National Forest Foundation

BUILDING 27, SUITE 3, FORT MISSOULA ROAD
MISSOULA, MONTANA 59804
TEL 406.542.2805
NATIONALFORESTS.ORG

Request for Quotes
Chapman Campground Waterline Replacement
White River National Forest, Colorado

Background and Statement of Work:

Located within the scenic Fryingpan River drainage on the Aspen-Sopris District of the White River National Forest (WRNF) in Colorado, Chapman Dam and Campground is a popular destination uniquely known for its historic dam, which was originally constructed by the Civilian Conservation Corps during the Great Depression and is often described as a replica of the Hoover Dam. The Chapman Campground serves as a vital hub for both day-use recreation and overnight camping, offering 84 sites and access to the Chapman Reservoir for fishing and boating.

The National Forest foundation (NFF) in partnership with the WRNF is seeking a contractor to perform essential maintenance on Chapman Campground's main waterline, a project fundamental to ensuring the continued delivery of clean and fresh drinking water to the hundreds of visitors who use the site every year. This project includes excavating, demolishing and reconstructing sections of the north portion of the public water system at the Chapman Campground. The north part of the system has historically had problems with rust and iron contamination due to aging infrastructure.

Water system and line replacement will take place in portions north of the bridge over the Frying Pan River including Area A; Area B; Area C; Loop E; and all system lines between and supplying these areas. Appendix A: Project Map details segments that are to be replaced.

Work will include excavation and disposal of the current system lines, hydrants and drain lines and all associated demolition materials; placement of bedding material; installation of new 1-inch HDPE water lines; installation of new hydrants including shutoff valves, drainage grates and drain lines; and construction of ADA/accessible gravel paths and pads at each hydrant.

New waterlines will be installed in the same locations/alignments as the current lines. It is estimated that the burial depth of the existing lines is approximately 3 to 4 feet.

Pad construction using concrete in place of gravel will be considered as an Option Item.

Information Requested

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

- technical approach
- work experience
- cost

- capacity for this project
- experience in similar projects

Specific requirements are detailed below.

I. PROJECT OVERVIEW AND REQUIREMENTS

General Specifications

(a) Description of Work – This Request for Quotes is for restoration services related to replacement of the water system and line in the Chapman Campground on the WRND, specifically in Area A; Area B; Area C; Loop E; and all system lines between and supplying these areas. Specific project details include the following:

1. General Conditions

2. Mobilization/Demobilization
    i. Areas for staging operations and storage of materials shall be approved by the Forest Service. The Contractor must request approval from the Forest Service to stage trailers (work or housing) on site.

3. Waterline Replacement
    i. Waterline replacement will follow all specifications outline in Appendix B: Project Specifications
    ii. Excavate the old water line and drains. New waterlines will be installed in the same locations/alignments as the current lines. It is estimated that the burial depth of the existing lines is approximately 3 to 4 feet. Replace with new HDPE 1-inch water line in the following locations (refer to Appendix C: Waterline Replacement Locations):
        1. E Loop “T” to Site 26 Hydrant – 695 ft
        2. Loop E line to Site 36 Hydrant – 425 feet
        3. End of fill station to Area B Hydrant – 245 feet
        4. Area B Hydrant to Area C Hydrant – 505 feet
        5. Area B Hydrant to Area A Hydrant – 275 feet
    iii. Dispose old water line material
    iv. Install screens on all outlets

4. Water Hydrant and Curb Valve Installation
    i. Water hydrant and curb valve installation will follow all specifications outlined in Appendix B: Project Specifications and Appendix D: Typical Pad Hydrant Drawing
    ii. Replacement of 7 (Areas A, B, C; E Loop Site 26 and 36; D Loop; and Host Site)
    iii. Installation of 5 “isolation” curb stop shutoff valves (Area c; Area B just after D Loop hydrant; Area a; E Loop after the “T”; and the Host Site)
    iv. Remove and dispose of concrete rings around hydrants and replace with gravel that is flush to the ground surface to meet accessibility requirements

5. Waste Disposal

6. Optional Items
    i. Construct Concrete Pads at each hydrant (7)
    ii. Additional waterline replacement if excavation of the existing line reveals longer lines than what was anticipated in the original bid

Site Information and Limitations:
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. The campground ("construction site") will be closed to the public during construction. Camping will be permitted during construction.
2. The Contractor will provide all materials and labor necessary for erosion protection during construction activities. The Contractor will be required to submit an erosion control plan and receive approval from the Forest Service, 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. Construction equipment shall be inspected on a trailer prior to offloading the equipment. Contractor shall give the Forest Service a minimum of 72 hours (3 business days) notice prior to needing inspection.
4. Trees can be removed for excavation of existing water lines. Cut trees should be lopped to 6-foot lengths and scattered/dispersed in the forest around the campground.
5. Parking barriers can be moved as necessary for water line excavation and access. If removed, they should be piled in the parking lot for the Forest Service to dispose of.
6. Water treatment, chlorination, or water quality testing is not included in this scope of work
7. No permits are required. The Forest Service will conduct all inspections.
8. Contractors may be required to follow Stage II fires Restrictions should these restrictions be in effect during construction. See Appendix E: Stage II Fire Restriction Protocols
9. Campsites in Loop E will be under concurrent construction. Coordination with the Forest Service and campsite construction contractor will be needed.
10. Seeding after new waterlines have been installed and buried is not part of the scope of work.

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

(b) Project Location – The project is located approximately 60 miles east of Basalt, CO on County Road 104 ("Frying Pan Road", Eagle and Pitkin Counties), see Appendix A: Project Map.

(c) Work Schedule – Work will ideally start September 9th and occur into October 2026 if needed. The system will be available for leak testing until September 30th, 2026. The campground is already planned to be closed during this time for additional construction work on campground sites. We will give preference to bids that can meet this timeline; however; we will still accept and consider bids that cannot complete construction until 2027.

Other Project Requirements and Specifications

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

a. Camping will be allowed onsite per Forest Service approval
b. Utilities are not available at the site for construction purposes; however, potable water may be available on site.
c. Vault toilet facilities are available at the site for contractor use, and if used shall be cleaned and pumped at the end of the construction at the expense of the Contractor.
d. Trash/dumpster service will not be available during construction and Contractor will be responsible for removal of all trash and personal waste.

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

- Appendix B: Project Specifications
  - This document provides specifications for mobilization, submittal procedures, cast-in-place concrete, water distribution systems, curb valves and boxes, water hydrants, and earthwork.
- Appendix D: Typical Pad Hydrant Drawing

Insurance Requirements

Upon selection of the winning bid, the Contractor agrees that it has and shall maintain the following insurance coverage indicated below. The effective date of all coverage shall precede the start of any work.

a. State minimum workers' compensation insurance coverage for its employees, if any.

b. Broad form general liability, property damage, and automotive liability insurance in the minimum amount of $1,000,000 for bodily injury, death, or damage to property of any person and $2,000,000 for bodily injury, death, or damage to property of more than one person. The Contractor shall name NFF an Additional Named Insured and provide NFF with a certificate of insurance evidencing such coverages, prior to the initiation of the Scope of Services.

c. If the Scope of Services includes professional services as identified herein, Contractor shall also provide professional errors and omissions liability insurance. Professional services for purposes of this section include, but are not limited to performing architecture, engineering, landscape architecture, land surveying or planning, preparation and signing or stamping of drawings, maps, surveys or construction specifications, or design and development of computer software, programs or websites by the Contractor or by subcontractors on behalf of the

Contractor, for which professional liability insurance would typically be required. The minimum coverage limits required are $1,000,000 for each claim and $1,000,000 annual aggregate.

Prohibited Telecommunications Services and Equipment

If applicable, Contractor is responsible for compliance with the prohibition on certain telecommunications and video surveillance services or equipment identified in 2 CFR 200.216.

Payment/Performance Security

Contractor shall post cash, a letter of credit, bond, or other financial security that is easily convertible into cash in a form acceptable to the NFF, in its sole determination, to assure completion of the work required under any subsequent agreement and payment of all amounts lawfully due to all persons supplying or furnishing to the Contractor or Contractor's subcontractors with labor, laborers, materials, rental machinery, tools or equipment used or to perform the work. Contractor may incorporate required associated costs into mobilization costs or other approved expenses.

a. Work that is classified as construction in accordance with the Miller Act or Little Miller Act or if required per conditions of the funding source, payment and performance bonding will be required in the full amount of any Agreement. For the purposes of this Request for Quote, construction is defined as "any contract greater than $100,000 for the construction, alteration, or repair of any public building or public work where the federal government is the owner", or

b. If Contractor is not self-performing at least 85% of the total contract value or if the cost of materials is in excess of the larger of $100,000 or 50% of the contract total, payment and performance bonding will be required in the full amount of the agreement, or

c. If the value of the agreement is in excess of $250,000, Contractor will be required to post financial security in a form acceptable to the NFF in the amount of 5% of the total agreement value up to $250,000 in total financial security.

Federal Exclusion Verification

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

Federal Flowdown Provisions

Flowdown Requirements: Any Agreement associated with this RFQ may be subject to flowdown requirements under associated federal or state funding agreements, which are included and made part of by this reference.

(b) REQUIRED COMPONENTS

Technical Quote

Please provide a detailed technical approach to the work.

Contractor Qualifications

(a) Past Experience – Please provide a brief explanation of previous work experience with land management agencies.

(b) References – Please provide three professional references that can speak to past performance.

Pricing Schedule

Contractor shall price work according to the schedule below. Prevailing wages are required per conditions of funding sources.

	Task/Item	Units	Quantity	Unit Cost	Extended Cost
	1. General Conditions	LS	1		
	2. Mobilization/ Demobilization	LS	1		
	3. Waterline Replacement	Feet	2,145		
	4. Water Hydrant and Curb Valve Installation	Hydrants and Pads	7		
	5. Waste Disposal	LS	1		
	6. OPTIONAL ITEM: Concrete Pad Construction	Hydrants and Pads	7		
	7. OPTIONAL ITEM: Concrete Pad Construction	Feet	200		
				Total Bid	

(c) SUBMISSION, EVALUATION, AND CONTACTS

Contractor Selection Process

The NFF will use the Evaluation Factors below to review each submitted bid. Based on the outcomes of that selection process, the NFF will notify successful and unsuccessful bidders by July 20th, 2026 and will prepare a separate contract document.

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

Point of Contact

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

Emily Kasyon
National Forest Foundation, white River National Forest Senior Program Coordinator
ekasyon@nationalforests.org

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

Bid Submission

Submit bids via email to ekasyon@nationalforests.org by 5 pm on July 15th, 2026.

Equal Opportunity Provider

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

National Forest Foundation

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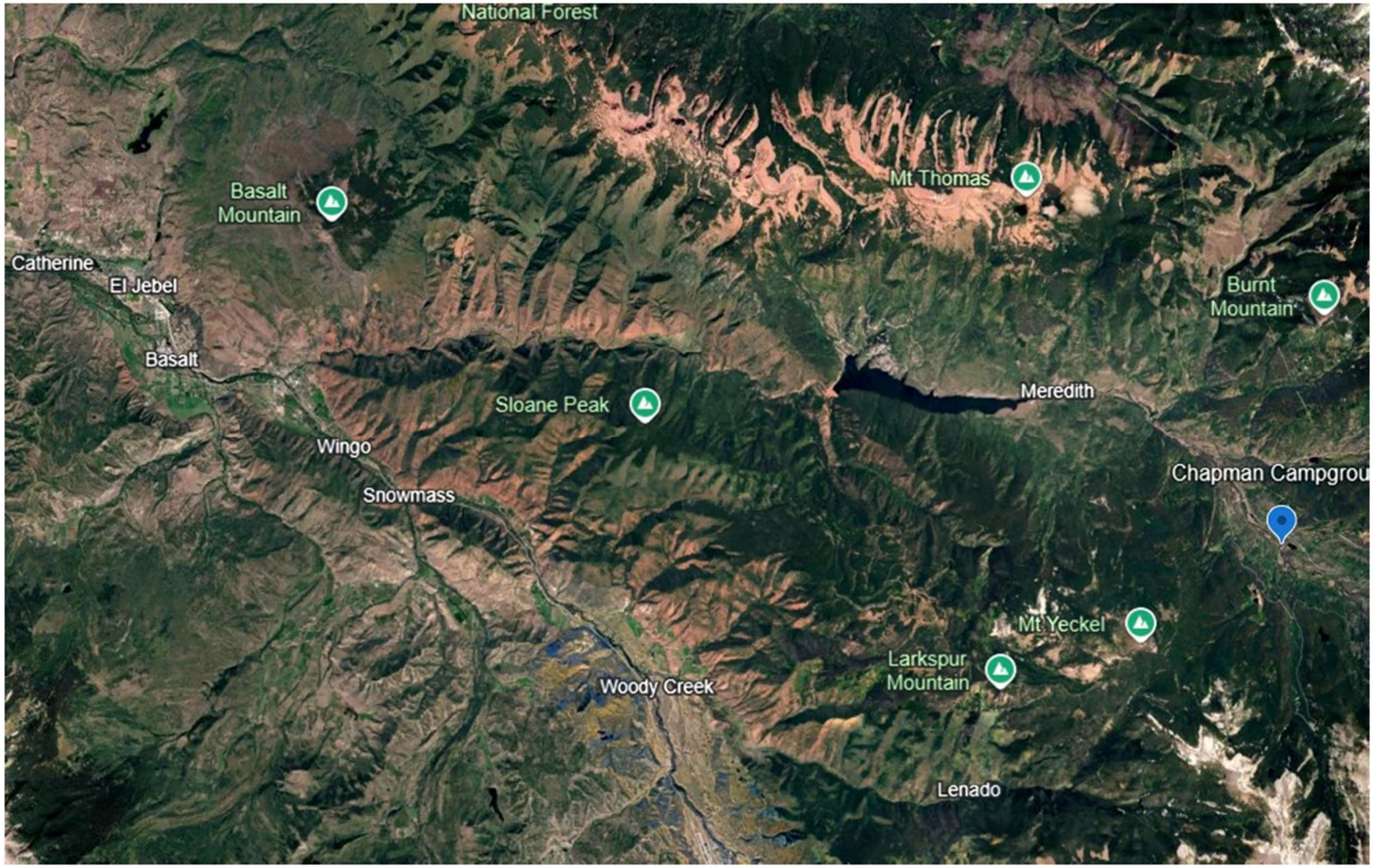
Appendix A: Project Map



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1.1 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 000001 – SECTION C

SECTION 011900 - MOBILIZATION
SECTION 013300 - SUBMITTAL PROCEDURES
SECTION 033000 - CAST-IN-PLACE CONCRETE
SECTION 221100 - WATER DISTRIBUTION SYSTEMS
SECTION 221102 - CURB VALVES AND BOXES
SECTION 221105 - WATER HYDRANTS
SECTION 312000 - EARTHWORK

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 as required; 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, as needed 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.

END OF SECTION 011900

SECTION 013300 - SUBMITTAL PROCEDURES

PART 2 - GENERAL

2.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Product Data, Samples, and other miscellaneous submittals.

B. See other specification section within this package for additional requirements on submittal.

2.2 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

B. Processing Time: Allow enough time for submittal review, including time for re-submittals, as needed. Time for review shall commence on Forest Service receipt of submittal.

C. Submittal Tracking: Contractor shall create a tracking spreadsheet with the following information: Date; Item; Brand/Model/Description; and Approval Initials.

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, initial approval of submittal may serve as final submittal.

2.3 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 3 - PRODUCTS

3.1 ACTION SUBMITTALS – (Submittals requiring Forest Service approval)

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. 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.

B. Contractor's Construction Schedule: The contractor shall submit a Construction Schedule, for approval by the Forest Service, in accordance with the contract provisions within 5 days of commencement of work.

3.2 INFORMATIONAL SUBMITTALS – (Submittals NOT requiring Forest Service approval)

A. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment.

B. 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 the manufacturer.

END OF SECTION 013300

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies cast-in place concrete for the Optional Item, if awardrd, 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 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, if awardrd, for items shown on the Schedule of Items.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A 82, as drawn.

2.2 REINFORCEMENT ACCESSORIES

A. 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:

2.3 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 I.

B. Normal-Weight Aggregates: ASTM C 33, graded, from a single source.

1. Maximum Coarse-Aggregate Size: ¾ inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. 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.

2.5 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Slabs-on-Grade: Unless otherwise indicated 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 ¾ -inch nominal maximum aggregate size.
5. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

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.

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 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

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.

3.4 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 Forest Service.

C. Before 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. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
2. 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 slabs in a continuous operation, within limits of construction joints, until placement of 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.

3.5 FINISHING SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. 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.

C. Broom Finish: Apply a broom finish to exterior concrete 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.

3.6 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.

3.7 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: See Table 3.6 in Section 014100. 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 test fails, 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 the Forest Service 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

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 and testing of waterlines.

1.2 SUBMITTALS

A. Product Data: For the following:

1. Pipe and fittings.
2. Accessories.
3. Drain and vent screens.

B. Operation and Maintenance Data: For specialties to include in emergency, operation, and maintenance manuals. Include the following:

1.3 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 for materials for water-service piping and specialties for domestic water.

1.4 MINIMUM SYSTEM REQUIREMENTS

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

1.5 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.

1.6 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, drains, thrust blocks, and tracer wire.
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.

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. Minimum Cell Classification: ASTM D 3350, 445574C
c. Dimension Ratio and Minimum Pressure Rating: DR11, 200 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.

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 drainpipe 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.

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 established in the field.

B. Verify locations of waterlines as shown on the Drawings. Waterline location shall be approved by the Forest Service before installation.

C. All waterline shall be graded to drain, without any humps, depressions, or low spots.

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 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. Bury piping with compacted depth of cover equal to the surrounding subgrade.

I. Install underground piping with restrained joints at horizontal and vertical changes in direction as indicated on the Drawings. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

J. 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 ensure 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.

K. Laying Pipe

1. No pipe shall be placed in the trench until the Forest Service 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 1%. Waterlines not meeting this requirement shall be removed by the Contactor 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. When work is not in progress, securely close open ends of pipe and fittings.

6. When pipes are installed in a structure or utility box, they shall be adequately supported.
7. 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.
8. Bends that result in joint tension or permanent pipe deformation are prohibited.
9. Pipelines may be relocated slightly, if necessary, to avoid existing obstacles. However, the required slopes must be maintained.

L. 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.

M. 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.

            a) Stainless steel transition fittings are not to be used on galvanized steel 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. 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.

3.3 IDENTIFICATION

A. According to Section 312000 “Earthwork.”

B. Use detectable warning tape over piping.

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 1%.

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. Testing shall take place at the operating pressure utilized during normal operations, and water system will be in operation until 9/30/26. Pneumatic testing may be allowed if the use of water will jeopardize the system due to the onset of below-freezing weather.
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 Forest Service shall be present during the testing period.
5. In order to facilitate placement and compaction of backfill, leak and pressure testing may take place in individual “zones” as construction of these areas is completed.
6. Test pressure will be maintained and held for a minimum of 1 hour.
7. 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 their own expense with new material and the test repeated until satisfactory to the Forest Service.
8. After testing is completed the system will be drained and winterized as part of seasonal shutdown.

9. No paints, asphalts, tars, enamels, or other types of pipe compounds shall be used to eliminate leaks.

3.6 CLEANING AND FLUSHING

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

1. Purge new systems 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.
5) 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.

END OF SECTION 221100

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:

1. All products in contact with potable water shall comply with NSF 61.

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.

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 valve. Furnish one valve operating wrench or shut-off rod with every five (or fraction thereof) curb boxes installed, as indicated on the Drawings. If the tops of the valves have a different connection type an additional valve wrench shall be provided.

a. Valve Operating Extension for Poly Valves: Polyethylene or PVC, with adapter to fit valve, extend to within 4 inches of ground level.

2. Poly Valves

a. NSF Approved (Potable water systems only)
b. Valves 4-Inch and Larger: AWWA C906.
c. Valves Smaller Than 4-inch: Similar quality to AWWA C906.

d. Opening (Bore): Full.
e. Dimension Ratio and Pressure Rating: Same as pipe in which the valve is installed
f. Model: Poly-Water Valves, as manufactured by Nordstrom Audco Inc., 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 Poly Valves:

a. Design: Slider or screw type, Buffalo pattern.
b. Bottom Sections: Compatible with valve.
c. For 1-Inch Valves: 2-1/2-Inch shaft, Series 200 or 250 Plastic Boxes, with #002 bottom sections, as manufactured by Bingham and Taylor 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. Crushed Gravel Bed: Under each valve, 6" wider than bottom of valve box on all sides, 6-inch minimum depth.

C. Knockouts: Remove knockouts from valve box.

D. 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.

E. Curb Box Lid: Flush with finished grade, unless indicated otherwise on the Drawings.

END OF SECTION 221102

SECTION 221105 - WATER HYDRANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Provides for furnishing and installing hydrants as follows:

1. Haws Model 6252HLS/EHLF self-closing faucet.

B. Related Sections include the following:

1. Section 024100 “Waste Material Disposal.”
2. Section 033000 “Cast-In-Place Concrete.”
3. Section 221100 “Water Distribution System.”
4. Section 321204 “Crushed Aggregate Base or Surface Course.”

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 Forest Service.

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.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS

A. Lumber: S4S, Redwood, construction grade, meeting requirements of Redwood Inspection Service.

B. Lumber: S4S, hem-fir, No. 1, ACQ- or CAB- treated with 0.60 pcf retention for UC4B, AWPA category.

C. Stain: Solid color stain as manufactured by Olympic. or an approved equal.

1. Color: Forest Service "Oxford Brown." Contractor shall submit color sample to the Contracting Officer for approval.

D. Framing Anchors: 16 gauge, 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.

E. 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.

F. 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

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. 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.

2.3 PAD SURFACING

A. Crushed Aggregate: As shown on the Drawings, Grade G 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 remain 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

SECTION 312000 - EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for slabs-on-grade.

1.2 SUBMITTALS

A. Contractor shall submit to the Forest Service for approval source of aggregates and backfill materials and certified sieve analysis. Materials from Government Sources are exempt from this requirement.

1.3 PROJECT CONDITIONS

A. Demolish and completely remove from site existing underground waterlines indicated to be removed.

1.4 MEASUREMENT AND PAYMENT

A. Payment will be as follows:

1. Trenching: There will be no separate measurement or payment for trenching or placing and compacting backfill. Trenching, backfilling and compaction is included in the measurement of the waterline installation.
2. All Other Work: There will be no separate measurement or payment for other work in this Section. Payment will be included in the contract unit price as shown on the Schedule of Items for the building.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS, GENERAL

A. Excavated material will be used for backfill. Where waterline trenches are excavated in roadways the granular roadbase material(s) will be placed separately from the subsurface materials for re-use on the road surface.

B. 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.

2.2 BACKFILL MATERIALS, UTILITY TRENCHES

A. Trench Backfill

1. Backfill material for waterlines shall be trench-excavated material consisting of soil, sand, or fine granular material free of organic material.
2. Frozen material will not be allowed.

B. Waterline Bedding Material

1. Bedding material shall consist of rounded river gravel or crushed, free-draining material, meeting the following graduation, as determined by ASTM C 136 and ASTM C 117.

SPECIAL BEDDING GRADATION	
Sieve Designation Square Openings	Percentage by Weight Passing Sieve
1”	100
3/4”	90 – 100
1/2"	20 – 55
3/8”	0 – 15
No. 4	0 - 5

2.3 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. Blue: Water systems.
3. Green: Sewer systems.

B. Tracer Wire: 14 copper wire, covered.

PART 3 - EXECUTION

3.1 LOCATION, ALIGNMENT AND GRADE

A. New waterlines will be placed in the same location as the lines that are removed. Locations shall be verified by the Forest Service during excavation.

3.2 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.

3.3 EXPLOSIVES

A. Explosives: Not permitted to be used.

3.4 EXCAVATION SUPPORT AND PROTECTION

A. Protect excavations from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation.

B. As needed, 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.

3.5 EXCAVATION, GENERAL

A. Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including soil materials, and obstructions.

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 practicable adjacent to the excavation to be replaced after trench compaction.

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 appropriately fenced to protect the public.

3.6 EXCAVATION FOR TRENCHES

A. Excavate to existing waterline depth. Trench width shall be sufficient to allow placement of bedding and new waterline placement. The Contractor may excavate the trench

narrower or wider than necessary, however the pay item for this work will be per linear foot of pipe installation.

B. All trench excavation shall conform, as near as possible, to the locations illustrated on the site plans.

C. All waterline trenches shall conform with the general locations illustrated on the drawings. Any change from the indicated alignment due to differing location(s) of existing lines must receive prior approval by the Forest Service prior to work being started.

3.7 STORAGE OF SOIL MATERIALS

A. Stockpile soil materials along excavated trenches without intermixing. Place, grade, and shape windrows to facilitate placement and compaction into trenches.

B. Topsoil and road base materials 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 and road base materials will be reused after backfilling on those areas from which it came.

C. Place backfill in horizontal layers not more than 12 inches thick for the required degree of compaction. Compaction of trench backfill shall be identical/consistent with existing grades of undisturbed materials adjacent to the excavated trench.

D. Provide for anticipated settlement and shrinkage of the backfill and for the finished grades required.

3.8 UTILITY TRENCH BACKFILL

A. Backfilling will be permitted only after all inspections of piping and/or connections have been performed and tests completed and the work to be covered has been approved by the Forest Service. Backfill which has been improperly placed and/or compacted shall be corrected, if directed by the Forest Service, 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. 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, as constructed. 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.

2. 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.
3. 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.

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 12inches 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.

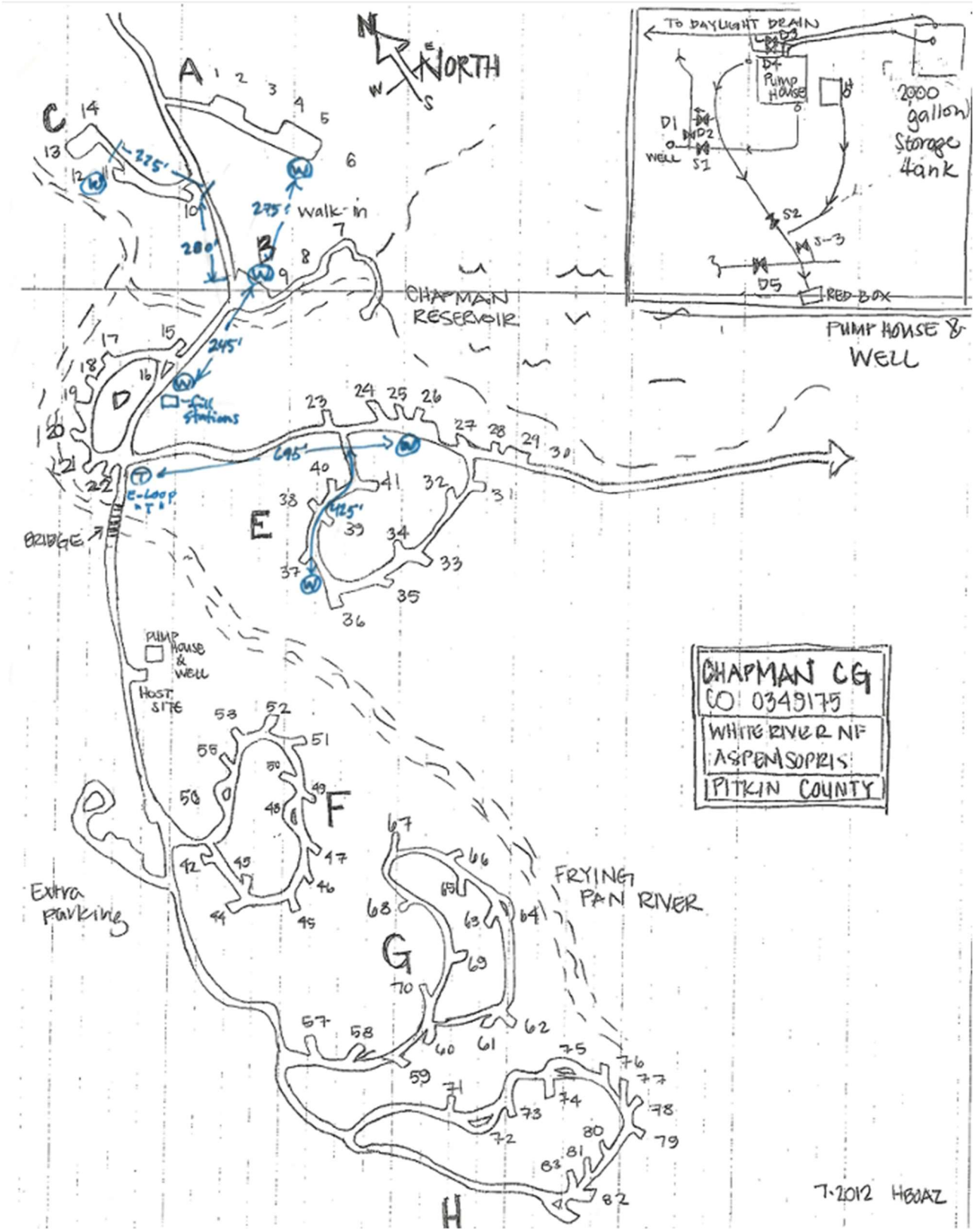
3.9 GRADING

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.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

END OF SECTION 312000

Appendix C: Waterline Replacement Locations



National Forest Foundation

BUILDING 27, SUITE 3, FORT MISSOULA ROAD
MISSOULA, MONTANA 59804
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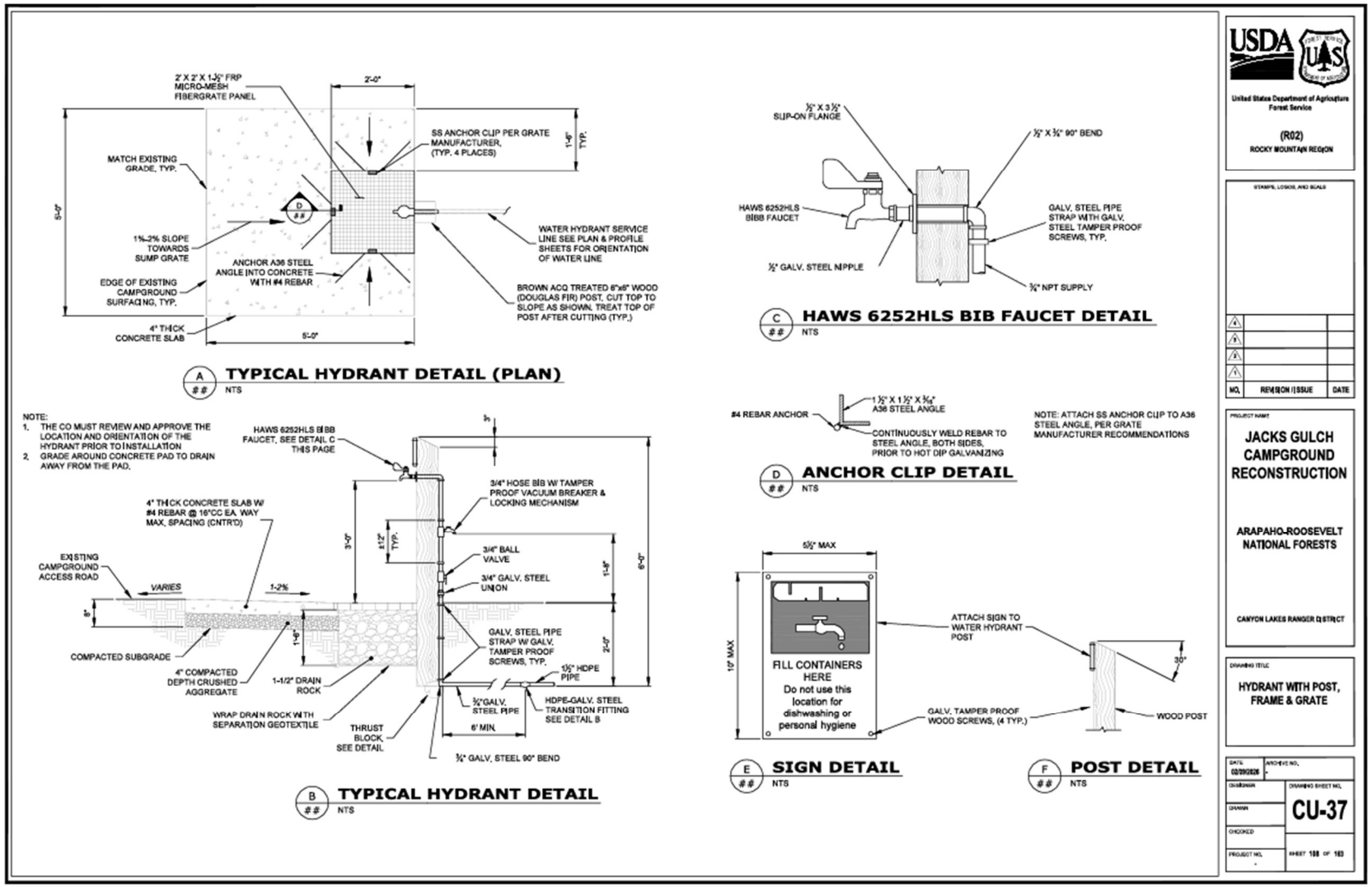
Appendix D: Typical Pad Hydrant Drawing



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White River National Forest
Stage II Fire Restriction Protocols

These restrictions are necessary for the overall protection of the forest should Stage II fire restrictions be put into effect. To ensure these requirements are met, contractors must notify and get clearance in the form of a letter with specific protocols concerning their project from their Forest Service project contact prior to starting any exempted activity listed in this letter.

Exempted activities will not be performed during a national weather service issued red flag warning for that location.

Welding, Griding and Cutting Torches

Contractors are authorized to operate welding machinery, grinders or a cutting torch within the project area subject to the following conditions:

1. The ground must be barren of all flammable materials, or all combustible ground fuels must be wet down within a 10-foot radius of the cutting or welding area prior to operations.
2. A watchperson must be situated at each point where welding or cutting is occurring and shall remain on duty for at least one hour after welding or cutting is completed. The watchperson must be equipped with a radio/cell phone and shovel and have direct access to water to extinguish a fire.
3. A fire extinguisher of the size and type designed to extinguish a fire in the flammable material surrounding the area where welding or cutting is occurring must be readily available during welding and cutting operations.
4. A water truck, trailer, other container, or pump with sufficient water quantity to extinguish a fire must be present at the project site.
5. A dozer, excavator or similar machine, and operator must be present at the project site.

Blasting

Contractors are authorized to continue with already approved blasting operations within the project area subject to the following conditions:

1. The ground must be barren of all flammable materials, or all combustible ground fuels must be wet down within a 10-foot radius of the blasting area prior to operations.

2. A watchperson must be situated at a safe distance from each point where blasting is occurring and shall remain on duty for at least one hour after blasting is completed. The watchperson must be equipped with a radio/cell phone and shovel and have direct access to sufficient water to extinguish a fire.
3. A fire extinguisher of a size and type designed to extinguish a fire in the flammable materials surrounding the area being blasted must be readily available during blasting operations.
4. Each blasting site and the surrounding area must be re-inspected at the end of the day.

Vehicle Use

Contractors are authorized to use motor vehicles equipped with spark arresters off of National Forest System roads to accomplish planned construction activities, subject to the following conditions:

1. Vehicles must be parked in areas devoid of vegetation, or areas that have been wet down to reduce the risk of ignition.

In addition, internal combustion engines must be equipped with a spark arrester at all times on National Forest; wood burning/sheepherder stoves must also have a spark arrester.