, or 5052-H38 and shall be of the minimum thickness shown below.

Sign Width (inches)	Sheet Aluminum Thickness (inches)
Less than 8	0.022
8-12	0.040
13-19	0.063
20-30	0.080
31-48	0.100
over 48	0.125

2.2 POSTS

- A. Wood Posts - 4"X 4" and 4"X6" posts shall be rough sawn standard and better hemlock fir or pine. All lumber shall be pressure treated using the "Empty Cell Process" as required by the American Wood Preservers Association (AWPA), with copper naphthenate solution. The copper naphthenate solution shall contain not less than 6% or more than 8% copper in the form of copper naphthenate, in petroleum oil, AWPA P9, conforming to AWPA P8 and C1 for oil-born preservatives.
- B. Steel Posts: Steel posts shall meet the requirements of ASTM A 499, galvanized in accordance with AASHTO M 111. Minimum weight per foot will be as listed in the Schedule of Items. The posts shall have 7/16-inch holes drilled or punched, before galvanizing, along the centerline of the web. The punching or drilling should begin 1 inch from the top of the post, at 2-inch centers for the upper 5 feet of the post.
- C. Aluminum Posts: Aluminum posts shall be standard shapes as SHOWN ON THE DRAWINGS and shall be aluminum alloy 6061-T6 or 6351-T5 meeting the requirements of ASTM B 221.

2.3 FASTENER BOLTS

- A. Vandal-Proof Bolts and hardware shall be galvanized or cadmium plated steel. Bolts shall be 5/16" carriage bolts. Nuts installed with wood posts shall be NTPAFN fluted nuts. Nuts installed with tubular steel posts shall be vandal-proof tufnuts or approved equal. A known supplier is Intermountain Traffic Safety, West Valley City, Utah, phone (801) 972-6515.

2.4 CONCRETE

- A. Concrete for installing sign posts shall conform to the requirement of Section 033000 or 033020.

2.5 SIGN BRACES

- A. All sign braces shall be made of aluminum alloy 6061-T6 and shall be a minimum 1/4" thick.
- B. Bolts shall be 3/8"X1" Galvanized steel w/ stainless steel and nylon washers for attaching brace to sign and 3/8"X3" Galvanized lag bolts with stainless steel and neoprene washers for attaching brace to post.

PART 3 - EXECUTION

3.1 POST SETTING

- A. Post holes not larger than 18-inch diameter shall be excavated to a depth as shown on the drawings. Backfill shall be hand tamped around the wood posts so as to make the post solid and plumb. Any loose posts shall be removed and re-installed. Concrete shall be used to backfill tubular steel posts as shown on the drawings.

3.2 SIGN MOUNTING

- A. Signs shall be mounted as shown on the drawings. Bolt holes shall be neatly drilled in the signs so as to prevent splintering and drilling through letters or delaminate sheathing. Sign face sheathing or coverings shall not be broken

3.3 GRADING AND CLEANUP

- A. The area around the post shall now be graded to the desired contour. When the installation is completed, the general area shall be cleaned up by removing all debris and material not utilized.

END OF SECTION

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 101415 - SITE IDENTIFICATION SIGN FABRICATION (WOOD)

PART 1 - GENERAL

- 1.1 This item shall consist of fabricating and installing carved wood engraved signs with routed letters for mounting on a stone-faced concrete support base for a major site identification sign and installing carved wood engraved signs with routed letters mounted on single or double wood posts for minor site identification signs that is in accordance with these specifications and details shown on the drawings.
- 1.2 METHOD OF MEASUREMENT
- A. Major Site Identification Sign:
1. The quantity to be measured shall be the number of Each (EA) "Major Site Identification" signs furnished, installed and accepted as shown in the Schedule of Items.
 2. Double sided major site identification sign shall be considered as one sign.
 3. Major site identification signs require a Forest Service shield and/or Credit Plaque and will be considered as one sign.
 4. Stone veneer sign base shall be in accordance with specification 044313.16
- B. Minor Site Identification Signs:
1. The quantity to be measured shall be the number of Each (EA) "Minor Site Identification" signs furnished, installed and accepted as shown in the Schedule of Items.
 2. Double sided signs on a single-post will be considered as one installation. Signs that require more than one post will be considered as one installation.
- 1.3 REFERENCE SPECIFICATIONS - The publication listed below form a part of this specification to the extent referenced. The publication is referred to in the text by the basic designation only.
- A. EM 7100-15 Sign and Poster Guidelines for the Forest Service.
- B. Section 099600 "High Performance Coatings"
- C. Section 033020 "Concrete From Packaged Dry Mix For Minor Structures"
- D. Section 044313.16 "Adhered Stone Masonry Veneer"
- 1.4 SUBMITTAL
- A. Sign Submittal: The contractor shall submit a list of wood carved signs proposed for the project. The list shall include detailed drawings showing the size of the sign, size of

letters, colors, materials, sign texts, and location for installation. The Contracting Officer shall approve the submitted list, prior to the Contractor ordering the signs.

1.5 QUALITY ASSURANCE

- A. The Fabricator shall have sufficient covered shop space, tooling and equipment to properly fabricate, inspect and handle the signs. Raw materials shall be stored in a covered warehouse or similar cool, dry storage area so that it protects the raw materials from environmental factors.
- B. The fabricator shall be regularly engaged in the design and manufacture of wooden signs and shall have at least 5 years experience. References with contacts shall be provided if requested by the Contracting Officer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. WOOD

- 1. Wood for sign panel shall be according to notes shown on the drawings. Logo colors shall be approved by the CO prior to fabrication.

B. Size:

- 1. Sign:
 - a. 2-inch thick hand-tooled natural pine planks painted cream and brown with a high performance coating as shown on the drawings.
 - b. Cut wood planks in one-piece to the dimensions as shown on the drawings. Spliced wood signs will be rejected.

2.2 METAL

1. Sign Support Pipe:

- a. 2, 4 x 4-inch tubular steel pipe, 1/4" wall thickness. Length as required as shown on the drawings.

PART 3 - EXECUTION

1.1 FABRICATION

- A. Work shall be preformed by a high speed, computer-controlled electric router with the sheets in a horizontal position so that the routed surfaces are uniform in depth and finish.

1.2 ROUTING LETTERS AND LOGO'S

- A. Signs shall be routed to a depth of 1/2" to 3/4". Do not go through material.

1.3 SIGN INSTALLATION

- A. Sign locations will be approved on the ground by the Contracting Officer, prior to commencement of work. The longitudinal axis of the sign will be perpendicular to the centerline of the main road, plus or minus 5 degrees.
- B. Base and sign supports shall be constructed plumb and at the angles show on the drawings.
- C. Mount signs with zinc coated hardware. Paint bolt heads, washers, nuts and other hardware to match "Rust" powder coated finish.
- D. Care shall be taken when drilling holes that locations avoid routed letters on signs and logos.

1.4 STORAGE - Upon completion of fabrication, signs shall be packaged, crated and protected in such a manner as to prevent damage in normal handling while in transit.

END OF SECTION 101415

February 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 129400 - FAMILY UNIT AND SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Type of furnishings includes:
1. Picnic Tables
 2. Utility Tables
 3. Metal Fire Ring
 4. Unit Markers
 5. Aggregate Surface Material
 6. Timber Header

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Color Samples: For each type of product indicated.

1.3 MEASUREMENT AND PAYMENT

- A. The quantity to be measured shall be as follows:
1. Family Unit – Single: number of each (EA) 16' x 24' pads constructed and accepted. Payment shall include all site furnishings (picnic table, utility table and fire ring) aggregate surface material, timber headers, select borrow (if necessary), fasteners, and other items required for installation.
 2. Family Unit – Double: number of each (EA) 24' x 24 pads constructed and accepted. Payment shall include all site furnishings (picnic tables, utility tables and fire ring) aggregate surface material, timber headers, select borrow (if necessary), fasteners, and other items required for installation.
 3. Unit Markers: Number of unit markers constructed, installed and accepted.
 4. Clearing & Grubbing, and Excavation & Embankment for preparation of sites will be paid for under Section 312100 "Project Site Preparation and Grading".

PART 2 - GENERAL

2.1 PICNIC TABLES (EMBEDDED POSTS)

- A. Tabletops and Seats: Tabletops and seats shall be untreated #1 grade Southern Yellow Pine 3" by 10" nominal sized planks, S4S. Kiln dried to a moisture content of 19% or less. Planks that are twisted or warped shall be rejected.

- B. Channel supports and hardware: Supports and hardware shall be AS SHOWN ON THE DRAWINGS. Prior to assemble, all channel supports shall be powder coated brown. The support posts shall be Pilot Rock as manufactured by R. J. Thomas Manufacturing Co., Inc., POB 946, Cherokee, IA, 51012, phone no. 1-(712)-225-5115 or 1-(800)-762-5002, or an approved equal.
- C. 8-Foot Picnic Table with Embedded Channel Supports: The table shall be manufactured by Pilot Rock Model #APT/CW-8-UP as manufactured by R. J. Thomas Manufacturing Co., Inc., POB 946, Cherokee, IA, 51012, phone no. 1-(712)-225-5115 or 1-(800)-762-5002, or an approved equal.
- D. Concrete: Table supports shall be embedded in concrete. The concrete shall be installed as shown on the drawings and shall be in accordance with specification Section 033020.

2.2 UTILITY TABLES (EMBEDDED POSTS)

- A. Utility tables shall be manufactured by Pilot Rock Model # ULT/B-1 or approved equal.
- B. Concrete: Utility table posts shall be embedded in concrete. The concrete shall be installed as shown on the drawings and shall be in accordance with specification Section 033020.

2.3 METAL FIRE RING (EMBEDDED ANCHORS)

- A. Fire ring shall be manufactured by Pilot Rock Model #FSW-30-24-PA-H/S with rotating cook top grate and heat shield model HS-F and pin anchors or an approved equal.

2.4 UNIT MARKERS

- A. Timber: Grade and Finish – The unit markers shall be pressure treated, cedar or redwood. S4S with natural finish.
- B. Numerals: Numerals shall be square plaque numbered markers mounted on the timber unit marker posts. The numeral plaques shall be ordered by Wood Product Signs 4890 County Road 76 Parlin, CO 81239 Tel: 970-641-1675 Fax: 970-641-8107 or an approved equal.

2.5 AGGREGATE SURFACE MATERIAL

- A. Aggregate: The aggregate shall be installed as shown on the drawings and shall be grading ‘G’ and conform to the requirements of Section 321204 “Crushed Aggregate Base Or Surface Course”.
- B. Aggregate material shall remain stable when saturated with water.
- C. Source:
 1. Materials shall be obtained from a commercial source, the contractor shall submit test results for aggregate gradation and a Certificate of Compliance that states gradation meets contract requirements.

2. Sampling and testing of the material before incorporation into the work shall be in accordance with AASHTO requirements and shall occur as follows:
 - a. For commercially produced aggregates: at the producer's plant or stockpile.
 - b. These test results shall not preclude later sampling and testing for final acceptance after final processing of the material.
 - c. Crushing, screening, and mixing plants shall be equipped with sampling devices.
 - d. The contractor shall take additional samples as required to validate the certification.

2.6 TIMBER HEADER

- A. Timbers shall be pressure treated, cedar or redwood, pre-cut and pre-drilled.
 1. Lumber Size:
 - a. Border Edge Header - 6" x 6"
- B. Timber to be laid on a continuous solid soil surface.
- C. All timbers will be of full length (no splicing, except when necessary).
- D. All timber length, lap joints and holes will be cut and drilled, and then C.C.A. treated.
- E. All joints shall be lapped and pinned.
- F. All timber corners shall be cross-braced.
- G. If family unit pad is located directly adjacent to the campground unit, the common timber border shall be eliminated.

PART 3 - EXECUTION

3.1 INSTALLATION – PICNIC TABLES

- A. Install tables on a finished surface according to the locations indicated on the site plans or as directed by the contracting officer.
- B. Install to the finished heights, lines and dimensions as shown on the drawings to meet accessibility requirements.
- C. If required, assemble tables according to the manufacturer's requirements.

3.2 INSTALLATION – UTILITY TABLE

- A. Utility Table: The table shall be installed in accordance with the details as shown on the drawings. All tables that are damaged through improper handling or placing shall be rejected.
- B. Installation:

1. Excavation of the required dimensions AS SHOWN ON THE DRAWINGS shall be performed to the lines and grades required. The dimensions of the concrete support AS SHOWN ON THE DRAWINGS are normal. The entire excavation and footing shall be filled with concrete to finished grade. The table shall be installed flat and the pedestal post set plumb. The completed installation must be solid and stable. Any table determined by the CO to be loose or out of level shall be removed and reinstalled with new concrete supports at no additional cost to the Forest Service.

3.3 INSTALLATION – METAL FIRE RING

- A. Metal Ring: The metal ring shall be installed in accordance with the details as shown on the drawings. All rings that are damaged through improper handling or placing shall be rejected.
- B. Washed Rock: Drain rock shall be 1”–2” in size.
- C. Install to the finished heights, lines and dimensions as shown on the drawings to meet accessibility requirements.
- D. Concrete shall be in accordance with Specification 033020 “Concrete from Packaged Dry Mix for Minor Structures.”

3.4 INSTALLATION – UNIT MARKERS

- A. Finishing Markers: The UNIT MARKERS shall be cut to length with the chamfer cut angled top. All surfaces shall be finished smooth.
- B. Numerals: Numerals shall be plaque numbered markers fastened to the top of the unit marker posts on the angled side in numerical sequences shown on the drawings. Use standard AASHTO Highway 4-inch Series “C” numerals (9/16) inch stroke width or as approved by the Contracting Officer and manufacturer.
- C. Installing Post: The hole for the post shall be excavated no larger than necessary for proper backfilling and tamping. The post shall be set plumb and to the desired elevation and numerals oriented for visibility as directed by the Engineer. After the post has been positioned, the hole shall be backfilled in layers not to exceed a 6-inch lift. Each lift shall be tamped. Care shall be taken to protect the finish on the post during installation.
- D. Grading and Cleanup: The area around the post shall now be graded to the desired contour. When the installation is completed, removing all debris and material not utilized shall clean up the general area.

3.5 INSTALLATION – AGGREGATE SURFACE MATERIAL

- A. The area inside the lines and dimension AS SHOWN ON THE DRAWINGS shall be constructed to a natural shape with aggregate surfacing material installed to the depth AS SHOWN ON THE DRAWINGS.

- B. The surfacing material shall be spread in a uniform layer, with no segregation of size, and to a loose depth that shall have the required density when compacted.
- C. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, hand raked, and left in a uniform and neat condition. Surface drainage shall be diverted so that it will not enter into the area. See drawings for details.

3.6 INSTALLATION – TIMBER HEADER

- A. Install timber edger in straight lines and makes directional changes at 90 degree angles. Backfill native soil against the edger 1-inch from the top.
- B. Install header with clean cut edges and recess fastened stakes below grade.

3.7 SITE CLEARING

A. General:

1. Remove trees, shrubs, grass and other vegetation, improvements, or obstructions interfering with installation of new construction.
2. Remove such items elsewhere on site or premises as specifically indicated.
3. Removal includes digging out stumps and roots.
4. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.
5. Clearing shall be kept to a minimum within the specified working limits and care exercised to not damage the root system of adjacent trees or shrubbery.

B. Topsoil:

1. Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material.
2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
3. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to main root system.
4. Stockpile topsoil in storage piles in areas shown, or where approved.
5. Construct storage piles to freely drain surface water.
6. Dispose of unsuitable or excess topsoil same as waste material, herein specified.

C. Clearing and Grubbing:

1. Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing.
2. Completely remove stumps, roots, and other debris protruding through ground surface.
3. Use only hand methods for grubbing inside drip line of trees indicated to be left standing.

4. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

a. Place fill material in horizontal layers not exceeding 6" loose depth, and thoroughly compact to a density equal to adjacent original ground.

D. Removal of Improvements: Remove existing above-grade and below-grade improvements necessary to permit construction, and other work as indicated.

3.8 FINISH GRADING

A. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, hand raked, and left in a uniform and neat condition. Surface drainage shall be diverted so that it will not enter into the area. See drawings for details.

3.9 CLEANUP

A. After backfilling and grading has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized. Cleanup shall include disposal of waste materials in accordance with Section 024100. Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line.

END OF SECTION 129400

January 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 129410 - SITE FURNISHINGS AT GROUP SITES

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of installing site furnishings at group sites, which includes picnic tables, serving tables, pedestal grills, concrete fire ring, concrete slab and aggregate base, and excavation and construction of the pads in accordance with these specifications and details as SHOWN IN THE DRAWINGS.
- B. Extent of each type of site furnishings is indicated as shown on the drawings.
- C. Type of site furnishings includes:
 - 1. Picnic Tables
 - 2. Serving Tables
 - 3. Pedestal Grills
 - 4. Concrete Fire Ring with Steel Ring insert
 - 5. Concrete Surface Pad and Aggregate Base

1.2 SUBMITTALS

- A. Product Data: For each product specified.
 - 1. Submit manufacturer's data and installation instruction for each type of furnishings, including anchorage and accessory items.
- B. Color Samples: For each type of product indicated.
 - 1. Submit manufacturer's available color options for each type of furnishing.

1.3 MEASUREMENT AND PAYMENT

- A. The quantity to be measured shall be as follows:
 - 1. Group Site Furnishings:
 - a. Each (EA) group site shall have the following furnishings installed and accepted. They include: Two wood plank serving tables, eight wood plank picnic tables, two pedestal grills and concrete fire ring with steel insert. Installation includes all bolts, hardware, assembly, and anchors necessary to complete surface mounting all items.
 - 2. Concrete Pad:
 - a. Concrete surface pad and aggregate base material.

PART 2 - PRODUCTS

2.1 PICNIC TABLES

1. Tabletops and Seats: Tabletops and seats shall be untreated #1 grade Southern Yellow Pine 3" by 10" nominal sized planks, S4S. Kiln dried to a moisture content of 19% or less. Planks that are twisted or warped shall be rejected.
2. Channel Supports and Hardware: Channel supports and hardware are AS SHOWN ON THE DRAWINGS. Prior to assemble, all channel supports shall be powder coated brown.
3. 8-Foot Picnic Table with Surface Mount Posts: The table shall be Pilot Rock Model APT/P/CW-8UP as manufactured by R. J. Thomas Manufacturing Co., Inc., POB 946, Cherokee, IA, 51012, phone no. 1-(712)-225-5115 or 1-(800)-762-5002, or an approved equal.
4. Concrete: Table posts shall be surface mounted on a thickened concrete slab. The concrete shall be installed AS SHOWN ON THE DRAWINGS and shall be in accordance with specification Section 033000.

2.2 SERVING TABLE

1. Tabletop: Tabletop shall be untreated #1 grade Southern Yellow Pine 3" by 10" nominal sized planks, S4S. Kiln dried to a moisture content of 19% or less. Planks that are twisted or warped shall be rejected.
2. Channel Supports and Hardware: Channel supports and hardware are AS SHOWN ON THE DRAWINGS. Prior to assemble, all channel supports shall be powder coated brown.
3. 8-Foot Serving Table with Surface Mount Posts: The table shall be Pilot Rock Model APT/P/CW-8UP (no seats) as manufactured by R. J. Thomas Manufacturing Co., Inc., POB 946, Cherokee, IA, 51012, phone no. 1-(712)-225-5115 or 1-(800)-762-5002, or an approved equal.
4. Concrete: Table posts shall be surface mounted on a thickened concrete slab. The concrete shall be installed AS SHOWN ON THE DRAWINGS and shall be in accordance with specification Section 033000.

2.3 PEDESTAL GRILL

1. The grill and pedestal shall be Pilot Rock "Model D2-48/S/B3" as manufactured by R.J. Thomas Manufacturing Co., Inc., POB 946, Cherokee, IA, 51012, 1-800-762-5002, or an approved equal. The complete fixture shall be finished with a high temperature, flat black paint.
2. Concrete: Pedestal grill posts shall be surface mounted on a thickened concrete slab. The concrete shall be installed AS SHOWN ON THE DRAWINGS and shall be in accordance with specification Section 033000.

2.4 CONCRETE FIRE RING WITH STEEL INSERT

- A. Concrete Fire Ring with Steel insert: The fire ring shall be prefabricated concrete AS SHOWN ON THE DRAWINGS and as manufactured by Dura-Crete, Inc., West Valley City, UT 84119, (801)-972-8686, or an approved equal.

- B. Steel Ring: The steel ring insert with 4" rim shall be constructed of 1/4" thick steel plate conforming to the requirements of ASTM A-36.
- C. Concrete: Concrete and reinforcing steel shall conform to the requirements of Specification 033000 "Cast-In-Place Concrete."
- D. Washed Rock: Drain rock shall be 1"–2" in size.

2.5 CONCRETE SURFACE PAD

- 1. Concrete: Concrete shall be installed AS SHOWN ON THE DRAWINGS and conform to the requirements of Section 033000 "Cast-in-Place Concrete".

PART 3 - EXECUTION

3.1 INSTALLATION – PICNIC TABLES

- A. Surface mount picnic tables on the concrete slab in the locations as shown on the drawings with the appropriate vandal resistant fasteners as recommended by the manufacturer.
- B. Install picnic tables to the spacing and dimensions as shown on the drawings.
- C. All surfaces of the table shall be masked and protected from damage, defacement, concrete splattering and spillage.
- D. Any damage to the units shall be repaired or replaced at the Contractor's expense. All required hardware should be installed properly before acceptance of the tables.
- E. Cleanup: When a unit is completed, the area shall be cleaned up of false work, debris, and material not utilized.

3.2 INSTALLATION – SERVING TABLE

- A. Surface mount serving tables on the concrete slab in the locations as shown on the drawings with the appropriate vandal resistant fasteners as recommended by the manufacturer.
- B. Install serving tables to the spacing and dimensions as shown on the drawings.
- C. All surfaces of the table shall be masked and protected from damage, defacement, concrete splattering and spillage.
- D. Any damage to the units shall be repaired or replaced at the Contractor's expense. Cleanup: When a unit is completed, the area shall be cleaned up of debris, and material not utilized.

3.3 INSTALLATION – PEDESTAL GRILL

- A. Surface mount pedestal grills on the concrete slab in the locations as shown on the drawings with the appropriate vandal resistant fasteners as recommended by the manufacturer.

- B. Remove all debris and unused material from the site.

3.4 INSTALLATION – CONCRETE FIRE RING WITH STEEL INSERT

- A. Concrete Fire Ring: The concrete ring shall be precast in accordance with the details as shown on the drawings. All rings that are damaged through improper handling or placing shall be rejected. Set ring on leveled concrete slab.
- B. Steel Ring: Fabricate steel ring. Weld 4" rim to the ring with a stitch fillet weld completely around ring. Buff sharp corners. Center ring inside concrete ring and fill to the required depth with gravel.
- C. Placement: Install fire ring level and plumb in the location(s) identified by the Contracting Officer.

3.5 INSTALLATION – CONCRETE SURFACE PAD

- A. Concrete shall conform to the requirements of Section 033000 "Cast-in-Place Concrete".

3.6 SITE CLEARING

A. General:

1. Remove trees, shrubs, grass and other vegetation, improvements, or obstructions interfering with installation of new construction.
2. Remove such items elsewhere on site or premises as specifically indicated.
3. Removal includes digging out stumps and roots.
4. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.
5. Clearing shall be kept to a minimum within the specified working limits and care exercised to not damage the root system of adjacent trees or shrubbery.

B. Topsoil:

1. Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material.
2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
3. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to main root system.
4. Stockpile topsoil in storage piles in areas shown, or where approved.
5. Construct storage piles to freely drain surface water.
6. Dispose of unsuitable or excess topsoil same as waste material, herein specified.

C. Clearing and Grubbing:

1. Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing.

2. Completely remove stumps, roots, and other debris protruding through ground surface.
3. Use only hand methods for grubbing inside drip line of trees indicated to be left standing.
4. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - a. Place fill material in horizontal layers not exceeding 6" loose depth, and thoroughly compact to a density equal to adjacent original ground.

D. Removal of Improvements: Remove existing above-grade and below-grade improvements necessary to permit construction, and other work as indicated.

3.7 FINISH GRADING

- A. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, hand raked, and left in a uniform and neat condition. Surface drainage shall be diverted so that it will not enter into the area. See drawings for details.

3.8 CLEANUP

- A. After backfilling and grading has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized. Cleanup shall include disposal of waste materials in accordance with Section 024100. Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line.

END OF SECTION 129410

March 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 129700 - FEE TUBE

PART 1 - GENERAL

- 1.1 This item shall consist of installing a Government furnished fee tube as described in the drawings and this section, in conformity with the lines and grades established, or as directed by the Contracting Officer.
- 1.2 METHOD OF MEASUREMENT - The quantity to be measured shall be the number of Government furnished fee tubes removed and re-installed in the location(s) identified and accepted.

PART 2 - PRODUCTS

- 2.1 FEE TUBE
 - A. The Fee Tube, including the concrete footing shall be furnished as one unit on the project site by the Government.
- 2.2 FOREST SERVICE SUPPLIED COMPONENTS – Padlock shall be supplied by the Forest Service.

PART 3 - EXECUTION

- 3.1 The Government furnished Fee tube and concrete footing shall be removed as one unit, relocated and re-installed by the contractor AS SHOWN IN THE DRAWINGS.
- 3.2 Backfill and compact the excavation hole where the Government furnished fee tube was removed and restore to natural grade. Excavate the new fee tube hole to the size and shape of the fee tube concrete footing in the location as identified by the contracting officer. Backfill around the concrete footing in 6-inch lifts and compact until natural grade.
- 3.3 The complete fee tube shall be installed straight and plumb to the depth AS SHOWN ON THE DRAWINGS.

END OF SECTION 129700
January 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 132700 - PRECAST CONCRETE VAULT RESTROOMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section applies to the fabrication and installation of one Precast Concrete Vault Restroom building, including shipment to site, all work necessary to completely fabricate, and installation of other manufactured accessories needed or specified in this section for a complete Vault Restroom.

1.2 SUBMITTALS

- A. Manufacturer's Literature: Submit literature for the following items to the Contracting Officer (CO) for approval within 10 day after award of contract. Drawings and literature must be marked to show the exact model, size, and color proposed.
 - 1. Door, louvered vents, and door hardware.
 - 2. Paint, interior and exterior.
 - 3. Caulk, ground and adhesive.
 - 4. Concrete color additive, stains, concrete curing compound and concrete sealer.
- B. Shop Drawings: Submit four sets of shop drawings of the Vault Restroom stamped by a Professional Engineer.
- C. Design Calculations: Submit two sets of design calculations showing that the building is designed for the structural loads required, fabrication and transportation loads, and crack prevention and control.
- D. Concrete Delivery Certificates: Supplier shall furnish a certificate with each truckload of concrete delivered showing the items in the following list. Submit these certificates to the CO upon delivery of the Vault Restroom.
 - 1. Weight of cement in each load.
 - 2. Weight of fine aggregate in each load.
 - 3. Weight of coarse aggregate in each load.
 - 4. Weight of water in each load.
 - 5. Time of day cement was added to the aggregate and water.

1.3 MEASUREMENT AND PAYMENT

- A. Payment will be for each (EA) Pre-cast Concrete Vault Restroom installed including all appurtenances inside of the building and all associated clearing, excavation, fill, aggregate, backfill and grading necessary to complete the item.

PART 2 - PRODUCTS

2.1 PRECAST VAULT RESTROOM

- A. Vault restroom shall be a double unit vault. Model “Cascadian” in Java Brown upper exterior wall Board & Bat texture, Java Brown lower exterior wall Horizontal Lap Siding and Evergreen (dark green) Cedar Shake roof with no chase by CXT or approved equal.
- B. Vault restroom shall have bird exclusion screens installed on top of vent stacks.
- C. Design criteria
 - 1. Snow Load: 200 lbs/ft²
 - 2. Wind Load: 90 mph, exposure C from 2015 International Building Code
 - 3. Seismic Load: Category E from 2015 International Building Code

2.2 BUILDING WALLS AND SLAB

- A. Floor Slab: 5-inch minimum thickness.
- B. Walls: 4-inch average thickness, 3-inch minimum wall thickness at the top of the walls.

2.3 OPTIONAL POST TENSIONING

- A. The contractor may elect to circumferentially post tension reinforcing steel for the floor and roof slabs to protect against leaking and cracking. Should the Contractor elect to post tension reinforcement steel in the roof slab, fluid applied elastomeric roofing may be deleted.

2.4 WALL VENTS

- A. Wall vents: Airolite No. 609B, size shown on the drawings, The Airolite Co., Marietta, OH, www.airolite.com, or an approved equal.

2.5 ROOF

- A. Sloped slab shed type or gabled type with a turned down edge to prevent water from migrating down the bottom edge of the roof panel and back into the building.

2.6 PRECAST CONCRETE FORM WORK

- A. Construct forms of plywood, lumber, or steel sheets or plates free of defects. Forms must be removable without injuring the concrete and must be constructed to maintain tolerances between mating surfaces of building components.
- B. Form liners
 - 1. Walls: Wood-textured appearance, Symons Corporation’s “Board & Bat” and “Horizontal Lap Siding” or an approved equal.
 - 2. Roof: “Cedar Wood Shake” appearance.

- C. Form coating: Non-staining type that will not leave residual matter on concrete surface or adversely affect proper bonding of subsequent coatings, caulking, grout or adhesive applied to concrete surfaces.
 - 1. Form release agent or coating: As recommended by form liner manufacturer.
 - 2. Coating containing mineral oils or other nondrying ingredients will not be permitted.

2.7 CONCRETE REINFORCEMENT

- A. Reinforcing steel: ASTM A615, Grade 60.
- B. Pre-stress strand (if used): ASTM A416, Grade 270.
- C. All reinforcement shall be new, free from dirt, oil, paint, grease, loose mill scale, and loose or thick rust when placed.

2.8 CONCRETE MIX

- A. Concrete supplier: Ready-mix or another approved precast concrete product firm.
- B. Proportion cement, aggregate, and water to obtain concrete with good workability.
- C. Concrete design
 - 1. Aggregate: Coarse No. 67 (Table 2, ASTM C33)
 - 2. Minimum cement content: 6.5 sacks per yd³
 - 3. Cement type: ASTM C150 Type II, IIA, or III for building
 - 4. Maximum water-cement ratio: 0.45
 - 5. Slump: 3 to 5 inches by ASTM C143
 - 6. Air content: 4-7% by ASTM C231
 - 7. Minimum strength concrete: 4,500 psi at 28 days
 - 8. Water: Potable
 - 9. Admixtures:
 - a. Air-entraining agent: ASTM C260
 - b. Water reducing agent: ASTM C494, Type A
 - c. Use of other admixtures is subject to approval by the Contracting Officer

2.9 COLORED CONCRETE

- A. Color additives: ASTM C979. Provide a 12"x 12"x 1" color sample to the Contracting Officer for approval. The following components shall contain colored concrete:
 - 1. Building roof panels
 - 2. Building wall panels

2.10 CONCRETE CURING COMPOUND AND ROOFING

- A. Curing compound: Colorless, ASTM C309, Type 1 or 1-D.

- B. Fluid Applied Elastomeric Roofing: Acrylic latex resin-base elastomeric roofing material applied in fluid form suitable for use over concrete roof slabs. If manufacturer elects to post-tension roof panel, the roofing material may be deleted.

- 1. Color: Dark Green.
- 2. Material: "Rapid Roof" as manufactured by the Conclin Company or an approved equal.

2.11 BIRD SCREEN:

- A. Provide steel bird screen, secured with stainless steel screws for all stacks to prevent birds from entering the vault. <https://tetonraptorcenter.org/our-work/poo-poo-project/> Screen shown in link or equal.

2.12 CAULKING, GROUT, ADHESIVE, AND MORTAR

- A. Caulking shall remain flexible and non-sag at temperatures from -50° to 140° Fahrenheit.
 - 1. Exterior, roof peak joint: 100% silicone caulk, clear; GE Silicone II or an approved equal.
 - 2. Exterior joints (including roof/wall and wall panel joints): Tripolymer sealant caulk which compliments exterior color and has a minimum 5 year guarantee.
 - 3. Interior joints: Paintable silicone based caulking with a minimum 5 year guarantee.
- B. Grout: Non-shrink type matching color of surrounding concrete as closely as possible.
- C. Epoxy concrete adhesive: Two component, rigid, non-sag gel adhesive for bonding to dry or damp surfaces, moisture insensitive. Color to match surrounding concrete as closely as possible.
- D. Portland cement mortar: One part Portland cement, three parts sand, and enough water to make a workable mixture.

2.13 FINISHES AND PAINTS

- A. Paint and accessory materials: Similar to the "top-of-the-line" products of the manufacturer's listed below.
 - 1. Benjamin-Moore and Company, www.benjaminmoore.com
 - 2. Columbia Paint Company, www.columbiapaint.com
- B. Maximum lead content: 0.06 % by weight of lead.
- C. Type of Paint
 - 1. Metal, interior and exterior
 - a. Waterborne acrylic bonding primer, Columbia 04-022, or an approved equal.
 - b. Alkyd-oil Based Enamel, semi-gloss, Columbia 03-241, or an approved equal.
 - 2. Exterior Concrete

- a. Stain- pure acrylic water repellent penetrating stain
 - b. Sealer- clear acrylic anti-graffiti sealer
- 3. Interior Concrete
 - a. Floors- 1 part water based epoxy with a silica sand suspension to provide a uniform texture.
 - b. Interior walls and ceiling- modified acrylic, penetrating pigment followed by a clear acrylic anti-graffiti sealer.
- D. Paint colors
 - 1. Metal window and door frames, louvered vents, and doors (interior and exterior): Java Brown
 - 2. Exterior concrete walls and floor: Java Brown
 - 3. Exterior concrete roof: Evergreen (Dark Green)
 - 4. Interior concrete walls: White
 - 5. Interior concrete floor: Gray

2.14 STEEL DOORS

- A. Doors: Flush panel type, 1 ¾ inch thick, minimum gauge zinc-coated steel panels, with minimum 18 gauge internal bracing channels, equal to Steelcraft L-16 of size shown on the drawings.
- B. Door frames shall be knockdown or welded type, single rabbet, minimum 16 gauge zinc-coated steel, width to suit wall thickness, equal to Steelcraft.
 - 1. Three (3) rubber door silencers shall be provided on latch side of frame
- C. Door frame anchors
 - 1. Provide three (3) anchors per jamb located approximately at the same level as hinge locations.
 - 2. Use anchor type suitable for fastening to precast concrete and designed for future removal of frame.
 - 3. Anchors may be omitted if frame is cast in panel.
- D. Door hinges
 - 1. One (1) pair shall be 4 ½ inch spring hinges
 - 2. One-half (½) pair shall be standard butt hinge
 - 3. Top and bottom hinge shall have an adjustable tension spring and be adjusted to a 5 lb. maximum pull.
 - 4. Finish shall be US26D (dull chrome)
- E. Deadbolt shall be Mortised type, operated by key from outside only, which will receive the Forest Service cylinder; similar and equal to Yale 1152. Finish shall be US26D (dull chrome).

- F. Door Louver shall be fixed, inverted split Y, non-vision, 18 gauge galvanized steel with factory prime coat, equal to FDLS series by Anemostat Door Products, www.anemostatwest.com. There shall be no insect screen between louvers.
- G. Door sweep shall be an adjustable brush type placed at bottom of door.
- H. Door stop shall be a cast metal base, US26D (dull chrome) finish with gray rubber 2 3/8 inch diameter bumper with a 1 inch projection
- I. Threshold shall be extruded aluminum with neoprene seal, Pemco #170, or an approved equal.

2.15 CRUSHED AGGREGATE LEVELING COARSE

- A. According to Section 321204 Grading E.

PART 3 - EXECUTION

3.1 BUILDING CONSTRUCTION

A. Concrete

1. Support and brace forms sufficiently to prevent distortion of forms due to pressure of the concrete during vibrating of concrete and the curing period.
2. Vertical grooves in the form liner pattern shall be continuous except for openings for doors.
 - a. Horizontal butt joints between liner panels will not be allowed.
 - b. Vertical butt joints between form liner panels shall be made at vertical groove in liner pattern except at outside corners.
 - c. Vertical grooves in form liner pattern shall be arranged so that there is equal space between vertical doorframe edges and the adjacent vertical grooves at each opening.
3. Form ties will not be allowed.
4. Thoroughly clean forms and form liners before each use.
5. Apply form coating and form release agent on all forms and form liners in accordance with the manufacturer's recommendations
6. The Contractor shall assume all responsibility for determining when to remove the concrete components from the forms without causing structural damage to the components. Vault Restrooms constructed with damaged components will be rejected.

B. Concrete Reinforcement

1. Details of reinforcement: ACI 318.
2. Center steel reinforcement in the cross-sectional area of the walls. Provide at least 1 inch of concrete cover on the under surface of roof and floor. Provide diagonal reinforcement at openings.

3. Accurately place and adequately support reinforcing steel or strand in final position prior to starting placement of concrete. The maximum allowable variation for center-to-center spacing of reinforcing steel is ½ inch.
 4. Use full length reinforcing steel whenever possible and keep the number of splices to a minimum. When splices are necessary on long runs, alter splices from opposite sides of the component for adjacent steel bars.
 - a. No. 4 or smaller shall be lapped a minimum of 12 inches;
 - b. Larger than No. 4 shall be lapped a minimum of 24 bar diameters.
 5. Bend bars cold. Do not bend bars partially embedded in concrete
- C. Cold Weather Concrete
1. Cold weather concrete: ACI 306 and as follows:
 - a. Do not place concrete if ambient temperature is expected to be below 35°F during the curing period unless heating equipment is readily available to maintain temperature of at least 45°F.
 - b. Use no materials containing frost or lumps of frozen.
- D. Hot Weather Concrete
1. The temperature of the concrete shall not exceed 80°F at the time of placement, and when the ambient temperature reaches 90°F, the concrete shall be protected with moist covering or other methods approved by the Contracting Officer.
- E. Mixing And Delivery Of Ready Mix Concrete: ASTM C94, Section 11.5 through 11.9.
- F. Placing And Consolidating Concrete
1. Notify the Contracting Officer at least 24 hours before any concrete placement to permit inspection
 2. Place layers not more than 24 inches deep. Do not move concrete with vibrators or tampers
 3. Consolidate the concrete with suitable mechanical vibrators operating within the concrete or attached steel forms. Vibrate at any point sufficiently to accomplish compaction, but do not prolong to a point where segregation occurs.
- G. Finishing Concrete
1. Interior Floor and Exterior Slab
 - a. Strike flush to within 1/8-inch variation in 6 feet.
 - b. Float and trowel slabs smooth until no marks remain.
 - c. Apply final light broom finish to exterior slabs only.
 2. Interior Wall Surfaces and Ceiling
 - a. Finish shall be that provided by smooth steel form or smooth trowel finish with no trowel marks.

3. Exterior Wall Surfaces: Bat & Board upper texture and Horizontal Lap Siding lower texture provided by approved form liner.
4. Exterior Roof Surface: Shake texture provided by approved form liner.
5. Cracks and Patching
 - a. Cracks in concrete components caused by Contractor fabrication, shrinkage during curing, handling, shipping, and installation shall be cause for rejection if the Government determines that the crack will affect the serviceability or structural integrity of the component.
 - b. Fill small holes, depressions, and air or rock pockets in all surfaces with non-shrinking Portland cement based patching material while concrete is still green and within one day of form removal. Patch shall match the color, finish, and texture of surrounding surface.
 - c. Patching will not be allowed on any component with holes, chips, or exposed reinforcement totaling more than 18 in³ or with any defects more than 2 inches deep. Those components will be rejected and must be replaced at Contractor's expense.

H. Curing And Hardening Concrete

1. Keep all concrete surfaces moist for at least six days after being placed. Acceptable methods include ponding, wet burlap, curing paper, plastic sheets, and membrane curing compound. Other methods are subject to the approval of the Contracting Officer.
2. Membrane curing compounds will not be allowed where curing compound will interfere with penetration or adhesion of final finish

I. Colored Concrete

1. Use the same type and brand of cement, coloring agent, aggregates, and other additives throughout the building. Use ingredients from the same lot or manufacturing process. Use aggregates from only one source.
2. Use uniform batches of concrete to ensure consistency of the finished concrete color. Weigh all ingredients. Add color by weight as recommended by manufacturer of the concrete color. Uniformly disperse the color throughout each batch during the mixing operation.
 - a. Wash and thoroughly clean the mixer and transporting equipment before mixing colored concrete. Repeat each time a change is made to a different color.

J. Structural Joints

1. Joining details other than those detailed below will not be allowed unless shown on shop drawings that are stamped by a Professional Engineer and approved by the Contracting Officer prior to manufacture of buildings.
2. Anchor weld plates into concrete panels and weld together with a continuous weld. Thoroughly clean welds prior to application of caulk or paint.
3. Join wall components together with two welded plate pairs at each joint.

- a. Weld plate: 6 inches long; with one pair located in the top quarter and one pair in the bottom quarter of the seam.
 - b. Seal inside seams with paintable caulk.
 - c. Seal outside seams with caulk to match building color or clear.
- 4. Join walls and roof with weld plates, minimum 3" x 6", at each building corner.
 - a. Where the Contracting Officer determines that the joint between walls and the roof is true enough to prevent point loadings on the walls, seal the joint between walls and roof gas-tight with paintable caulk.
 - b. Where the joint between the walls and roof is not true enough to prevent point loading, grout the joint with approved rigid non-shrinking grout that will distribute the weight of the roof evenly around the perimeter of the building walls.
 - c. Seal exterior seams with caulk that is clear or matches building color.
- 5. Join the floor slab and walls with a grout mixture on the interior and two weld plate pairs for each wall component, one near each end of each wall panel, or each corner on each side, whichever is greater.
 - a. Weld plate: 6 inches long
 - b. Grout: Provide smooth cover between walls and floor

K. Finishes And Paint

- 1. Apply materials in accordance with manufacturer's recommendations.
- 2. Examine surfaces to ensure all are properly prepared to receive finish.
 - a. Allow a minimum of 14 days curing time for concrete before paints are applied to concrete. Allow longer time when recommended by paint manufacturer.
 - b. If needed to ensure uniform application, prepare concrete surface for paint application by acid etching with 30% H=hydrochloric acid. Flush with water and allow to thoroughly dry.
- 3. Painting shall not be done under the following conditions:
 - a. Temperature is 50°F or below.
 - b. Surfaces are damp.
 - c. Dusty areas.
- 4. Schedule of Finishes
 - a. Metalwork (steel doors, door vents and frames, and roof posts)
 - 1) One coat metal primer
 - 2) Two coats alkyd oil enamel in Java Brown
 - b. Exterior surfaces of building walls and roof, unless concrete color manufacturer recommends a different procedure:
 - 1) Two coats of stain

- 2) Linseed oil (may be applied and allowed to cure for brown buildings)
 - 3) One coat of clear sealer
 - c. Interior Concrete Surfaces
 - 1) Walls and ceiling of building: Two coats of pigment followed by one coat of clear sealer.
 - 2) Interior floor: One coat of epoxy with a silica sand suspension.
- L. Fluid Roofing
 - 1. Apply a minimum of two coats of elastomeric roofing on top of the roof slab.
 - a. Prepare concrete surface and apply and cure roofing in accordance with manufacturer's recommended procedures.
 - b. Minimum coverage: 3 gallons per square (100 ft²)
 - c. Apply joint tape to hairline cracks between applications of the two coats of elastomeric roofing.
 - 2. This item may be deleted if there are no cracks.
- M. Metal Doors And Frames
 - 1. Install steel doorframe in accordance with manufacturer's recommendations.
 - a. Fit door accurately in frame
 - b. Mount louvers on door with cadmium or zinc-plated corrosion resistant non-removable metal screws
 - 2. Install hardware in accordance with manufacturer's instructions after finish painting is completed.
 - 3. Install sweep on bottom of door and adjust so it contacts the threshold when door is closed.

3.2 CLEARING AND GRUBBING

- A. Site clearing and grubbing shall be in accordance with Section 311000 "Clearing and Grubbing".

3.3 EXCAVATION, BACKFILL, AND SITE GRADING

- A. Excavation, backfill, and site grading shall be in accordance with Section 312000.
- B. Coordination with the Building Manufacturer
 - 1. Contractor shall coordinate with the manufacturer of the precast concrete building to accommodate installation at the time of delivery.
 - 2. The Contractor shall be responsible to obtain installation instructions from the manufacturer and perform the excavation, backfill, and site grading in accordance with those instructions.

3. The Contractor must have excavation complete prior to delivery of the precast concrete building. The Contractor will be provided 1-week minimum lead-time to have the excavation work performed.
 - a. The excavation shall be over excavated two feet (horizontal measurement) on each side of the slab to allow for compaction and minor adjustments in orientation.
 - b. Stockpile excavated material away from the excavation to facilitate crane and delivery truck access. The crane and delivery truck typically need to be side-to-side during placement.
 - c. Compact the natural ground at the bottom of the vault excavation with a minimum of three passes with an approved whacker-type mechanical tamper.
4. The Contractor must be on site at the time of delivery to perform the backfill operation as soon as the precast concrete building is in place.

C. Bedding

1. The Contractor shall place a leveling course prior to placement of the vault or building.
2. Compact leveling course with one pass of an approved mechanical tamper.
3. Grade leveling course so there will be no high spots in the middle.
4. Compact with a second pass of a tamper.
5. Slope the top of the bedding one percent from back to front of building.
 - a. Minimum compacted leveling course for building slab shall be 6 inches.

D. Backfill

1. Backfill shall be permitted only after the work to be covered has been approved by the Contracting Officer.
2. Backfill shall be placed in 8" thick (loose measurement) lifts and compacted with three complete passes of an approved vibratory compactor.

E. Finish Grading

1. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, and raked, and left in a uniform and neat condition. Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line. Final grade shall be flush with top of front slab to provide accessibility.
2. The surface of shall be graded and shaped as shown on the drawings. Surface drainage shall be diverted so that water will not enter into the area.

F. Cleanup

1. After backfilling and grading has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized.
2. Clean building walls, floors, and roof using soapy water.

G. Disposal

1. All unsuitable excavated material, oversize boulders, stumps, small limbs, brush, sod and other construction refuse shall be disposed of off-site at a State-approved disposal site.

END OF SECTION 132700

September 2017

DRAFT

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 133442 - PRE-MANUFACTURED SHELTER

PART 1 - GENERAL

1.1 SUMMARY

- A. This section consists of furnishing and installing pre-manufactured shelters of size indicated with concrete footings.
- B. Related Sections include the following:
 - 1. Section 033000 "Cast-In-Place Concrete
 - 2. Section 321204 "Crushed Aggregate Base or Surface Course"

1.2 QUALITY ASSURANCE

- A. Provide a Professional Engineer, licensed by the State of Utah to provide pavilion and foundation engineering design.
- B. Standards:
 - 1. Comply with the 2018 IBC, ASCE 7-16 and all other applicable state and local building codes.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Keep structural components dry during delivery, storage, handling, and erection, by maintaining factory-applied protective covering in weather-tight and lightproof condition, or by applying other weather-tight protection. Maintain protective covering until building enclosure is completed to extent necessary for protection of interior wood components until final finishing of exterior work is ready to proceed.
- B. If stored temporarily, members shall be placed on blocks well off the ground and separated with wood strips for ventilation purposes.
- C. Protective wrapping shall remain on members until they are enclosed within the building.
- D. Use non-marring slings for loading, unloading, and handling members to prevent damage to the paper and members.

1.4 SUBMITTALS

- A. Shelter Design and Shop Drawings: The submittal shall include:
 - 1. Consult the floorplan and elevations provided in the design documents for the size and appearance of the shelters.
 - 2. The contractor shall submit the shelter designs for the project. The design shall include detailed shop drawings showing the size of each shelter, spacing of columns

- and beams, size, configuration, reinforcement and connections for concrete footings (including design calculations), colors, materials, and style for installation.
3. The contractor shall submit a full, stamped and signed set pdf sets of detailed drawings (floor plan, roof plan, elevations, proposed color scheme and concrete footing design). Design calculations for the proposed shelter and concrete footings shall be provided to the Contracting Officer (for Regional Engineer's Design Approval) within four (4) weeks after the award of the contract. The drawings and design shall be stamped by a licensed Engineer in the State the structure will be installed, certifying the design meets the design requirements specified herein.
 4. The contractor shall not order or procure the pre-manufactured shelter prior to written approval of the structure by the Contracting Officer.

1.5 MEASUREMENT AND PAYMENT

- A. The bid line item shall be per pavilion, complete with design, materials, labor, concrete foundations, slabs, beams, columns, decking, CMU, rockwork, facias, roofing, paint, stain and any other work or materials needed to complete pavilion installations.
- B. Furniture and improvements are covered in other line items.

PART 2 - PRODUCTS

2.1 MANUFACTURER AND INSTALLATION

- A. Basis of Design: The shelter/pavilion shall be model LB-40'x52'(L), with 3:12 pitch beams and steel columns, as manufactured by Cedar Forest Products Company located at 1008 S. Division (Box 98), Polo, Illinois 61064; 815-946-3994; www.cedarforestproducts.com.
- B. Other shelter manufacturer's may be submitted as equals for review and approval by the Contracting Officer.
- C. Size: minimum 40' width x 52' length with minimum interior clearance height of 9'. Beam open span of 35' (+/- 1'); Column placement a minimum of 8' on center.
- D. Design to 2018 International Building Code (IBC)
- E. Design Loading:
 1. Ground Snow Load: minimum of 100 psf
 2. Wind Load: minimum of 100 mph (exp.C)
 3. Seismic: designed to IBC 2018 requirements/ ASCE 7-16
 4. Misc: other loading as required by IBC 2018/ ASCE 7-16
- F. Roof:
 1. Open Gable End with low pitch glulam beams.
 2. Pitch 3:12
 3. Overhangs: 24 inch on ends and sides.

4. Decking: 2" x 6" (nominal), #1 grade, single tongue and groove with V-joint on bottom face, kiln dried pine or approved equal, maximum moisture content shall be 19% or less selected for decking. Specified lengths, with all joints over supports.
 5. Roofing:
 - a. West pavilions shall be roofed with dimensional asphalt shingles as required by Specification 073113.
 - b. East pavilion (1 adjacent to the amphitheater) Shall be roofed with cedar shingles as shown in details and required in specification section 073129.
 6. Fascia: (Nominal) 2" x 8" Western Red Cedar, "D"/ Better Grade, kiln-dried, Surfaced on Four Sides, Western Wood Products Association Grading Rules-(latest edition).
- G. Beams: Structural glue laminated timber beams shall be in conformance with ANSI/AITC Standard A.190.1-(latest edition). Species: Laminating lumber shall be kiln-dried, architectural grade, sealed and wrapped.
- H. Columns: All structural members shall be fabricated from structural steel tubing conforming to ASTM A-500. All structural steel members shall be designed in accordance with the requirements of American Institute of Steel Construction (AISC) and American Iron and Steel Institute (AISI). Finish on steel frame is first painted with a PPG Epoxy Ester Primer with a dry film thickness of 1.0 – 1.5 mils. Then finish painted using a PPG Tecstar acrylic modified alkyd enamel with polyurethane enhancer with a dry film build of 1.5 – 2.0 mils. Color shall be Koko Brown as selected from the manufacturer's standard colors.
- I. Connector Plates: Plates shall be fabricated from structural steel ASTM-A-36 (5" x 12" x 1/4") steel plates. Surface preparation in accordance with SSPC-SP10. Shall be primed painted with a corrosive resistant primer. Finish coat: Premium rust control latex inhibitive enamel as manufactured by PPG, or equal. Hardware: A-325 zinc plated machine bolts and nuts.
- 2.2 Concrete Masonry shall comply with specification section 048100. Rock veneer shall comply with specification section
- 2.3 Concrete shall conform to the requirements of Section 033000 "Cast-In-Place Concrete".

PART 3 - EXECUTION

3.1 SITE PREPARATION AND GRADING

- A. It will be the Contractor's responsibility to provide rough and finish grading for the pad, and adding crushed aggregate base as necessary to bring the pad to a smooth uniform surface. Crushed aggregate shall be compacted with 3 passes of a mechanical compactor.

3.2 CONCRETE

- A. Concrete footings shall be in accordance with Section 033000 “Cast-In-Place Concrete”. Anchors shall be of the size recommended by the manufacturer for the specified loads and for the soil type encountered.

3.3 FABRICATION AND ERECTION

- A. The shelter shall be constructed in accordance with the manufacturer’s instructions and detailed drawings. Field labor will be kept to a minimum by pre-manufactured parts.

3.4 FINISH GRADING

- A. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, hand raked, and left in a uniform and neat condition. Surface drainage shall be diverted so that it will not enter into the area. See drawings for details.

3.5 CLEANUP

- A. After backfilling and grading has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized. Cleanup shall include disposal of waste materials in accordance with Section 024100 “Waste Material Disposal”. Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line.

END OF SECTION

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 133450 - PRECAST VAULT TOILET INSTALLATION

PART 1 - GENERAL

1.1 SCOPE

- A. This item shall consist of excavating, backfilling, and site grading for precast concrete vault comfort stations. It is the responsibility of the Contractor to coordinate with the Government for on-site delivery dates for installation of the restrooms.

1.2 MEASUREMENT AND PAYMENT

- A. There will be no payment for this item. Payment will be made for each restroom installed and accepted under "Project Site Preparation and Grading" section 312100 according to the Schedule of Items.

1.3 RELATED WORK

- A. The work shall be in accordance with the following subsidiary specifications. The subsidiary specifications are referred to in the text by the Section designation only.
 - 1. Section 311000 Clearing and Grubbing (Recreation)
 - 2. Section 024100 Waste Material Disposal (Landfill)

PART 2 - PRODUCTS

2.1 CLASSIFICATION

- A. Excavation will be unclassified as to materials and shall include all materials which are encountered in the required excavation.

2.2 BACKFILL AND EMBANKMENT MATERIAL

- A. Backfill and embankment material shall be loam, sandy clay, sand, gravel, soft shale, or other suitable material free from brush, perishable material, dirt clods, rocks, or boulders larger than six inches in greatest dimension, or frozen material.
- B. Backfill and embankment within six inches of concrete shall contain no rock larger than two inches and no rock two inches or larger shall lie closer than six inches to the ground surface.
- C. Backfill and embankment material shall be excavated material whenever it meets specification requirements. Whenever excavated material contains less than 10 percent of oversized material, the Contractor will be required to remove boulders larger than 6" from the excavated material at no additional compensation and utilize it as backfill material. Whenever material meeting the specification requirements is not available from

excavation, the Contractor will be required to import material from a designated or approved source.

2.3 SELECT BORROW

- A. When excavated soil does not meet the requirements for backfill, and Contractor shall backfill with select borrow where directed.

2.4 WASHED GRAVEL LEVELING COURSE

- A. Gravel shall comply with Section 321204, Crushed aggregate base or surface course, Grading "C". Two inches of gravel shall be used as a leveling course beneath the concrete vault.

PART 3 - EXECUTION

3.1 STAKING BY THE GOVERNMENT

- A. The Government will establish the excavation depth and finish floor elevation prior to the Contractor's excavation work.

3.2 CLEARING AND GRUBBING

- A. Before starting any excavation, the Contractor shall have completed all necessary clearing and grubbing within the specified working limits, in accordance with Section 311000.

3.3 CONSERVING TOPSOIL

- A. Topsoil shall be removed from the area to be excavated and from the area where excavated material will be piled prior to excavating. Topsoil shall be kept separate from excavated material. Topsoil will be reused on those areas from which it came after backfilling and embankment construction is complete.

3.4 SAFETY, SHORING, AND PROTECTION

- A. The Contractor shall meet the prescribed safety rules and regulations. Walls of excavations 4' or more in depth shall be supported by bracing, shoring, or other methods, unless the walls are sloped to a safe angle from the bottom. If shored, the excavation shall be of proper width to accommodate shoring and bracing, as required, to keep walls from collapsing, and to allow for proper installation of the work. All existing improvements, either on public or private property, will be fully protected from damage. All supports shall be removed after construction is completed, and shall be withdrawn in a manner that will prevent the collapse of the sides of the excavation. All openings in the ground, caused by the removal of supports, shall be filled with suitable material properly compacted.

3.5 REMOVAL OF WATER

- A. The Contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water entering the excavations or other parts of the work without damage to adjacent property. All excavations shall be kept free from standing water. Any damage caused by water in the excavation shall be repaired by the Contractor at his expense.

3.6 EXCAVATION, BACKFILL, AND SITE GRADING

- A. Coordination with the Manufacturer - The contractor will be required to coordinate with the manufacturer of the comfort stations to accommodate installation at the time of delivery. The Contractor will be responsible to obtain installation instructions from the manufacturer and perform the excavation, backfill, and site grading in accordance with those instructions. The excavation shall be over excavated two feet (horizontal measurement) on each side of the vault to allow for compaction and minor adjustments in orientation. The Contractor must have excavation complete prior to vault comfort station delivery. The Contractor must be on site at the time of delivery to perform the backfill operation as soon as the vault comfort station is in place.
- B. General - Excavation shall be performed by any acceptable method, including the use of explosives. When blasting, the Contractor shall provide skilled blasting operators and precautions shall be taken to avoid damage to adjacent property. Pile excavated material away from the ends of the hole to facilitate crane and delivery truck access. The crane and delivery truck typically need to be side-to-side during the placement.
- C. Gravel Leveling Base - The Contractor shall place a 6-inch thick leveled layer of gravel, Grading "C", prior to placement of the comfort station. Slope the top of the gravel one percent back to front and side to side out of the doorway.
- D. Backfill and Embankment Operations - Backfill will be permitted only after the work to be covered has been approved by the Contracting Officer. Backfill and embankments shall be layer placed 8-inches thick (loose measurement) and compacted with three complete passes of an approved vibratory compactor.

3.7 FINISH GRADING

- A. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, hand raked, and left in a uniform and neat condition. Surface drainage shall be diverted so that it will not enter into the area. See drawings for details.

3.8 CLEANUP

- A. After backfilling and grading has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized. Cleanup shall include disposal of waste materials in accordance with Section 024100. Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line.

END OF SECTION

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 136100 - AMPHITHEATER RENNOVATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section consists of rehabilitating an historic amphitheater including selective demolition of benches and piers, limited repointing of historic rockwork, new concrete pier bench supports with decorative form liners, wood plank benches, epoxy fasteners, concrete fasteners and concrete stair repair.

1.2 SUBMITTAL

- A. Product Data: Submit product data on:
 - 1. Wood bench material.
 - 2. Paint colors.

1.3 MEASUREMENT AND PAYMENT

- A. Payment shall be lump sum for amphitheater rehab, constructed and accepted as shown on the drawings A14 and A15.

PART 2 - PRODUCTS

2.1 STONE REPOINTING:

- A. See notes on the plans for limited areas requiring repointing. It is estimated that approximately 50 LF of steps including the tread and riser are damaged and need to be repointed. Coordinate with COR for areas to be repaired.
- B. Contractor to inspect the riser and edge of the rock retaining wall at each row of the amphitheater for loose rocks and repair as needed. Areas that are in poor condition should be repointed.
- C. Portland Cement: ASTM C 150, Type I or Type II.
 - 1. Provide white cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Mortar Sand: ASTM C 144, unless otherwise indicated.
 - 1. Color: Provide natural sand; of color necessary to produce required mortar color.
 - 2. For pointing mortar, provide sand with rounded edges.
 - 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands, if necessary, to achieve suitable match.

2.2 CONCRETE STAIRS

- A. Concrete stairs will be pushed back into place per notes on the drawings.

2.3 CONCRETE BENCH SUPPORTS

- A. Concrete shall be in accordance with Section 033000 "Cast-In-Place Concrete".

2.4 WOOD PLANK BENCHES AND FASTENERS

- A. Lumber: S4S, Doug Fir Larch No 2.
 - 1. Wood Planks shall be sanded smooth.
- B. Bolts: All bolts shall be hot dip galvanized.
- C. Benches shall be painted on all surfaces as required by specification section 099600- High Performance Coating.

PART 3 - EXECUTION

3.1 CONCRETE

- A. Concrete shall be in accordance with Section 033000 "Cast-In-Place Concrete".
- B. Piers: Work concrete sufficiently so that all voids are eliminated. Faces of benches shall have an architectural finished surface as approved by the Contracting Officer's Representative.
- C. Architectural Finish Concrete:
 - 1. See Section 033000.

3.2 REPOINTING STONE:

- A. Investigate areas to be repointed with the Contracting Officer's Representative. Clearly mark with tape or chalk to convey area of work for the contractor.
- B. Remove in an undamaged condition as many whole stone units as possible.
 - 1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
 - 2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
- C. Stone Repair: Carefully remove loose stone fragments in areas indicated to be repaired. Reuse only stone fragments that are in sound condition.
 - 1. Remove soil, loose stone particles, mortar, and other debris or foreign material from fragments and stone from which fragments were removed by cleaning with stiff-fiber brush.

2. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces completely filling all crevices and voids.
 3. Fit stone fragments onto building stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured.
- D. Clean residual adhesive from exposed surfaces and patch chipped areas.

3.3 ADJUSTING AND CLEANING

- A. After work has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized. Cleanup shall include disposal of waste materials in accordance with Section 024100 "Waste Material Disposal". Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line.
- B. Any wood benches that have been damaged during construction shall be removed and replaced at the expense of the Contractor.
- C. Paint shall be touched up at completion.

END OF SECTION 136100
JANUARY 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 221100 - WATER DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section shall consist of furnishing and installing the following:
 - 1. Potable water distribution pipe and fittings.
 - 2. Drains.
- B. This Section shall also include the flushing, testing and disinfection of waterlines.
- C. Related Sections include the following:
 - 1. Section 024100 "Waste Material Disposal."
 - 2. Section 033020 "Concrete From Package Dry Mix for Minor Structures."
 - 3. Section 221102 "Curb Valves and Boxes."
 - 4. Section 312000 "Earthwork."

1.2 DEFINITIONS

- A. GSP: Galvanized Steel Pipe.
- B. HDPE: High Density Polyethylene plastic.
- C. NPWL: Non-potable waterline (includes sewerline).
- D. PVC: Polyvinyl chloride plastic.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Pipe and fittings.
 - 2. Drain and vent screens.
- B. Plan for disposal of water used for testing and disinfection of waterlines.
- C. Water System Operations and Maintenance Manual.

1.4 QUALITY ASSURANCE

- A. All work is to be completed according to applicable Federal, State and Local codes. This work includes, but is not limited to, materials, installation, testing and disinfection
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. NSF Compliance:

1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
2. Comply with NSF 61 Annex G for materials for water-service piping and specialties for domestic water. All pipes, fittings, fixtures, solder and flux shall meet the 0.25% maximum lead content rules for all wetted components.

1.5 MINIMUM SYSTEM REQUIREMENTS

- A. Unless otherwise noted, the minimum working pressure for piping and specialties shall be 160 psig.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Protect stored piping from moisture and dirt. Elevate above grade.
- C. Protect flanges, fittings, and specialties from moisture and dirt.
- D. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.7 COORDINATION

- A. Coordinate connection to existing waterlines with Contracting Officer.
- B. Verify piping materials, sizes, entry locations and pressure requirements are compatible with connection point.
- C. Coordinate other utility impacts.

1.8 MEASUREMENT AND PAYMENT

- A. Payment will be as listed for the following items:
 1. Pipeline: Linear Feet of pipe of each type and size designated, including fittings, trench, tracer wire, and connections to existing waterlines.
 - a. This item also includes imported pipe zone and special bedding material from a commercial source excavated, processed, hauled and installed.
 2. Daylight Drains: Number of Daylight Drains, including excavation, galvanized steel pipe, fittings, screen, suction strainer, riprap, backfill and all work within 10 feet of the drain outlet, as shown on the Drawings.
 3. Water System Operations and Maintenance Manual: This item is considered incidental to this section and will not be paid for separately.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All waterlines, pipes, and fittings shall be new and unused, of the type, pressure rating or class, and size specified and as shown on the Drawings.

2.2 PIPES AND FITTINGS

A. HDPE:

1. Pipe, AWWA C901:
 - a. Material Designation: PE 4710 resin
 - b. Material Classification: ASTM D1248
 - c. Minimum Cell Classification: ASTM D 3350, 345434C
 - d. Dimension Ratio and Minimum Pressure Rating: DR11, 160 psig
2. Fittings:
 - a. Molded HDPE Fittings: ASTM D 3350, PE 4710 resin, butt-fusion type, made to match HDPE pipe dimensions and class.
 - b. Insert Fittings: Not allowed.
 - c. Transition Fittings to non-HDPE Pipe: Approved by HDPE pipe manufacturer. Compression-type fittings are not allowed.
3. Pipe Larger than 2-inch Diameter: Provide in 40-foot lengths rather than in rolls.

B. Galvanized Steel: ASTM A53, Schedule 40, threaded ends meeting ASME B1.20.1.

1. Fittings: Threaded, ASTM A 338.

2.3 PIPING SPECIALTIES

A. Flexible Connectors:

1. Nonferrous-Metal Piping: Bronze hose covered with bronze wire braid; with copper-tube, pressure-type, solder-joint ends or bronze flanged ends brazed to hose.
2. Ferrous Piping: Stainless-steel hose covered with stainless-steel wire braid; with ASME B1.20.1, threaded steel pipe nipples or ASME B16.5, steel pipe flanges welded to hose.

B. Dielectric Fittings: Combination of copper alloy and ferrous; threaded, solder, or plain end types; and matching piping system materials.

1. Dielectric Unions: Factory-fabricated union assembly, designed for 250-psig minimum working pressure at 180 deg F. Include insulating material that isolates dissimilar metals and ends with inside threads according to ASME B1.20.1.
2. Dielectric Flanges: Factory-fabricated companion-flange assembly, for 160- or 300-psig minimum working pressure to suit system pressures.
3. Dielectric-Flange Insulation Kits: Field-assembled companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

- a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure to suit system pressures.
- 4. Dielectric Couplings: Galvanized-steel couplings with inert and noncorrosive thermoplastic lining, with threaded ends and 300-psig minimum working pressure at 225 deg F).
- 5. Dielectric Nipples: Electroplated steel nipples with inert and noncorrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig minimum working pressure at 225 deg F.
- C. Daylight Drains and Overflows
 - 1. Suction Strainer
 - a. Design: Galvanized (zinc plated), cold rolled, 16-gage steel strainer with threaded end to fit GSP drain pipe size.
 - b. Model: “SSS” Series, Round Hole Strainer, as manufactured by Campbell Manufacturing Inc., or an approved equal.
 - 2. Insect Screens
 - a. For Daylight Drains: 4-mesh woven wire cloth, galvanized steel.
 - b. For Water Storage Tank and Spring Development Drains and Overflows: 24-mesh woven wire cloth, type 304 stainless steel standard grade, non-corrodible.
 - 3. Riprap
 - a. The stones may be obtained from on-site excavated material or a borrow source designated by the Contracting Officer. Stones used shall be such that not more than 10 percent of the individual stones shall have a perimeter less than 12 inches in the smallest section. All of the stones shall have a volume less than a 1/2 cubic foot.
 - b. The stones shall be sound, hard, durable and free from laminations, fractures, or other structural defects. They shall be of such quality that they will not disintegrate on exposure to water or weathering.

2.4 OPERATION AND MAINTENANCE MANUAL

- A. The Contractor shall furnish three sets of instructions for operating and maintaining the complete water system, including start-up and shut-down procedures, operator safety procedures, location of valves and other key system features, parts list and parts order form, instructions for draining the system, etc.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Refer to Section 312000 “Earthwork” for excavating, trenching, bedding, and backfilling.

3.2 PIPING INSTALLATION

- A. Construct the water system to the lines and grades shown or established in the field.
- B. Stake locations of waterlines as shown on the Drawings. Waterline location shall be approved by the Contracting Officer before installation.
- C. All waterline shall be graded to drain.
- D. All pipe, fittings, and appurtenances shall be handled and installed in strict conformance to the manufacturer's recommendations.
- E. Drains, valves, and other regulating and controlling devices shall be installed in the line where called for on the drawings.
- F. The interior of all pipe, fittings, and other accessories shall be kept as free as possible from dirt and foreign matter at all times. Each piece of line as it is laid shall be cleaned of all debris. When the pipeline has become dirty on the inside during shipment or storage, it shall be swabbed out by drawing a damp swab through the line before placing in trench. Care shall be exercised to keep all joining surfaces clean. Any pipe with contaminated or damaged joining surfaces, which cannot be satisfactorily cleaned or repaired, shall be discarded. Under no circumstances shall pipe be installed in water, and no pipe shall be installed when trench conditions or the weather is unsuitable for such work. At all times when work is not in progress, all open ends of the pipe and fittings shall be securely closed to the satisfaction of the Contracting Officer so that no trench water, rodents, earth, or other substance will enter the pipe or fittings.
- G. Any section of pipe already installed and found to be defective shall be removed and replaced with new pipe at the Contractor's expense.
- H. Water and Non-Potable/Sewer Line Crossings
 - 1. Potable and NPWL lines shall never be installed in the same trench.
 - 2. If a new line crosses below an existing line, the existing line shall be supported to prevent settling.
 - 3. Where waterlines intersect NPWLs or are within 10 horizontal feet of NPWLs, the following applies:
 - a. At least one of the pipes (either the waterline or NPWL) shall be constructed or reconstructed with 200 psi pipe or encased in a continuous sleeve with same rating. At crossing, extend 200 psi pipe or sleeve for a distance of 10 feet perpendicular distance from each side of the waterline. The waterline and NPWL pipes or sleeves shall be centered at the crossing so that the joints will be an equal distance and as far as possible from the crossing.
 - 1) Sleeves: Nominal sleeve diameter to be at least 3 inches larger than nominal diameter of pipe to be encased. Install end seals in annular space at each end of sleeves.
 - 2) In lieu of constructing or reconstructing the NPWL with pipe conforming to waterline requirements, the NPWL may be encased in

concrete at least 6 inches thick around the pipe measured at the bell, for 10 feet each side of the waterline.

- b. Construct according to applicable federal, state and local regulations, including Utah Division of Drinking Water, "Rules Governing Public Drinking Water Systems, R309-550." The Contractor is responsible for obtaining and following these regulations.
 - c. Where applicable, state and local regulations supersede the above requirements.
- I. Culvert Crossings: Where waterline crosses a road culvert, adjust grade of waterline to provide a minimum of 12 inches of separation between the waterline and culvert, maintaining slope of waterline to drain.
- J. A minimum of one-foot separation shall be maintained between electric and waterlines in the same trench. Unless the electric conductors are in conduit the waterline shall be a minimum of one foot below the electric conductors.
- K. Cutting and Handling of Pipe
 - 1. Cutting of pipe for closure pieces or for other reasons shall be done in a neat manner by methods, which will not damage the pipe. The pipe and fittings shall be handled in such a manner as to insure delivery and final placement in good, undamaged condition. Particular care shall be exercised not to injure the pipe surfaces or coatings. Damaged pipe shall not be used in the work.
- L. Laying Pipe
 - 1. No pipe shall be placed in the trench until the Contracting Officer has approved the trench and bedding.
 - 2. Do not drop pipe into trench. If HDPE pipe is fusion welded above ground outside of the trench, gently lay pipe into the trench. Ensure installation procedures meet the manufacturer's requirements.
 - 3. Pipes shall be placed true to the lines and grades shown on the Drawings and as specified. Complete water system shall be constructed to drain by gravity to drains for seasonal shutdown. Waterlines shall be constructed to drain at a minimum grade of 2%. Waterlines not meeting this requirement shall be removed by the Contractor and replaced at no cost to the Government.
 - 4. Each section of the pipe shall rest upon the pipe bed for the full length of its barrel.
 - 5. Backfill the pipe within 24 hours after installing the pipe in the trench, leaving the joints and one foot of pipe on each side of each joint exposed until testing is complete.
 - 6. When work is not in progress, securely close open ends of pipe and fittings.
 - 7. When high density polyethylene or solvent weld joint pipe is used, it shall be weaved in the trench to provide horizontal slack in the line for expansion and contraction.
 - 8. High density polyethylene pipe shall be allowed to cool to within 20°F of the shaded trench bottom temperature before backfilling.

9. When pipes are installed in a structure or utility box, they shall be adequately supported.
10. Use proper fittings in order to follow the required line and grades and to avoid excessive curvature. Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed the manufacturer's recommended maximum joint deflection or curvature for their pipe.
11. When more than one pipeline is in the same trench, the pipes shall be separated by at least eight horizontal inches, or as shown on the Drawings.
12. Bends that result in joint tension or permanent pipe deformation are prohibited.
13. Pipelines may be relocated slightly, if necessary, to avoid existing obstacles. However, the required slopes must be maintained.

M. Branch Connections

1. Branch connections to the main shall be made with tees.
2. Horizontal tees for waterline laterals shall not be permitted. The branch side of tees shall be up when drainage is toward the tee, and down when drainage is away from the tee.
3. Waterline tees shall be the same diameter as the largest pipe connected to the tee.

N. Pipe Joints

1. Joints shall be made, using jointing materials and applied with the proper accessories, in accordance with the manufacturer's instructions. Completed joints shall be watertight, and capable of passing the required hydrostatic testing. If pipe and fittings are assembled with a lubricant, it must be nontoxic.
2. Dissimilar Joints: Connections between two dissimilar pipes or fittings shall be installed in manner recommended by the pipe manufacturer and approved by the Contracting Officer. Use adapters compatible with both piping materials, outer diameters and system working pressure.
 - a. For HDPE pipelines:
 - 1) Use HDPE/GSP transition fittings for connections to galvanized steel pipe.
 - 2) Use HDPE/PVC transition fittings for connections to PVC pipe.
 - b. For other situations, use fittings to suit the actual conditions.
 - c. Compression-type fittings are not allowed.
3. Threaded Metal Joints:
 - a. Thread pipes with tapered pipe threads according to ASME B1.20.1, apply tape or joint compound, and apply wrench to fitting and valve ends into which pipes are being threaded.
 - b. Exposed threaded pipe joints on galvanized steel pipe shall be painted with mastic following the manufacturer's application procedures.
 - c. Field cut ends shall be squared off by grinding or filing; ends shall be reamed with all chips and flakes removed.

- d. Field cut threads or machined joints shall be made with sharp tools to sharp finished ends.
4. HDPE Heat-Fusion Joints
- a. According to ASTM D 2657 and piping manufacturer's written instructions.
 - b. The joining method shall be butt fusion method and shall be performed in accordance with the pipe manufacturer's recommendations. Butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer, including but not limited to, temperature requirements, alignment, and fusion pressures.
 - c. Personnel trained in butt fusion techniques by the manufacturer of the pipe, shall supervise or perform butt fusion operations.
 - d. Butt fusion shall be performed between pipe ends or pipe ends and fitting and valve outlets, of like outside diameter and wall thickness, SDR or DR. Butt fusion joining between same diameters but unlike wall thickness shall not be permitted. Transitions between unlike wall thickness shall be made with a transition nipple (a short length of the heavier wall pipe with one end machined to the lighter wall) or by mechanical means.
 - e. Branch connections to the main shall be made with polyethylene fittings, and butt fused.
 - f. Bent Strap Test: On each day that butt fusions are to be made, perform a "Bent Strap Test." The first fusion of the day shall be a trial fusion. The trial fusion shall be allowed to cool completely, and then fusion test straps shall be cut out. The test strap shall be 12" (min) or 30 times the wall thickness in length with the fusion in the center, and 1" (min) or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. If the fusion fails at the joint, a new trial fusion shall be made, cooled completely and tested. Butt fusion of pipe to be installed shall not commence until a trial fusion has passed the bent strap test.
5. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
- a. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
- O. Install piping by directional boring, tunneling, jacking, or combination, under streets and other obstructions that cannot be disturbed.

3.3 IDENTIFICATION

- A. According to Section 312000 "Earthwork."
- B. Wrap all buried, non-metallic, nonperforated piping with tracer wire.
- C. Use detectable warning tape over piping and at outside edges of underground structures.

3.4 DAYLIGHT DRAINS

- A. Transition from water system piping to galvanized steel pipe 10-feet from atmospheric outlet of daylight drain.
- B. Install suction strainer and insect screens on the atmospheric outlet of daylight drains. Attach insect screens to pipe with stainless steel hose clamps.
- C. Minimum grade of slope of drain shall be 2%.
- D. Place riprap securely around outlet with a minimum 12" air gap.

3.5 HYDROSTATIC TESTING

A. General

- 1. The Contractor shall conduct pressure and leakage tests on all newly constructed portions of the water system, including water mains, service lines, fittings, valves, and hydrants. New waterlines that are extensions or modifications of an existing water system shall be tested at the test pressure specified here unless the Contracting Officer specifies another pressure. Pneumatic testing will not be allowed.
- 2. The contractor shall ensure that any appurtenance attached to the pipeline at the time of testing is rated to withstand the pressures that will exist during testing.
- 3. Conduct piping tests before joints are covered and after thrust blocks, if required, have hardened sufficiently. Joints shall remain uncovered until testing is completed satisfactorily.
- 4. The Contractor shall furnish the pump, pipe, gauge, measuring device, connections, and all other necessary equipment, and shall furnish the necessary personnel to conduct the tests. All equipment, gauges, and attachments shall be subject to approval by the Contracting Officer.
- 5. The Contracting Officer shall be present during the testing period.
- 6. Waterlines shall be tested in sections not to exceed 2,000 ft in length or a maximum pressure differential of 30 psi in the test section.
- 7. No paints, asphalts, tars, enamels, or other types of pipe compounds shall be used to eliminate leaks.

B. Pressure and Leakage Test

- 1. The test pressure shall:
 - a. Equal at least 100 psi at the highest elevation of the test but not exceed 160 psi at any point being tested.
 - b. Not exceed the thrust restraint design pressures.
 - c. Not vary by more than +/- 5 psi from the established test pressure.
 - d. Not exceed twice the rated pressure of valves when the test section includes closed valves.
 - e. Be not less than 100 psi for all piping within buildings.
- 2. Pressure Test Procedure
 - a. Equipment: The test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Contracting Officer.

- b. Preparation: Fill pipeline 24 hours before testing. Use only potable water. Each valved section of pipeline shall be slowly filled with water and all air shall be expelled from the pipeline. Apply test pressure to stabilize system.
- c. Pressurization:
 - 1) Increase pressure in 50-psig increments and inspect each joint between increments.
 - 2) Hold at test pressure for 1 hour.
 - 3) Decrease to 0 psig.
 - 4) Slowly increase again to test pressure and hold for 1 more hour. If the test pressure cannot be sustained within +/- 5 psi during this time, then the system will be determined to have leakage.
 - 5) Leakage shall be verified by the Contractor and the Contracting Officer.
 - 6) Locate and repair leaking joints with new materials and repeat test until leakage is within allowed limits. All visible leaks are to be repaired regardless of the amount of leakage.
- d. Examination: All exposed pipe, fittings, valves, and joints shall be carefully examined. Any cracked or defective pipe, fitting, or valve discovered shall be repaired or replaced by the Contractor at his own expense with new material and the test repeated until satisfactory to the Contracting Officer.

3. Results

- a. The Contractor shall furnish a written report to the Contracting Officer describing the results of each test. The report must identify the specific portions of the pipeline tested, the pressure, the duration of the tests, and the amount of leakage.

3.6 CLEANING AND DISINFECTION

A. Clean and disinfect water-distribution piping as follows:

- 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
- 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as described below:
 - a. Flushing Pipelines
 - 1) After the pressure and leakage testing has been completed, all water pipes shall be thoroughly flushed.
 - 2) Flushing shall remove all debris from the pipeline, including HDPE pipe shavings, gravel and any other material that may have accidentally entered the pipeline during construction.
 - 3) Remove all self-closing faucets and drinking fountains from hydrants before flushing lines. Failure to do so will likely clog the internal parts of the faucet.

- 4) If no hydrants or other outlets are installed at the end of the waterline, an outlet at the end of each lateral shall be provided. Outlets shall be large enough to develop a velocity in the waterlines of at least 2.5 feet per second (see Table 1 for necessary flows). If necessary, use a booster pump or other method to obtain the necessary flows.
- 5) Minimum velocities must be obtained in all mainlines, laterals and drainlines.
- 6) Ensure flushing outlets have adequate drainage and no damage or erosion will occur from the flushing process. Install hoses and/or pipe extensions if necessary.

TABLE 1
Required Flow in Gallons per Minute
(GPM) to provide 2.5 feet per second
Flushing Velocity

Type of Pipe			
Nominal Pipe Size (inches)	HDPE (SDR 11)	PVC (160 psi)	Galv. Steel (Schedule 40)
1	7	9	7
1 ¼	11	15	12
1 ½	14	19	16
2	22	30	27
2 ½	-	44	38
3	49	64	58
3 ½	-	84	77
4	81	106	100
5	-	162	156
6	175	229	225
8	274	388	390
10	461	603	615
12	648	848	872

b. Requirement of Chlorination

- 1) Pipelines: After flushing, all new waterlines and repaired portions of, or extensions to, existing waterlines shall be disinfected by chlorination. Chlorination shall provide a minimum of 25 mg/l residual after 24 hours contact in the system. This may be expected with an application of 50 mg/l, although some conditions may require more. The entire system including the storage tank or spring box shall be filled with the disinfecting solution. All taps, hydrants, and other outlets shall be opened and left open until chlorine is noticeable by odor or testing in the water coming from each. Immediately close taps, hydrants, and other outlets. The chlorinated water shall be retained in the waterlines for at least 24 hours. An alternative of introducing a chlorine solution of 300 mg/l for a period of 3 hours is also approved.

- 2) Reservoirs Only: For large reservoirs where water is not going to be reused to disinfect connecting distribution lines, or where it is not economical to treat the entire contents with 50 mg/l of chlorine, disinfection can be accomplished by swabbing or spraying the walls, floor, and ceiling with a chlorine solution containing 300 mg/l of available chlorine. A minimum of 3 hours shall elapse before the structure is flushed and returned to service.
- c. Preparation of Disinfecting Mixture: Chlorine-bearing compounds used for disinfection shall comply with ANSI/NSF 60.
- 1) Calcium hypochlorite must be prepared as a water mixture for introduction into the waterlines. The powder should first be made into a paste and then thinned to either a 1 percent or 5.25 percent chlorine solution.
 - 2) Sodium hypochlorite is already a water mixture.
 - 3) Table 2 gives the amount of chlorine-bearing compound to mix to obtain either a 1 percent or 5.25 percent solution.
 - 4) Table 3 gives the amount of a 1 percent or 5.25 percent solution required to obtain a 50 mg/l solution for various volumes.
 - 5) Table 4 gives the volume of water contained in each 100 feet of pipe of various sizes.

TABLE 2

Amount of Chlorine-bearing Compound to Mix to Obtain a 1% or 5.25% Solution				
Product	1% Solution		5.25% Solution	
	Amount of Compound	Gallons of Water	Amount of Compound	Gallons of Water
Calcium Hypochlorite (65% Cl)	1 pound	7.67	1 pound	1.36
Sodium Hypochlorite (5.25% Cl)	1 gallon	4.25	1 gallon	0

TABLE 3

Amount of Chlorine-Water Solution Required to make 50 mg/l Chlorine Solution for Various Volumes		
Volume (Gallons)	5.25% Solution	1.00% Solution
100	1.52 cup	0.50 gal.
500	0.48 gal.	2.50 gal.
1,000	0.95 gal.	5.00 gal.
5,000	4.76 gal.	25.0 gal.
10,000	9.52 gal.	50.0 gal.
50,000	47.6 gal.	250 gal.
100,000	95.2 gal.	500 gal.

TABLE 4

Volume in Gallons per 100 feet of Pipe
--

Nominal Pipe Size (inches)	Type of Pipe		
	HDPE (SDR 11)	PVC (160 psi)	Galv. Steel (Schedule 40)
1	4.6	5.8	4.5
1 1/4	7.3	9.6	7.8
1 1/2	9.6	12.6	10.6
2	15.0	19.6	17.4
2 1/2	-	28.8	24.9
3	32.6	42.6	38.4
3 1/2	-	55.6	51.4
4	53.8	70.4	66.1
5	-	107.5	103.9
6	116.7	152.6	150.1
8	182.8	258.6	259.9
10	307.2	401.8	409.6
12	432.2	565.2	581.4

- d. Method of Chlorine Application: The preferred method is to fill the storage tank (for a distribution system) or the spring head box (for a supply system) with chlorinated water of the proper strength. The water shall then be released through the outlet lines to the remainder of the system and retained there for the required period of time. If either of these points of application is unavailable, chlorinated water of the proper strength may be added to the beginning of the pipeline extension, or to any valved section of the extension, through a corporation stop installed by the Contractor in the top of the pipe. Other methods may be approved by the Contracting Officer.
- e. Testing of Chlorine Residual: To ascertain the concentration, the chlorine residual shall be measured by the Contracting Officer in accordance with the procedures described in the current edition of "Standard Methods for the Examination of Water and Wastewater," or AWWA M12, or by using an appropriate high-range chlorine test kit
- f. Final Flushing and Testing: Following the retention period, as specified in this Section, all heavily chlorinated water shall be thoroughly flushed from the pipeline until the chlorine concentration in the water leaving any part of the line is no higher than 1 mg/l.
- g. Disposal:
 - 1) Heavily chlorinated water shall not be drained directly into streams, rivers, lakes or drainage ditches which lead to surface water.
 - 2) When emptying the lines or tank after the 24-hour period, whether the system has passed or failed, the chlorine solution shall be neutralized before being discharged. Neutralize system by adding sodium thiosulfate to the storage tank in accordance with Table 5 below. Let the sodium thiosulfate sit in the storage tank for 24-hours and then release the water from the tank and flush the system. Residual chlorine at the outlets shall be minimal.

TABLE 5
Amounts of Chemical Required to Neutralize
Various Residual Chlorine Concentrations in
1,000 gallons of Water

Residual Chlorine Concentration mg/L	Pounds of Sodium Thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3 - 5\text{H}_2\text{O}$)
1	0.012
2	0.024
10	0.12
50	0.60

- h. Bacteriological Examination: After the system has been disinfected as specified, but before the new water piping is put to use or connected to existing piping, the Contractor shall test the water for bacteriological contamination from representative points in the system as approved by the Contracting Officer. The coliform organisms shall be tested for presence/absence in accordance with State drinking water regulations. If coliform bacteria are present, testing shall be repeated in accordance with State drinking water regulations. If the report of this examination is unsatisfactory, the system shall be flushed and the disinfection procedure repeated until the results of bacteriological examinations are satisfactory.

END OF SECTION 221100
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 221102 - CURB VALVES AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Curb Valves and Boxes.
- B. Related Sections include the following:
 - 1. Section 312000 "Earthwork."

1.2 QUALITY ASSURANCE

- A. All work is to be completed according to applicable Federal, State and Local codes.
- B. NSF Compliance:
- C. All products in contact with potable water shall comply with NSF 61 Annex G. All pipes, fittings, fixtures, solder and flux shall meet the 0.25% maximum lead content rules for all wetted components.

1.3 MEASUREMENT AND PAYMENT

- A. Payment will be as listed for the following items:
 - 1. Curb Valves and Boxes: Number of valves of each type and size designated, including boxes, operating rods, lid keys and all work within five feet of the center of the valve box.
 - 2. Exception: Waterlines shall be paid for separately under Section 221100 "Water Distribution Systems."

PART 2 - PRODUCTS

2.1 CURB VALVES AND BOXES

- A. Valves: Valves shall be the same nominal size as the line in which they are installed or as indicated on the Drawings.
 - 1. Valve Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and end matching curb valve. Furnish one valve operating wrench or shut-off rod with every five (or fraction thereof) curb boxes installed, as indicated on the Drawings.
 - a. Stationary Rods for Metal Valves: Steel, with adapter to fit valve, extend to within 12 inches of ground level.

2. Metal Valves

a. 3/4-Inch Through 2-Inch Valves:

- 1) Design: Minneapolis Top, Solid Tee Head, AWWA C 800.
- 2) Model: "Mark II Oriseal" Valve, Mueller H-10287, as manufactured by Mueller Company, or an approved equal.

b. Valves Larger than 2-Inches:

- 1) Design: AWWA C 509, NSF 61, gate valves with iron body, "O" ring stem seals, nonrising stem, with 2-inch square wrench nut head.
- 2) Ends: Threaded, flanged, hub, spigot, mechanical joint or other as appropriate for connection to line in which they are installed.
- 3) Model: Mueller A-2360, as manufactured by Mueller Company, or an approved equal.

B. Curb Boxes:

1. Lids: Lockable, with pentagon-type bolt, compatible with valve box; labeled "WATER" or "SEWER" respectively.
2. Pentagon Lid Keys: Furnish one key with every five (or fraction thereof) curb boxes installed.
3. Curb Boxes for Metal Valves:

a. For 3/4-Inch Through 2-Inch Valves: Extension type, Minneapolis pattern base. Models below as manufactured by Mueller Company or an approved equal.

- 1) 3/4-Inch and 1-Inch Valves: Mueller H-10302.
- 2) 1-1/4-Inch Through 2-Inch Valves: Mueller H-10304.
- 3) Outside roadways, a galvanized pipe and threaded cap may be used in lieu of a commercial curb box, as indicated on the Drawings.

b. For Valves Larger Than 2-Inches: Buffalo type, two piece, 5-1/4-Inch, Series 6855 as manufactured by Tyler Corporation, or an approved equal.

C. Gravel: Hard, durable, screened material, 1/4-inch to 1-inch in size, free of soil or clay lumps.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating and backfilling for valves and boxes is specified in Section 312000 "Earthwork."

3.2 CURB VALVE AND BOX INSTALLATION

- A. Crushed Gravel Bed: Under each valve, 12-inch minimum diameter, 12-inch minimum depth.

- B. Knockouts: Remove knockouts from valve box.
- C. Curb Box Position: Centered over valve bonnet, no part in contact with valve. The curb valve box shall not rest on the pipe, but shall be fully supported by the gravel base.
- D. Curb Box Lid: Flush with finished grade, unless indicated otherwise on the Drawings.

END OF SECTION 221102

January 2022

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 221105 - WATER HYDRANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provides for furnishing and installing hydrants as follows:
 - 1. Type A: A self-closing faucet.
 - 2. Type B: A self-closing faucet and hose bibb with backflow preventer.
 - 3. Type C: Two hose bibbs, upper bibb with vacuum breaker, lower bibb with backflow preventer.
- B. Related Sections include the following:
 - 1. Section 024100 "Waste Material Disposal."
 - 2. Section 221100 "Water Distribution System."
 - 3. Section 321204 "Crushed Aggregate Base or Surface Coarse."

1.2 LOCATION

- A. General location and orientation of all hydrants are shown on the drawings.
- B. Exact location and orientation shall be approved by the Contracting Officer.

1.3 SUBMITTALS

- A. Manufacturer's Literature and Maintenance Data: Faucet, hose bibb, vacuum breaker and backflow preventer.
- B. Certification that washed rock meets the gradation requirements of this section.
- C. Maintenance information to be included in maintenance manual.
- D. Stain for Wood Post: Color Sample.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Products shall be kept free from damage during delivery, storage, and handling. Protect from dirt and moisture during storage.

1.5 QUALITY ASSURANCE

- A. NSF Compliance:
 - 1. All products in contact with potable water shall comply with NSF 61 Annex G. All pipes, fittings, fixtures, solder and flux shall meet the 0.25% maximum lead content rules for all wetted components.

1.6 MEASUREMENT AND PAYMENT

- A. Hydrants: Number of hydrants of each type designated, including all work within ten feet of hydrant post.
 - 1. Exception: Buried water supply line shall be paid for separately under Section 221100 "Water Distribution Systems."

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS

- A. Lumber: S4S, Redwood, construction grade, meeting requirements of Redwood Inspection Service.
- B. Stain: Moorwood solid color stain as manufactured by Benjamin Moore & Co. or an approved equal.
 - 1. Color: Forest Service "Brown." Contractor shall submit color sample to the Contracting Officer for approval.
- C. Framing Anchors: 16 gage, galvanized, 3-1/4 inches high with 1-1/4 inch long flanges
 - 1. Model: GA2 model angle connector, as manufactured by Simpson Strong, or an approved equal.
- D. Galvanized Steel Drain Grate
 - 1. Design: 1/2" x 2" on-center press-locked close mesh, ADA compliant, hot-dipped galvanized steel, and 1-1/2" depth with welded lugs. Length and width shall be as shown on the Drawings.
 - 2. Model: 8-P-2 as manufactured by Alabama Metal Industries Corporation (AMICO), or an approved equal.
- E. Washed Rock for Gravel Sump: 3/4-inch to 1-inch washed and screened material, without lumps of soil, clay or organic material.

2.2 FOREST SERVICE STANDARD HYDRANTS (TYPES A, B & C)

- A. Pipe and Fittings: As specified in Section 221100 "Water Distribution System."
 - 1. Galvanized Steel Pipe and Fittings: Schedule 40.
- B. Plumbing Appurtenances
 - 1. Self-Closing Faucet
 - a. Design: 1/2-inch, plain end, chrome or rough brass finish, self-closing lever handle, ADA compliant.
 - b. Model: 6252EHLF, as manufactured by Haws Corporation, or an approved equal.
 - 2. Hose Bibb

- a. Design: 1/2-inch FIP, rough brass finish, loose key lockshield, with backflow preventer.
 - b. Model: 253BFPLK “No Kink”, as manufactured by Arrowhead Brass Products, Inc., or an approved equal.
 - c. Provide two operating keys for first five hydrants, then one additional key for each additional five hydrants.
- 3. Stop Valve
 - a. Design: 3/4-inch curb valve, with removable key, FIP thread and drain.
 - b. Model: Mark II H-10284 as manufactured by the Mueller Company, or an approved equal.
 - c. Provide two operating keys for first five hydrants, then one additional key for each additional five hydrants.
- 4. Backflow Preventer
 - a. Design: 1/2-inch, ASSE 1024, CSA B64.6, bronze-bodied, dual check.
 - b. Model: Series 7, as manufactured by Watts Regulator Company, or an approved equal.
 - c. Location: Attach to lower hose bibb, as shown on the Drawings.
- 5. Vacuum Breaker
 - a. Design: ASSE 1011, Brass body, anti-siphon, non-removeable, 3/4-inch HTF inlet, 3/4-inch HTM outlet.
 - b. Model: 8A, as manufactured by Watts Regulator, or an approved equal.

2.3 PAD SURFACING

- A. Crushed Aggregate: As shown on the Drawings, Grade D and according to Section 321204 “Crushed Aggregate Base or Surface Coarse.”

PART 3 - EXECUTION

3.1 FOREST SERVICE STANDARD HYDRANT INSTALLATION

- A. Fabricate and install hydrant post, frame, sump, grate and pad as shown on the Drawings.
- B. Wood Posts: Cut and drill to required lengths and chamfer, as shown on the Drawings. All exposed corners shall be lightly rounded and the surfaces finished smooth. Apply two coats of stain to portion of post that will be above ground.
- C. Excavate to the bottom of the gravel sump. Below this point, excavate hole for supporting post no larger than necessary for proper backfilling and compacting. Set post plumb, at the elevation shown on the Drawings. Securely brace hydrant and adjacent plumbing in proper position during installation. Backfill 6-inch lifts at optimum moisture content. Compact each lift with three complete passes of a mechanical compaction device.
- D. Stain finishes on the post, if damaged during installation, shall be touched up or repaired. Stain shall not be spattered on the pipe and fittings.

3.2 GENERAL INSTRUCTIONS

- A. Pipe and Fittings: Pipe and fittings shall be watertight. If any appurtenances are not rated for the pressure required for pressure testing the pipelines, ensure hydrant will be isolated from the pipeline during pressure testing.
- B. Backfill and compact area where supply line enters. Backfill with material removed from sump area. Remove stones over 1-inch size. Backfill and compact in 6-inch lifts with three complete passes of a mechanical compaction device. Shape, clean, and fill sump with approved sump gravel. Compact in 8-inch layers to work rocks into a dense mass. Level gravel even with adjacent subgrade elevation required.
- C. Grate Frame: Set grate frame on natural ground or compacted subgrade material rather than on the gravel. Position frame at required elevation shown on Drawings for later installation of the grate.
- D. Elevation of edge of pad or gravel sump shall be the same as adjacent finished surface of edge of road, spur, or trail. Pads not meeting this requirement shall be removed by the Contractor and replaced at no cost to the Government. Backfill and fine grade around the outside of the pad.
- E. After hydrant pad base material is placed and compacted around hydrant area, anchor grate to the frame as shown on the Drawings. Prevent base material from entering sump area.

3.3 GRADING AND CLEANUP

- A. Remove all debris and material not utilized when complete according to Section 024100 "Waste Material Disposal."

END OF SECTION 221105

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 221310 - SEWAGE HOLDING TANK

PART 1 - GENERAL

1.1 SUMMARY

- A. This item shall consist of furnishing and installing a sewage holding tank including a trailer service hookup and piping to the holding tank; a pump out access; and an inspection access as shown on the Drawings and as specified herein.
- B. Related Sections include the following:
 - 1. Section 024100 "Waste Material Disposal."
 - 2. Section 033020 "Concrete From Packaged Dry Mix For Minor Structures."
 - 3. Section 312000 "Earthwork."

1.2 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. PVC: Polyvinyl chloride plastic

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Pipe and fittings.
- B. Shop Drawings: Include access way openings, covers, pipe connections, and accessories for the following precast concrete structures:
 - 1. Holding Tank.
- C. Coordination Drawings: Show piping, underground structures, and other utilities. Indicate size and invert elevations of piping and structures.
- D. Certificate: Submit letter stating tank is approved by Health Department having jurisdiction, if applicable.

1.4 QUALITY ASSURANCE

- A. All work is to be completed according to applicable Federal, State and Local codes.

1.5 COORDINATION

- A. The contractor shall acquire all necessary permits from authorities having jurisdiction prior to construction.

1.6 MEASUREMENT AND PAYMENT

- A. Payment will be lump sum for the Sewage Holding Tank and will include the tank, access openings and risers to grade, trailer service hookup, concrete collar, excavation and backfill, pipe and fittings and all equipment, material, work and incidentals within 5 feet of the tank required to complete the item.
 - 1. This item also includes the sewerline, trench, and bedding and pipe zone material between the trailer service hookup and the sewage holding tank.

PART 2 - PRODUCTS

2.1 HOLDING TANK

- A. Precast Concrete Holding Tanks: ASTM C 1227, single-chamber, precast, reinforced-concrete tank with one concrete riser and one inspection hole.
 - 1. Design: For structural loading according to ASTM C 890.
 - 2. Access Way: 22-inch minimum diameter opening with reinforced-concrete riser to grade and gasketed, bolt down, cast iron lid. Install one access ways per tank, centered on the tank.
 - 3. Minimum Tank Requirements:
 - a. Wall and Bottom Concrete Thickness: 3-inch
 - b. Top Concrete Thickness: 4-inch
 - c. Concrete Strength: 4000 psi
 - d. Reinforcing Steel: 6"x6" No. 6 Welded Wire Fabric
 - 4. Seal inside and outside of tank with two coats of emulsified asphalt.
- B. Capacity and Characteristics
 - 1. Capacity: 2,000 gallons.
 - 2. Inlet Size: NPS 4

2.2 TRAILER SERVICE HOOKUP AND INSPECTION HOLE

- A. Cast-Iron: ASME A112.36.2M; with round, flanged, cast-iron housing and secured, scoriated, heavy-duty loading class, cast-iron cover, cast-iron ferrule, and countersunk brass cleanout plug.
- B. Gas Tight Adapter
 - 1. Furnish and install one gas-tight adapter for each trailer service hookup.
 - 2. Design: Universal-fit, threaded sewer fitting with a standard bayonet end.
 - 3. Model: EZ Coupler 90 Bayonet Sewer Fitting, Item No: 11-0431, as provided by RV Supply Warehouse, or an approved equal.

2.3 PIPE AND FITTINGS

- A. Cast-Iron Soil Pipe and Fittings: ASTM A74.

- B. PVC: ASTM D 3034, SDR 35, nonperforated, for solvent-cement or elastomeric gasket joints.
 - 1. Solvent Cement: ASTM D 2564.
 - 2. Gaskets: ASTM F 477, elastomeric seal.
 - 3. PVC Sewer Pipe and Fittings: ASTM F 402 and ASTM D 2855 for solvent-cemented joints, or ASTM D 3212 and ASTM D 3034 for gasketed joints.
- C. ABS: ASTM D 2751, SDR 35, for solvent-cement or elastomeric gasket joints.
 - 1. Solvent Cement: ASTM D 2235.
 - 2. Gaskets: ASTM F 477, elastomeric seal.
 - 3. ABS Sewer Pipe and Fittings: ASTM F 402 and ASTM D 2751 for solvent-cemented joints, or ASTM D 2751 and ASTM D 3212 for gasketed joints.

2.4 CONCRETE COLLAR

- A. Concrete: Per Section 033020 "Concrete From Packaged Dry Mix For Minor Structures."

PART 3 - EXECUTION

3.1 GENERAL

- A. Asphalt Coating: If the asphalt coating on the tank has been chipped or damaged during construction, the contractor shall make complete and adequate repairs using materials and methods recommended by the tank manufacturer and approved by the Contracting Officer.
- B. All Pipe Connections to holding tanks shall be watertight. All pipe joints shall be watertight.

3.2 CLEARING AND GRUBBING

- A. Before starting any excavation operation, the Contractor shall have completed all necessary clearing and grubbing within the specified limits. Clearing shall be kept to a minimum and care exercised to minimize the damage to the root system of adjacent trees or shrubbery or to mar adjacent trees. All materials 3 inches or more in diameter shall be cut into 2-foot lengths and stacked in an area readily accessible for loading and hauling equipment, and where they will not interfere with the remainder of the work. All stumps and roots within the excavation area shall be removed completely. All clearing and grubbing debris shall be removed from the area and disposed of in accordance with Section 024100 "Waste Material Disposal."

3.3 EXCAVATION AND BEDDING

- A. Excavation shall extend a sufficient distance from the structure to provide for adequate working space. The excavated material shall be properly disposed of as directed by the Contracting Officer. Tanks shall be placed on a prepared level surface. Place the tank on a 4-inch leveling course of crushed aggregate. When rock or water bearing strata are

encountered, excavation shall be carried to a minimum of one foot below the tank bottom and selected granular bedding (1/2-inch minus gravel) of one foot minimum thickness shall be required.

3.4 HOLDING TANK LEAKAGE TEST

- A. The tank shall be filled with water and observed for a 48-hour period. If any leakage is observed and/or measured, the area shall be repaired in a manner approved by the Contracting Officer and the test repeated. No backfill shall be placed around the unit until the test is completed and the Contracting Officer approves the unit.

3.5 BACKFILLING

- A. Backfill shall consist of select material taken from the area. Material placed within 2 feet of the tank shall not contain any rock larger than 3-inches in its greatest dimension, any trash, lumber, large earth clods, or other debris. The balance of the backfill shall be reasonably free of large rocks, frozen earth and clods. Backfill shall be hand or mechanically tamped in 6-inch lifts to a density of 90 percent ASTM D-698 or AASHTO T-99. No heavy equipment shall be allowed on the tank or within 4 feet of the tank during backfilling operations.

3.6 PIPE INSTALLATION

- A. Slope sewerline to drain towards tank at minimum of 2 percent.
- B. Install pipe in accordance with Section 312000 "Earthwork."

3.7 FINISH GRADING – CLEANUP

- A. After the installation of the unit is completed, the area shall be finish graded to the desired contour to present a smooth appearance. The general area shall be cleaned up by removing all debris and material not utilized.

END OF SECTION 221310
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GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 231126 - FACILITY LIQUEFIED-PETROLEUM GAS PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Pipes, tubes, and fittings.
 - 2. Piping specialties.
 - 3. Piping and tubing joining materials.
 - 4. Valves.
 - 5. Storage containers.
 - 6. Mechanical sleeve seals.
- B. Related Sections include the following:
 - 1. Section 312000 "Earthwork."

1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
 - 1. For Piping Containing Only Vapor:
 - a. Piping and Valves: 125 psig (862 kPa) unless otherwise indicated.
- B. LPG System Pressure within Buildings: One pressure range. 0.5 psig (3.45 kPa) or less.

1.3 CERTIFICATIONS

- A. The LP gas system installer must have an LP gas installation license from the state or local authority, if required by that authority.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For facility LPG piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
- C. Pipe Sizing Calculations.
- D. Field quality-control reports.
- E. Operation and maintenance data.

1.5 COORDINATION

- A. Coordinate with an LPG supplier that services the area. Available suppliers include:
 - 1. AmeriGas, (435) 586-6731.
 - 2. Blackburn Propane, (435) 586-8931.

1.6 MEASUREMENT AND PAYMENT

- A. Payment will be lump sum for the exterior Liquefied-Petroleum Gas System and will include earthwork, concrete, pipes and fittings, valves, and all other equipment, material, work and incidentals necessary to complete the item.
 - 1. Storage Container (LPG Tank) shall be provided by the LPG supplier.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedules 40 and 80, Type E or S, Grade B.
 - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
 - 2. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
- B. PE Pipe: ASTM D 2513, SDR 11.
 - 1. PE Fittings: ASTM D 3261, butt-fusion type with dimensions matching PE pipe.
 - 2. PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D 2513, SDR 11; and steel pipe complying with ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
 - 3. Anodeless Service-Line Risers: Factory fabricated and leak tested.
 - a. Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet.
 - b. Casing: Steel pipe complying with ASTM A 53/A 53M, Schedule 40, black steel, Type E or S, Grade B with corrosion-protective coating covering.
 - c. Aboveground Portion: PE transition fitting.
 - d. Outlet shall be threaded suitable for welded connection.
 - e. Tracer wire connection.
 - f. Ultraviolet shield.
 - g. Stake supports with factory finish to match steel pipe casing or carrier pipe.

2.2 PIPING SPECIALTIES

- A. Flexible Piping Joints:
 - 1. Approved for LPG service.
 - 2. Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.

3. Minimum working pressure of 250 psig (1723 kPa) and 250 deg F (121 deg C) operating temperature.
4. Threaded-end connections to match equipment connected and shall be capable of minimum 3/4-inch (20-mm) misalignment.
5. Maximum 36-inch (914-mm) length for liquid LPG lines.

B. Appliance Flexible Connectors:

1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
4. Corrugated stainless-steel tubing with polymer coating.
5. Operating-Pressure Rating: 0.5 psig (3.45 kPa).
6. End Fittings: Zinc-coated steel.
7. Threaded Ends: Comply with ASME B1.20.1.
8. Maximum Length: 72 inches (1830 mm).

C. Quick-Disconnect Devices: Comply with ANSI Z21.41.

1. Copper-alloy convenience outlet and matching plug connector.
2. Nitrile seals.
3. Hand operated with automatic shutoff when disconnected.
4. For indoor or outdoor applications.
5. Adjustable, retractable restraining cable.

2.3 JOINING MATERIALS

A. Joint Compound and Tape: Suitable for LPG.

2.4 MANUAL GAS SHUTOFF VALVES

A. General Requirements for Metallic Valves, NPS 2 (DN 50) and Smaller for Vapor Service: Comply with ASME B16.33.

1. CWP Rating: 125 psig (862 kPa).
2. Threaded Ends: Comply with ASME B1.20.1.
3. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch (25 mm) and smaller.
4. Service Mark: Valves 1-1/4 inch (32 mm) to NPS 2 (DN 50) shall have initials "WOG" permanently marked on valve body.

B. Bronze Plug Valves: MSS SP-78.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lee Brass Company.
 - b. McDonald, A. Y. Mfg. Co.
2. Body: Bronze, complying with ASTM B 584.

3. Plug: Bronze.
4. Ends: Threaded
5. Operator: Square head or lug type with tamperproof feature where indicated.
6. Pressure Class: 125 psig (862 kPa).
7. Listing: Valves NPS 1 (DN 25) and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
8. Service: Suitable for LPG service with "WOG" indicated on valve body.

2.5 EARTHQUAKE VALVES

A. Earthquake Valves: Comply with ASCE 25.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Vanguard Valves, Inc.
2. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction.
3. Maximum Operating Pressure: 5 psig (34.5 kPa).
4. Cast-aluminum body with nickel-plated chrome steel internal parts.
5. Nitrile-rubber valve washer.
6. Sight windows for visual indication of valve position.
7. Threaded-end connections complying with ASME B1.20.1.

2.6 PRESSURE REGULATORS

A. General Requirements:

1. Single stage and suitable for LPG.
2. Steel jacket and corrosion-resistant components.
3. Elevation compensator.
4. End Connections: Threaded for regulators NPS 2 (DN 50) and smaller.

B. Integral Twin Stage Regulators: Comply with ANSI Z21.80, UL listed.

1. Body and Diaphragm Case: Cast iron, zinc or die-cast aluminum.
2. Springs: Zinc-plated steel; interchangeable.
3. Diaphragm Plate: Zinc-plated steel.
4. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
5. Orifice: Aluminum; interchangeable.
6. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
7. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet and no pressure sensing piping external to the regulator.
8. Pressure regulator shall maintain discharge pressure setting downstream and not exceed 150 percent of design discharge pressure at shutoff.
9. Overpressure Protection Device: Factory mounted on pressure regulator.

10. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
11. Maximum Inlet Pressure: 200 psig.
12. Model: LV404B34 as manufactured by Rego Products or an approved equal.

2.7 DIELECTRIC UNIONS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Capitol Manufacturing Company.
 2. Central Plastics Company.
 3. Hart Industries International, Inc.
 4. McDonald, A. Y. Mfg. Co.
 5. Watts Regulator Co.; Division of Watts Water Technologies, Inc.
 6. Wilkins; Zurn Plumbing Products Group.
- B. Minimum Operating-Pressure Rating: 150 psig (1034 kPa).
- C. Combination fitting of copper alloy and ferrous materials.
- D. Insulating materials suitable for LPG.
- E. Combination fitting of copper alloy and ferrous materials with threaded, brazed-joint, plain, or welded end connections that match piping system materials.

2.8 STORAGE CONTAINERS

- A. Provided by the LPG supplier.
- B. Description: Factory fabricated, complying with requirements in NFPA 58 and ASME Boiler and Pressure Vessel Code and bearing the ASME label. Tanks shall be rated for 250-psig (1723-kPa) minimum working pressure.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Welding & Tank.
 - b. Hanson, Roy E. Jr. Mfg.
 - c. Trinity Industries, Inc.
 - d. United Industries Group, Inc.
 2. Liquid outlet and vapor inlet and outlet connections shall have shutoff valves with excess-flow safety shutoff valves and bypass and back-pressure check valves with smaller than 0.039-inch (1-mm) drill-size hole to equalize pressure. Liquid-fill connection shall have backflow check valve.
 - a. Connections: Color-code and tag valves to indicate type.
 - 1) Liquid fill and outlet, red.

- 2) Vapor inlet and outlet, yellow.
3. Level gage shall indicate current level of liquid in the container. Gages shall also indicate storage container contents; e.g., "Butane," "50-50 LPG Mix," or "Propane."
4. Pressure relief valves, type and number as required by NFPA 58, connected to vapor space and having discharge piping same size as relief-valve outlet and long enough to extend at least 84 inches (2130 mm) directly overhead. Identify relief valves as follows:
 - a. Discharge pressure in psig (kPa).
 - b. Rate of discharge for standard air in cfm (L/s).
 - c. Manufacturer's name.
 - d. Catalog or model number.
5. Container pressure gage.
6. For outdoor installation, exposed metal surfaces mechanically cleaned, primed, and painted for resistance to corrosion.
7. Ladders for access to valves more than 72 inches (1830 mm) aboveground.
8. Stainless-Steel Nameplate: Attach to aboveground storage container or to adjacent structure for underground storage container.
 - a. Name and address of supplier or trade name of container.
 - b. Water capacity in gallons and liters.
 - c. Design pressure in psig (kPa).
 - d. Statement of maximum pressure, "This container shall not contain a product having a vapor pressure in excess of ? **psig (kPa) at 100 deg F (37.8 deg C)**>."
 - e. Outside surface area in sq. ft. (sq. m).
 - f. Year of manufacture.
 - g. Shell thickness in inches (mm).
 - h. Overall length in feet (m).
 - i. OD in feet (m).
 - j. Manufacturer's serial number.
 - k. ASME Code label.
9. Felt support pads and two concrete or painted-steel saddles per storage container. Corrosion protection required at container-to-felt contact.
10. Tie straps for each saddle.

2.9 SLEEVES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

2.10 CONCRETE

- A. Cast-In-Place Concrete Pad: Concrete, cast in place, reinforced with bars or welded wire fabric, according to Section "033020 Concrete From Package Dry Mix For Minor Structures."

2.11 IDENTIFICATION

- A. According to Section 312000 "Earthwork."
- B. Wrap all buried, non-metallic, nonperforated piping with tracer wire.
- C. Use detectable warning tape over piping and at outside edges of underground structures.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Comply with requirements in Section 312000 "Earthwork" for excavating, trenching, and backfilling.

3.2 OUTDOOR PIPING INSTALLATION

- A. Comply with NFPA 58, NFPA 54, and the International Fuel Gas Code requirements for installation and purging of LPG piping.
- B. Install underground, LPG piping buried at least 18 inches (450 mm) below finished grade. Comply with requirements in Section 312000 "Earthwork" for excavating, trenching, and backfilling.
 - 1. If LPG piping is installed less than 36 inches (914 mm) below finished grade, install it in containment conduit.
- C. Exterior-Wall Pipe Penetrations: Seal penetrations using steel or cast-iron sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- D. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 and the International Fuel Gas Code for installation and purging of LPG piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Locate valves for easy access.
- E. Install LPG piping at uniform grade of 2 percent down toward drip and sediment traps.

- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Verify final equipment locations for roughing-in.
- I. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- J. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
 - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches (75 mm) long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- K. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- L. Connect branch piping from top or side of horizontal piping.
- M. Install unions in pipes NPS 2 (DN 50) and smaller, adjacent to each valve, at final connection to each piece of equipment.
- N. Do not use LPG piping as grounding electrode.

3.4 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, or copper connector.
- B. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
- C. Install earthquake valves aboveground outside buildings according to listing.

3.5 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:
 - 1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
 - 2. Cut threads full and clean using sharp dies.
 - 3. Ream threaded pipe ends to remove burrs and restore full ID of pipe.
 - 4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.

5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
 1. Plain-End Pipe and Fittings: Use butt fusion.

3.6 HANGER AND SUPPORT INSTALLATION

- A. Install seismic restraints on piping as required.
- B. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
 1. NPS 1 (DN 25) and Smaller: Maximum span, 96 inches (2438 mm); minimum rod size, 3/8 inch (10 mm).
 2. NPS 1-1/4 (DN 32): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).
 3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).

3.7 CONNECTIONS

- A. Connect to utility's gas service according to utility's procedures and requirements.
- B. Install piping adjacent to appliances to allow service and maintenance of appliances.
- C. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches (1830 mm) of each gas-fired appliances and equipment. Install union between valve and appliances or equipment.
- D. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

3.8 STORAGE CONTAINER INSTALLATION

- A. Fill storage container to at least 80 percent capacity with propane.
- B. Install piping connections with swing joints or flexible connectors to allow for storage container settlement and for thermal expansion and contraction.
- C. Ground containers according to NFPA 780.
- D. Set storage containers in felt pads on concrete or steel saddles. Install corrosion protection at container-to-felt contact.
- E. Install tie-downs over storage containers on saddles with proper tension.
- F. Set concrete saddles on dowels set in concrete base. Anchor steel saddles to concrete base.

3.9 LABELING AND IDENTIFYING

- A. Install detectable warning tape directly above gas piping, 12 inches (305 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.10 FIELD QUALITY CONTROL

- A. Test, inspect, and purge LPG according to NFPA 58, NFPA 54, and the International Fuel Gas Code and requirements of authorities having jurisdiction.
- B. LPG piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.11 OUTDOOR PIPING SCHEDULE

- A. Underground LPG vapor piping shall be the following:
 - 1. PE pipe and fittings joined by heat-fusion; service-line risers with tracer wire terminated in an accessible location.
- B. Aboveground LPG vapor piping shall be the following:
 - 1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
- C. Containment Conduit: Schedule 40, galvanized steel pipe with galvanized threaded steel fittings. Coat pipe and fittings with protective coating for steel piping.

3.12 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG (3.45 kPa)

- A. Aboveground, distribution piping shall be the following:
 - 1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
- B. Underground, below building, piping shall be the following:
 - 1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
- C. Containment Conduit: Schedule 40, steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
- D. Containment Conduit Vent Piping: Schedule 40, steel pipe with malleable-iron fittings and threaded or wrought-steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

3.13 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

- A. Distribution piping valves for pipe NPS 2 (DN 50) and smaller shall be the following:
 - 1. Bronze plug valve.
- B. Valves in branch piping for single appliance shall be the following:

1. Bronze plug valve.

END OF SECTION 231126

January 2022

DRAFT

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Electrical equipment coordination and installation.
2. Grout.
3. Common electrical installation requirements.
4. Hangers and supports.

1.2 SUBMITTALS

A. Product Data:

1. For any substitutions for equipment referred to by name in Division 26 specifications or the drawings.

1.3 QUALITY ASSURANCE

- A. The installation shall conform to the 2020 Edition of the National Electrical Code (NFPA 70) and to the requirements specified herein.
- B. The Contractor shall perform all work necessary and required to accomplish the task as detailed on the drawings and discussed in the installation notes. All work shall be done by a state licensed electrician.

1.4 MEASUREMENT AND PAYMENT

- A. The work in this section, including all incidentals in other electrical sections, shall be measured and paid for by one or more of the following methods as shown in the Schedule of Items:
 1. Electrical Site Demolition - Lump Sum including full compensation for all labor, and incidentals necessary to complete the work as shown on the ED drawings, removing all feeders, and including backfill, and all other incidentals.
 2. Electrical Site Distribution System - Lump Sum including full compensation for all labor, materials, and incidentals necessary to complete the work as shown on the drawings including all equipment not associated with a building, wiring, trenching, bedding, backfill, and all other incidentals necessary for a functional system. Includes all feeder connections to panelboards even if inside a building. Does not include the amphitheater and trail electrical beyond the handhole at the amphitheater main controls at the start of the trail.

3. Electrical Amphitheater and Trail Distribution System - Lump Sum including full compensation for all labor, materials, and incidentals necessary to complete the work as shown on the drawings including all wiring, trenching, bedding, backfill, and all other incidentals necessary for a functional system, from the handhole at the amphitheater main controls, and both sets of controls and receptacles mounting, and associated lighting.
4. Electrical System, Storage Building - Lump Sum including full compensation for all labor, materials, and incidentals necessary to complete the work as shown on the drawings including all wiring and all other incidentals necessary for a functional system. Includes demolition as described, breakers and photo control for feeders, but feeders after these devices cost shall be included in the Electrical Site Distribution System.
5. Electrical System, Pavilion - Lump Sum including full compensation for all labor, materials, and incidentals necessary to complete the work as shown on the drawings including all wiring and all other incidentals necessary for a functional system. Includes demolition as described, breakers and photo control for feeders, but feeders after these devices cost shall be included in the Electrical Site Distribution System.
6. Electrical System, Restroom - Incidental to the building item or included as part of other pay items or separate as shown in the Schedule of Items.

PART 2 - PRODUCTS

2.1 PRODUCTS REFERRED TO BY NAME

- A. The materials referred to by trade name, make, or catalog number on the drawings shall be regarded as establishing a minimum standard of quality; substitutions of equal or greater quality can be made by submitting a data sheet of the proposed substituted item to the Contracting Officer, for approval.

2.2 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.2 RACEWAY AND SIMILAR PENETRATIONS (NON-FIRE RATED, NOT SLEEVED)

- A. Concrete Slabs and Walls: Core-drilled holes.
 - 1. Fill oversized holes with grout to within 1/4-inch (6 mm).
- B. Roof-Penetrations: Seal penetration of individual raceways with flexible boot-type flashing units applied in coordination with roofing work.
- C. Stick-built and Similar Interior-Wall Penetrations (Finished Areas): Repair wall to within 1/8-inch (3 mm) to match the surrounding wall finish.
 - 1. Allow for a small gap or flexible fill to allow expansion and contraction to minimize cracking.
- D. Stick-built and Similar Interior-Wall Penetrations (Unfinished Areas): Repair wall to within 1/4-inch (6 mm).
 - 1. Allow for a small gap to allow for expansion and contraction.
- E. Aboveground, Exterior-Wall Penetrations: Seal exterior opening around the raceway or cable, using a flexible, waterproofing, joint sealant appropriate for size, depth, and color to closely match the surrounding surface. Finish interior openings, filling opening and matching the exiting surface with appropriate materials and finish quality for the space.

3.3 HANGERS AND SUPPORTS

- A. Installation:
 - 1. Comply with NECA 1 and NECA 101 for installation requirements, except as specified in this article.
 - 2. Separate dissimilar metals and metal products from contact with wood or cementitious materials by painting each metal surface in area of contact with a bituminous coating or by other permanent separation.
 - 3. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, as permitted in NFPA 70.
 - 4. Multiple Raceways or Cables: Install on trapeze-type supports fabricated with steel slotted channel.
 - 5. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

6. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods, unless otherwise indicated or required by Code:
 - a. To Wood: Fasten with lag screws or through bolts.
 - b. To New Concrete: Bolt to concrete inserts.
 - c. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - d. To Existing Concrete: Expansion anchor fasteners.
 - e. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount on slotted-channel racks attached to substrate.
7. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

END OF SECTION 260500

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USDA FOREST SERVICE, R4

GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Phone OSP cable.
3. Connectors, splices, and terminations rated 600 V and less.

1.2 MEASUREMENT AND PAYMENT

- A. No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Standards:
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- C. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- D. Conductor Insulation:
1. Type THHN/THWN-2: Comply with UL 83.
 2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
 3. Type XHHW-2: Comply with UL 44.
- E. Cable: Comply with NEMA WC 70/ICEA S-95-658 for:
1. Armored cable, Type AC.
 2. Metal-clad cable, Type MC.

2.2 PHONE CABLE

- A. 2 pair / 22 AWG, OSP, ADP-S, solid annealed copper, gel filled, with conductor metallic foil shield.

1. Rated for direct burial, water resistant, and sunlight resistant.
2. More pairs and larger gage is allowed.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Circuits: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
 1. Aluminum conductors are prohibited.
- B. Exposed to Direct Sunlight: Sunlight resistant.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance and Feeders: Type THHN/THWN-2 or XHHW, single conductors in raceway.
- B. Branch Circuits, Typical: Type THHN/THWN-2, single conductors in raceway.
- C. Branch Circuits Inside Storage Buildings: Type THHN/THWN-2, single conductors in raceway; Armored cable, Type AC; or Metal-clad cable, Type MC.
- D. Phone Cable: Direct buried 24 inches, sleeved in PVC schedule 40 conduit above grade, to 6 inches minimum below finished grade penetration.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in pavilion column cladding.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

END OF SECTION 260519

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.2 MEASUREMENT AND PAYMENT

- A. No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.

2.3 CONNECTORS

- A. Listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

2.4 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet (19 mm by 3 m).

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be bonded between the neutral and ground buses.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least two rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
 - a. Existing ground rods may count as one of these.
- C. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use bare copper conductor not smaller than No. 4 AWG or as indicated on the drawings, whichever is largest.
 - 1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
 - 2. Bond to all electrically conductive coated steel reinforcing bars or rods in footing.
 - a. If reinforcing is in multiple pieces, connect footing reinforcing together by the usual steel tie wires (two wraps minimum) and bond to conductor in at least three locations with rebar clamps, or connect together with exothermic welding.

- D. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
 2. Make connections with clean, bare metal at points of contact.
 3. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

END OF SECTION 260526

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GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Boxes, enclosures, and cabinets.
4. Handholes and boxes for exterior underground cabling.

1.2 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. IMC: Intermediate metal conduit.

1.3 MEASUREMENT AND PAYMENT

- A. No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. IMC: Comply with ANSI C80.6 and UL 1242.
4. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit or IMC.
 - a. Comply with NEMA RN 1.
 - b. Coating Thickness: 0.040 inch (1 mm), minimum.
5. EMT: Comply with ANSI C80.3 and UL 797.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.

4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
3. Rigid HDPE: Comply with UL 651A.
4. Continuous HDPE: Comply with UL 651A.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for RNC: Comply with NEMA TC 3; match to conduit type and material.
3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, [Type FD, with gasketed cover.
- D. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Standard: Comply with SCTE 77.
4. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
5. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
6. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
7. Cover Legend: Molded lettering, "ELECTRIC".

- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
- C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete, reinforced concrete, or cast iron.
- D. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of fiberglass.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC or IMC.
 - a. Feeders and Branch Circuits: EMT allowed with UL listed raintight compression fittings, once the metal raceway is 5-ft (1.5-m) minimum above finished grade.
 - 2. Underground Conduit: GRC or IMC.
 - a. Once the direct buried conduit extends beyond 5-ft (1.5-m) of initial grade penetration or building foundation penetration, whichever is greater: HDPE; or RNC, Type EPC-40-PVC direct buried may be substituted.
 - 3. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R or Type 4.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: Rigid metallic conduit or tubing.
 - a. Cabling allowed only in storage buildings.
 - 2. Boxes and Enclosures: NEMA 250, Type 1.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 3. EMT: Comply with NEMA FB 2.10.

3.2 HANDHOLE APPLICATION

- A. Application of Handholes and Boxes for Underground Wiring:

1. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Tier 15 structural load rating.
2. Handholes and Pull Boxes in Sidewalk, within 5-ft (1.5-m) of a roadway and unprotected by terrain features, and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer-concrete units or heavy-duty fiberglass units with polymer-concrete frame and cover, SCTE 77, Tier 8 structural load rating.
3. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf (13 345-N) vertical loading.

3.3 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits
- B. Do not fasten conduits or devices onto the bottom side of a metal deck roof.
- C. Complete raceway installation before starting conductor installation.
- D. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- E. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- F. Install conduits parallel or perpendicular to building lines.
- G. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- H. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- I. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- J. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- K. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- L. Flexible conduits not allowed.
- M. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

- N. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- O. Locate boxes so that cover or plate will not span different building finishes.
- P. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.4 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving." All backfill shall be free of materials that may damage the conduit system, such as construction waste, large rocks, sharp rocks, etc. Where natural backfill poses a hazard, alternate backfill material is required.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.5 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Legend requirements for warning labels and signs.
2. Labels.
3. Tapes.

1.2 MEASUREMENT AND PAYMENT

- A. No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

2.2 LEGEND REQUIREMENTS

- A. Warning labels and signs shall include, but are not limited to, the following legends:
1. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.3 LABELS

- A. Self-Adhesive Labels: Polyester or vinyl, thermal, transfer-printed, 3-mil- (0.08-mm-) thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

2.4 TAPES

- A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide; compounded for outdoor use.
- B. Underground-Line Warning Tape:
 - 1. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 - d. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - e. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE".
 - f. Pigmented polyolefin, bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
 - g. Width: 3 inches (75 mm).
 - h. Thickness: 4 mils (0.1 mm).
 - i. Weight: 18.5 lb/1000 sq. ft. (9.0 kg/100 sq. m).
 - j. Tensile according to ASTM D 882: 30 lbf (133.4 N) and 2500 psi (17.2 MPa).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

D. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches (400 mm) overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.

3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
- D. Arc Flash Warning Labeling: Self-adhesive labels.
- E. Operating Instruction Signs: Laminated acrylic or melamine plastic signs.
- F. Equipment Identification Labels:
 1. Equipment: Self-adhesive label, or Laminated acrylic or melamine plastic sign.
 2. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of an engraved, laminated acrylic or melamine label.
 - b. Switches, grouped: Identify switch with load information.
 - c. Luminaire hoods and pole handhole covers interior at amphitheater and trail: Lamp requirements detailed label.
 - d. Pole handhole covers, exterior at amphitheater and trail: Special lamp requirements sign shall be in the form of an engraved, laminated acrylic or melamine label attached with hardware compatible with aluminum pole.

END OF SECTION 260553

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Straight-blade convenience receptacles.
 2. GFCI receptacles.
 3. Toggle switches.
 4. Digital timer light switches.
 5. Wall plates.

1.2 DEFINITIONS

- A. Abbreviations of Manufacturers' Names:
1. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.
 2. Leviton: Leviton Mfg. Company, Inc.
 3. Pass & Seymour: Pass& Seymour/Legrand.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.4 MEASUREMENT AND PAYMENT

- A. No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

- C. Devices that are manufactured for use with modular plug-in connectors may be
- D. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STRAIGHT-BLADE RECEPTACLES

- A. Tamper-Resistant Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Eaton (Arrow Hart); Tamper Resistant Commercial Grade Receptacles 20A-125V NEMA 5-20R - TRBR20, TR1877, TR6352, TR6350, TR8300.
 - b. Hubbell Incorporated; Wiring Device-Kellems; AFR20TRW, BR20TR, HBL 8300 SGA.
 - c. Leviton Manufacturing Co., Inc.; 800-SGG.
 - d. Pass & Seymour/Legrand (Pass & Seymour); TR63H.
 - 2. Description: Labeled and complying with NFPA 70, "Health Care Facilities" Article, "Pediatric Locations" Section.

2.3 GFCI RECEPTACLES

- A. General Description:
 - 1. 125 V, 20 A, straight blade, feed-through type.
 - 2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
 - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
- B. Tamper-Resistant, Duplex GFCI Convenience Receptacles:
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Hubbell Incorporated; Wiring Device-Kellems; GFTR20.
 - 2. Pass & Seymour/Legrand (Pass & Seymour); 2095TR.

2.4 TOGGLE SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:
 - 1. Single Pole:
 - a. Eaton (Arrow Hart); AH1221 AC Quiet Toggle Switches.
 - b. Hubbell Incorporated; Wiring Device-Kellems; HBL1221.
 - c. Leviton Manufacturing Co., Inc.; 1221-2.
 - d. Pass & Seymour/Legrand (Pass & Seymour); CSB20AC1.

2. Two Pole:

- a. Eaton (Arrow Hart); AH1222.
- b. Hubbell Incorporated; Wiring Device-Kellems; HBL1222.
- c. Leviton Manufacturing Co., Inc.; 1222-2.
- d. Pass & Seymour/Legrand (Pass & Seymour); CSB20AC2.

2.5 TIMER LIGHT SWITCH

A. Products: Subject to compliance with requirements, provide one of the following:

1. Intermatic; EI200 Timer.
2. Leviton Manufacturing Co., Inc.; LTB30-IL.

B. Description: Switchbox-mounted, combination digital timer and conventional switch lighting-control unit, with backlit digital display, with selectable time interval in five-minute increments.

1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277- V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.

2.6 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Unfinished Spaces: Galvanized steel.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, extra duty, weather-resistant, die-cast aluminum or thermoplastic with lockable cover.

1. Amphitheater main control switches shall be as above for controlled (lockable) access. Switch plates at amphitheater shall be Bell 5121-0 series with lever for easy access.

2.7 FINISHES

A. Device Color:

1. Wiring Devices: Brown (Ivory when brown is not available).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. Tighten unused terminal screws on the device.
8. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical. Group adjacent switches under single, multigang wall plates.

3.2 GFCI RECEPTACLES

- A. Install GFCI receptacles at all locations noted on the drawings, non-feed-through unless noted for feed-through protection of downstream receptacles specifically.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use durable wire markers or tags inside outlet boxes.

END OF SECTION 262726

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 311000 - CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of clearing, grubbing, trimming, removing, and disposing of or treatment of timber, construction slash, and debris. This work shall also include preservation of vegetation and objects designated to remain from injury or defacement.

1.2 RELATED SECTIONS

- A. Section 024100 "Waste Material Disposal."

1.3 DEFINITIONS

- A. Areas to be Cleared and Grubbed - The limits of clearing and grubbing will be established by this specification, by other specification items, or on contract Drawings. The clearing and grubbing limits will normally coincide with the designated working limits; however, the Contracting Officer may also designate individual trees and snags outside the clearing limits for selective removal and disposal, or he may designate areas within the working limits where clearing and grubbing is not required or allowed within the provisions of this specification.
 - 1. Grading Limits - Area that is to be excavated or covered with additional materials during construction.
 - 2. Working Limits - Area consisting of the grading limits plus room for equipment to maneuver to perform the necessary clearing and grubbing. These limits, to be held to a minimum, will be designated for each project.
 - 3. Clearing Limits - Area consisting of the working limits plus any additional area to operate a boom or other above-ground clearance requirement.

1.4 MEASUREMENT AND PAYMENT

- A. Payment shall be lump sum for Clearing and Grubbing.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

- A. All trees, brush, shrubs, stumps, roots, and other vegetative material and debris within the designated clearing limits, shall be cleared, grubbed, removed, and disposed of except the following condition:

1. Those items designated to remain by the Contract or Contracting Officer.
 2. Undisturbed stumps outside the roadway, trailway, and parking area, provided they do not extend more than 12 inches above the original ground (measured from the uphill side) and are not closer than 2 feet from the edge of road or parking area, are not in the cut or fill slopes, and they do not interfere with the placement or compaction of embankments.
- B. All roots over 3 inches in diameter within the roadbed area shall be grubbed to a minimum depth of 6 inches below subgrade. Roots over 3 inches in diameter protruding from the excavated slope shall be cut flush with the excavated slope surface.
- C. Clearing slash shall be treated in accordance with “Slash Treatment” paragraph below.
- D. Trees shall be felled within the clearing limits, usually towards the center, so as to prevent damage to the trees that are to be left standing. In some cases, controlled felling, cutting of trees into sections from the top downward, or other means shall be used when required to prevent damage to property, structures, traffic, and trees/vegetation to remain.
- E. Fire-dangerous dead trees or unstable live trees, designated by the Contracting Officer within, 200 feet slope distance of the centerline of roads shall be cut off not more than 12 inches above the uphill ground line and utilized or removed.
- F. Branches on remaining trees or shrubs shall be trimmed to give a clear height of 14 feet above the roadbed unless otherwise shown on the Drawings. Tree limbs shall be trimmed as near flush with the trunk as practicable.

3.2 UTILIZATION OF TIMBER

- A. Merchantable timber is timber that meets Utilization Standards. Utilization Standards shall be trees larger than 8-inches in diameter measured 12-inches above grade.
- B. Utilization and Removal of Timber: Trees that meet “Merchantable Timber” standards shall be treated as follows:
1. Logs meeting utilization standards shall be limbed and decked at locations shown on the Drawings or approved by the Contracting Officer. Decking shall be done in such a manner that logs are piled parallel one to the other, can reasonably be removed by standard log loading equipment, will not damage standing trees, and will not roll. Decks shall be free of brush and soil. Title to all such timber cut from National Forest land shall remain with the Forest Service, U.S. Department of Agriculture, in accordance with its regular procedures, unless otherwise specified.
 2. Removal from Government Land. Merchantable timber, designated for removal, shall become the property of the contractor without charge and removed from Government land. This timber shall not be exported from the United States nor used as substitution (as defined in 36 CFR 223 Subpart D) for timber from private lands exported by the contractor or an affiliate directly or indirectly.
 3. Logs meeting utilization standards shall be limbed, cut into 16-inch to 36-inch lengths, and stacked in various locations throughout the recreation development. Logs stacked shall be stable and free of brush and soil.

4. Disposal as Unmerchantable Timber. Timber on this project is not considered merchantable and shall be disposed of in accordance with “Slash Treatment” paragraph below.

3.3 PIONEER

- A. Pioneering operations shall be done in a manner that prevents undercutting of final excavation slopes, maintains materials within the road, trail, or parking limits, and controls runoff.

3.4 SLASH TREATMENT

- A. Treatment of construction slash larger than 3-inches in diameter and 3-feet in length shall be accomplished by one or more of the following methods as Designated by the Contracting Officer:
 1. Scattering: Construction slash shall be scattered outside the clearing limits without damaging trees. All logs shall be limbed and placed away from trees, positioned so they will not roll, and not be placed on top of one another. Stumps shall be removed and disposed of off site. Other construction slash shall be limbed and scattered to reduce slash concentrations.
 2. Chipping: Construction slash up to at least 3 inches in diameter and longer than 3 feet shall be processed through a chipping machine. Chips shall be deposited on embankment slopes or outside the roadway to a loose depth not exceeding 6 inches. Minor amounts of chips may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.
 3. Stacking of Unmerchantable Material: Logs not meeting utilization standards and other material that exceeds 4-inches in diameter shall be limbed, cut into 16-inch to 36-inch lengths, and stacked in various locations throughout the recreation development. Log stacked shall be stable and free of brush and soil.
 4. Removal: Construction slash shall be removed or hauled to locations shown on the Drawings and designated on the ground.
 5. Piling: Construction slash shall be piled in areas shown on the Drawings and designated on the ground for later burning or disposal by others. Piles shall be placed and constructed so burning will not damage remaining trees. All stumps shall be reasonably free of dirt. Unmerchantable logs shall be cut into lengths less than 20 feet prior to placement in the pile.
 6. Placing Slash on Embankment Slopes: Construction slash shall be placed on completed embankment slopes to reduce soil erosion where shown on the Drawings. Construction slash shall be placed as flat as practicable on the completed slope. Slash shall be placed from the toe of the embankment to a point at least 2 feet below subgrade elevation. Priority for the use of available slash shall be given to (1) through fills, (2) inside of curves, and (3) ditch relief outlets.
- B. Construction slash less than 3 inches in diameter and 3 feet in length may be scattered within the clearing limits.

- C. No construction slash shall be deposited in lakes, meadows, streams, or streambeds. Construction slash that interferes with drainage structures shall be removed immediately.

3.5 CLEARING OR CLEARING AND GRUBBING REQUIREMENTS FOR VARIOUS ITEMS:

- A. Paths and Trails - The path and trail clearing limits shall be 3 feet on each side of the tread centerline and extend to a height of 8 feet above the tread. Shrubs normally growing less than 2 feet tall when mature shall be left undisturbed where they occur outside the cut and fill slope areas. All branches, except short shrubs, which extend into the travelway shall be removed by cutting them flush with the trunk of the tree or shrub.
- B. Roadways and Parking Areas - On roadways and parking areas, the area to be grubbed shall be an area between the cut and/or fill stakes. The clearing area will normally be an additional 5 feet on each side of the grubbed area and shall extend to a height of 14 feet above the finished roadway surface.
- C. Summer Play Areas - Trees and shrubs are to be removed from summer play area sites. Tree stumps may be left if cut within 4 inches of the finished ground surface.
- D. Trenches for Water, Sewer, Electrical Lines, and other Underground Utilities - If no reference is made elsewhere, a clearing of 10 feet on each side of centerline will be allowed.
- E. Buildings - Construction work shall disturb a minimum of the existing terrain and plant life adjacent to the building site. Only trees, shrubs, stumps, and major roots which interfere may be removed. When excavation reveals the major roots of a live and significant tree nearby, the Contractor shall not remove the tree unless it interferes with the construction and removal is authorized by Contracting Officer.
 - 1. Comfort Stations - Maximum clearing limits shall be confined to an area 20 feet outside the outside structure foundation wall on two sides and to an area 10 feet outside the outside structure foundation wall on the other two sides, unless otherwise shown on Drawings.
 - 2. Bituminous-Surfaced and Concrete Pads, Fire Areas, and Other Campground Items (Hydrants, Wastewater Sumps, Tent Sites, Pads at Individual Units, Trailer Dump Station, etc.) - Maximum clearing limits shall be confined to an area 5 feet outside the exterior sides of the completed unit on three sides. On the fourth side, sufficient space will be allowed to properly perform the work with equipment of sufficient size to do the work. Normally, the limits will be as indicated on the Drawings. Construction work shall disturb a minimum of the existing terrain and plant life adjacent to the site work. Branches of trees extending over the cleared area shall be trimmed to give a clear height of 12 feet above the cleared areas.

3.6 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to Section 023701 "Sediment and Erosion Control Measures."

- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.7 WASTE DISPOSAL

- A. Debris and refuse shall be disposed of in accordance with Section 024100 “Waste Material Disposal”.

END OF SECTION 311000

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 312000 - EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Preparing subgrades for slabs-on-grade.
 - 2. Excavating and backfilling for buildings and structures.
 - 3. Sub-surface drainage.
 - 4. Excavating and backfilling for utility trenches.
- B. Related Sections include the following:
 - 1. Section 329206 "Seeding."

1.2 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
- B. Borrow or Select Borrow: Satisfactory soil material used for embankment, backfill, or fill construction that is either imported from off-site or excavated from designated locations at the site.
- C. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Contracting Officer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - 2. Bulk Excavation: Excavations more than 10 feet (3m) in width and pits more than 30 feet (9m) in either length or width.
 - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction of the Contracting Officer. Unauthorized excavation, as well as remedial work directed by Contracting Officer, shall be without additional compensation.
 - 4. Unclassified Excavation: Excavation to subgrade elevation and to lines and dimensions indicated regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
- D. Fill: Soil materials used to raise existing grades.
- E. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

- F. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, aggregate base, drainage fill, initial or subsequent backfill, or topsoil materials.
- G. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building.

1.3 SUBMITTALS

- A. Contractor shall submit to the Contracting Officer for approval source of aggregates and backfill materials and certified sieve analysis. Materials from Government Sources are exempt from this requirement.

1.4 PROJECT CONDITIONS

- A. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.5 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this Section. Payment will be included in the contract unit price as shown on the Schedule of Items.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS, GENERAL

- A. Excavated material may be processed and used for backfill if the Contractor can show compliance with the material specified herein to the satisfaction of the Contracting Officer. If excavated material is not sufficient to meet requirements, Contractor shall import needed material.
- B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Backfill and Fill: Satisfactory soil materials.
 - 1. Remove rocks over 8 inches in maximum dimension, ice or frozen earth, muck, debris, and earth with high void content.
 - 2. Remove rocks over 4 inches in maximum dimension for backfill placed within 12 inches of foundation.

2.2 BACKFILL MATERIALS, UTILITY TRENCHES

A. Pipe Zone Material

1. Backfill material for electrical cable and all types of pipe, except ductile iron pipe and galvanized steel pipe, shall consist of soil, sand, or fine granular material free of $\frac{3}{4}$ inch or larger stones, and free of organic material.
2. Backfill material for all ductile iron or galvanized steel pipe shall consist of soil, sand, or rock smaller than two inches in largest dimension and free of organic material.
3. Frozen material will not be allowed.
4. Backfill material shall be trench-excavated material whenever it meets specification requirements. Whenever material meeting the requirements for pipe zone backfill is not readily available from trench excavation, the Contractor will be required to import pipe zone material from a designated or approved source. Imported pipe zone material shall be paid for as such.

B. Above-Pipe-Zone Material

1. Backfill material shall be free from brush, perishable material, trash, rocks, or boulders larger than 6 inches in greatest dimension, or frozen material.
2. Backfill material shall be trench-excavated material whenever it meets specification requirements. Whenever trench excavated material contains less than 10 percent of oversized material, the Contractor will be required to remove rocks larger than 6 inches from the trench excavated material at no additional compensation and utilize it as backfill material. If, after all suitable trench excavated material has been used as backfill, the trench is not filled to the required grade, the Contractor shall delay his backfill operations until the Contracting Officer can obtain profile elevations of the top of the partially filled trench. These elevations shall be used in computing the cubic yards for which payment will be made for imported material. Whenever material meeting the specification requirements for backfill above the pipe zone is not available from trench excavation, the Contractor will be required to import material from a designated or approved source. Imported above-pipe-zone material shall be paid for as such.

C. Special Bedding – Imported

1. Special bedding material shall consist of rounded river gravel or crushed, free-draining material, meeting the following gradation, as determined by ASTM C 136 and ASTM C 117.

SPECIAL BEDDING GRADATION	
Sieve Designation Square Openings	Percentage by Weight Passing Sieve
1"	100
$\frac{3}{4}$ "	90 – 100
$\frac{1}{2}$ "	20 – 55
$\frac{3}{8}$ "	0 – 15
No. 4	0 - 5

2.3 ENGINEERED FILL

- A. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1 1/2 inch sieve and not more than 12 percent passing a No. 200 sieve.

2.4 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.
- B. Tracer Wire: #14 copper wire, covered.

PART 3 - EXECUTION

3.1 LOCATION, ALIGNMENT AND GRADE

- A. The location of all structures shall be staked out and grades established by the Contractor. Locations shall be approved by the Contracting Officer before excavation is started.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.4 EXPLOSIVES

- A. Do not use explosives.

3.5 EXCAVATION SUPPORT AND PROTECTION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation.
- B. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and resisting soil and hydrostatic pressures and superimposed and construction loads.
- C. The contractor shall meet State General Safety Orders and the provisions of the Occupational Safety and Health Administration (OSHA) pertaining to excavation support and protection, including 29 CFR 1926 Subpart P.
- D. Walls of excavations 5 feet or more in depth shall be supported by shoring and bracing methods or the walls shall be sloped at one and a half to one.
- E. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

3.6 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Topsoil shall be removed from the area to be excavated and from the area where excavated material will be piled, prior to excavation. Topsoil shall be stored as specified below.
- C. Maintain the excavations to guard against and prevent injury to employees and the public. Provide adequate shoring and bracing as required by OSHA and other local governing regulations.
- D. Excavations left open at the end of the working day shall be fenced to protect the public.

3.7 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - 2. Excavation for Underground Tanks, Basins, Pump Houses and Utility Boxes: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface.

3.8 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.9 EXCAVATION FOR UTILITY TRENCHES

- A. All trench excavation shall conform, as near as possible, to the lines and grades illustrated on the drawings.
- B. Classification of Excavation Material - Excavation will be unclassified as to materials and shall include all materials which are encountered in the required excavation. Any information that has been obtained by the USDA Forest Service concerning possible ground conditions is available at the Supervisor's Office for the Forest where the project is located to interested parties upon request.
- C. Unsatisfactory Material - During excavation, if material which does not meet the backfill requirements of Article 2 (such as structurally unstable material, solid rock, over-sized rock, angular or sharp rock), as determined by the Contracting Officer, is encountered at the grade line for the pipe or cable, the unsatisfactory material shall be removed to a minimum depth of 6 inches below the utility line. Trenching shall be performed by any acceptable method, including the use of explosives, as permitted by the Contract General Provisions. In addition to the General Provisions, the Contractor shall provide skilled blasting operators and precautions shall be taken to avoid damage to adjacent property.
- D. Trenching by Machine or by Hand - The use of trench digging machines will be permitted except in places where machines may cause damage to existing structures, utilities, or trees, in which case hand methods shall be employed. Areas specifically to be trenched by hand will be as indicated on the drawings and paid for separately. Machines shall be of the proper size to operate within the specified working limits. In areas being excavated by machine, any hand digging necessary to locate or cross utilities will not be paid for as hand trenching.
- E. Depth - Trench excavation shall provide a uniform (for all utilities) or gently changing (for all utilities except gravity flow sewer lines) flow line.

- F. Width of Trenches - The bottom width that will be used in arriving at pay quantities that are paid on the basis of volume shall be the design bottom width, as shown on the Schedule of Items, or as shown on the trench cross-section detail on the drawings. The width of trench allowed when computing excavation and/or backfill quantities shall be vertical lines for trenches less than 4 feet and for trenches greater than 4 feet shall be computed on 1/2 to 1 side slopes. In circumstances where trench sides will not stand or are not considered safe when sloped at 1/2 to 1, a slope will be determined in the field by the Contracting Officer for which pay quantities will be computed, and the slopes shall be laid back to the stable slope determined.
- G. The Contractor may excavate the trench narrower or wider than the design width shown on the drawings; however, the design width of the trench will be used to calculate the number of cubic yards of all excavated volume and volume of imported material that is paid for by unit volume.
- H. Any over excavation (width) performed by the Contractor for his convenience shall be at his own expense.
- I. Alignment and Grade - The location of all pipelines and structures will be staked out and grades established by the Contracting Officer before excavation is started. All trenches shall conform with the lines and grades illustrated on the drawings or staked on the ground. The Contractor shall set batter boards and shall establish grade lines and levels necessary for the work from dimensions and elevations shown on the drawings and as established in the field. Any shifting or change from the indicated alignment and grade must receive prior approval by the Contracting Officer in writing. Alignment and grade shall also meet the requirements of Sections governing the utilities which are being installed in the trench.

3.10 APPROVAL OF SUBGRADE

- A. Notify Contracting Officer when excavations have reached required subgrade.
- B. If Contracting Officer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Contracting Officer.

3.11 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Contracting Officer.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Contracting Officer.

3.12 STORAGE OF SOIL MATERIALS

- A. Stockpile, borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- B. Topsoil shall be kept separate from trench-excavated material by either stockpiling or by windrowing on the opposite side of the trench from which the trench excavated material will be placed. Topsoil will be reused after backfilling on those areas from which it came.

3.13 STRUCTURE BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for record documents.
 - 3. Inspecting and testing underground utilities and storage tanks.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place and compact fills and backfills adjacent to structures in such a manner as to prevent wedging action or eccentric lodging upon or against the structures.
- C. Place backfill in horizontal layers not more than 12 inches thick with proper moisture content for the required degree of compaction. Flooding or puddling is not allowed. Compact each layer as specified. Backfill layers under concrete flatwork shall be not more than 6 inches thick
- D. Do not place backfill against any concrete footings or structure without prior permission of the Contracting Officer and in no case less than 7 days after placement of concrete.
- E. Heavy equipment shall not be operated within four feet of any structure.
- F. Provide for anticipated settlement and shrinkage of the backfill and for the finished grades required.

3.14 UTILITY TRENCH BACKFILL

- A. Backfilling will be permitted only after all inspections of piping and/or cable have been performed and tests completed and the work to be covered has been approved by the Contracting Officer. Backfill which has been improperly placed and/or compacted shall be corrected, if directed by the Contracting Officer, by reopening the trench to the depth

required to obtain proper compaction. Then the trench shall be refilled and compacted according to specifications.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. Backfill at Pipe Zone

1. Any backfill in trench bottom where over excavation was performed by the Contractor for his convenience, shall be brought back to the pipe grade indicated at his own expense. If the trench bottom is prepared in wet conditions, special bedding conforming to Article 2 shall be used if determined necessary by the Contracting Officer.
2. The bottom of trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe along its entire length, except for portions of the pipe sections where it is necessary to excavate for pipe joints. Depressions for joints shall be made in accordance with the recommendations of the manufacturers for the particular joint used. The bedding shall be a minimum of 6 inches in depth under the pipe and be of either special bedding or pipe zone material as conditions dictate. Trench bottom preparation shall be such that when final placement of pipe has been made, pipe will be true to line and grade. All adjustment to line and grade shall be made by scraping away or filling in with pipe zone material or special bedding material, as conditions dictate, under the body of the pipe and not by wedging or blocking.
3. After pipe is placed as called for in applicable Sections governing the utilities being placed in the trench, pipe zone material shall be deposited in the trench uniformly on both sides of the pipe for the full width of the trench in 6-inch horizontal layers (loose measurement) and compacted from the bottom of the trench to a depth of 1 foot over the top of the pipe.
4. An exception to this is on water lines and sewer lines where the Contractor elects to hydrostatically pressure test the pipe. Joints, couplings, fittings, and valves shall then be left uncovered until after the pipe has been tested. After testing proves the pipe installation to be satisfactory, pipe zone material shall then be placed carefully and compacted around the joints, couplings, fittings, and valves to a depth of 1 foot above the pipe, after which the remainder of the trench shall be backfilled. On gravity flow sewer lines, the Contractor may elect to pressure test the pipe with air. In this case, the entire trench is to be properly backfilled prior to the acceptance test.
5. Where electrical conduit is buried in the same trench as the waterline or sewer line, the backfill procedure for the conduit shall be performed as outlined in the preceding paragraphs. Location with respect to other utilities in a trench shall be as indicated on the trench cross-section detail as shown on the drawings.
6. When an electrical conduit is buried singly in a trench, or if only conduit is buried in a trench, the bedding shall be a minimum of 2 inches in depth under the conduit. After the conduit is placed, pipe zone material shall be deposited in the trench uniformly for the full width of the trench and compacted from the bottom of the trench to a depth of 4 inches over the top of the conduit.
7. **Compaction and Testing:** All compaction within the pipe zone (electrical conduit area is considered as pipe zone), shall meet the following: Material shall be

compacted to not less than 95 percent of the maximum dry unit weight, as determined by AASHTO T 99, Method D, or ASTM D 698, Method D. Ascertain adequate compaction during the backfill operation by performing in-place density tests in accordance with one or more of the following standard test procedures: ASTM D 1556, D 2167, or D 2922, or AASHTO T 191, or T 205.

D. Backfill Above-Pipe-Zone

1. When shown on the drawings as being required, marking tape shall be installed eight inches below the ground surface and shall run the full length of the trenches.
2. Backfill in trenches in areas other than under roadways and parking areas shall be placed in horizontal layers 12 inches thick or less (loose measurement). Layers shall be compacted before the succeeding lift is placed with at least three passes of an approved mechanical compaction device.
3. **Compaction and Testing:** Backfill in trenches under roadways and parking areas shall be maintained, wetted, or dried to optimum moisture for maximum compaction, placed in the trench in horizontal layers not to exceed 6 inches in thickness (loose measurement), and compacted to not less than 95 percent of maximum dry unit weight, as determined by AASHTO T 99, Method D, or ASTM D 698, Method D. Ascertain adequate compaction during the backfill operation by performing in-place density tests in accordance with one or more of the following standard test procedures: ASTM D 1556, D 2167, or D 2922, or AASHTO T 191, or T 205.

E. Special Bedding – Imported

1. Special bedding shall be placed, as directed by the Contracting Officer, in trenches, as necessary, to provide a minimum of 6 inches firm bedding on which to set the pipe in areas where relatively unstable conditions exist, due to seeping ground water or mud caused by ground water, or by water from any other source which cannot be diverted. After the material is placed in the trench, leveled, and consolidated, it shall be trimmed to proper sub grade and shaped to receive the pipe.
2. The Contractor shall construct restrictive sections (dams) in the special bedding material at least every 200 feet to minimize the possibility of excessive ground water flows undercutting the pipe. The dam shall extend across the entire width of the trench, be a minimum of 3 feet long, and shall extend to the top of the pipe zone material.

F. Imported Material

1. Any trench excavated material that can be transported less than 300 feet to other areas along the trench and used, in accordance with specifications, shall not be considered as imported material. When the Contractor is required to import material, it shall be from a designated or approved source.

G. Trenches in Embankments

1. When pipelines are to be placed in trenches excavated in embankments, the excavation of each trench shall be performed after the embankment has been

constructed to an elevation at least 3 feet over the pipe or to finish grade, whichever is least.

H. Surface Restoration in Areas Other Than Roads

1. All surfaces shall be restored to the required grade (usually original ground line), mounded over or smoothed off as directed, and left in a uniform and neat condition, to the satisfaction of the Contracting Officer. Surface drainage shall be diverted so that it will not flow along a trench. In areas where natural revegetation is designated (no planting to be done), the Contractor shall scarify all disturbed or compacted areas and right-of-ways such that the surface of the ground is loose to a depth of at least one inch. In areas to be seeded, the area shall be prepared in accordance with Section 329206 "Seeding."

I. Warning Tape and Tracer Wire:

1. Warning Tape: Install directly above utilities, as shown on the Drawings.
2. Tracer Wire: Wrap all buried, non-metallic, nonperforated piping with tracer wire.
 - a. Conductivity Testing: Conductivity to be tested before and maintained while backfilling trench. After backfilling, the contractor shall perform a continuity test to the satisfaction of the Contracting Officer.
 - b. Access: Extend tracer wire at least 12-inches above grade at junctions, valves, hydrants and ends of new lines. Attach tracer wire to object or structure where possible. Fold or wrap remaining wire so it is accessible to owner, but not generally visible to the public.

3.15 FILL

- A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Place and compact fill material in layers to required elevations as follows:
 1. Under grass and planted areas, use satisfactory soil material.
 2. Under sidewalks, concrete slabs and pavements, use satisfactory soil material.
 3. Under steps and ramps, use engineered fill.
 4. Under building slabs, use engineered fill.
 5. Under vault toilets, use engineered fill or fill according to Section 132700 "Precast Vault Toilets."
 6. Under footings and foundations, use engineered fill.

3.16 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.17 COMPACTION OF BACKFILLS AND FILLS

- A. The minimum degree of compaction required shall be a percent of the maximum laboratory density obtained by the standard proctor test AASHTO T99 or ASTM D698. The in-place field density shall be determined by AASHTO T238 or ASTM D2922. The minimum compaction requirements are:
 1. For Utility Trenches, see “Utility Trench Backfill” article above.
 2. Under structures, water and septic tanks, utility boxes, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.
 3. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 90 percent.
 4. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent.

3.18 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between adjacent existing grades and new grades.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
 2. Walks: Plus or minus 1 inch (25 mm).
 3. Pavements: Plus or minus 1/2 inch (13 mm).
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.
- D. Finishing Slopes: Finished slopes shall conform reasonably to the lines staked on the ground or shown on the drawings. The finished slope shall be left in a roughened condition to facilitate the establishment of vegetative growth. The finish associated with template and stringline or hand-raking methods will not be allowed.

3.19 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent geotechnical engineering testing agency to perform field quality control testing.

- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work complies with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design-bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Contracting Officer.
- D. Testing agency will test compaction of soils in place according to ASTM D 2922. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq ft (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
- E. When testing agency reports that subgrades, fills or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.
- F. Excessive settlement or other evidence of improper backfill shall be corrected by reopening the trench or excavation to the depth required for proper compaction and then shall be refilled and satisfactorily compacted.
- G. The correction and retesting of unacceptable work shall be paid by the Contractor at no expense to the Government.

3.20 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specify tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Contracting Officer, reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.21 SURFACE FINISH

- A. In unpaved areas all surfaces shall be restored to the original ground line or elevations shown on the drawings and left in a uniform and neat condition. Any stockpiled topsoil shall be smoothly distributed over disturbed areas to elevations shown on the drawings.
- B. In paved areas, apply surface treatment as specified and shown on the drawings.

3.22 WASTE MATERIAL

- A. According to Section 024100 “Waste Material Disposal.”

END OF SECTION 312000

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USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 312010 - SELECT BORROW

PART 1 - GENERAL

- 1.1 This item shall consist of excavating, hauling, and satisfactorily placing approved material from an approved source in accordance with these specifications and in conformity with the lines and grades established.
- 1.2 Select borrow shall be placed as directed within the improvement or area to construct the roadbed or embankments, parking spurs, parking areas, approach roads, paths, and boat ramps, etc., or as subgrade reinforcement.
- 1.3 MEASUREMENT AND PAYMENT
 - A. Payment for select borrow shall be the number of cubic yards of GOVERNMENT-FURNISHED material excavated, hauled and installed, as measured in the hauling vehicle.
 1. The measurement will not include material excavated and used for purposes other than as directed in the Drawings or by the Contracting Officer.
- 1.4 RELATED WORK
 - A. The work shall be in accordance with the following subsidiary specifications. The subsidiary specifications are referred to in the text by the Section designation only.
 1. Section 312100 "Project Site Preparation and Grading."

PART 2 - PRODUCTS

- 2.1 GENERAL
 - A. Select borrow shall be selected from the designated borrow source and approved by the Contracting Officer as meeting the requirements for which the material was intended. Granular materials shall be reasonably well graded.
- 2.2 GRADATION
 - A. General select borrow shall contain not more than 20 percent material capable of passing a 200 sieve and shall not contain rock larger than 6 inches in greatest dimension. However, where select borrow is to be used in fills 0 - 5 inches thick, the maximum allowable size of rock particles shall be less than 6 inches in greatest dimension in order to be compatible with the depth of fill. In any case, the select borrow shall contain not more than 40 percent rock particles larger than 4 inches in greatest dimension.

2.3 SOURCE

- A. Select borrow shall be obtained from a commercial source.

PART 3 - EXECUTION

3.1 SAFETY

- A. The government borrow pit shall be signed to keep the public out during excavation operations. The pit shall be left safe at the end of each work day.

3.2 PLACING MATERIAL

- A. All placement and compaction shall be in accordance with Section 312100.

3.3 PROCESSING

- A. When the select borrow is a granular material used as subgrade reinforcement, the Contractor shall use necessary precautions in loading and spreading the material to assure reasonable uniformity in grading. The material as placed shall be processed to provide a uniform mixture.

3.4 CLEARING, OVERBURDEN AND CLEANUP

- A. Prior to beginning a borrow excavation, all necessary clearing and grubbing on the area shall be performed and refuse properly disposed of.
- B. Unsuitable or other spoils or overburden material shall be removed and deposited clear of the work.
- C. After a select borrow excavation has been completed, the side slopes shall be flattened and the general area smoothed up, including the haul road. Grade area to drain surface water away from the borrow source. Cleanup will include roughly grading the overburden, unsuitable material and spoils material over the area. Cleanup shall be done as directed and the area left suitable for reseeding.

END OF SECTION 312010

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GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 312100 - PROJECT SITE PREPARATION AND GRADING

PART 1 - GENERAL

1.1 This Section includes the following:

- A. Clearing, grubbing, sediment and erosion control measures, road obliteration, shaping, compacting, excavating, and/or filling to the established sub grade as shown on the drawings, details and as staked. Such items covered include, but are not limited to construction of subgrade for roads, parking areas, campground spurs, pathways, concrete slabs, subsurface drainage structures, and grading around constructed features.
- B. This section also includes the disposal of waste materials generated.

1.2 RELATED SECTIONS:

- A. The following Sections contain requirements that relate to this Section:
 - 1. Section 022340 "Obliteration of Old Roadways and Parking Spurs."
 - 2. Section 023701 "Sediment and Erosion Control Measures."
 - 3. Section 024100 "Waste Material Disposal" for the loading, handling, hauling, and placing of excess excavation material, and unsuitable excavation material.
 - 4. Section 311000 "Clearing and Grubbing" for site clearing, grubbing, trimming, disposing of or treatment of timber, slash, and construction debris, and for protection of existing trees and plantings.
 - 5. Section 312000 "Earthwork" for preparing subgrades for slabs-on-grade, walks, pavements, lawns, and plantings, and for excavating and backfilling for buildings, structures, utility trenches, and buried mechanical and electrical utilities.
 - 6. Section 312010 "Select Borrow" for excavating, hauling, and placing approved material from an approved source to construct roadbeds, embankments, parking areas, approach roads, paths and boat ramps, or as subgrade reinforcement.
 - 7. Section 312225 "Excavation and Embankment" for construction of roads, parking areas, spurs, pathways, and drainage features.

1.3 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Standard Moisture Density Test, AASHTO T-99, Method C or D.
 - 2. Density of Soil In-Place by the Sand-Cone Method, AASHTO T191
 - 3. Density of Soil In-Place by the Drive Cylinder Method, AASHTO T204
 - 4. Density of Soil In-Place by the Rubber-Balloon Method, AASHTO T205
 - 5. Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)), ASTM D698

6. Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method, ASTM D1556
7. Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method, ASTM D2167
8. Standard Classification of Industrial Fluid Lubricants by Viscosity System, ASTM D2422

1.4 METHOD OF MEASUREMENT AND PAYMENT:

- A. Project Site Preparation and Grading: Lump Sum for Project Site Preparation and Grading and shall include clearing and grubbing, sediment and erosion control, road obliteration, shaping, earthwork, and excavation and/or embankment (including compacting), and all other incidentals necessary to complete the work as shown on the drawing details and as staked. This item shall also include hauling excess excavation, boulders and clearing and grubbing waste to the borrow site.
- B. Measurement and payment for Select Borrow required to construct the roads, parking areas, spurs, pathways and family unit pads will be paid for separately under Section 312010 "Select Borrow."

PART 2 - PRODUCTS

- 2.1 Select Borrow for construction of road and parking area shall consist of approved material from the designated borrow area shown on the drawings and in accordance with Section 312010 "Select Borrow".

PART 3 - EXECUTION

3.1 PREPARATION

- A. Stripping Sod and Other Organic Materials: Sod, pine needles, and soil heavy in organic materials (topsoil) shall be stripped to mineral soil prior to any excavation or placement of fill material. Stripped material shall be stockpiled on site and placed on disturbed areas upon completion of grading operations. Excess stripped material shall be disposed of in accordance with Section 024100 "Waste Material Disposal".
- B. Clearing and Grubbing
 1. All clearing and grubbing shall be performed in advance of beginning excavation and grading operations in accordance with Section 311000 "Clearing and Grubbing".
 2. Care shall also be taken to protect and preserve trees and plantings not marked for removal.
 3. During all phases of construction the contractor shall confine all of his operations within the working limits as defined in Section 311000 "Clearing and Grubbing".

- C. Sediment and Erosion Control Measures: All sediment and erosion control measures shall be placed prior to any ground disturbance in accordance with Section 023701 "Sediment and Erosion Control Measures."

3.2 GRADING

- A. Graded areas shall be constructed of shallow cuts and fills using native excavated soil and/or select borrow. Some light excavation shall be performed to remove protruding boulders and surface irregularities and at other locations as staked by the Contracting Officer.

3.3 EARTHWORK

- A. Shall be completed in accordance with Section 312000 "Earthwork" for the construction of subgrades for slabs-on-grade, family unit and group area pads, sidewalks, plantings, and for excavating and backfilling for buildings, structures, utility trenches, and buried mechanical and electrical utilities.
- B. Shall be completed in accordance with Section 312225 "Excavation and Embankment" for construction of Roads, Parking Areas, Asphalt Paths, Campground Spurs, and Drainage Features.

3.4 CLEANUP

- A. The Contractor shall confine his operation to that area within the staked fill or cut line of existing roadways, parking areas, paths, etc. No equipment shall be moved over, operated from, or be parked outside this staked fill or cut line, clearing limit, or existing roadway. No materials shall be moved over, stored, or obtained from outside the staked cut or fill lines except by written permission of the Contracting Officer. No rocks, stumps, limbs, debris, soil, or other material shall be left as a windrow or accumulation along the toe of fills, top of cuts, or adjacent areas.

END OF SECTION 312100
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GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 312225 - EXCAVATION & EMBANKMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This work consists of excavating material and constructing embankments. This work includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material; drainage excavation; removal of slide material; and excavation and disposal of unsuitable material.

1.2 DEFINITION

- A. Excavation - All material excavated from within the right-of-way or easement areas that is not included under other pay items listed in the Schedule of Items. Roadway excavation includes all material encountered regardless of its nature or characteristics.
- B. Borrow or Select Borrow - Material used for embankment construction that is obtained from outside the roadway prism from sources shown on the Drawings. Additional sources of borrow excavation will be subject to approval in advance by the Contracting Officer.
- C. Embankment Construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:
 - 1. Preparing foundation for embankment;
 - 2. Constructing roadway embankments;
 - 3. Benching for side-hill embankments;
 - 4. Constructing dikes, ramps, mounds, and berms, and
 - 5. Backfilling subexcavated areas, holes, pits, and other depressions.
- D. Suitable Material - Granular material conforming to ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 24 inches in any dimension, debris, waste frozen materials, vegetation, and other deleterious matter.
- E. Unsuitable Material - ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.

1.3 SUBMITTALS AND QUALITY CONTROL

- A. Density Tests results in "Embankment Placing Methods" paragraph in Part 3.
- B. Testing frequency shall be as indicated below. Repeat tests shall be conducted in any areas where test results indicate noncompliance with specification requirements. All tests shall be conducted under the direction of a registered engineer or certified testing laboratory.

Type of Test	Frequency
Moisture-Density Relationship	1 for each soil type encountered
Density of Soil In-Place	1 for each 5000 square feet of subgrade and 1 per 1000 linear feet of embankment per 24 inches depth

1.4 MEASUREMENT AND PAYMENT

- A. There will be no separate measurement or payment for work in this section. Payment will be included at the contract unit price for other items shown on the Schedule of Items see “Project Site Preparation and Grading”. Measurement and payment under those separate items shall include:
1. Roadway excavation.
 2. Rock and unsuitable material below the required grade and unsuitable material beneath embankment areas.
 3. Outlet (Furrow) ditches outside the roadway.
 4. Topsoil and other material removed and stockpiled as directed.
 5. Borrow material used in the work and generated from other areas on the project.

PART 2 - PRODUCTS NOT APPLICABLE

PART 3 - EXECUTION

3.1 CLEARING & GRUBBING

- A. Clearing and Grubbing shall be completed in accordance with specification Section 311000 “Clearing and Grubbing”.
- B. Clearing and grubbing shall be accomplished before excavation or embankment placement begins. Pioneering of roads, slash disposal, and grubbing of stumps may proceed concurrently with clearing and grubbing operation when approved by the Contracting Officer. Excavation and placement operations shall be conducted so slash material to be treated will not be incorporated in the roadway.

3.2 ROADWAY EXCAVATION AND EMBANKMENT SURFACE PREPARATION

- A. General: Do not disturb material and vegetation outside the construction limits. Incorporate only suitable material into embankments. At the end of each day’s operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.
- B. Rock Cuts: Excavate rock cuts to 6 inches below subgrade within the roadbed limits. Backfill to subgrade with suitable material.

- C. Earth Cuts: Scarify earth cuts to 6 inches below subgrade within the roadbed limits.
- D. Embankments Surface Preparation: Remove topsoil and break up the ground surface to a minimum of 6 inches by plowing or scarifying.
- E. All material shall be compacted according to “Embankment Placing Methods” paragraph in Part 3.

3.3 PIONEERING

- A. Pioneering operations for the top of excavation slopes, toe of embankments, or pioneer road construction shall prevent undercutting of the final excavation slope, depositing of materials outside of the roadway limits, and any restriction of drainage.

3.4 UTILIZATION OF EXCAVATED MATERIALS

- A. All suitable, excavated material shall be used in the construction of embankments, subgrades, shoulders, slopes, bedding, and backfill for structures and for other purposes as shown on the Drawings.
 - 1. Excess Excavation:
 - a. Designated excess excavation shall be disposed of as shown on the Drawings.
 - 2. Rock for Slope Protection:
 - a. Excavated rock suitable for protection of embankments may be conserved and used in lieu of a DESIGNATED materials source.
 - 3. Conserving Material:
 - a. Material encountered in the excavation, suitable for cushion, road finishing, or other purposes, may be conserved and utilized instead of materials from DESIGNATED sources. Excessively wet material that is otherwise suitable for embankment shall be field drained and dried before placement.
 - 4. Excavation of Unsuitable Material:
 - a. Unsuitable material shall be excavated and disposed of as shown on the Drawings or on site as directed by the Contracting Officer (CO). Excavated areas shall be backfilled with suitable material when necessary to complete the work. Frozen material shall not be placed in embankments. Rocks that are too large to be incorporated into the embankment shall be broken for incorporation into the embankment, maneuvered to the face of the embankment and embedded so that they will not roll, or hauled to the disposal area.
 - 5. Conservation of Topsoil:
 - a. When shown on the Drawings, suitable topsoil shall be removed, transported, and deposited in the DESIGNATED stockpile areas.

3.5 DRAINAGE EXCAVATION

- A. Drainage excavation shall include construction of side ditches, minor channel changes, inlet and outlet ditches, furrow ditches, ditches constructed along the road but beyond the roadway limits, and other minor earth drainage structures as shown on the Drawings. Excavated material shall be utilized in accordance with “Utilization of Excavated Materials” paragraph above.

3.6 FINISHING ROADBED

- A. For roads receiving aggregate base or surface course, only rocks that do not protrude above the subgrade more than one-third of the depth of the base or surface course, or 3 inches, whichever is less, may remain in place.
- B. For unsurfaced roads, unless otherwise shown on the Drawings, the top 4 inches below the finished road surface shall not contain rocks larger than 4 inches in greatest dimension. Oversize material shall be removed, reduced to acceptable size, or covered by importing suitable material approved by the Contracting Officer.
- C. The subgrade shall be visibly moist during shaping and dressing. Low sections, holes, cracks, or depressions shall be brought to grade with suitable material approved by the Contracting Officer. Final compaction of the subgrade shall meet the requirements of the embankment placing method specified.

3.7 SNOW REMOVAL

- A. Snow or ice shall not be incorporated in the embankment. Snow shall be removed in advance of the work and deposited beyond the roadway limits in a manner that will not cause resource damage or waste material.

3.8 FINISHING SLOPES

- A. Finished slopes shall conform reasonably to the lines staked on the ground or shown on the Drawings. The finished slope shall be left in a roughened condition to facilitate the establishment of vegetative growth. The finish associated with template and stringline or hand-raking methods will not be allowed. Loose rock, loose debris, and other loose material, each of which is larger than 6 inches in diameter, shall be removed from the slope unless otherwise shown on the Drawings.
- B. The tops of excavations, excluding areas of solid rock, shall be blended with the adjacent terrain by rounding where shown on the Drawings. Decomposed rock that may be cut without blasting or ripping shall be rounded. Earth overlying rock shall be rounded above the rock.
- C. All rock excavations that require blasting shall be formed with controlled blasting techniques unless otherwise shown on the Drawings. Controlled blasting is defined as the controlled usage of explosives and blasting accessories in appropriately aligned and spaced drill holes for the purpose of producing a free surface or shear plane in the rock

excavation slopes and of minimizing landscape damage, adjacent ground vibration, and overbreak. Presplitting is not intended unless shown on the Drawings.

- D. Unless directed otherwise by the Contracting Officer, the contractor shall drill, blast, and excavate short test sections (not to yield in excess of 1,000 cubic yards) to determine the controlled blasting method, hole spacing, and charge best suited to the material encountered.

3.9 OVERBUILDING & LANDSCAPE & STREAM PROTECTION

- A. Unless otherwise agreed to by the Contracting Officer, excavation or embankment material shall be confined within the roadway limits to avoid overbuilding and to protect the landscape and streams.

3.10 SUBGRADE TREATMENTS

- A. Subgrade treatment shall consist of soil modification by admixing aggregates, placing geotextiles, fiber mat, wood corduroy, rock blanket, or other similar materials. The construction and material requirements for the type of subgrade treatment will be shown on the Drawings.

3.11 EARTH BERMS

- A. Permanent earth berms shall be constructed along the shoulder of the traveled way at locations shown on the Drawings. Material used in the construction of berms shall be well graded with no rocks having a dimension greater than one-fourth the height of the berm.
- B. Acceptable material for the berm may be windrowed as the roadbed is constructed. When the local material is not acceptable, material shall be imported from approved sources. Material used for berm construction shall contain no frozen material, roots, sod, or other deleterious material. Material shall not be wasted over the embankment slope.
- C. Compaction shall be accomplished by operating the spreading equipment over the full section of the berm.

3.12 EMBANKMENT PLACING METHODS

- A. All Methods: When an embankment is to be placed across swampy ground and removal of unsuitable material or subgrade treatment is not required, the lower part of the embankment shall be constructed in a single layer to the minimum depth necessary to support construction equipment.
- B. Specific Methods: All embankments shall be placed by Method 4 unless otherwise noted.
 - 1. Method 1. Side Casting and End Dumping: Embankment may be placed by side casting and end dumping. Where material containing a large amount of rock is used to construct embankments, working smaller rocks and fines in with the larger rocks and fines to fill the voids shall provide a solid embankment.

2. Method 2. Layer Placement: Surfaces steeper than a ratio of 3 horizontal to 1 vertical (3:1) upon which embankment is to be placed, shall be roughened or stepped to provide permanent bonding of new and old materials.
 - a. Embankment shall be layer placed, except over rock surfaces, in which case material may be placed by end dumping to the minimum depth needed for operation of spreading equipment. Each embankment layer shall be leveled and smoothed before placement of subsequent layers. Hauling and spreading equipment shall be operated uniformly over the full width of each layer.
 - b. Suitable material shall be placed in layers no more than 12 inches thick, except when the material contains rock more than 9 inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. No layer shall exceed 24 inches before compaction.
 - c. Placing individual rocks or boulders greater than 24 inches will be permitted provided the embankment would accommodate them. Such rocks and boulders shall be at least 6 inches below subgrade. They shall be carefully distributed and the voids filled with finer material to form a dense and compacted mass.
 - d. Where material containing large amounts of rock is used to construct embankments, the layers may be of sufficient thickness to accommodate the material involved. A solid embankment with adequate compaction shall be constructed by working smaller rock and fines in with the larger rocks to fill the voids and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.
 - e. Material shall be at moisture content suitable to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Excessively wet material shall be handled in accordance with Subsection 3.3.1.3.
3. Method 3. Layer Placement (Roller Compaction): Embankments shall be placed as specified in Method 2. Placement shall be in horizontal layers not exceeding 12 inches prior to compaction except when the material contains rock more than 9 inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. Compaction equipment shall be operated over the full width of each layer until visible deformation of the layer ceases or in the case of the sheepfoot roller, the roller "walks out" of the layer. At least three complete passes shall be made.
 - a. Compaction equipment shall be capable of obtaining compaction requirements without detrimentally affecting the compacted material. The compacting units may be of any type, provided they are capable of compacting each lift of material as specified and meet the minimum requirements contained herein. Minimum requirements for rollers are as follows:
 - 1) Tamping or sheepfoot rollers shall meet the following minimum requirements:
 - a) Diameter - 40"

- b) Completely filled with liquid.
 - 2) Grid rollers shall be capable of exerting a force of 250 pounds per inch of width of roller drum.
 - 3) Steel-wheel rollers, other than vibratory, shall be capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.
 - 4) Vibratory steel-wheel rollers shall have a minimum weight of 6 tons. The compactor shall be equipped with amplitude and frequency controls and specifically designed to compact the material on which it is used.
 - 5) Pneumatic-tire rollers shall have smooth tread tires of equal size that provide a uniform compacting pressure for the full width of the roller and shall meet the following minimum requirements:
 - 6) Towed rollers:
 - a) Ballast density shall exceed 100 pounds per cubic foot;
 - b) Volume of ballast shall exceed 7 cubic feet per tire;
 - c) Tire pressure shall exceed 45 pounds per square inch
 - 7) Self propelled rollers: Shall exert a force that exceeds 200 pounds per linear inch of rolling width.
4. Method 4. Controlled Compaction: Embankments shall be placed as specified in Method 2, except earth embankments shall be placed in horizontal layers not exceeding 12 inches (loose measure) and compacted. Material shall be at moisture content suitable for attaining the required compaction. Embankments and the top 1-foot of excavation sections shall be compacted to at least 95 percent of the maximum density as determined by AASHTO T 99, Method C or D.
- a. The density of the embankment material will be determined during the progress of the work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239, or T 255. Corrections for coarse particles will be made in accordance with AASHTO T 99, Note 7.
 - b. Density requirements will not apply to portions of rock embankments that cannot be tested in accordance with approved methods. When this condition exists, compaction shall be provided by working smaller rocks and fines in with the larger rocks to fill the voids and by operating equipment over the embankment materials.
5. Method 5. Controlled Compaction Using Density Control Strips. The embankment placement requirements for Method 4 shall apply for this method except that compaction shall be performed as shown below:
- a. To determine target density, a control strip shall be constructed at the beginning of work on each type of material to be compacted. Each control strip, constructed to acceptable density and surface tolerances, shall remain in place and become a section of the completed roadway. Unacceptable control strips shall be corrected or removed and replaced at the contractor's

expense. A control strip shall have an area of approximately 400 square yards and shall be of the same depth specified for the construction of the course that it represents.

- b. The materials used in the construction of the control strip shall meet the specification requirements. They shall be furnished from the same source and shall be of the same type and moisture content used in the remainder of the course represented by the control strip.
 - c. The base upon which a control strip is to be constructed will be approved by the Contracting Officer before placing control strip material.
 - d. The equipment used in the construction of the control strip will be approved by the Contracting Officer and shall be of the same type and weight as that to be used on the remainder of the course represented by the control strip.
 - e. Compaction of control strips shall commence immediately after the course has been placed to the specified thickness and shall be continuous and uniform over the entire surface. Compaction of the control strip shall be continued until no discernable increase in density can be obtained by additional compactive effort.
 - f. Upon completion of the compaction, the mean density of the control strip will be determined by averaging the results of 10 nuclear density tests taken at randomly selected sites within the control strip. The mean density of the control strip shall be the target density for the remainder of the course that it represents.
 - g. If the mean density of the control strip is less than 95 percent of the maximum density as determined in the laboratory compacted specimens, the Contracting Officer may request the construction of another control strip. The test procedure used to establish the maximum density will be shown on the Drawings.
 - h. A new control strip may also be requested by the Engineer or by the contractor when:
 - i. A change in the material or job mix formula is made.
 - j. Ten days of production have been accepted without construction of a new control strip.
 - k. There is reason to believe that a control strip density is not representative of the material being placed.
 - l. The specified course shall be compacted to at least 95 percent of the target density. A portable nuclear moisture-density test device in accordance with AASHTO T 238 and T 239 will test density.
 - m. Where portions of rock embankment are constructed that cannot be tested in accordance with approved methods, each layer shall be rolled full width with the same number of passes as the adjacent embankment containing material represented by a control strip.
6. Method 6. Special Project Controlled Compaction: Embankments shall be placed and compacted to at least 90 percent of the maximum density determined by AASHTO T 180, Method C or D, except that compaction of not less than 95 percent of AASHTO T 180, Method C or D, shall be obtained for a minimum depth of 1

foot below subgrade for the width of the roadbed in both excavation and embankment sections.

- a. The density will be determined during the work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239 or T 255. Corrections for coarse particles will be made in accordance with AASHTO T 99, Note 7.

3.13 CONSTRUCTION TOLERANCES

- A. The tolerance class shall be “C” for roads, spurs and parking areas and “E” for all pathways. Roadway ditches shall be constructed to flow in the direction shown on the Drawings.
- B. Deviations shall be uniform in the direction of change for a distance of 200 feet or more along the project centerline.

TOLERANCE CLASS **

Item	A	B	C	D	E	F	G	H	I	J
Roadbed Width (Ft)	+0.5	+0.5	+1	+1	+1	+1	+1	+1.5	+1	+2
Subgrade Elevation (Ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1	±1	±1.5	±2	±3
Centerline Alignment (Ft)	0.2	0.2	0.5	0.5	1	1	1	1.5	2	3
Slopes, Excavation and Embankment (Percent Slope)*	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10

**Maximum allowable deviation from construction stakes and drawings.

*Maximum allowable deviation from staked slope measured from slope stakes or hinge points.

END OF SECTION 312225

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 321200 - HOT-MIX ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes hot-mix asphalt concrete pavement, patching and repair.
- B. Related Sections include the following:
 - 1. Section 321204 "Crushed Aggregate Base or Surface Course."

1.2 DEFINITIONS

- A. FP-14: "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects," U.S. Department of Transportation, Federal Highway Administration.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
- B. Job-Mix Designs: Submit written job-mix formulas for approval at least 28 days before production. Furnish mixes of aggregate, asphalt binder, recycled asphalt pavement, and additives that meet the applicable gradation and material requirements in one of the following:
 - 1. Superpave designed asphalt mixture with performance grade asphalt binder **PG 58-28**.
 - 2. Hveem or Marshall designed asphalt mixture as approved by the Contracting Officer.
 - 3. State Department of Transportation approved asphalt concrete pavement mixture as approved by the Contracting Officer.
 - 4. All Job Mix designs must be approved by the Contracting Officer.
- C. Material certificates.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall be registered with and approved by the Department of Transportation of the state in which Project is located.
- B. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.
- C. Testing Agency Qualifications: The contractor shall engage a qualified independent testing and inspecting agency to perform field tests and to prepare test reports.

- D. Pre-paving Conference: Coordinate attendance with the Contracting Officer and all applicable subcontractors. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
 2. Review condition of subgrade and preparatory work.
 3. Review Traffic Control Plan
 4. Review Contractor Quality Control Plan for paving and testing.
 5. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
 6. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 7. Review acceptance procedures

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
1. Prime and Tack Coats: Minimum surface temperature of 60 deg F.
 2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

1.6 MEASUREMENT AND PAYMENT

- A. Hot Mix Asphalt Pavement: Number of tons of pavement installed. Includes surface preparation, subgrade compaction, and installation of pavement. Repair and patching also includes cutting, tack coat and other necessary preparations.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations. Must conform to aggregate requirements in FP-03 Section 703.
- B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.
- C. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, properly cured blast-furnace slag, or combinations thereof.
1. For hot-mix asphalt, limit natural sand to a maximum of 10 percent by weight of the total aggregate mass.

2.2 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes designed according to one of the following:
 - 1. Superpave Bituminous Concrete Wearing Surface Layer, Leveling, ½" Maximum Aggregate Size Mix, ESAL Range 3 to <30 as designed in FP-03, Section 401.
 - 2. Hveem or Marshall designed asphalt mixture class B, Grading C as designated in FP-14, Subsection 402.
 - 3. State Department of Transportation approved mix design. The mix design shall have a history of satisfactory performance in geographical area where project is located.
 - 4. Do not begin mix production until the job-mix formula is approved by the Contracting Officer.
- B. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes designed according to procedures in AI SP-2 "Superpave Mix Design", AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.", or State Department of Transportation approved mix design. The mix design shall have a history of satisfactory performance in geographical area where project is located. Do not begin mix production until the job-mix formula is approved by the Contracting Officer.

2.3 ROAD BASE

- A. Crushed Aggregate Base shall be according to Section 321204 "Crushed Aggregate Base or Surface Coarse."

PART 3 - EXECUTION

3.1 GENERAL

- A. Execution is based on requirements of approved mix design. If hot-mix asphalt as identified in Part 2 above is approved execution will be based on FP-03, Sections 401, 402, or 403 as applicable.
- B. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
- C. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.
- D. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.
- E. Proceed with paving only after unsatisfactory conditions have been corrected.
- F. Saw Cutting of Adjacent Pavement –
 - 1. Make a vertical cut through the full depth of surface in a straight clean line.
 - 2. Where the edge of the existing surface is cracked, broken, or deteriorated, make the cut so the defective surface can be removed.
 - 3. Do not allow traffic or construction equipment to cross the cut edge.

4. Apply a tack coat (at a rate of 0.05 to 0.15 gal./sq.yd.) to the cut edge before placing hot mix asphalt surfacing.
5. Avoid smearing or staining adjoining surfaces.

3.2 MIXING

- A. Hot-Mix Asphalt Pavement Mix and Mixing Plant shall conform to AASHTO M156.

3.3 HAULING

- A. Trucks used for hauling bituminous mixtures shall have tight, clean, smooth metal beds that have been thinly coated with a material to prevent the mixture from adhering to the beds. Truck beds shall be drained prior to loading. Each truck shall have a cover to protect the mixture from the weather. When necessary to ensure that the mixture will be delivered at the specified temperature, truck beds shall be insulated and covers shall be securely fastened.

3.4 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 2. Place hot-mix asphalt surface course in single lift.
 3. Spread mix at minimum temperature of 250 deg F.
 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.
 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.
- D. Pavers: Use pavers that are self-contained, power-propelled units with adjustable vibratory heated screeds, capable of spreading and finishing courses of asphalt mix in thicknesses and widths shown on the Drawings without segregating, tearing, shoving, or gouging. When indicated, pavers shall be equipped with automatic screed controls and with sensors capable of sensing grade from an outside reference line, sensing transverse

slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.

3.5 COMPACTING

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
- B. Thoroughly and uniformly compact the asphalt surface by rolling. Do not cause cracking, shoving, or undue displacement. Continue rolling until all roller marks are eliminated, all cracks are sealed, and the required density is obtained. Do not roll the mix after the surface cools below 175 ° F.
- C. Monitor the compaction process with nuclear density gauges. Compact to a pavement specific gravity (density) that is no less than **92 percent** of the maximum specific gravity (density) determined according to AASHTO T 209.

3.6 JOINTS, TRIMMING EDGES, AND CLEANUP

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
 - 3. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 - 4. Compact asphalt at joints to a density within 2 percent of specified course density.
- B. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- C. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- D. Disposal: Except for material indicated to be recycled, remove all trimmed or otherwise discarded materials from Project site and legally dispose of them in an EPA-approved landfill. Do not allow waste materials to accumulate on-site.

3.7 PAVEMENT SMOOTHNESS

- A. Use a 10-foot metal straight edge to measure at right angles and parallel to the centerline. Defective areas are surface deviations in excess of ¼ inch in 10 feet between any two contacts of the straightedge with the surface. Correct defective areas using approved methods.

3.8 PATCHING AND REPAIR

- A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Apply uniformly to clean, vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Patching: Fill excavated pavements with hot-mix asphalt, while still hot, compact flush with adjacent surface.
- D. Thickness: The completed pavement shall have a minimum thickness of 3 inches after compaction or as shown on the Drawings.
- E. Acceptance: The compacted bituminous surfacing, when ready for acceptance, shall be thoroughly compacted, smooth, and match existing grade and cross section.

3.9 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
 - 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.
- B. Herbicide Treatment: When shown on the Drawings, apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
- C. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.
 - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 - 2. Protect primed substrate from damage until ready to receive paving.
- D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.10 ACCEPTANCE

- A. Hot Asphalt Concrete Pavement shall be tested as indicated in Part 1 – “Quality Assurance.”
- B. Gradation and Asphalt Content
 1. Gradation: AASHTO T30
 2. Asphalt Content: AASHTO T 308
 3. Frequency: 1/1000 tons or a minimum of 3 per project
 4. The Contractor shall provide a split to the Contracting Officer when requested.
- C. Field density
 1. Shall be determined in place after final rolling by nuclear method according to ASTM D 2950 or other approved procedure. The frequency of testing shall be once per 800 square yards or more frequently if needed to show compliance with the specifications. The test results shall be provided upon completion.
- D. Thickness
 1. In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549. The frequency of testing shall be once per 1500 square yards or more frequently if needed to show compliance with the specifications. Tests shall be performed after compaction. The test results shall be provided upon completion.
 2. Tolerance: Plus 1/4 inch, no minus.
- E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 321200
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 321204 - CRUSHED AGGREGATE BASE OR SURFACE COURSE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes furnishing, hauling and placing one or more courses of aggregate base or surface course material on roadways, campground spurs, parking areas, concrete pads, and pathways. In addition, may include furnishing, hauling, and placing crushed aggregate for bedding and backfill.

1.2 SUBMITTALS

- A. Compaction density test results and proctor.

1.3 MEASUREMENT AND PAYMENT

- A. Crushed Aggregate: Number of Cubic Yards of commercial material excavated, hauled and installed, measured in place to the lines and grades shown on the Drawings. Crushed aggregate shall be used for the construction of roadways, campground spurs, parking areas, concrete pads, sidewalks, pathways and other items as shown on the Drawings.
- B. No adjustment in a contract unit price will be made for variations in quantity due to differences in the specific gravity or moisture content.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Furnish aggregate Subbase, Base, or Surface Courses meeting the gradation ranges shown in Table 321204-1 and Table 321204-2. Aggregate grade selection shall be as shown on the Drawings and in the Schedule of Items.
- B. Materials shall be obtained from an approved source. Furnish aggregates that consist of hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel meeting the appropriate gradation and conforming to the following:
 - 1. Los Angeles abrasion, AASHTO T 96..... % max
 - 2. Sodium sulfate soundness loss (five cycles), AASHTO T 104..... % max
 - 3. Durability index, AASHTO T 210..... 35 min
 - 4. Fractured faces, ASTM D 5821 (Subbase or Base)... 50% min
 - 5. Fractured faces, ASTM D 5821 (Surface Course). 75% min
 - 6. Free from organic matter and lumps or balls of clay.
- C. Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

2.2 AGGREGATE GRADATION

Table 321204-1, Crushed Aggregate Grading Requirements for Subbase and Base.

Percent Passing (AASHTO T27 and T11)					
Sieve	Grading A (Subbase)	Grading B (Subbase)	Grading C (Base)	Grading D (Base)	Grading E (Base)
2 1/2 -inch	100				
2-inch	97-100	100	100		
1-1/2-inch		97-100			
1-inch	65-79 (6)		80-100 (6)	100	
3/4-inch			60-94 (6)	86-100 (6)	100
1/2-inch	45-59 (7)				
3/8-inch			40-69 (6)	51-82 (6)	62-90 (6)
No. 4	28-42 (6)	40-60 (8)	31-54 (6)	36-64 (6)	36-74 (6)
No. 40	9-17 (4)			12-26 (4)	12-26 (4)
No. 200	4-8 (3)	4-12 (4)	4-7 (3)	4-7 (3)	4-7 (3)

() The value in the parentheses is the allowable deviation (+ / -) from the target values.
Liquid Limit, AASHTO T89 = 25 max. Plastic Limit, AASHTO T-90 = nonplastic.

Table 321204-2, Crushed Aggregate Grading Requirements for Surface Course.

Percent Passing (AASHTO T27 and T11)		
Sieve	Grading F (Surface Course)	Grading G (Surface Course)
1-1/2-inch	100	
1-inch	97-100	100
3/4-inch	76-89 (6)	97-100
1/2-inch		
3/8-inch	56-68 (6)	70-80 (6)
No. 4	43-53 (7)	51-63 (7)
No. 8		
No. 16	23-32 (6)	28-39 (6)
No. 40	15-23 (5)	19-27 (5)
No. 200	10-16 (4)	10-20

() The value in the parentheses is the allowable deviation (+ / -) from the target values.
Liquid Limit, AASHTO T 89 = 35 max, Plastic Index, AASHTO T90 = 2 to 9 if percent passing the No. 200 sieve is less than 12% and less than 2 if the percent passing the No. 200 sieve is greater than 12%.

If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

PART 3 - EXECUTION

3.1 GENERAL

- A. Verify that subgrade is dry and in suitable condition, locate areas that are unstable or that require further compaction.
- B. Proceed with aggregate placement only after unsatisfactory conditions have been corrected and subgrade is approved in writing by the Contracting Officer (CO).

3.2 PREPARATION OF SUBGRADE

- A. The subgrade shall be prepared in accordance with requirements of other specifications sections.
- B. The subgrade shall conform to the lines and grades shown on the Drawings. Suitable material shall be utilized in the preparation of the subgrade. When embankment or fill is necessary, subgrade shall be placed in compacted layers not exceeding 6 inches. Unless specified otherwise, subgrade shall be compacted to 95 percent of AASHTO T 99, method C or D.
- C. Suitable material for subgrade shall be granular material or fine compatible soil free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Remove all rock particles and hard earth clods larger than 3 inches in the longest dimension.

3.3 MIXING AND SPREADING

- A. Mix the aggregate and adjust the moisture content to obtain uniform moisture. Spread and shape the mixture on the prepared surface in a uniform layer not to exceed 6 inches in compacted thickness.
- B. Route hauling equipment uniformly over the full width of the surface to minimize rutting or uneven compaction.

3.4 COMPACTING

- A. Compact each layer of aggregate full width. Compact each layer to a density of at least 95 percent of the maximum density as determined by AASHTO T 99 method C or D.
- B. Testing shall be at intervals specified in tables shown in Section 014100 "Quality Control."

3.5 SURFACE AND CONSTRUCTION TOLERANCES

- A. Shape the surface to the required template and as staked. Surface shall be graded and shaped smooth to within 1/2-inch in 10 feet.
- B. Maintain the aggregate course to the correct lines, grade, and cross-section by blading, watering, and rolling until placement of the next course.

- C. Upon completion of full placement and after haul trucks have completed their haul across section of the road, the road shall be finish bladed, watered, and rolled.
- D. Aggregate shall be placed as shown on the drawings and as staked. Tolerance for thickness of aggregate shall be $\pm \frac{1}{2}$ -inch and for width shall be + 1-foot.

3.6 ACCEPTANCE

- A. Aggregate shall be accepted following placement when shown to meet material quality, gradation, compaction requirements, required depth and width, and finish blading.

END OF SECTION 321204

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 322100 - TENT PADS

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of construction of tent pads. It includes furnishing the timber edging, surfacing material, excavation and constructing the pads in accordance with these specifications and details as SHOWN IN THE DRAWINGS.

1.2 MEASUREMENT AND PAYMENT

- A. Site preparation for tent pads shall be measured and paid for according to specification 312100 "Project Site Preparation and Grading".
- B. Tent Pads –
 - 1. Single Family Unit: number of 16' x 16' tent pads constructed and accepted. Payment shall include crushed bedding material, select borrow (if necessary), treated timber lumber, stakes, fasteners, and other items required for installation.
 - 2. Double Family Unit: number of 16' x 20' tent pads constructed and accepted. Payment shall include crushed bedding material, select borrow (if necessary), treated timber lumber, stakes, fasteners, and other items required for installation.

PART 2 - PRODUCTS

2.1 TREATED TIMBER LUMBER

- A. Treated lumber shall be pre-cut and pre-drilled Douglas Fir No. 2 Grade or Hem Fir No. 2 Grade, as grade by WWPA.
 - 1. Size:
 - a. Timber Header - 6" by 6"

2.2 SURFACE MATERIAL FOR TENT PADS

- A. Source:
 - 1. Materials shall be obtained from a commercial source. The Contractor shall submit test results for aggregate gradation and a Certificate of Compliance that states gradation meets contract requirements.
 - 2. Sampling and testing of the material before incorporation into the work shall be in accordance with AASHTO requirements and shall occur as follows:
 - a. For commercially produced aggregates: at the producer's plant or stockpile.

- b. These test results shall not preclude later sampling and testing for final acceptance after final processing of the material.
- c. Crushing, screening, and mixing plants shall be equipped with sampling devices.
- d. The contractor shall take additional samples as required to validate the certification.

B. Crushed Bedding Material:

- 1. 5/16" decomposed granite (DG).
 - a. This material shall remain stable when saturated with water.

PART 3 - EXECUTION

3.1 SITE PREPARATION

A. General:

- 1. Remove trees, shrubs, grass and other vegetation, improvements, or obstructions interfering with installation of new construction.
- 2. Remove such items elsewhere on site or premises as specifically indicated.
- 3. Removal includes digging out stumps and roots.
- 4. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.
- 5. Clearing shall be kept to a minimum within the specified working limits and care exercised to not damage the root system of adjacent trees or shrubbery.
- 6. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
- 7. Place fill material in horizontal layers not exceeding 6" loose depth, and thoroughly compact to a density equal to adjacent original ground.

B. Topsoil:

- 1. Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material.
- 2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
- 3. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to main root system.
- 4. Stockpile topsoil in storage piles in areas shown, or where approved.
- 5. Construct storage piles to freely drain surface water.
- 6. Dispose of unsuitable or excess topsoil same as waste material, herein specified.

3.2 TREATED LUMBER

- A. Timber to be laid on a continuous solid soil surface.

- B. All timbers will be of full length (no splicing, except when necessary).
- C. All timber length, lap joints and holes will be cut and drilled, and then C.C.A. treated.
- D. All joints shall be lapped and pinned.
- E. All timber corners shall be cross-braced.
- F. If tent pad is located directly adjacent to the campground unit, the common timber border shall be eliminated.

3.3 CRUSHED BEDDING MATERIAL

- A. After treated lumber edge is complete, the area inside the treated lumber shall be constructed with crushed bedding material installed to the depth AS SHOWN ON THE DRAWINGS.
- B. The surfacing material shall be spread in a uniform layer, with no segregation of size, and to a loose depth that shall have the required density when compacted.

3.4 FINISH GRADING

- A. All surfaces and slopes shall be shaped to blend with the original ground line, mounded over or smoothed off, hand raked, and left in a uniform and neat condition. Surface drainage shall be diverted so that it will not enter into the area. See drawings for details.

3.5 CLEANUP

- A. After finish grading has been completed, the disturbed area shall be finished to present as near a natural appearance as possible and cleaned up by removing all debris and materials not utilized. Cleanup shall include disposal of waste materials in accordance with Section 024100. Stockpiled topsoil shall be smoothly distributed over disturbed areas and hand raked to blend with ground line.

END OF SECTION 322100
October 2018

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 322205 - BARRIER ROCKS

PART 1 - GENERAL

1.1 SUMMARY

- A. This item shall consist of obtaining barrier rocks from a commercial source. They shall be placed and installed in conformity with the details as shown on the drawings at the locations staked by the Contracting Officer Representative (COR).
- B. This item shall also consist of having the option of installing a minimum of 20 barrier rocks in locations as directed by the (COR) in addition to the quantity shown on the schedule of items.

1.2 MEASUREMENT AND PAYMENT

- A. Payment will be made for each (EA) barrier rock delivered to the site, installed and accepted.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Rock: The rock used for this work shall be angular or rounded, sound, hard, and free from laminations, fractures, or other structural defects. They shall be of such quality that they will not disintegrate on exposure to water or weathering. Barrier rocks shall be Granite and obtained from a commercial source.
- B. Rocks used shall have a volume of greater than 16 cubic feet (approximately 2000 pounds).

PART 3 - EXECUTION

3.1 PROTECTION OF TREES AND SHRUBS

- A. All work under this item shall be done in such a manner that trees and larger vegetation are not damaged.

3.2 EXCAVATION

- A. All barrier rock shall be placed according to detailed drawings.
- B. All excavated material 3 inches and smaller shall be used for backfill of barrier rock.

- C. Excavation shall be of such size and depth that 30 to 50 percent by volume of the placed barrier rock is set below finished grade or natural ground as the specific location may dictate.

3.3 PLACING OF ROCK BARRIERS

- A. Rock barriers shall be placed according to detailed spacing shown on drawings.
- B. Fifty to 70 percent of rock volume shall be visible when work is complete.

3.4 COMPACTION

- A. Accepted segregated backfill material used in placing the barrier rock shall be placed by hand and compacted with a minimum of three passes of an approved mechanical tamper.

3.5 CLEANUP AND EXCESS MATERIAL DISPOSAL

- A. After the barrier rocks have been placed and the backfill completed, the general area shall be cleaned up by removing all debris and material not utilized.
- B. Any excess excavated material that can be transported less than 300 feet within the total project area and used in accordance with other project specifications will not be paid for separately. For disposal of excavated material in excess of total project needs or material not meeting other specifications, the Contractor shall see Section 024100, "Waste Material Disposal."

END OF SECTION 322205
September 2017

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 322622 - PRECAST CONCRETE CURB STOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. This item shall consist of furnishing and installing pre-cast concrete curb stops in accordance with these specifications and details shown on drawings in conformity with the typical layout and dimensions to the grade established.

1.2 MEASUREMENT AND PAYMENT

- A. 6 – Foot Curb Stops: Payment will be made for each (EA) pre-cast concrete curb stop (including concrete, reinforcement, delivery, labor, and anchor pins) installed and accepted and as listed in the Schedule of Items.
- B. 8 – Foot Curb Stops: Payment will be made for each (EA) pre-cast concrete curb stop (including concrete, reinforcement, delivery, labor, and anchor pins) installed and accepted and as listed in the Schedule of Items.

1.3 SUBMITTAL

- A. Certificate of compliance: Certificate confirming compliance for reinforcement and strength

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE CURB STOPS

- A. Precast Curb Stops - The precast concrete curb stops shall be the size and shape as shown on the drawings. The concrete shall be reinforced as shown on the drawings and shall be 4,000 psi (28 day), 6.5 bag mix, with 6 percent entrained air. Before any of the precast sections are placed in the work, the Contractor shall furnish to the Contracting Officer a “certificate confirming compliance for reinforcement and strength” issued by the Precast Plant.

PART 3 - EXECUTION

3.1 INSPECTION

- A. The Forest Service shall have the right to inspect the precast curb stops either at the precast plant or after delivery. Units delivered to the project site shall be rejected if they have spalls, surface hairline cracks exceeding 12 inches in any single square foot area, or any cracks exceeding 1/16 inch width. All curb stops that are damaged through improper handling or placing shall be rejected.

3.2 BEDDING

- A. When the curbing is to be installed on a bituminous surfaced area, the curb stops shall be set on top of the surfacing and no bedding will be required.
- B. When the curbing is to be installed on a crushed aggregate or native surfaced area, the base on which the curb units are to set shall be compacted by a minimum of three passes with a vibratory compactor to a firm, even surface. All soft or unsuitable material shall be removed and replaced with material suitable to the Contracting Officer.

3.3 PLACING AND ANCHORING

- A. The pre-cast curb stops shall be placed or set as illustrated on the drawings or as directed by the Contracting Officer. This may be in a continuous line or as cords of a curve with or without openings between. They shall, when set in final location, set solidly on the bedding or surfacing.
- B. When lifting wires have been cast in the bottom of the sections, they shall be removed. The wires may be removed by cutting reasonably flush so that they do not interfere with the section setting solidly.
- C. The pre-cast sections shall be anchored in place by driving steel pins or dowels flush with the top through the two holes provided. These pins shall be 3/4 inch round or No. 6 deformed reinforcing steel, 24 inches long.

3.4 CLEANUP

- A. When the installation of the curbing has been completed, the area shall be cleaned up by removing all debris and material not utilized.

END OF SECTION 322622

January 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 322640 - PAVEMENT MARKING

PART 1 - GENERAL

1.1 SUMMARY

- A. This item shall consist of furnishing and applying the paint markings along the centerline and/or shoulders of the road, the individual lines for parking stalls, cross walks, directional arrows, letters, numerals, or signs on the roads for the control of traffic, at locations as shown on the drawings, marked in the field, or as directed by the Contracting Officer.
- B. All work shall comply with the direction in the Manual of Uniform Traffic Control Devices (MUTCD).

1.2 DEFINITIONS

- A. DOT: Department of Transportation.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.5 PROJECT CONDITIONS

- A. Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F (4 deg C) for oil-based materials, 50 deg F (10 deg C) for water-based materials, and not exceeding 95 deg F (35 deg C).

1.6 MEASUREMENT AND PAYMENT

- A. Line Striping: The quantity of 4" wide striping, to be paid for shall be the number of linear feet of stripes measured along the center line of the painted strips completed and accepted with no deduction for the unpainted area caused by broken stripe.
- B. Directional Arrows: The quantity of directional arrows, to be paid for shall be the number of such symbols designated in the Schedule of Items, completed and accepted.

- C. Accessible Parking Symbol: The quantity of International Symbol of Accessibility symbols completed and accepted.
- D. The accepted quantities will be paid for at the contract unit price for each pay item shown in the Schedule of Items.
- E. Payment will be made under:

Pay Item		Pay Unit
322640.1	Traffic Markings, Reflectorized Broken, White, or Yellow	Linear Foot
322640.2	Traffic Markings, Reflectorized, Solid, White, or Yellow	Linear Foot
322640.3	Traffic Markings, Parking Stall Lines, Non-Reflectorized, Solid, Yellow	Linear Foot
322640.4	Traffic Markings, Reflectorized, Symbols and Letters, White	Each
322640.5	Directional Arrows, Reflectorized, White	Each
322640.6	International Symbol Of Accessibility, Reflectorized Symbol, White on Blue Background	Each

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type I or AASHTO M 248, Type N or F.
- B. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 3 minutes.
- C. Glass Beads: AASHTO M 247, Type 1.

2.2 COLORS

- A. Colors for commonly used lines, marking, and symbols are as follows:
 1. Parking Stall Lines: Normally white.
 2. Fog Lines on Edges of Road: White.
 3. Twelve-Inch-Wide Stop Lines: White.
 4. Road Traffic Lane Divider Lines: Yellow.
 5. Speed Bump: White
 6. International Symbol of Accessibility: White on Blue background.
 7. Directional Arrows: White.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall be responsible for preliminary spotting of the lines to be painted and approval by the Contracting Officer must be obtained before applying pavement-marking paint.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust. The area to be painted shall be dry, clean, and free of loose particles.
- D. Apply paint with mechanical equipment to produce pavement markings, of required dimensions, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm). The equipment shall include a mechanical bead dispenser that will distribute the glass beads uniformly into the wet pavement markings at a rate of 6 lb/gal. (0.72 kg/L).
- E. Stripes shall be 4 inches wide. Broken line segments (dashed or skip traffic strip) shall be 10 feet in length with 30-foot gaps, or 2 feet in length with 4-foot gaps.
- F. Arrows and letters shall be of the dimensions as shown on the drawings.
- G. The painted area shall be protected from traffic until the paint is thoroughly dry.
- H. All markings shall present a clean-cut, uniform appearance. All markings which fail to have a uniform appearance, either day or night, shall be corrected by the Contractor.

3.2 DISPOSAL

- A. Dispose of excess construction material in accordance with Section 024100 "Waste Material Disposal".

END OF SECTION 322640
January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 322706 - ASPHALT PAVEMENT PULVERIZING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes pulverizing and mixing in place the existing asphalt and road base and sawcutting the existing road surface as shown on the drawings.

1.2 MEASUREMENT AND PAYMENT

- A. Measurement shall be Number of Square Yards of existing asphalt pulverized and mixed, measured in place. Sawcutting shall be considered incidental.
1. Where pulverized asphalt will not be covered with new asphalt surfacing, the mixed pulverized asphalt shall be hauled to new road subgrades to be used as fill. Hauling and placing shall be paid for under Section 312100.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

- 3.1 Pulverize all existing asphalt pavement and underlying materials to a minimum of a 5-inch depth with an approved rotary milling machine capable of cutting to the required depth, pulverizing, and sizing the material to meet the following size requirements according to ASHTO T27:

A. Sieve Designation	B. Percent Passing
C. 1 ½ inch	D. 100
E. 1 inch	F. 85-100

- G. Pulverized material shall be left in place, shaped, graded and compacted according to Section 312225 for areas to be resurfaced or be moved and used as fill in other location throughout the project.

3.2 CLEAN UP

- A. No pulverized asphalt shall be left exposed upon completion of project. Material shall be used as fill or base under new asphalt surfaces.

END OF SECTION 322706
JAN 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 323116 - GATES FOR ROADS

PART 1 - GENERAL

1.1 SUMMARY

- A. This item shall consist of gates of various types, constructed by fabricating pipe and installing in accordance with these specifications and details shown on the drawings at the locations designated, in conformity with the line and grade established.

1.2 MEASUREMENT AND PAYMENT

- A. Gates: Number of gates of each size designated, including materials, fabrication, earthwork, installation, concrete, backfill, signs, incidentals and all other work within 10 feet of the gate.

PART 2 - PRODUCTS

2.1 PIPE

- A. Pipe used to fabricate the posts and gates shall be standard weight black steel conforming to the requirements of ASTM A53. The entire gate shall be painted as shown on the drawings.

2.2 CONCRETE

- A. The concrete used in the bases shall be as required by Section 033000.

2.3 SIGNS AND OBJECT MARKERS

- A. Signs and object markers shall meet the requirements of Section 101400 "Signs," conform to the Manual of Uniform Traffic Control Devices (MUTCD) and shall be furnished and installed by the Contractor.

2.4 FASTENER BOLTS

- A. According to Section 101400 "Signs."

2.5 LOCKS

- A. Padlocks will be furnished by the Forest Service.

PART 3 - EXECUTION

3.1 FABRICATING GATES AND POSTS

- A. The gates, receiving sockets, and posts shall be fabricated in accordance with the dimensions and details shown on the drawings. Ends of pipe members shall be coped to approximately fit and welded, using a continuous fillet weld. All exposed pipe ends shall be ground smooth. Paint all exposed metal surfaces with one coat of Benjamin Moore Retardo metal primer and two coats of Benjamin Moore brown Impervo No. 20059 or approved equal.

3.2 ERECTION

- A. Neat excavation shall be made to receive the concrete base and socket or post. In boulder formation, individual rocks may intrude into the neat excavation, but they shall be firmly imbedded. Protruding rock surfaces shall be cleaned and dampened to improve bonding to the concrete.
- B. The concrete shall be thoroughly tamped while being placed to insure a firm bearing against the sides of the excavation. The top-exposed portion of each concrete base shall be formed so that the base will appear relatively circular. The top surface of the concrete shall be wood float finished and conical shaped for drainage. The concrete shall be covered with suitable material and kept moist for 3 days or a liquid membrane of approved curing material may be applied.
- C. The receiving sockets or posts, when the concrete has been placed, shall be plumb and at the desired elevation.
- D. The gates, entrances and service road, shall rotate freely and be plumb, level, and in line.

3.3 SIGN AND OBJECT MARKERS

- A. Install signs and object markers using vandal-proof hardware. Use 4 bolts for each sign and each type 3 object marker. Adhere type two object markers directly to metal plates.

3.4 GRADING AND CLEANUP

- A. The area around the unit shall be finish graded to the desired contour. When complete, the general area shall be cleaned up by removing all debris and material not utilized.

END OF SECTION 323116

January 2022

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 329206 - SEEDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This item shall consist of broadcast seeding designated areas using specified seed mixtures with fertilizer.
- B. The areas to be seeded shall be all cut slopes, fill slopes and other disturbed areas.
- C. Related Specifications include the following:
 - 1. Federal Specifications JJJ-S-181

1.2 METHOD OF MEASUREMENT

- A. Measurement shall be lump sum for "Seeding."

PART 2 - PRODUCTS

2.1 SEED

- A. The seed mix shall be as follows:

SPECIES COMMON NAME	LBS LS/ ACRE*	% OF MIX	Minimum PLS% Required
Artemisia tridentata SAGEBRUSH	0.1	3	70+
Leymus cinereus GREAT BASIN WILDRYE	5	15	85+
Elymus trachycaulus SLENDER WHEATGRASS	8	20	80+
Koeleria macrantha PRAIRIE JUNEGRASS	1	30	85+
Poa secunda ssp. Sanbergii SANDBERG BLUEGRASS	2	25	80+
Eriogonum umbellatum SULPHURFLOWER BUCKWHEAT	0.5	2	80+
Lupinus argenteus SILVER LUPINE	0.25	0*	75+
Geranium viscosissimum WILD GERANIUM	0.25	0*	80+
Helianthus annuus ANNUAL SUNFLOWER	0.5	1	90+
Penstemon cyanthus	1	4	80+

WASATCH PENSTEMON			
TOTALS	18.6	100	
		*Nominal	

B.

C. All seed shall conform to the requirements of Federal Specifications JJJ-S-181; State Laws; and U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act; in effect on the date of invitation of bids. Seed which has become wet, moldy or otherwise damaged in transit or storage will not be accepted.

D. Seed shall be furnished separately or in mixture in standard containers clearly marked or labeled with (1) Seed name, (2) Lot number, (3) Net weight, (4) Percentage of purity and of germination and hard seed, (5) Percentage of weed seed content, and (6) all seed shall be certified as noxious weed-free seed. The Contractor shall furnish the Contracting Officer duplicate signed 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 date of delivery. This statement shall include: (1) Name and address of laboratory, (2) Date of test, (3) Lot number of each kind of seed, and (4) Results of tests as to name percentages of purity and of germination, and percentage of weed content, for each kind of seed furnished, and in case of a mixture, the proportions of each kind of seed.

2.2 FERTILIZER

A. The fertilizer shall be 16% total nitrogen, 16% available phosphoric acid, and 16% total water soluble potash applied at the rate of 400 pounds per acre.

B. Fertilizer shall be dry, free-flowing type suitable for application with broadcast seeding. It shall be a standard commercial fertilizer supplied separately or in mixtures in standard containers with name, weight, and guaranteed analysis of contents clearly marked. Fertilizer which has become wet or otherwise damaged in transit or storage will not be accepted.

PART 3 - EXECUTION

3.1 GENERAL

A. The specified seed mixture, with fertilizer, shall be uniformly spread on the designated areas to the density in pounds of live seed per acre as specified.

B. Each area or suitable section of the area to be seeded shall be seeded as soon as the grading and finishing work have been completed and the area prepared and approved for seeding. Seeding shall follow the finishing work as closely as feasible and if possible before the ground has become packed or hardened. No regard shall be given to the season of the year except that no seeding shall be done during windy weather or when the ground is excessively wet or deeply frozen.

3.2 PREPARATION OF SEEDING AREA

- A. Cut slopes, fill slopes, embankments or other areas to be seeded shall be shaped and finished as specified under the Sections involved. The area, where necessary, shall then be hand raked or otherwise worked such that the surface is loose to a depth of at least one inch. Each area shall be approved for seeding by the Contracting Officer before seed is applied.

3.3 SEEDING

- A. The seed or seed mixtures, with or without fertilizer, shall be accurately proportioned as stipulated and thoroughly mixed. They shall be remixed as necessary so that a uniform mixture will result as each loading of the seeder is made.
- B. Seed, with fertilizer, shall be applied with a rotary hand seeder or other approved type commercial seeder or by an agreed upon method. All portions of the area shall be uniformly covered to the required density.
- C. Immediately after seeding the contractor shall rake in the seed such that the seed becomes integrated with the soil.

3.4 MAINTENANCE OF SEEDED AREA

- A. The Contractor will not be required to maintain an area which has been satisfactorily seeded except that he shall protect the area against traffic by warning signs or barricades or other methods approved by the Contracting Officer.
- B. When a seeded area has become damaged by storm or otherwise prior to final acceptance of the project, the Contracting Officer may order the area reworked. The damage shall then be repaired as directed and the area reseeded.

END OF SECTION 329206

February 2021

USDA FOREST SERVICE, R4
GUINAVAH-MALIBU CAMPGROUND RENOVATION PROJECT
SECTION 332228 - CULVERT PIPE AND PIPE ARCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of furnishing and installing metal pipe and pipe appurtenances, including all excavation, bedding, and backfilling required to complete the work.

1.2 DEFINITIONS

- A. GSP: Galvanized Steel Pipe.
- B. HDPE: High Density Polyethylene Plastic Pipe.
- C. PVC: Polyvinyl Chloride Plastic Pipe.
- D. CMP: Corrugated Metal Pipe.

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. Flared End Sections (Corrugated Iron or Steel).
 - 2. Structural Plate Pipe Arch Culverts.
- B. Provide fabricator's certification that the sheet and pipe fabrication are in accordance with AASHTO M 36, M 196, and M245, as applicable. Submit the certification before installing the pipe.

1.4 COORDINATION

- A. The lengths and locations of individual pipe SHOWN ON THE DRAWING are approximate. Do not order pipe until culvert locations are DESIGNATED ON THE GROUND and a written list of the correct lengths is approved by the Contracting Officer.

1.5 MEASUREMENT AND PAYMENT

- A. Linear Feet of pipe of each type and size designated, including, coupling bands, fittings, trenching, bedding, backfill and all other work needed to complete the item. When ends of a round pipe culvert are cut on a skew or slope, measurement will be the average of the top and bottom centerline lengths. When ends of a pipe arch culvert are cut on a slope, measurement will be the bottom centerline length.

PART 2 - PRODUCTS

2.1 STEEL PIPE AND PIPE ARCHES

A. Corrugated Iron or Steel Pipe and Pipe Arches

1. Riveted Pipe and Pipe Arches: AASHTO M36.
2. Welded Pipe and Pipe Arches: Resistance spot welded, AASHTO M36.
3. Helical Pipe: Non-perforated helically corrugated pipe with continuous lock or welded seams, AASHTO M36.
4. Coupling Bands: AASHTO M36.
5. Special Sections (Elbows, tees, wyes, etc.): Same thickness as the conduit to which they are joined, AASHTO M36.
6. Flared End Sections: AASHTO M36. Fabricated as shown on the Drawings. Minor variations may be accepted to permit the use of the manufacturer's standard methods of fabrication.

B. Galvanized Steel End Sections: AASHTO M218.

2.2 BEDDING AND BACKFILL

A. Bedding and Backfill Material: According to Section 312000 "Earthwork."

2.3 MATERIAL COMPATIBILITY

- A. The materials used in each pipe installation shall be compatible with each other to prevent electrolysis or physical failure. Either annular or helical pipe corrugations will be acceptable, but each pipe installation shall consist of only one class of corrugation.

PART 3 - EXECUTION

3.1 POLLUTION CONTROL

- A. Water pollution and stream degradation shall be controlled.
- B. Pipe which is installed in or which will affect streams shall be installed only during those periods SHOWN ON THE DRAWINGS.

3.2 EXCAVATION

- A. Excavation shall be according to Section 312000 "Earthwork" and the following:
1. Construct the width of trenches in natural ground to permit satisfactory joining of the culvert sections and thorough tamping of the bedding material under and around the culvert. Excavate trenches to a minimum width equal to the culvert diameter plus 2 feet.
 2. Construct trenches for culverts being placed in embankments to a width of one diameter, plus one diameter on each side.
 3. Excavate unsuitable foundation material below the invert of the culvert to an approximate depth of 2 feet and a width of at least the culvert diameter plus 4 feet. Remove rock, hardpan, or other unyielding material below the foundation grade for a depth of at least 1 foot and a width of at least 2 feet greater than the outside width of the culvert.

4. Excavate to foundation grade without unduly disturbing the trench or foundation surface. Foundation grade is the elevation at the bottom of any bedding of the installation of the structure.
5. All suitable excavated material shall be utilized as backfill or embankment. No excavated material shall be placed in live streams. All surplus material shall be disposed of according to Section 024100 "Waste Material Disposal."

3.3 BEDDING

- A. The material shall be select mineral soil and shall have the moisture content needed for effective compacting. Bedding shall be readily compactable material free of frozen lumps, chunks of highly plastic clay, rocks larger than 3 inches in diameter or other objectionable material.
- B. Bed the pipe to a depth of not less than 10 percent of its total height. The foundation surface, after excavation, shall be compacted in accordance with paragraph 3.7 and shaped to fit the pipe.
- C. The completed bedding shall have a longitudinal camber when SHOWN ON THE DRAWINGS.
- D. The bedding material shall be selected mineral soil meeting the requirements for backfill in paragraph 3.7.

3.4 LAYING PIPE

- A. No pipe shall be placed in service until a suitable outlet is provided.
- B. The final installed alignment of all pipe shall have no sag and no point shall vary from a straight line drawn from inlet to outlet by more than 2 percent horizontally and vertically of the culvert length or 1 foot, whichever is less, unless otherwise SHOWN ON THE DRAWINGS.
- C. Helically corrugated lock-seam pipe shall be installed with the seam at the inlet end placed below the horizontal centerline.
- D. Longitudinal laps on riveted or spot-welded pipe shall be positioned at any location between 45 degrees above or below horizontal.
- E. Place outside circumferential laps facing upstream.
- F. Damaged spelter coating caused by welding, field cutting, or mishandling shall be cleaned and painted as specified in AASHTO M36.

3.5 JOINING PIPES

- A. Pipe shall be firmly joined by form-fitting coupling bands. End sections shall be attached to pipe by connecting bands or other means as recommended by the manufacturer. Rubber gaskets shall be installed at each joint to form a watertight connection when SHOWN ON THE DRAWINGS. Dimpled bands shall not be used when the slope of the pipe is greater than 25 percent.

- B. The coupling bands shall meet the strength requirements of field joints for Non-Erodible Soil Condition--Special Joint Type according to Division 2, Section 23 of the "Standard Specification for Highway Bridges" by AASHTO.

3.6 SHOP ELONGATION

- A. When SHOWN ON THE DRAWINGS, the vertical diameter of round pipe shall be increased 5 percent by shop elongation.

3.7 BACKFILLING

- A. Pipe meeting any of the following conditions shall not be placed or back-filled until the excavation and foundation have been approved by the Contracting Officer:
 - 1. Embankment height greater than 10 feet at subgrade centerline.
 - 2. Installation in a live stream.
 - 3. Round pipe with a diameter of 48 inches or greater.
 - 4. Pipe arches with a span of 50 inches or greater.
- B. After the bedding is prepared and the pipe is placed, backfill material shall be placed in layers not exceeding 6 inches loose thickness and compacted under the haunches and alongside the pipe.
- C. The material shall have the moisture content needed for effective compacting. Backfill shall be readily compactable material free of frozen lumps, chunks of highly plastic clay, or other objectionable material. Rocks larger than 3 inches in diameter shall not be used within 1 foot of the pipe. Backfill shall be compacted without damaging or displacing the pipe. The density shall be that of the surrounding embankment or 95 percent of the maximum density as determined by AASHTO T 99 Method C or D, whichever is greater. Backfilling and compacting shall be continued until the backfill is 12 inches above the top of the pipe. After being bedded and backfilled pipe shall be protected by an adequate cover of embankment before heavy equipment is permitted to cross during roadway construction. Pipe distorted more than 5 percent of nominal dimension, ruptured, or broken shall be replaced at the expense of the Contractor.

END OF SECTION 332228
January 2022