GLACIER BAY NATIONAL PARK AND PRESERVE

REHAB WATER SERVICE LINES AT
BARTLETT COVE HOUSING
PMIS NO. 307989A

PROJECT SPECIFICATIONS
COMPLETE 100% CD

NATIONAL PARK SERVICE
INTERIOR REGION 11
MARCH 2025

This page was intentionally left blank

Project Specifications
Table of Contents

TABLE OF CONTENTS (TOC)

DIVISION 1 – GENERAL REQUIREMENTS

01 11 00 Summary of Work
01 26 01 Contract Modification Procedures
01 27 00 Definition of Contract Line Items
01 31 00 Project Management and Coordination
01 32 16 Construction Schedule
01 32 33 Photographic Documentation
01 33 23 Submittal Procedures
01 35 13.22 Archeological Protection
01 35 23 Safety Requirements
01 35 91 Historic Preservation Treatment Procedures
01 40 00 Quality Requirements
01 42 00 Reference Standards
01 50 00 Temporary Facilities and Controls
01 57 19.12 Noise and Acoustics Management
01 57 23 Temporary Storm Water Pollution Prevention (SWPP), Under-an-Acre Pollution Prevention (UPP)
01 67 00 Product Requirements
01 73 40 Execution
01 74 19 Construction Waste Management and Disposal
01 77 00 Closeout Procedures
01 78 23 Operation and Maintenance (O&M) Data

DIVISION 2 – EXISTING CONDITIONS

02 41 00 Demolition

DIVISION 31 – EARTHWORK

31 05 25 Utility Line Marking
31 10 00 Site Clearing
31 11 01 Rock Excavation
31 11 23 Aggregate Base Course
31 21 00 Trench Excavation
31 23 00 Earthwork

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 01 01 Tree Protection
32 12 16 Asphalt Concrete Pavement
32 91 19 Topsoil
32 92 19 Seeding

DIVISION 33 - UTILITIES

33 12 13 Water Distribution System
33 31 23 Fusible HDPE
33 61 13 Arctic Pre-Insulated HDPE

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Work Covered by Contract Documents
2. Work Phases
3. Government-Furnished Materials
4. Construction Contractor Use of Site
5. Public Use of Site
6. Conduct of Operations
7. Work Restrictions
8. Special Construction Requirements
9. Soils Investigation Report
10. Additional Reports

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Location: The project is located in Glacier Bay National Park and Preserve in the Bartlett Cove housing area; which is in the front country developed area west of the city of Gustavus, Alaska.

B. The Work consists of:

1. Implementing improvements to the water distribution system to bring the system up to fire flow requirements. This includes upsizing existing water distribution lines, installing new lines to tie into the existing distribution main, and reinstalling relevant service and fire lines, fire hydrants, gate valves, and other miscellaneous system appurtenances.

C. Project will be constructed under a single prime contract.

1.3 GOVERNMENT-FURNISHED MATERIALS

A. In case of Government -furnished materials:

1. The government will arrange and pay for delivery of Government-furnished items according to Construction Contractor's Construction Schedule.
2. Construction Contractor is responsible for initial inspection, receiving, unloading, and handling Government-furnished items at Project site.
3. The government will inspect delivered items for damage after delivery. Construction Contractor shall be present for and assist in Government's inspection.
4. Government will arrange for replacement if Government-furnished items are damaged, defective, or missing.

5. Construction Contractor is responsible for protecting Government-furnished items from damage during storage and handling, including damage from exposure to the elements.
6. If Government-furnished items are damaged as a result of Construction Contractor's operations, Construction Contractor shall repair or replace them.
7. Construction Contractor shall install and otherwise incorporate Government-furnished items into Work.

1.4 CONSTRUCTION CONTRACTOR USE OF SITE

A. General: Construction Contractor shall have limited use of site for construction operations. Limit use of premises to work in areas indicated in the drawings. Do not disturb portions of the Project site beyond areas in which the Work is indicated.

1. Limits: Confine constructions operations to disturbance limits, as shown on drawings, and staging areas.

B. Storage of Materials: Materials must be stored within the designated area shown on the plans. Any additional storage beyond this area must be off-site

C. Parking: Confine parking to Construction area west of building Q4 for construction/CMR trailers and parking. Maintenance Building for construction equip./personal vehicles parking (overflow).

D. Stockpiling: Confine stockpiling to outside of the park or within construction limit areas designated on the construction drawings

E. Preservation of Natural Features:
1. Prevent damage to natural surroundings. Restore damaged areas at no additional expense to the Government.
2. An NPS arborist shall conduct a pre-construction survey and mark trees for removal or protection.
3. Provide temporary barriers to protect existing trees and plants and root zones.
4. Do not remove, injure, or destroy trees or other plants without prior approval. Consult with Contracting Officer (CO) and remove agreed-on roots and branches that interfere with construction.
5. Do not fasten ropes, cables, or guys to existing trees.
6. Carefully supervise excavating, grading, filling, and other construction operations near trees to prevent damage.

F. Roads, Driveways, and Entrances: Maintain clear access to driveways and entrances serving the premises for Government employees and emergency vehicles at all times. Do not use for parking or material storage. If closure is necessary, coordinate with the CO at least one week in advance, ensuring closure does not exceed 4 hours.
1. Schedule deliveries to minimize the use of driveways and entrances.
2. Schedule deliveries to reduce on-site storage time and space requirements for materials and equipment.

G. Construction Camp: Establishment of a camp within park will not be permitted.

H. Hauling Restrictions: Comply with legal load restrictions in hauling of materials. Load restrictions on park roads are identical to state load restrictions with such additional regulations

as may be imposed by the Park Superintendent. Information regarding rules and regulations for vehicular traffic on park roads may be obtained from the Office of the Park Superintendent. A special permit will not relieve Construction Contractor of liability for damage which may result from moving of equipment.

I. Bridge Restrictions: Identify jurisdictions, load restrictions, permit requirements, time and calendar restrictions as outlined.

1.5 PUBLIC USE OF SITE

A. The immediate area surrounding construction, including portions of Tlingit Trail and forest area between Park Rd and the water tanks will be closed to the public during construction.

B. Construction Contractor shall conduct his operations to ensure the least inconvenience to public. Road closures may be permitted, when required, upon specific approval of Contracting Officer for a maximum of 5 days.
   1. Any closures of Park Road shall be limited to a maximum of half-width and must be approved by the Contracting Officer to ensure continuous access for Park resources, including Law Enforcement, Fire, EMS, and Maintenance personnel.
   2. Contractor shall develop and implement a pedestrian phasing plan to ensure safe and continuous pedestrian access throughout construction. The plan shall address temporary routes, signage, and any necessary protective measures. Any modifications to pedestrian access must be reviewed and approved by the Contracting Officer prior to implementation.

1.6 CONDUCT OF OPERATIONS

A. Construction Contractor shall conduct his operations in conformance with rules and regulations promulgated by the Secretary of the Interior for the National Park Service, and applicable park rules and regulations prescribed by Park Superintendent.

B. Work on Saturdays, Sundays, Federal holidays or at night may not be performed unless stated in the Work Restrictions below or without prior consent from the Contracting Officer. Submit requests **2 business days** in advance of the work to the Contracting Officer for approval.

C. No signs or advertisements (except those specified herein) shall be displayed on the construction site or within the park unless approved by the Contracting Officer.

D. The Contractor must provide notice of **5 business days** prior to any road closures or utility shutdowns within the park to ensure adequate coordination with Park resources.

1.7 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall generally be performed during normal business hours based on the following seasonal schedule:
   1. Summer (May 15 – September 15):
      a. Monday – Saturday, 7:00 AM – 5:00 PM
   2. Spring (April 1 – May 15):
      a. Monday – Saturday, 7:00 AM – 7:00 PM

3. Fall (September 15 – October 31):
    a. Monday – Saturday, 7:00 AM – 7:00 PM
4. Equipment Operations: Equipment use is not permitted before 8:00 AM year-round.
5. Vegetation and Tree Removal: To protect migratory bird nesting habitat, any removal of low ground vegetation or trees between April 1 – July 15 requires a survey by an NPS biologist. All grubbing and tree removal shall be completed outside this nesting window.
6. Federal Holidays: No work is permitted on federal holidays without prior approval from the CO.

B. Existing Utilities

1. Existing Utilities: Notify Contracting Officer and utility companies of proposed locations and times for excavation.
2. Construction Contractor shall be responsible for locating and preventing damage to known utilities. If damage occurs, repair utility at no additional expense to the Government.
3. If damage occurs to an unknown utility, repair utility. An equitable adjustment will be made in accordance with the Changes clause of the contract.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Government or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Contracting Officer not less than five business days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Contracting Officer's written permission.
3. Hours and length of Utility Shutdowns:
    a. May 15–September 15: Interruptions are permitted between 12:00 AM and 4:00 AM and must not exceed 4 hours in duration. Proper disinfection is required per AWWA N6.2.
    b. Outside main season: Utility outages may have a maximum duration of 6-8 hours and can occur at different times of day. Longer outages are possible. A 24-hour disinfection period is required.
    c. Provide a plan for potable water supply per construction segment during utility interruptions.
4. Utility Ownership and Specific Requirements: ACS owns the telephone lines. All other utilities at GLBA are owned by the National Park Service (NPS).
    a. Lodge services rely on ACS phone lines for sales transactions, and interruption of phone service could impact these operations.

D. Nonsmoking Building/Tobacco Use/Vaping: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes. Pre-Con to discuss. Smoking area required by the construction trailer. Must be monitored and kept free of cigarette butts and vape cartridges.

1.8 SPECIAL CONSTRUCTION REQUIREMENTS

A. Limited access to the park is typical during the months of October thru April due to inclement weather conditions, limiting the window of time construction can be commenced during.

1.9 SUBMITTALS

A. Pedestrian phasing plan
   1. The Contractor shall submit a Pedestrian Phasing Plan for review and approval by the Contracting Officer prior to the start of any work affecting pedestrian access. The plan shall detail proposed pedestrian detours, safety measures, signage, and coordination efforts to maintain accessibility throughout construction

B. **Traffic Control Plan for Road Closures**
   1. If any closures of Park Road are required, the Contractor must submit a traffic control plan for approval by the CO. The plan should outline the proposed closure limits, traffic management strategies, and ensure that access for Park resources, including Law Enforcement, Fire, EMS, and Maintenance personnel, is maintained.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 11 00

SECTION 01 26 01 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section consists of administrative and procedural requirements for contract modifications.

1.2 DEFINITIONS AND ALLOWANCES

A. Home Office Overhead: Costs incurred in support of all of a contractor's projects and not attributable to a specific job. The cost for home office overhead is only allowed as a percentage of all direct work excluding profit. The following items represent allowable home office overhead costs identified in Part 31 of the Federal Acquisition Regulation (FAR):

1. Rent
2. Utilities
3. Furnishings
4. Office equipment
5. Executive and management staff not exclusively assigned to the project
6. Support, accounting, and administrative staff
7. Preparation of cost proposals, estimating, and schedule analyses connected with Modifications
8. Estimating and preconstruction services
9. Mortgage costs
10. Real estate and corporate taxes
11. Automobile maintenance and travel costs for home office personnel
12. Home office insurances i.e. structure, automotive, umbrella, flood, etc.
13. Depreciation of equipment and other assets
14. Home office supplies (paper, staples, etc.)
15. Legal services
16. Accounting and data processing
17. Professional fees/registration

B. General Conditions (Field Office Overhead): Management and administrative costs incurred on site for the designated project. Costs associated with preparation of modifications will not be allowed. Costs for these items are to be included only in the general conditions of the modification estimate. Only in the case of a contract time extension are additional general conditions included in modifications. The following items, if applicable, are considered allowable costs for calculating General Conditions:

1. Project Manager (PM), Assistant Project Manager
2. Superintendent, Assistant Superintendent
3. Quality Control, Safety Officer, Environmental Manager, etc.
4. Engineers
5. Travel, lodging, and per diem (as established by Federal Travel Regulations)
6. Scheduling

7. Field Office Trailers and associated temporary utilities
8. Field office supplies

    a. Mailing and couriers
    b. Reproduction costs
    c. Storage
    d. Phones
    e. Computers
    f. Copiers

9. Personal vehicles i.e. Superintendent Pickup trucks

C. General Requirements: Costs directly associated with the project and are necessary to perform the actual work of the modification. These costs shall be shown as direct costs in the estimate. The following items, if applicable, are considered allowable costs for calculating General Requirements:

1. Hoisting
2. Material handling
3. Temporary fencing
4. Port-a-lets
5. Trash removal, dumpsters
6. Barricades
7. Small tools
8. Safety supplies
9. Scaffolding
10. Daily cleaning
11. Traffic control
12. Temporary signage
13. Temporary heating and power

D. Personnel Costs: Costs included in the modification must only be for General Conditions staff and workers actually present and working on project site. Modification costs for salaried workers are only allowed within the structure of a 40-hour week and no overtime or holiday pay will be allowed.

1. Worker Hourly Rates are costs directly associated with the individual worker and consist of the following:

    a. Base Rate: The hourly rate paid directly to the worker
    b. Labor Burden: Employer payments of all applicable burdens; includes insurance and taxes the business must pay on behalf of the worker to government entities and educational forums, such as:

        1) Social Security
        2) Medicare
        3) Workers Compensation – Policy and company calculation to be made available.
        4) Federal Unemployment Tax Act (FUTA) - Cap Rate and percentage to be proportionally allocated over one year.
        5) State Unemployment Tax Act (SUTA) - Cap Rate and percentage to be proportionally allocated over one year.

6) Union agreement costs - Other costs required under an enforceable collective bargaining agreement.

c. Fringe Benefits: Various non-wage compensations provided to employees such as:

1) Health Care Insurance Premiums
2) Cell Phone
3) Clothing
4) 401K and Pensions
5) Vehicle allowances
6) Gas allowance
7) Life insurance premiums
8) Disability insurance
9) Other Fringe Benefits required under an enforceable collective bargaining agreement

E. Bonuses or Deferred Compensation: No Bonus or Deferred Compensation will be allowed within any components of pricing including Home Office Overhead, General Conditions, General Requirements, Hourly Worker Rates, or the direct costs of work.

F. General Liability Insurance: An insurance policy that protects Contractor from claims resulting from bodily injury or property damage to a third party. Include as a separate line item within all modification proposals and provide a current insurance quote upon request.

G. Performance and Payment Bonds: A performance bond is a surety bond issued by an insurance company or bank to guarantee satisfactory completion of a project. The Payment Bond guarantees the Contractor will pay the labor and material costs incurred. Banks and Insurance companies charge a premium for individual project based on a sliding scale related to the size of the project. Include as a separate line item in modification proposals and provide current company bonding rates upon request.

H. Builder's Risk Insurance: Covers the contractor's loss due to fire, high winds, or other natural forces. Not reimbursed by the National Park Service (NPS) and shall not be included in modification proposals.

1.3 MODIFICATION PROPOSAL PRICING REQUIREMENTS

A. General:

1. Proposal be received in the format and within the time frame specified in the Request for Proposal (RFP) letter. Costs or delays resulting from failure of contractor to submit within the time frame specified will not be compensable.
2. Proposal shall be detailed with itemized lists of equipment, materials, labor, production rates, overhead, profit, and bond markup for each item. Labor costs must be itemized by craft and hourly rate, including Fringe Benefits and Labor Burden. If the costs of Fringe Benefits and Labor Burden are not itemized, it is assumed they are included in the hourly rate shown, or contractor is not requesting reimbursement. Contractor may utilize the government provided Contractor Estimate Form, or their own form, provided that it contains the same information and level of detail as the Government's form.

3. Requests for extensions of contract time as a result of change must be justified with a Time Impact Analysis (TIA). Refer to Section 01 32 16 "Construction Schedule", for time impact analysis requirements. TIA and associated costs shall be received with the proposal by the date shown within the Request for Proposal letter. Contractor's failure to submit within the specified time frame will be construed as the Contractor waiving right for additional time and no time extension will be allowed.
4. All supporting documentation used to justify the proposed modification will be made available to the Contracting Officer (CO) upon request.
5. Contractor shall review and approve all subcontractor/supplier pricing in detail for proper format, scope, production rates, and pricing prior to submission to NPS. All delay costs associated with not reviewing and approving subcontractor/supplier pricing will be borne by the Contractor.
6. All pricing and production rates within the estimate must be based on fair and reasonable pricing and cannot include built-in contingency.

B. Labor:

1. Contractor shall estimate cost of labor by itemizing each craft involved, indicating worker hourly rate (base rate + labor burden + fringe benefits) for each and itemizing hours required for each craft directly engaged in modification work. Any work proposed requiring overtime work or premium pay shall be itemized separately. Rates shall be in accordance with the Davis-Bacon Act as incorporated herein. Labor Burden may include payroll taxes, Social Security, unemployment insurances, workers compensation insurance, Federal Insurance Contributions Act (FICA), FUTA, and other direct costs resulting from Federal, State or local laws.
2. Itemize labor costs for equipment operators separate from equipment costs.
3. Labor cost for foremen shall only be costs for related work required for the modification.

C. Materials:

1. Estimated cost for materials shall include quotes from multiple sources. Material prices shall include applicable fees and credits, including but not limited to, sales tax, freight and delivery charges, and tax rebates.
2. No markup shall be applied to any material provided by NPS.

D. Equipment:

1. Equipment used for the project must be appropriately sized for work being performed.
2. Do not include costs for "miscellaneous tools and equipment", in your proposal for a replacement value of $500 or less. Costs shown in excess of $500 shall be broken out separately.
3. Regardless of ownership, rates to be used in determining equipment rental costs shall be the lowest cost from one of the following sources:

    a. United States (U.S.) Army Corps of Engineers, Ownership and Operating Expense Schedule (use latest edition and applicable region)
    b. Construction Blue Book
    c. Local equipment rental rates, documented by actual invoice charges, or itemized vendor quotes.

4. Estimated equipment rates shall include operating costs of all fuel, oil, lubrication, supplies, small tools, necessary attachments, ground engaging components, tires and tracks, routine repairs and maintenance (cost of major repair and overhaul is not allowed per Federal Acquisition Regulation (FAR) 31.105(d)(2)), depreciation, storage, insurance, and all incidentals. Mobilization, if applicable, may be included for equipment solely used on the modification work but must be listed separately.
5. Estimate full rate for equipment only for duration that equipment will be utilized to accomplish work of the modification.
6. Standby unit rates used in accordance with paragraph 1.3, D, 2, above. If the U.S. Army Corp of Engineers is utilized then their standby rates prevail. If Bluebook or local equipment pricing is accepted, then 1/2 of equipment costs minus any operating costs, major repair and overhaul will be accepted.
7. If equipment is in standby mode due solely to a documented NPS delay, established standby rate shall apply from the first day of the delay.
8. Equipment not used and on job site for up to five consecutive days may be classified at standby rates, provided the equipment is or has been used solely to perform work on the modification and will be necessary to complete additional modification work. Equipment still on the jobsite but not in use after five consecutive days will not be considered in the modification pricing.
9. Requests for compensation for equipment stand by time must be justified, documented and itemized separately.
10. The estimated timeframe (daily, weekly, monthly) for use of the equipment must reflect the lowest cost to the Government.

E. Establishment and Application of Overhead and Profit Percentages:

1. Home Office Overhead and Profit (OH&P) shall be applied to direct costs only. Profit shall not be applied to overhead amounts; and overhead shall not be applied to profit. Home office overhead shall contain only allowable, allocable, and reasonable costs per the contract documents and FAR Part 31. Profit percentages are based on risk factors found in FAR Part 31which have been applied to the specific type of work included in this project. Negotiated rates shall not exceed the following percentages for OH&P for contractor self-performed work:

Overhead……10%

Profit……...10%

2. Total aggregate limit of markup (OH&P) for Contractor and Subcontractors on modification work shall not exceed 25%. The NPS will not be responsible for allocation of percentages between contractor and subcontractors at any tier.
3. If Contractors form a partnership, partnership may only receive home office overhead and profit in same amount as an individual Contractor (refer to paragraph 1.3,E,1 above). It is the responsibility of the partners to decide on division of revenue.
4. Combined Increases and Decreases: On proposals involving both increases and decreases in the Contract Price, overhead and profit mark-ups are required on net increases and deducted on net decreases.
5. At no time can profit be calculated on Overhead or itself, it must be calculated on direct costs of work only.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 012601

SECTION 01 27 00 – DEFINITION OF CONTRACT LINE ITEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section explains in general, what is and is not included in a contract line item, and limits or cut-off points where one item ends and another begins.

B. If no contract line item exists for a portion of work, include costs in a related item.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF CONTRACT LINE ITEMS

A. Contract Line Item Number 1: Rehab Water Service Lines
   1. This item consists of the rehabilitation of water service lines, including the installation of 4,445 linear feet of new 6", 8", and 10" HDPE water main, as well as sections of Arctic Pipe where specified. Work also includes the installation of 2" HDPE water service lines, necessary fittings, couplings, and mechanical restraints to ensure a fully integrated and operational system.
      a. Demolition and Removal: Includes the demolition and disposal of existing water service vaults and the capping of abandoned water lines as needed.
      b. Pipe Installation: The contractor shall install HDPE water main piping with appropriate pipe bedding and backfill using stockpiled material. Where required, pipe shall be insulated, including the placement of 2" rigid insulation at all trenching and pipe insulation at crossings to protect against freezing.
      c. Valves & Appurtenances: The project requires the installation of multiple gate valves (10", 8", and 6") with valve boxes and tracer wire, as well as necessary blowoff assemblies and air release valve assemblies to maintain system integrity and operational efficiency.
      d. Fire Protection: Work includes the installation of fire hydrant assemblies, complete with gate valves, valve boxes, and protective 6" steel bollards to prevent accidental damage.
      e. Water Service Connections: The contractor shall install new water service assemblies, including saddles, corporation valves, curb valves, and boxes, ensuring proper service to designated locations.
      f. Tracer & Warning Systems: To facilitate future maintenance and location, tracer wire, warning tape, and tracer boxes with 1.5LB magnesium ground rods shall be installed throughout the system.
      g. Testing & Disinfection: The contractor shall perform all necessary testing, flushing, and disinfection of the water main system in accordance with project specifications before the system is approved for operation.

h. Site Restoration & Protection: The contractor is responsible for restoring all disturbed areas, including grading and stabilizing excavated slopes as specified. Tree protection measures shall be implemented, such as the use of temporary reusable barriers, to minimize impacts to the surrounding environment.

2. Measurement for Payment: Payment for this item will be made as a lump sum for the entire scope of work, including all pipe materials, fittings, valves, hydrants, insulation, excavation, backfill, testing, and restoration. No additional measurement will be made for varying pipe sizes, fittings, or appurtenances; all are included in the total length specified.
3. Payment Terms: Payment will be made at the contract lump sum price for the complete installation, including all associated work as outlined in the specifications.

END OF SECTION 01 27 00

01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Definitions
2. Construction Coordination
3. Submittals
4. Coordination Drawings
5. Requests for Information (RFIs)
6. NPS Project Management and Communication Software
7. Project Meetings
8. Environmental Coordination
9. Permits

B. Related Requirements:

1. Section 01 32 16 "Construction Schedule" for preparing and submitting Construction Contractor's construction schedule.
2. Section 01 73 40 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.
4. Section 01 91 14 "Total Building Commissioning" for coordinating the work with Owner's Commissioning Authority.

1.2 DEFINITIONS

A. Agency with Jurisdiction
B. Construction Permits – Contractor Provided
C. Government Furnished Permits

1.3 CONSTRUCTION COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other Construction Contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of components, including mechanical and electrical.
5. Properly plan construction operations to include permit requirements. Allow enough time to execute permit provisions to maintain work schedule, site visits, inspections, and reporting deadlines.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Construction Contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to:

1. Preparation of Construction Contractor Construction Schedule
2. Preparation of the Schedule of Values
3. Installation and removal of temporary facilities and controls
4. Delivery and processing of submittals
5. Progress meetings
6. Permit requirements
7. Pre-installation conferences
8. Project closeout activities
9. Commissioning activities

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of Contract Documents or standard printed data. Include following information, as applicable:

a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
b. Indicate dimensions shown on Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Contracting Officer (CO) for resolution of such conflicts.
c. Indicate space requirements for routine maintenance and anticipated replacement of components during the life of the installation.
d. Show location and size of access doors required for access to concealed dampers, valves, and controls.
e. Indicate required installation sequences.

2. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

3. Follow **NPS DSC Electronic Drawing Standards.** See CAD/BIM (Computer Aided Design/Building Information Modeling) & Drafting Standards page > **DSC Requirements** section.

B. Coordination Digital Data Files: Prepare coordination digital data files according to:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Submittal Format: Submit or post coordination drawing files using Portable Document Format (PDF) file format.
3. Contracting Officer will furnish Construction Contractor one set of digital data files (AutoCad.dwg) of Drawings for use in preparing coordination digital data files.

    a. Contracting Officer makes no representations as to accuracy or completeness of digital data files as they relate to Drawings.
    b. Digital Data Software Program: Drawings are available in AutoCad.dwg.

C. Division 1 documents:

1. Letter designating Project Superintendent
2. Construction Schedule
3. A Comprehensive Schedule of Values
4. Accident Prevention Plan
5. A List of Subcontractors for this project
6. Written statements from Subcontractors certifying compliance with applicable labor standard clauses.
7. Certificates of Insurance and Standard Form SF1413 for Contactor and all Subcontractors
8. Waste Management Plan
9. Quality Control Plan
10. Temporary Storm Water Pollution Prevention Plan (SWPP or UPPP)
11.
12. Construction Contractor Commissioning Plan
13. Historic Preservation Treatment Plan (HPTP)
14. List of Required Construction Permits. Include the following information for each permit:
    a. Name of Permit
    b. Agency(ies) with Jurisdiction issuing the permit
    c. Information required from Government to complete permit application

D. Provide items listed to Contracting Officer at least one week prior to Pre-Construction Conference, or as directed by Contracting Officer.
1. Failure to submit items may result in:
    a. Construction conference may be cancelled, Notice to Proceed may not be issued, and Contracting Officer will consider other contractual remedies.
    b. Work shall not commence until written Notice to Proceed has been issued and Certificates of Insurance and SF1413 documents are received for Construction Contractor and all Subcontractors.

1.5 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of Contract Documents, Construction Contractor shall prepare and submit an RFI utilizing form created on NPS project management and communication software.

1. Contracting Officer will not respond to RFIs submitted by other entities controlled by Construction Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in the work.

B. Content of RFI: Include detailed, legible description of item needing information or interpretation and the following:

1. RFI number, numbered sequentially
2. Date
3. RFI subject
4. Specification Section number and title and related paragraphs, as appropriate.
5. Drawing number and detail references, as appropriate.
6. Field dimensions and conditions, as appropriate.
7. Construction Contractor's suggested resolution: If suggested resolution impacts Contract Time or Contract Sum, Construction Contractor shall state impact in RFI.
8. Construction Contractor's signature
9. Requested date for response
10. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Form: Complete and submit on NPS project management and communication software.

D. Contracting Officer’s Action: Contracting Officer will review each RFI, determine action required, and respond. Contracting Officer will determine critical nature of each RFI and issue response accordingly.

1. The following are not considered to be RFIs and will receive no action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Construction Contractor's means and methods.
    d. Requests for coordination information already indicated in Contract Documents.
    e. Requests for adjustments in Contract Time or Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Contracting Officer's action may include a request for additional information; time for response will date from time of receipt of additional information.
3. Contracting Officer's action on RFIs may result in need for a change to Contract Time or Contract Sum. All contract changes will be processed following terms and conditions of contract.

1.6 PROJECT MANAGEMENT AND COMMUNICATION SOFTWARE

A. Use to manage project communication and document sharing during contract period on:

1. Project directory
2. Project correspondence
3. Meeting agendas and minutes
4. Contract modifications forms and logs
5. RFI form and processing
6. Task and issue management
7. Photo documentation
8. Baseline schedule, schedule updates and calendar management
9. Submittal form and processing
10. Payment coordination documentation
11. Reminder and tracking functions
12. Archiving functions
13. Notification of submittal and RFI statuses and current responsible party
14. Permits and addendums

B. Some documents are not suitable to be shared using NPS project management and communication software. Documents containing Personal Identifying Information (PII) (i.e. certified payrolls) shall not be shared and shall be coordinated with project team as appropriate.

1.7 PROJECT MEETINGS

A. Preconstruction Conference: Before start of construction, Contracting Officer will arrange an on-site meeting with Construction Contractor. Meeting agenda will include the following as a minimum:

1. Roles & Responsibilities / Lines of Authority
2. Park rules and regulations
3. Jobsite Safety
4. Resolution of comments on required Division 1 documents
5. Coordination of Subcontractors
6. Labor law application
7. Modifications
8. Payments to Construction Contractor
9. Payroll reports
10. Contract time
11. Liquidated damages
12. Construction Contractor Performance Evaluation
13. Display of Hotline posters
14. Notice to proceed
15. Correspondence procedures
16. NPS project management and communication software
17. Acceptance/rejection of work
18. Progress meetings
19. Submittal procedures
20. NPS Final Accessibility Inspection
21. Environmental requirements

22. Permit requirements
23. As-constructed drawings/operation and maintenance (O&M) manuals.
24. Saturday, Sunday, holiday and night work.
25. Reference materials
26. Value engineering
27. Schedule of Values

B. Progress Meetings: Contracting Officer will schedule weekly meetings with Construction Contractor.

1. Attendees: In addition to Government Representatives, each Construction Contractor, Subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented. Participants at meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Meeting agenda will include:

    a. Approval of minutes of previous meetings
    b. Submittal status
    c. Review of off-site fabrication and delivery schedules.
    d. Requests for information (RFI) and other issues.
    e. Modifications
    f. Work in progress and projected.
        1) Status of required inspections (Special Inspections, Accessibility, etc.)
    g. Inspections of work in progress and projected (Special inspections, Accessibility, etc.)
    h. Construction Schedule update (provide updated Critical Path Method (CPM)).
    i. Status of Project Record Drawings and O&M manuals.
    j. Other business relating to work.
    k. Permit requirements

C. Preinstallation Conferences: Conduct at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend meeting. Advise Contracting Officer of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for particular activity under consideration, including requirements for:

    a. Contract Documents
    b. Options
    c. Related RFIs
    d. Related Change Orders
    e. Purchases
    f. Deliveries
    g. Submittals
    h. Retain first subparagraph below for projects with LEED or other sustainable design documentation requirements. Review of mockups

i. Possible conflicts
j. Compatibility requirements
k. Time schedules
l. Weather limitations
m. Manufacturer's written instructions
n. Warranty requirements
o. Compatibility of materials
p. Acceptability of substrates
q. Temporary facilities and controls
r. Space and access limitations
s. Regulations of agency(ies) with jurisdiction
t. Testing and inspecting requirements
u. Installation procedures
v. Coordination with other work
w. Required performance results
x. Protection of adjacent work
y. Protection of construction and personnel

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene conference at earliest feasible date.

1.8 ENVIRONMENTAL COORDINATION

A. Construction Contractor’s Environmental Manager: Designate on-site party responsible for overseeing Construction Contractor’s conformance to environmental goals for project and implementing procedures for environmental protection.

1. Qualifications: Minimum 3 years Construction experience on projects of similar size and scope; with environmental procedures similar to this project; familiarity with Environmental Management Systems (EMSs) such as International Organization for Standardization (ISO) 14001; familiar with environmental regulations applicable to construction operations.
2. Responsibilities: Responsibilities shall include:

a. Compliance with applicable Federal, State, and local environmental regulations, including maintaining required documentation.
b. Implementation of Waste Management Plan (WMP).

c. Implementation of Storm Water Pollution Prevention Plan (SWPPP).
d. Present overview of environmental issues and summarize site specific procedures relating to management plans at Preconstruction conference.
e. Training for Construction Contractor personnel in accordance with position requirements.
f. Monitoring and documentation of environmental procedures.

B. Perform project quality control in accordance with requirements specified in Related Sections, including:

1. Quality Requirements
2. Regulatory Requirements
3. Noise and Acoustics Management
4. Temporary Storm Water Pollution Prevention Environmental Management
5. Construction Waste Management

C. Construction Contractor's Environmental Training Program: Construction Contractor shall provide environmental training for workers performing work on project site. Training shall include:

1. Overview of environmental issues related to building industry.
2. Overview of environmental issues related to Project.
3. Review of site-specific procedures and management plans:

    a. Construction Waste Management
    b. Noise and Acoustics Management
    c. Temporary Storm Water Pollution Prevention

4. Pollution Prevention (P2) practices: Submit evidence of participation in P2 programs and shall provide evidence of P2 training in accordance with US EPA programs=
5. Compliance with environmental regulations: As specified in Regulatory Requirements. Submit Construction Contractor 40 CFR (Code of Federal Regulations) employee training records upon request of Contracting Officer.

D. Provide documentation for environmental procedures as specified herein and in accordance with approved Waste Management Plan, IAQ Management Plan, and Storm Water Pollution Prevention Plan.

1.9 PERMITS

A. General:

1. Permits and Responsibilities: Construction Contractor shall, without additional expense to the Government, be responsible for obtaining necessary licenses and permits, and for complying with Federal, State and municipal laws, codes, and regulations applicable to the performance of the work. Construction Contractor shall also be responsible for damages to persons or property that occur as a result of Construction Contractor's fault or negligence; and for materials delivered and work performed until completion and acceptance of the work.
2. For the purpose of this contract, Construction Contractor will not be considered an agent of the Government. Construction Contractor shall comply with appropriate Federal, State and local laws.

B. Potential Permits: Construction Contractor shall obtain all permits required to legally conduct work.

C. Coordination with Agency(ies) with Jurisdiction Issuing Permits

1. Coordination: Contact the Agency(ies) with Jurisdiction as needed and sufficiently in advance to avoid delaying work: Coordinate meetings, reporting requirements, inspections, and other requirements.

D. Administrative Procedures:

1. Coordinate scheduling and timing of required administrative provisions of project permits with Agency(ies) with Jurisdiction, Construction Manager, and Park to avoid conflicts.
2. Supply needed information to Agency(ies) with Jurisdiction issuing permits, pay fees required and provide material needed to comply with permit's conditions and provisions.
3. Upload permits to NPS project management and communication software when permits are obtained.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

This page was intentionally left blank

SECTION 01 32 16 – CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 SUMMARY

A. Section consists of Construction Schedule requirements including:

1. Schedule of Values
2. Construction Schedule Requirements.
3. Construction Schedule Updates.
4. Time Impact Analysis.

B. Purpose: The Construction Schedule ensures adequate planning, coordination, scheduling, and reporting during execution of the work by the Construction Contractor. It shall assist the Construction Contractor and Contracting Officer (CO) in monitoring the progress of the work, evaluating proposed changes, and processing Construction Contractor's monthly progress payments. It shall include the dates in the contract, phases, milestones, occupancies, holidays, weather consideration, a critical path, and the requirements of this section.

1.2 DEFINITIONS

A. Activity: A discrete part of a project identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: Allocation of the Schedule of Values for completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by the Contracting Officer.

C. Critical Path Method (CPM): Method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: Longest connected chain of interdependent activities through the network schedule that establishes minimum overall Project duration and contains no float.

E. Float: Measure of leeway in starting and completing an activity.

1. Float: Not for the exclusive use or benefit of the Government or Construction Contractor but is jointly owned.
2. Free Float: Amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total Float: Measure of leeway in starting or completing an activity without adversely affecting planned Project completion date.

F. Resource Loading: Allocation of manpower and equipment necessary for completion of an activity as scheduled.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

1.3 SUBMITTALS

A. Electronic Copies: Schedules and reports submitted shall be posted on the NPS project management and communication software as PDF (portable document format) files. The intent of the Government is to limit the number of printed reports to those determined by the project team as essential.

B. Schedule of Values: After contract award and before Pre-Construction conference, submit schedule of dollar values based on Contract Price Schedule.

C. Construction Baseline Schedule: After contract award and before Pre-Construction conference, submit two paper copies of baseline schedule, large enough to show entire schedule for entire construction period. Utilize Schedule of Values in preparation of Construction Baseline Schedule.

D. Critical Path Method (CPM) Reports: Concurrent with CPM schedule, submit three paper copies of the following computer-generated reports. For each activity, include activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of predecessor and successor tasks for activities sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of activities sorted in ascending order of total float.

E. Construction Schedule Updates: On or before 7th day preceding progress payment request date, submit estimates of percent completion of each schedule activity and necessary supporting data. Provide two paper copies.

F. Construction Schedule Revisions and Time Impact Analysis: For each Construction Schedule revision, submit two paper copies of a Time Impact Analysis. Incorporate a Fragmentary Network (Fragnet) into currently accepted Construction Schedule demonstrating proposal to incorporate a modification, change, delay, or Construction Contractor request.

1.4 QUALITY ASSURANCE

A. Construction Contractor shall meet with Contracting Officer on day of the preconstruction conference to go over:

1. Review software limitations, content and format for reports.

2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Government occupancy/substantial completions.
4. Review delivery dates for Government-furnished products.
5. Review schedule for work of separate Government contracts.
6. Review time required for review of submittals and re-submittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review time required for obtaining and activating permits.
10. Review and finalize list of construction activities to be included in schedule.
11. Review baseline schedule comments, resolve issues and progress on incorporating them
12. Review procedures for updating schedule.
13. Discuss reporting requirements and establish protocol for naming and transmitting electronic schedules.

B. Construction Contractor's Schedule Representative: Before the preconstruction conference, designate an authorized representative to be responsible for preparing and maintaining the Construction Schedule. Submit resume outlining qualifications of Scheduler to Contracting Officer for acceptance. Scheduler shall have prepared and maintained at least 5 previous schedules of similar size and complexity similar to this Contract, demonstrating proficiency of using scheduling software. An authorized representative will be responsible for preparing the Baseline Schedule, required updates, revisions, Time Impact Analyses, and reports.

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate Construction Contractors.

B. Coordinate Construction Baseline Schedule with Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. In developing Construction Baseline Schedule, ensure Subcontractor’s work at all tiers, and prime Construction Contractor’s work, is included and coordinated.
2. Secure time commitments for performing critical elements of work from parties involved.
3. Coordinate each construction activity in network with other activities and schedule in proper sequence.

PART 2 - PRODUCTS

2.1 SCHEDULE OF VALUES

A. Breakdown each lump-sum item into component work activities used in the schedule for which progress payments may be requested. Work activities broken out within schedule of values shall be integrated into and made a logical part of the construction baseline schedule. Total costs for the component work activities shall equal contract price for that lump-sum item. Contracting Officer may request data to verify accuracy of dollar values. Include mobilization, general

condition costs, overhead and profit in the total dollar value of unit price items and in the component work activities for each lump-sum item. Do not include mobilization, general condition costs, overhead or profit as a separate item.

B. Do not break down unit price items. Use only the contract price for unit price items.

C. Total cost of all items shall equal the contract price. The Schedule of Values will form the basis for progress payments and the Construction Schedule.

2.2 CONSTRUCTION SCHEDULE REQUIREMENTS

A. Construction Baseline Schedule: Prepare Construction Baseline Schedule using a computerized, cost and resource-based**,** time-scaled Critical Path Method network analysis diagram for the Work.

1. Develop and finalize Construction Baseline Schedule so it can be accepted for use no later than 30 days after date established for the Notice of Award.

    a. Failure to include any work item required for performance of this Contract shall not excuse Construction Contractor from completing work within applicable completion dates, regardless of Governments acceptance of schedule.

2. Establish procedures for monitoring and updating Construction Baseline Schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

B. Construction Baseline Schedule Preparation: Prepare a list of all activities required to complete the Work. Using preliminary Critical Path Method network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate estimated duration, sequence requirements, and relationship of each activity in relation to other activities.
2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the Critical Path Method schedule within the limitations of the Contract Time.
4. Show sequence and interdependence of activities required for completion of work. Ensure work sequences are logical and Construction Baseline Schedule shows a coordinated plan of the work.
5. Resource loading of each activity shall include personnel by labor category and equipment type and capacity proposed to complete the activity in duration shown.
6. Consider seasonal weather conditions in planning and scheduling work influenced by high and low ambient temperatures, wind, or precipitation to ensure completion of work within contract time.
7. Time Frame: Proposed duration assigned to each activity shall be Construction Contractor's best estimate of time required to complete activity considering the scope and resources planned for activity.

a. An early finish date may be shown but the late finish date shall be same date as last day of contract period. An early completion schedule shall contain:

1) Insert an activity titled "Project Float" as a successor to last activity in early project completion schedule network.
2) Add a milestone titled "Contract End Date" as a successor to the activity "Project Float".
3) Add duration to the activity "Project Float" as required so the milestone "Contract End Date" equals the last day of Contract Period.

b. Contract completion date shall not be changed by submission of a schedule that shows an early completion date.
c. Construction Contractor shall limit use of lead or lag duration's between schedule activities.
d. Project Calendars: Develop and incorporate the following calendars:

1) Administrative Calendar: Include calendar based on a 7-day week to be used on activities based on calendar days. Apply this calendar to administrative tasks or other tasks not affected by non-working days (Federal Holidays, weather, etc.).
2) Project Calendar: Include calendar based on planned work week for the project. Include Federal Holidays, weekends, and non-workdays indicated in contract documents. Apply this calendar to activities not anticipated to be affected by weather. Be clear when identifying number of work days in work week.
3) Weather Calendar: Utilize Project Calendar and show anticipated normal downtime related to weather as non-working time. Weather days shall be based on data for local area from a reliable source like the National Oceanic and Atmospheric Administration (NOAA), National Park Service records, or source acceptable to Contracting Officer. Apply this calendar to activities anticipated to be affected by weather.

e. Activity Duration: Define so no activity is longer than 14 days, except for non-construction activities including mobilization, shop drawings and submittals, fabrication and delivery of materials and equipment.

f. Submittal Review Time: Include review and re-submittal times indicated. Coordinate submittal review times in Construction Baseline Schedule.
g. Startup and Testing Time: Include not less than 2 days for startup and testing and commissioning activities.
h. Substantial Completion: Allow time for Government administrative procedures necessary for certification of Substantial Completion. (For more information, refer to Specification 01 77 00 "Closeout Procedures.")

8. Constraints: Include constraints and work restrictions indicated in Contract Documents and as follows in schedule and show how the sequence of Work is affected.

1) Coordination with existing construction
2) Limitations of continued occupancies
3) Uninterruptible services
4) Partial occupancy before Substantial Completion

5) Use of premises restrictions
6) Provisions for future construction
7) Seasonal variations
8) Environmental control
9) Permit provisions

b. Work Stages: Indicate important stages of construction for each major portion of the Work.

1) Subcontract awards
2) Submittals
3) Purchases
4) Fabrication
5) Sample testing
6) Deliveries
7) Installation
8) Tests and inspections
9) Adjusting
10) Curing

9. Milestones: Include milestones indicated in Contract Documents in schedule, including, but not limited to, Notice to Proceed, Substantial Completion

C. Joint Review, Revision, and Acceptance:

1. Within seven calendar days of receiving Construction Contractor's proposed Construction Baseline Schedule, Contracting Officer shall review initial Construction Baseline Schedule.
2. Within seven calendar days after review, Construction Contractor shall revise and resubmit Construction Baseline Schedule in accordance with comments presented from review.
3. In the event the Construction Contractor fails to define any element of work, activity, or logic and the Contracting Officer review does not detect this omission or error, such omission or error, when discovered by Construction Contractor or Contracting Officer, shall be corrected by Construction Contractor within seven calendar days and shall not affect contract period.
4. Upon acceptance of the Construction Baseline Schedule, Contracting Officer saves schedule as a baseline and updates on a monthly basis. Construction schedule update will be used to evaluate Construction Contractor's monthly applications for payment based upon information developed at monthly Construction Schedule update meeting.

D. Cost Correlation: In the heading of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of dates used to prepare payment requests.

1. Construction Contractor shall assign cost to construction activities on Construction Baseline Schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Contracting Officer’s approval, be assigned to fabrication and delivery activities. Costs shall be included for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable).
2. Each activity cost shall reflect an accurate value based on the Contract Price Schedule.
3. Total cost assigned to activities shall equal total Contract Price.

E. Recovery Schedule: When periodic schedule update indicates Work is 14 or more calendar days behind current accepted schedule, a separate recovery schedule indicating means by which Construction Contractor intends to regain compliance with the schedule shall also be submitted. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery shall be accomplished.

F. Computer Software: Prepare schedules using a program developed specifically to manage construction schedules.

1. Use Microsoft Project or Primavera, for Windows 11 (Windows 7 and newer.)

PART 3 - EXECUTION

3.1 CONSTRUCTION SCHEDULE UPDATES

A. Progress Meeting Updates: Provide a 2 week look-ahead schedule, derived from the currently accepted schedule, before each weekly progress meeting. Utilize look-ahead schedule to facilitate and take notes on discussions held during progress meeting.

B. Monthly Schedule Updates:

1. General: Update Construction Schedule on monthly basis to reflect construction progress and activities throughout entire contract period and until project substantial completion. The status date of each schedule update shall be the 7th day preceding the progress payment request date.
2. Procedure: Construction Contractor shall meet with Contracting Officer each month at Construction Schedule update meeting to review progress made through the status date of the Construction Schedule update, including dates activities were started or completed and percentage of work completed on each activity started or completed.
3. Reports: Concurrent schedule revisions, prepare tabulated reports showing:

    a. Identification of activities that have changed
    b. Changes in early and late start dates
    c. Changes in early and late finish dates
    d. Changes in activity durations in workdays
    e. Changes in the critical path
    f. Changes in total float or slack time
    g. Changes in the Contract Time

4. Narrative: Report shall include a brief description of actual progress made during update period; actual and potential delaying activities; impediments to progress; issues related to inclement weather; progress toward established milestones and project float. Report shall include a brief description of work anticipated to be performed in the next month. Minor revisions to the schedule should be identified for evaluation and acceptance or rejection.
5. As Work progresses, indicate Actual Completion percentage for each activity.
6. If schedule update shows a late finish date after contract completion date, include:

    a. Known delays
    b. Actions to get back on schedule

c. Pending modifications
d. Impediments or constraints affecting progress

7. Progress Payments: Monthly updating of the currently accepted Construction Schedule shall be an integral part of the process upon which progress payments will be made. If Construction Contractor fails to provide schedule updates or revisions, a portion of the monthly payment may be retained until corrections have been made.

C. Distribution: Distribute copies of accepted schedule to Contracting Officer, Contracting Officers Representative, Construction Management Representative, Subcontractors, testing and inspecting agencies, and other parties identified by Construction Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to same parties and post in same locations. Delete parties from distribution when they have completed their assigned portion of the Work.

D. Construction Schedule Revisions:

1. Required Revisions: If, as a result of the monthly schedule update, it appears the currently accepted Construction Schedule no longer represents actual prosecution and progress of the work, Contracting Officer will request, and Construction Contractor shall submit, a revision to the Construction Schedule. Construction Contractor may also request reasonable revisions to currently accepted Construction Schedule in event the Construction Contractor's planning for the work is revised. If Construction Contractor desires to make changes, Construction Contractor shall notify Contracting Officer in writing, stating reason for proposed revision. Accepted revisions shall be incorporated into currently accepted Construction Schedule for next monthly schedule update.
2. Procedure: If revision to currently accepted Construction Schedule is contemplated, Construction Contractor or Contracting Officer shall advise the other in writing at least seven calendar days prior to next monthly schedule update meeting, describing revision and reasons for the revision. Government-requested revisions will be presented in writing to the Construction Contractor, who shall respond in writing within seven calendar days.
3. Reports: Concurrent with making revisions to schedule, prepare tabulated reports showing:

a. Identification of activities changed
b. Changes in early and late start dates
c. Changes in early and late finish dates
d. Changes in activity durations in workdays
e. Changes in critical path
f. Changes in total float or slack time

3.2 TIME IMPACT ANALYSIS FOR CONTRACT MODIFICATIONS CHANGES DELAYS AND CONSTRUCTION CONTRACTOR REQUESTS:

1. Requirements: When contract modifications or changes are initiated, delays experienced, or Construction Contractor desires to revise currently accepted Construction Schedule, Construction Contractor shall submit to Contracting Officer a written time impact analysis

illustrating the influence of modification, change, delay, or Construction Contractor request on contract time.

2. Time Extensions: Activity delays, resulting in a late completion date projection, shall not automatically mean an extension of contract time is warranted or due to Construction Contractor. It is possible a modification, change, or delay will not affect existing critical path activities or cause non-critical activities to become critical. A modification, change, or delay may result in absorbing a part of available total float that may exist within an activity chain of the Schedule, not causing any effect on contract time. Time extensions will be granted in accordance with terms of contract.
3. Extension of contract time will be granted only to the extent the equitable time adjustments to activity or activities affected by modification, change, or delay exceeds total (positive or zero) float available on a particular activity.
4. Procedure: Each time impact analysis shall be submitted within time period stated in a request for proposal, or time period designated under the clauses entitled Changes or Default. In cases where Construction Contractor does not submit a written request for extension of time and a time impact analysis within the designated time, it is mutually agreed that the particular modification, change, delay, or Construction Contractor request does not require an extension of the contract time. Upon acceptance, time impact analysis shall be incorporated into currently accepted Construction Schedule at next monthly schedule update.
5. Contract Modifications: Prepare time-impact analysis using fragnets to demonstrate effect of proposed change on overall Construction Schedule for each proposed contract modification concurrent with submission.

END OF SECTION 01 32 16

This page was intentionally left blank

SECTION 01 32 33 – PHOTO DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for:

1. Existing condition images
2. Periodic construction images

B. See Section 01 77 00 "Closeout Procedures" for a complete listing of closeout documents.

C. See Section 01 79 00 "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of National Park Service (NPS) personnel.

1.2 SUBMITTALS

A. Construction Images: Submit images electronically within seven days of taking the image. Include:

1. Date, time and number (sequentially number all images) in filename.
2. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
3. Submit digital images exactly as originally recorded in digital camera, without alteration, or modifications using image-editing software.

B. Closeout: Submit complete set of digital image electronic files as a Project Record Document**.** Submit on Digital Video Disc (DVD).

1. Provide index as separate file on Disc. List each image as a file name with number, date, and time. Include description and or vantage point image was taken.
2. Submit images that have the same aspect ratio as the sensor, un-cropped.

PART 2 - PRODUCTS

2.1 FORMAT REQUIREMENTS

A. Media: DVD-R Archival Gold

B. Media Labels: Archival DVD labeling markers, archival labels, or direct print.

C. Images: Provide sRGB (standard Red Green Blue) color images in JPEG (Joint Photographic Experts Group) format. Minimum sensor size of 8 megapixels, and at image resolution of not less than 1600 by 1200, and 300 dpi (dots per inch).

PART 3 - EXECUTION

3.1 CONSTRUCTION IMAGES

A. General: Take digital images using the maximum range of depth of field, in-focus, to clearly show the Work. No blurry or out-of-focus areas accepted.

1. Maintain index with each set of Construction images and identify the number, date, time, and description for each.
2. Maintain one set of images accessible in field office at Project site available for reference.

B. Existing Condition Images: Before starting construction, take color digital images of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.

1. Flag excavation areas before recording construction images.
2. Take eight separate images to show existing conditions adjacent to property before starting Work.
3. Take eight separate images of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

C. Periodic Construction Images: Take 12 color, digital images monthly, coinciding with cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last images were taken.

D. Additional Images: Contracting Officer may issue requests for additional images.

1. Three days advance, where feasible.
2. In emergency situations, take additional images within 24 hours of request.
3. Additional images include, but are not limited to:

a. Immediate follow-up when on-site events result in construction damage or losses.
b. Fabrication locations away from Project site.
c. Substantial Completion of a major phase or component of Work.
d. Discovery of historically or culturally significant buried artifacts
e. Extra record images at time of final acceptance.

END OF SECTION 01 32 33

SECTION 01 33 23 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

A. Action Submittals: Written, graphic information, and physical samples that require Government's responsive action.

B. Informational Submittals: Written information that does not require Government's responsive action. Submittals may be rejected for not complying with requirements.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 GENERAL SUBMITTAL PROCEDURES

A. General: Prepare and submit submittals required by individual Specification Sections and in some cases as requested in drawings. Types of submittals are indicated in individual specific sections.

1. Contracting Officer (CO) reserves right to require submittals in addition to those called for in individual sections.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Review for legibility, accuracy, completeness, and compliance with Contract Documents.

1. Coordinate submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of Work so processing will not be delayed because of need for concurrent review coordination.

a. Contracting Officer reserves right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittal List: Submittal list is attached to the end of this Specification Section. The intent is to provide an overall summary of submittal requirements. The requirements of individual Specification Sections and terms and conditions of the Contract still apply regardless of what is shown on submittal list.

D. Processing Time: Allow enough time for submittal review and re-submittals. Contract time extensions will not be authorized if submittals are not transmitted with enough time to permit processing, including re-submittals.

1. Action Submittals

a. Initial Review: Allow 30 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required.
b. Re-submittal Review: Allow 7 days for review of each re-submittal.

2. Informational submittals

a. Review: Allow 10 days for review of each submittal.

E. Approved Equal Submittal Requirements:

1. For each item proposed, submit supporting data, including:

a. Drawings and samples as appropriate.
b. Comparison of the salient characteristics of the proposed item with that specified.
c. Changes required in other elements of the work because of the substitution.
d. Name, address, and telephone number of vendor.
e. Manufacturer's literature regarding installation, operation, and maintenance, including schematics for electrical and hydraulic systems, lubrication requirements, and parts lists. Describe availability of maintenance service, and state source of replacement materials.

2. A request for approval constitutes a representation that Construction Contractor:

a. Has investigated the proposed item and determined that it is equal or superior in all respects to that specified.
b. Will provide the same warranties for the proposed item as for the item specified.
c. Has determined that the proposed item is compatible with interfacing items.
d. Will coordinate installation of an approved item and make changes required in other elements of the work because of the substitution.
e. Waives claims for additional expenses that may be incurred as a result of the substitution.

F. Submittals: Identify and incorporate information in each submittal file as follows:

1. Transmittal Form (CM-16): Utilize NPS Transmittal Form for all submittals. No action will be taken on a submittal item unless accompanied by this Transmittal Form.
2. Physical samples: Complete Transmittal Form and deliver physical sample to the Contracting Officer (or designee) on site for processing. All comments and actions will be documented on the Transmittal Form.

G. Identification: Submittal number or other unique identifier, including revision identifier.

1. Submittal number shall use a sequential number (e.g. .001). Re-submittals shall include alphabetic suffix after another decimal point (e.g. .001.A).

H. Re-submittals: Make re-submittals using same process used with initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in the title block on the Transmittal Form (CM-16) and clearly indicate extent of revision.
3. Re-submit submittals until they are marked "Approved" or "Approved with notations".

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, and others as necessary for performance of construction activities.

J. Use for Construction: Use only final submittals with mark indicating "Approved" or "Approved with notations". Ensure notations have been incorporated and, at a minimum, keep one copy of final approved submittal on site for use during construction.

1.4 CONSTRUCTION CONTRACTOR'S USE OF CAD/BIM FILES

A. General: At Construction Contractor's written request, copies of CAD/BIM (Computer Aided Design/Building Information Modeling) files will be provided to Construction Contractor for use in connection with Project, subject to:

1. Files provided as is; no format or other changes to files or changes to objects in the drawings will be done by the Government.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. 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 submittal to show which products and options are applicable.
3. As applicable, include:

a. Manufacturer's product specifications.
b. Manufacturer's installation instructions: When Contract Documents require compliance with manufacturer's printed instructions, provide one complete set of instructions to Contracting Officer and keep another complete set of instructions at the project site until substantial completion.
c. Manufacturer's catalog cuts: Submit only pertinent pages; mark each page of standard printed data to identify specific products proposed for use.
d. Wiring diagrams showing factory-installed wiring.
e. Printed performance curves.

f. Operational range diagrams.
g. Compliance with specified referenced standards.
h. Testing by recognized testing agency.

4. Submit product data in PDF (portable document format) file format before or concurrent with samples.

B. 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, unless submittal of CAD/BIM Drawings is otherwise permitted.

1. Preparation: Fully illustrate requirements in Contract Documents. As applicable, include:

a. Dimensions
b. Identification of products
c. Fabrication and installation drawings
d. Roughing-in and setting diagrams
e. Shopwork manufacturing instructions
f. Templates and patterns
g. Schedules
h. Notation of coordination requirements
i. Notation of dimensions established by field measurement
j. Relationship to adjoining construction clearly indicated
k. Seal and signature of professional engineer if specified

2. Submit shop drawings as PDF electronic file

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Complete and post the Transmittal Form (CM-16) on the NPS project management and communication software website for processing and documentation of action on submitted samples.
3. Identification: Attach label on unexposed side of Samples that includes:

a. Generic description of Sample
b. Product name and name of manufacturer
c. Sample source
d. Submittal Number and title of appropriate Specification Section

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing full range of colors, textures, and patterns available.

a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Contracting Officer will return with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit four sets of Samples. Contracting Officer will retain three Sample sets; remainder will be returned.

D. Construction Materials: Construction Contractor is encouraged to submit products made out of recycled or environmentally responsible material. Every effort will be made by NPS to approve these materials.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by individual Specification Sections.

1. Post informational submittals as PDF electronic files directly to the NPS project management and communication software.
2. Certificates and Certifications: Provide a notarized statement with signature of entity responsible for preparing certification. Certificates and certifications shall be signed by officer or other individual authorized to sign documents on behalf of that entity.
3. Informational submittals that do not comply with requirements specified in Contract Documents will be rejected and one copy will be returned.

B. Coordination Drawings: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."

C. Construction Contractors Construction Schedule: Comply with requirements specified in Section 01 32 16 "Construction Schedule."

D. Accident Prevention Plan: Comply with requirements specified in Section 01 35 23 "Safety Requirements."

E. Schedule of Values: Comply with requirements specified in Section 01 32 16 "Construction Schedule."

F. Waste Recycling Plan: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

G. Quality Control Plan: Comply with requirements specified in Section 01 40 00 "Quality Requirements."

H. Storm Water Pollution Prevention Plan: Comply with requirements specified in Section 01 57 23 "Temporary Storm Water Pollution Prevention" and storm water permit requirements identified in Section 01 31 00 "Project Management and Coordination."

I. Indoor Air Quality Management Plan: Comply with requirements specified in Section 01 57 19.11 "Indoor Air Quality Management."

J. Leadership in Energy and Environmental Design (LEED™) Submittals: Comply with requirements specified in Section 01 81 13.13 "Sustainable Design Requirements - LEED for New Construction and Major Renovations," Section 01 81 13.16 "Sustainable Design Requirements - LEED for Commercial Interiors," Section 01 81 13.19 "Sustainable Design Requirements - LEED for Core and Shell Development," and Section 01 81 13.23 "Sustainable Design Requirements - LEED for Schools."

K. Qualification Data: Prepare written information demonstrating capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on American Welding Society (AWS) forms. Include names of firms and personnel certified.

M. Installer Certificates: Prepare written statements on manufacturer’s letterhead certifying Installer complies with Contract Documents and, where required, is authorized by manufacturer for this specific Project.

N. Manufacturer Certificates: Prepare written statements on manufacturer’s letterhead certifying manufacturer complies with Contract Documents. Include evidence of manufacturing experience where required.

O. Product Certificates: Prepare written statements on manufacturer’s letterhead certifying product complies with Contract Documents.

P. Material Certificates: Prepare written statements on manufacturer’s letterhead certifying material complies with Contract Documents.

Q. 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 in Contract Documents.

R. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

S. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

T. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency’s standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in Contract Documents.

U. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

V. 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 in Contract Documents.

W. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Section 01 78 23 "Operation and Maintenance Data."

X. Design Data: Prepare written and graphic information, including: performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Y. Manufacturer's Instructions: Prepare written or published information documenting 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.

Z. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. As applicable, include:

1. Statement on condition of substrates and their acceptability for installation of product.
2. Summary of installation procedures being followed, compliance with requirements and, if not, what corrective action was taken.
3. Results of operational and other tests and a statement of whether observed performance complies with the requirements.

AA. Permit Compliance Products: Prepare required information for compliance with permit provisions. Products include written notification of project startup, suspension, and completion of work; photo documentation of site conditions; reports; and drawings.

PART 3 - EXECUTION

3.1 CONSTRUCTION CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of Contract and for compliance with Contract Documents. Note corrections and field dimensions.

3.2 CONTRACTING OFFICER'S ACTION

A. General: Submittals will be disapproved without technical review if identification information is missing, not filled in, or if placed on back of submittal; an incorrect format of submittals is

provided; transmittal form is incorrectly filled out; submittals are not coordinated; or submittals do not show evidence of Construction Contractor's approval.

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

B. Action Submittals: Contracting Officer will review each submittal, generate comments on corrections or modifications required, and indicate appropriate action on the Transmittal Form (CM-16). Submittal will be marked as defined below:

1. APPROVED: Acceptable with no corrections.
2. APPROVED WITH NOTATIONS: Minor corrections or clarifications required. Comments are clear and no further review is required. Construction Contractor shall address review comments when proceeding with the work.
3. DISAPPROVED - RESUBMIT: Rejected as not in accordance with the contract or as requiring major corrections or clarifications. Contracting Officer will identify reasons for disapproval. Construction Contractor shall revise and resubmit with changes clearly identified.

C. Informational Submittals: Contracting Officer will review each submittal and will either accept or reject it.

D. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.

END OF SECTION 01 33 23

Submittal List with Review Estimate Template

National Park Service (NPS) - Denver Service Center (DSC) | 1-27-21

SUBMITTAL LIST

Park Acronym/Project Management Information System (PMIS) Number: GLBA - 307989A

Project Title: Rehab Water Lines at Bartlett Cove Housing

ACTION SUBMITTAL REVIEW ESTIMATE

(Complete this portion for Architect / Engineer (A/E) construction service task order negotiation.)

SUBMITTAL			REQUIREMENTS (Indicate with **X**)								ARCHITECT / ENGINEER REVIEW TIME (Indicate in whole or partial hours.)							
			INFORMATIONAL				ACTION											
SPECIFICATION SECTION	PARAGRAPH NUMBER	DESCRIPTION	CERTIFICATIONS OR LABORATORY TESTS	REPORTS OR CALCULATIONS OR PLAN	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	SAMPLES	SHOP DRAWINGS	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	ARCHITECT	CIVIL ENGINEER	STRUCTURAL ENGINEER	MECHANICAL ENGINEER	ELECTRICAL ENGINEER	PROJECT MANAGER COORDINATION	LANDSCAPE ARCHITECT
01 31 00	1.4 A	Coordination Drawings		X		X											
01 31 00	1.4 D	Division 1 Documents	X	X													
01 32 16	1.3 B	Schedule of Values				X											
01 32 16	1.3 C	Construction Baseline Schedule				X											
01 32 16	1.3 D	Critical Path Method Reports		X													
01 32 16	1.3 E	Construction Schedule Updates				X											
01 32 16	1.3 F	Construction Schedule Revisions and Time Impact Analysis				X											
01 32 33	1.2 A	Construction Images				X											
01 35 13	1.3 A	Daily Work Schedule detailing construction in archeologically sensitive areas				X											
01 35 23	1.3 A	Accident Prevention Plan		X													
01 35 91	1.3 A	Historic Preservation Treatment Plan		X													
01 35 91	1.3 B	Alternative Methods and Materials				X											
01 35 91	1.3 C	Photographs or Videotapes of historic treatment operations				X											
01 40 00	1.4 A	Quality Control Plan		X													
01 40 00	1.4 B	Qualification Data for testing agencies				X											
01 40 00	1.4 C	Contractor Quality Control Daily Reports		X													
01 40 00	1.4 D	Test Reports	X	X													
01 40 00	1.4 E	Accessibility Inspection Report		X													
01 40 00	1.4 F	Off-Site Inspection Reports		X													
01 40 00	1.4 H	Permits, Licenses, and Certificates	X	X		X											
01 57 23	1.3 A1	Stormwater Pollution Prevention Plan		X													
01 57 23	1.3 A2	Under-an-acre Pollution Prevention Plan [possibly not needed]		X													

SUBMITTAL LIST

Park Acronym/Project Management Information System (PMIS) Number: GLBA - 307989A

Project Title: Rehab Water Lines at Bartlett Cove Housing

ACTION SUBMITTAL REVIEW ESTIMATE

(Complete this portion for Architect / Engineer (A/E) construction service task order negotiation.)

SUBMITTAL			REQUIREMENTS (Indicate with **X**)								ARCHITECT / ENGINEER REVIEW TIME (Indicate in whole or partial hours.)							
			INFORMATIONAL				ACTION											
SPECIFICATION SECTION	PARAGRAPH NUMBER	DESCRIPTION	CERTIFICATIONS OR LABORATORY TESTS	REPORTS OR CALCULATIONS OR PLAN	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	SAMPLES	SHOP DRAWINGS	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	ARCHITECT	CIVIL ENGINEER	STRUCTURAL ENGINEER	MECHANICAL ENGINEER	ELECTRICAL ENGINEER	PROJECT MANAGER COORDINATION	LANDSCAPE ARCHITECT
01 57 23	1.3 B	Inspection Schedule for pollution prevention measures				X											
01 57 23	1.3 C	Inspection Schedule for storm water pollution prevention measures				X											
01 57 23	1.3 D	Erosion Control Products Information							X								
01 67 00	1.3 A1	Affirmative Procurement Reporting Form				X											
01 67 00	1.3 A2	Environmental Data, as per ASTM E2129 Table 1				X											
01 67 00	1.3 A3	Material Safety Data Sheets							X								
01 73 29	1.2 A	Cutting and Patching Plan [entire spec possibly not needed]		X													
01 73 40	1.2 A	Signed certificates verifying location & elevation of improvements				X											
01 73 40	1.2 B	Landfill receipts				X											
01 73 40	1.2 C	Certified Surveys				X											
01 73 40	1.2 D	Quantity Surveys				X											
01 74 19	1.4 A	Waste Management Plan		X													
01 74 19	1.4 B	Progress Documentation - monthly supplement to WMP				X											
01 74 19	1.4 C	Waste Reduction Calculations		X													
01 74 19	1.4 D	Records of Waste Donations				X											
01 74 19	1.4 E	Records of Waste Sales				X											
01 74 19	1.4 F	Recycling and Processing Facility Records				X											
01 74 19	1.4 G	Landfill and Incinerator Disposal Records				X											
01 74 19	1.4 H	LEED Submittal [possibly not needed]				X											
01 74 19	1.4 I	Qualification Data for Waste Management Coordinator				X											
01 77 00	1.3	Summary of general Closeout Submittals															
01 78 23	1.2	Manuals (emergency, O&M, product maintenance, system maintenance)				X											
01 79 00	1.3 A	Instruction Program for Demonstration & Training				X											
01 79 00	1.3 B	Demonstration and Training Video				X											
02 41 00	1.4 A	Proposed Protection Measures		X													

SUBMITTAL LIST

Park Acronym/Project Management Information System (PMIS) Number: GLBA - 307989A

Project Title: Rehab Water Lines at Bartlett Cove Housing

ACTION SUBMITTAL REVIEW ESTIMATE

(Complete this portion for Architect / Engineer (A/E) construction service task order negotiation.)

SUBMITTAL			REQUIREMENTS (Indicate with **X**)								ARCHITECT / ENGINEER REVIEW TIME (Indicate in whole or partial hours.)							
			INFORMATIONAL				ACTION											
SPECIFICATION SECTION	PARAGRAPH NUMBER	DESCRIPTION	CERTIFICATIONS OR LABORATORY TESTS	REPORTS OR CALCULATIONS OR PLAN	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	SAMPLES	SHOP DRAWINGS	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	ARCHITECT	CIVIL ENGINEER	STRUCTURAL ENGINEER	MECHANICAL ENGINEER	ELECTRICAL ENGINEER	PROJECT MANAGER COORDINATION	LANDSCAPE ARCHITECT
31 05 25	1.2 B	Cutsheets: Marking tape and tracer wire			X												
31 05 25	1.2 C	Samples: 24-inch strips of marking tape and 2 markers					X										
31 05 25	1.2 D	Certification that the tape fabrication materials meet requirements	X														
31 10 00	1.4 A	Site Clearing Plan		X													
31 11 01	1.3 A	Equipment List				X											
31 11 01	1.3 B	Contractor List				X											
31 11 01	1.3 C	Manufacturer data if splitting rock by chemical methods			X												
31 11 23	1.3 A	Test results of sources to be used as base materials	X														
31 21 00	1.4 A1	Bedding material quality test results	X														
31 21 00	1.4 A2	Lab tests of all borrow materials	X														
31 23 00	1.5 A	Samples for testing laboratory					X										
31 23 00	1.5 B	Req'd density and moisture of any material to be compacted	X														
31 23 00	1.5 D	Material supplier details			X												
33 05 07.23	1.4 A	Shop drawings & technical data sheets						X									
33 12 13	1.5 A	Manufacturer's recommendations / instructions for type of pipe			X												
33 12 13	1.5 B	Certification and performance history for water main installation	X			X											
33 12 13	1.5 C	Manufacturer's information on fittings & valves to be used			X												
33 31 23	1.3 A	Pipe and fitting suppliers' submittals			X	X											
33 31 23	1.3 B	Fusion Providers' submittals			X	X											
33 61 13	1.3 A	Pipe and fitting suppliers' submittals			X	X											
											Total:	0	0	0	0	0	0	0

SUBMITTAL LIST											ACTION SUBMITTAL REVIEW ESTIMATE							
Park Acronym/Project Management Information System (PMIS) Number:			**GLBA - 307989A**								(Complete this portion for Architect / Engineer (A/E) construction service task order negotiation.)							
Project Title:		**Rehab Water Lines at Bartlett Cove Housing**																
SUBMITTAL			REQUIREMENTS (Indicate with **X**)								ARCHITECT / ENGINEER REVIEW TIME (Indicate in whole or partial hours.)							
			INFORMATIONAL				ACTION											
SPECIFICATION SECTION	PARAGRAPH NUMBER	DESCRIPTION	CERTIFICATIONS OR LABORATORY TESTS	REPORTS OR CALCULATIONS OR PLAN	MANUFACTURER DATA AND INSTRUCTIONS	OTHER	SAMPLES	SHOP DRAWINGS	MANUFACTURER DATA AND INSTRUCTIONS	OTHER		ARCHITECT	CIVIL ENGINEER	STRUCTURAL ENGINEER	MECHANICAL ENGINEER	ELECTRICAL ENGINEER	PROJECT MANAGER COORDINATION	LANDSCAPE ARCHITECT

This page was intentionally left blank

SECTION 01 35 13.22 – ARCHEOLOGICAL PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section consists of protecting archeological resources contained in soil deposits.

1.2 DEFINITIONS

A. Archeological Resources: Archeological resources are physical evidences of past human activity, including evidences of effects of that activity on the environment. Archeological resources represent both prehistoric and historic time periods, found above and below ground and under water.

B. Archeologically Sensitive Areas: Areas having potential to contain significant (National Register eligible) archeological resources. If National Register eligible or listed archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with state historic preservation officer and, if necessary, associated American Indian tribes.

C. Non-sensitive Areas: Areas with little potential of containing significant (National Register eligible) archeological resources.

D. Archeological Monitor: Representative of Government designated to oversee construction activities that could disturb archeological resources.

E. Archeological Resources Protection Act (ARPA) of 1979 (Public Law (P.L.) 96-95; 93 United States Statues at Large (Stat.) 712): defines archeological resources as any material remains of past human life or activities that are of archeological interest and at least 100 years old; Section 4 of the statute describes the requirements that must be met before Federal authorities can issue a permit to excavate or remove any archeological resource on Federal or Indian lands; the curatorial requirements of artifacts, and other materials excavated or removed.

1.3 SUBMITTALS

A. Daily Work Schedule: Detail construction work in archeologically sensitive areas. Submit to Contracting Officer (CO) 30 days before start of ground disturbing site work.

1.4 QUALITY ASSURANCE

A. At least one week before on-site work begins, Contractor shall meet with Contracting Officer and Archeological Monitor to discuss Daily Work Schedule, equipment, and special methods used in archeologically sensitive areas. Contractor shall ensure approved Daily Work Schedule is followed throughout construction.

PART 2 - PRODUCTS

2.1 DAILY WORK SCHEDULE

A. Daily Work Schedule is required for work occurring within archeologically sensitive areas. Include all work that is to occur within the area and key the schedule to the drawings to include:

1. Starting and ending dates of ground-disturbing construction.
2. Locations of temporary facilities, such as barriers, field offices, staging areas, sanitary facilities, borrow pits, and haul and access roads.
3. Types of construction, such as clearing, topsoil stripping, structure or trench excavation, landscaping, and post construction clean-up.
4. Methods and equipment used for each type of construction.
5. Plan for relocating work in the event of temporary work stoppages at each archeologically sensitive area

PART 3 - EXECUTION

3.1 BARRICADES

A. Comply with requirements specified in Section 01 50 00 "Temporary Facilities and Controls."

3.2 ARCHEOLOGICAL INVESTIGATION BY NON-NPS PERSONNEL

A. A permit is required for archeological investigations (e.g. excavation, shovel testing, coring, pedestrian survey, underwater archeology, rock art documentation, or other types of reconnaissance including archaeological monitoring of construction) carried out on parklands by non-National Park Service (NPS) personnel, unless carried out under a contract or a cooperative agreement specifically written for archeological investigations. Permits are issued under the Archaeological Resources Protection Act of 1979 (ARPA). The NPS does not issue a permit for archeological investigations carried out by NPS archeologists, or to archeologists working on NPS archeological projects under a contract or cooperative agreement.

B. Applicants should submit a Permit Application (DI Form 1926 (Revision September 2004) Office of Management and Budget (OMB) Number (No.) 1024-0037, approved through 1/31/2008. Permit Application form is available, in PDF (portable document file) format, to the manager of the park in which they propose to work; or to the regional director, with a copy to the park manager.

3.3 OBSERVATION

A. Archeological Monitor will observe ground-disturbing site work, including construction of temporary facilities, at archeologically sensitive areas, from a safe location mutually agreed on by Contractor and Monitor. As new ground is broken, Monitor will examine excavated materials, using construction layout centerline and perimeter staking as a reference point to record locations of findings.

3.4 DISCOVERY OF RESOURCES

A. If Archeological Monitor discovers resources, immediate relocation of work to a non-sensitive area may be required for Monitor to identify and document resources and, if necessary, develop appropriate mitigation plan. While Archeological Monitor is documenting resources in sensitive areas, Contractor shall relocate work to non-sensitive areas where monitoring is not normally required.

B. If resources are discovered while Archeological Monitor is absent, stop work immediately and report the discovery to the Contracting Officer.

3.5 WORK STOPPAGE

A. Contractor shall plan, schedule, and execute work to prevent stoppages at one area from stopping all work at construction site.

END OF SECTION 01 35 13.22

This page was intentionally left blank

SECTION 01 35 23 - SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes establishing an effective accident prevention program and providing a safe working environment for personnel and visitors.

1.2 CONDITIONS PRESENT FOR PROJECT

A. Confined spaces, water, electrocution, trenching, wildlife, weather, hazardous materials, floodings, fatigue, heat, cold, among many other requirements.

1.3 SUBMITTALS

A. Accident Prevention Plan (APP): Submit APP after contract award and before Pre-Construction conference. Contracting Officer (CO) will review proposed APP. If APP requires any revisions or corrections, Contractor shall resubmit Plan within 10 days. No progress payments will be made until the APP is accepted.

1.4 QUALITY ASSURANCE

A. Comply with contract clauses "Accident Prevention" and "Permits and Responsibilities." In case of conflicts between Federal, State, and local safety and health requirements, the most stringent shall apply. Onsite equipment shall meet 29 CFR 1926 (Code of Federal Regulations) (Occupational Safety and Health Administration (OSHA)) requirements. Failure to comply with requirements of this section and related sections may result in suspension of work.

B. Site Safety Supervisor:

1. Designate authorized onsite representative for preparation and maintenance of the APP.
2. Shall be responsible for:

a. Implementation and enforcement of the APP
b. Daily safety inspections
c. Conducting and documenting weekly and monthly safety meetings
d. Review of safety requirements at progress meetings
e. Compilation and maintenance of Safety Data Sheets (SDS) and safety reference materials
f. Tracking and resolution of safety violations
g. Site personnel and visitor compliance with site safety and health requirements and APP
h. Investigation and reporting of accidents and injuries

C. Qualifications of Employees:

1. Physically and able to perform their assigned duties in a safe manner.
2. Do not allow employees whose ability or alertness is impaired because of prescription or illegal drug use, fatigue, illness, intoxication, or other conditions that may expose themselves or others to injury to perform work.
3. Provide operating instructions for equipment. Operators of vehicles, hoisting equipment, and hazardous plant equipment shall be able to understand signs, signals, operating instructions, and be fully capable of operating such equipment. Retain copies of operator licenses and certifications onsite.

1.5 ACCIDENT REPORTING

A. Reportable Accidents: Defined as: death, occupational disease, and/or traumatic injury to employees or the public; fires; and/or property damage by accident in excess of $100.

1. Notify Contracting Officer immediately in the event of a reportable accident.
2. Fill out and forward an Accident/Property Damage Report Form (CM-22) to Contracting Officer within 7 days of a reportable accident. Obtain form from Contracting Officer.

1.6 RESOURCES

A. COVID-19 (Coronavirus Disease 2019) information provided below is not intended to provide a complete analysis of requirements for Contractor and is provided as a courtesy.
1. Occupational Safety and Health Administration (United States Department of Labor) - COVID-19
2. Center for Disease Control (CDC) - Get the Facts About Coronavirus
3. Federal Emergency Management Agency (FEMA) - Coronavirus (COVID-19) Response
4. National Park Service (NPS) - NPS Public Health Update

PART 2 - PRODUCTS

2.1 ACCIDENT PREVENTION PLAN (APP)

A. APP shall be written to comply with OSHA and project requirements (generic plan is not acceptable) including but not limited to:

1. Name and qualifications of supervisor responsible to carry out program.
2. Weekly and monthly safety meetings shall be documented with topics and attendees.
3. First aid and rescue procedures.
4. Job Hazard Analysis (JHA) for each major phase. List of hazards associated and methods proposed to provide for property protection and safety of the public, National Park Service personnel, and Contractor's employees. Include initial and continuing training.
5. Planning for possible emergency situations, as detailed in Article 1.2. Such planning shall take nature of construction, site conditions, and degree of exposure of persons and property into consideration.
6. Infectious Disease Preparedness:

a. Contractors are responsible for their employees' safety and the safety of job site visitors during the performance of this contract. We encourage Contractors to follow guidance from the Department of Labor (DOL), Occupational Safety and Health Administration (OSHA), the Centers for Disease Control and Prevention (CDC), and all other applicable local, city, and state mandates. We encourage Contractors to develop policies for infection prevention and an Infectious Disease Preparedness and Response Plan.
b. To the extent appropriate, Contractors should include the protective health and safety measures they intend to implement in any accident prevention or safety submittals required under this contract. These plans should contain preventive measures the Contractor intends to follow while performing work on government property as well as responsive and corrective actions to be taken if an employee exhibits symptoms or tests positive for contagion.
c. Upon contract award, Contractors should communicate with Contracting Officer regarding Contractor decisions and actions to protect the health and safety of workers for the duration of contract performance under which pandemic conditions exist.

2.2 FIRST AID FACILITIES

A. Provide adequate facilities for number of employees and appropriate to construction hazards.

2.3 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

A. Selection shall conform to OSHA Subpart E.

PART 3 - EXECUTION

3.1 DAILY SAFETY INSPECTIONS

A. Conduct daily safety inspections and maintain daily safety reports which include:
1. Area/operation inspected
2. Date of inspection
3. Identified hazards
4. Corrective actions taken

3.2 EMERGENCY INSTRUCTIONS

A. Post telephone numbers and reporting instructions for ambulance, physician, hospital, fire department, and police in conspicuous locations at work site.

3.3 FIRE AND LIFE SAFETY

A. Comply with requirements In the 2024 International Fire Code, the applicable chapter is Chapter 33, titled "Fire Safety During Construction and Demolition."

3.4 HAZARDOUS MATERIALS

A. Hazardous materials: Explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful substances that could cause death or injury.

B. Store hazardous materials in accordance with manufacturer's and OSHA Subpart D requirements. Maintain Safety Data Sheets (SDS) for each chemical readily available on site.

1. Immediately report spills of hazardous materials to the Park.
2. Maintain a spill emergency response kit.
3. Train employees how to respond to a spill and use emergency response kit.

3.5 PROTECTIVE EQUIPMENT

A. Inspect personal protective equipment daily and maintain in a serviceable condition. Clean, sanitize, and repair personal items as appropriate before issuing to another individual.

3.6 SAFETY MEETINGS

A. As a minimum, conduct one weekly 15-minute "toolbox" safety meeting conducted by a foreman or supervisor and attended by construction personnel at worksite. Topics shall coincide with work scheduled for following week. Document and submit meeting minutes to Contracting Officer within one day after meeting.

B. Conduct monthly safety meetings for personnel, contractors, and subcontractors performing work on the site. Notify Contracting Officer of meeting dates and times. Meetings shall be used to: review effectiveness of Contractor's safety effort; resolve current health and safety problems; provide a forum for planning safe construction activities, and for updating Accident Prevention Plan. Contracting Officers Representative will attend meetings and enter results of meetings into the daily log.

3.7 HARD HATS AND PROTECTIVE EQUIPMENT AREAS

A. A hard hat use area shall be designated by Contractor. Hard hat area shall be posted by Contractor in a manner satisfactory to Contracting Officer.

B. It is Contractor's responsibility to require persons working on or visiting site to wear hard hats and PPE in good repair at all times. As a minimum, maintain six hard hats and other APP required equipment.

3.8 TRAINING

A. First Aid: Provide training to personnel to ensure prompt and efficient first aid.

B. Hazardous Material: Train and instruct each employee exposed to hazardous material in safe and approved methods of handling and storage.

END OF SECTION 01 35 23

SECTION 01 35 91 - HISTORIC PRESERVATION TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes special procedures for historic treatment on Project including, but not limited to:

1. Definitions
2. Submittals
3. Quality Assurance
4. Storage and protection of existing historic materials
5. Project site conditions
6. Historic Preservation Treatment Plan
7. Protection, General
8. Protection during application of chemicals
9. Protection during use of heat-generating equipment
10. Historic preservation treatment procedures

1.2 DEFINITIONS

A. "Preservation" - To apply measures necessary to sustain existing form, integrity, and materials of historic property. Work may include preliminary measures to protect and stabilize the property.

B. "Rehabilitation" - To make possible a compatible use for property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

C. "Restoration" - To accurately return form, features, and character of a property to its appearance at a particular period of time by means of removal of features from other periods in its history and repair and reconstruction of missing and deteriorated features from the restoration period.

D. "Reconstruction" - To reproduce in exact form and detail, a building, structure, or artifact as it appeared at a specific period in time. Reconstructed elements do not possess historic integrity in their own right since they are-not original fabric.

E. "Stabilize" - To apply measures designed to reestablish a weather-resistant enclosure and structural reinforcement of an item or portion of the building while maintaining essential form as it exists at present. This level of intervention is aimed at retarding or arresting adverse impacts to structures.

F. "Protect and Maintain" - To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

G. "Repair" - To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible

substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

H. "Replace" - To duplicate in its entirety, a historic element or feature by matching its historic pattern, detail and appearance. Replacement is justified when original or historic elements are damaged beyond repair or are missing. Replacement conditions and methods include:

1. Replacement with Original or Historic Fabric: Includes fabric salvaged from other locations or projects having identical architectural qualities. Duplication of appearance using identical material possessing historical significance.
2. Replacement with New Materials: Includes replacement with new material of like kind (custom fabricated of manufactured). Duplication of appearance using like material.
3. Replacement with Substitute Materials: Includes replacement with a compatible substitute that is frequently contemporary and unlike the historic fabric. Duplication of appearance using modern (non-traditional) material Use of substitute materials is not approved unless matching materials are not available.

I. "Remove" - To demolish or detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

J. "Remove and Salvage" - To detach items from existing construction and deliver them [**ready for reuse**] to Contracting Officer (CO) or designee.

K. "Remove and Reinstall" - To detach items from existing construction, repair and prepare for reuse, and reinstall where indicated.

L. "Existing to Remain" or "Retain" - Existing items of construction not to be removed and not otherwise indicated to be removed and salvaged or removed and reinstalled.

M. "Material in Kind" - Material that closely matches existing materials through comparison of architectural qualities and salient characteristic such as species, cut, color, grain, dimension, profile, thickness, and finish.

1.3 SUBMITTALS

A. Historic Preservation Treatment Plan:

1. After contract award and before Pre-Construction conference, submit for approval a written Historic Preservation Treatment Plan (HPTP).
2. If the plan requires revisions or corrections, Contractor shall resubmit plan within 10 days.
3. No change in approved plan may be made without written concurrence by Contracting Officer.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.

C. Photographs or Videotape: In accordance with Section 01 32 33 "Photographic Documentation," show existing conditions of adjoining construction and site improvements including finish

surfaces that might be misconstrued as damage caused by historic treatment operations. Submit before work begins.

1.4 QUALITY ASSURANCE

A. Historic Preservation Treatment Specialist Qualifications: Experienced firm with required certifications and training able to demonstrate through past performance they are qualified to perform this work.

1.5 PROJECT-SITE CONDITIONS

A. Exterior Cleaning and Repairing:

1. Proceed with work only when forecasted weather conditions are favorable.

    a. Wet Weather: Do not attempt repairs during rainy or foggy weather. Do not apply primer, paint, putty, or epoxy when relative humidity is above 80 percent. Do not remove exterior elements of structures when rain is forecast or in progress.
    b. Do not perform exterior wet work when air temperature is below 40 degrees Fahrenheit (5 degrees Celsius).
    c. Do not begin cleaning, patching, or repairing given likelihood of frost or freezing.
    d. Do not begin cleaning when either air or surface temperature is below 45 degrees Fahrenheit (7 degrees Celsius) unless approved means are provided for maintaining 45 degrees Fahrenheit (7 degrees Celsius) temperature of air and materials during, and for 48 hours subsequent to, cleaning.

2. Perform cleaning and rinsing of the exterior only during daylight hours.

B. National Park Service will occupy portions of building immediately adjacent to historic treatment area. Conduct historic treatment so National Park Service operations will not be disrupted. Provide 72 hours' notice to Contracting Officer of activities that will affect National Park Service operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC PRESERVATION TREATMENT PLAN

A. Prepare written plan for preservation work covering preservation components of project. Plan shall verify construction strategy and intent is compatible with Department of the Interior’s (DOI) standards for Treatment of Historic Properties, guidelines for Treatment of Cultural Landscapes, and National Park Service management policies for cultural resources. Plan shall satisfy both project scope and resource protection requirements. Plan shall include:

1. Organized list of preservation components of project, systems, and tasks
2. Staging and sequence of work

3. Disassembly and reassembly techniques and steps
4. Equipment and tools required
5. Supplies and materials with manufacturer or supplier identified including specific clean up/storage procedure including frequency and documentation of such.
6. Skilled trades and crafts required
7. Anticipated testing and analysis of fabric
8. Additional investigations for extents or magnitude of treatments needed
9. Protective measures
10. Seasonal limitations on work
11. Alternative means if primary treatment method is unfeasible
12. Work conducted off-site (Approval from Contracting Officer required prior to taking resources off-site).

3.2 PROTECTION, GENERAL

A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure supervisory personnel are present when work begins and during progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
2. Attachments of temporary protection to existing construction shall be approved by Contracting Officer prior to installation.

D. Protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.
2. Bind spreading shrubs.
3. Coverings shall allow plants to breathe. Remove coverings at end of day. Do not cover plant material with waterproof membrane more than 8 hours at a time.
4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to start of work or cleaning operations, test drains and other water removal systems to ensure drains and systems function properly. Notify Contracting Officer immediately of stopped or blocked drains or systems. Do not begin Work of this Section until drains are in working order.

1. Provide method to prevent solids including stone or mortar residue from entering drains or drain lines. Clean out drains and drain lines blocked or filled because of work performed under this Contract.
2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners and paint removers.

B. Comply with requirements in Section 01 50 00 "Temporary Facilities and Controls."

C. Cover adjacent surfaces with materials proven to resist chemical cleaners selected for Project unless chemicals being used will not damage adjacent surfaces. Use covering materials containing only waterproof, UV (ultraviolet)-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. Promptly remove masking to prevent adhesive staining on completion.

D. Do not clean surfaces during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

E. Neutralize and collect alkaline and acid wastes and dispose of outside park boundaries.

F. Dispose of runoff from chemical operations by legal means and in a manner preventing soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

G. Document daily clean-up, proper storage, and disposition of any flammable/combustible materials with daily reports.

3.4 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT

A. Comply with following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Contracting Officer’s approval for operations involving use of open-flame or welding equipment.

    a. Notification shall be given for each occurrence and location of work with heat-generating equipment.
    b. Obtain appropriate permit from the park as required.

2. As far as practical, use heat-generating equipment in shop areas or outside building.
3. Before work with heat-generating equipment commences, furnish fire watch (or watches) for location(s) where work is to be performed.
4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use combustible gas indicator test to ensure area is safe.
5. Remove and keep area free of combustibles, including, rubbish, paper, waste, etc., within area of operations.

    a. If combustible material cannot be removed, provide fireproof blankets to cover such materials.

6. Where possible, furnish and use baffles of metal or gypsum board to prevent spraying of sparks or hot slag into surrounding combustible material.
7. Prevent extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
8. Inspect each location of day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires; ensure proper housekeeping is maintained.

B. Where sprinkler protection exists and is functional, maintain without interruption while operations are performed. If operations are performed near automatic sprinkler heads, shield individual heads temporarily with guards.

3.5 HISTORIC PRESERVATION TREATMENT PROCEDURES

The principal aim of preservation work is to halt the process of deterioration and stabilize the item's condition to sustain the integrity of the historic element, feature or structure being preserved. Cyclic maintenance is often required as well as repair work. Repair is required where specifically indicated. The following procedures shall be followed:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use traditional replacement materials and techniques if possible. New work shall be distinguishable from old work and original materials and techniques.
5. Record repair work during construction with periodic construction photos and daily inspection reporting. Photo documentation is specified in Section 013233 "Photographic Documentation."

B. Prohibit smoking by personnel performing work on or near historic structures.

C. Notify Contracting Officer of visible changes in integrity of material or components due to environmental causes including biological attack, UV degradation, freezing, or thawing, or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with work in question until directed by Contracting Officer.

D. Where Work requires existing features to be removed, cleaned, and reinstalled, perform operations without damage to material itself, to adjacent materials, or to substrate.

E. Identify new or replacement materials and features with inconspicuous, permanent marks to distinguish from original materials. Record legend of identification marks and locations of these marks on Record Drawings.

F. When cleaning, match samples of existing materials that have been cleaned and identified for acceptable cleaning levels. Avoid over-cleaning to prevent damage. Use gentlest methods available. Initiate cleaning using hand cleaning methods before introducing power cleaning methods and equipment.

END OF SECTION 01 35 91

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements. Quality of work shall be the responsibility of the Contractor.

1. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and control procedures that facilitate compliance with Contract Document requirements.

C. See Divisions 2 through 49 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the work to evaluate actual products incorporated into the work and completed construction comply with requirements.

C. Preconstruction Testing: Tests and inspections performed specifically for project before products and materials are incorporated into work to verify performance or compliance with specified criteria.

D. Product Testing: Tests and inspections performed by a Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or a testing agency qualified to conduct product testing, to establish product performance and compliance with industry standards.

E. Source Quality Control Testing: Tests and inspections performed at the source, i.e., plant, mill, factory, or shop.

F. Field Quality Control Testing: Tests and inspections performed on-site for installation of work and for completed work.

G. Testing Agency or Laboratory: Entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of corresponding generic name.

1.3 CONFLICTING REQUIREMENTS

A. Reference Standards: If compliance with two or more standards is specified and standards establish different or conflicting requirements for minimum quality levels, comply with most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Contracting Officer before proceeding.

B. Minimum Quality Levels: Quality level shown or specified shall be minimum provided or performed. Actual installation may comply exactly with minimum quality specified, or it may exceed minimum within reasonable limits. To comply with requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Contracting Officer before proceeding.

1.4 SUBMITTALS

A. Quality Control Plan:

1. After contract award and before Pre-Construction conference, submit a written Contractor Quality Control (CQC) plan.
2. If plan requires revisions or corrections, Contractor shall resubmit plan within 10 days.
3. Government reserves the right to require changes in plan during contract period as necessary to obtain the quality specified.
4. No change in the approved plan may be made without written concurrence by Contracting Officer.

B. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in form of a recent report on inspection of testing agency by a recognized authority.

C. Contractor Quality Control (CQC) Daily Reports: Submit showing inspections and tests on first workday following date covered by report. Quality Control Supervisor shall utilize DSC Forms.

1. Review Construction Management Representative (CMR) Daily report if applicable and reconcile any differences prior to posting.

D. Test Reports

1. Test reports shall be completed by person performing test.
2. Submit Daily Test Information Sheets with Quality Control Daily Reports.
3. Submit failing test results and proposed remedial actions within four hours of noted deficiency.

4. Submit three copies of complete test results no later than one calendar day after test was performed.

E. Accessibility Inspection Report:

1. Fill out applicable sections of the Accessibility Inspection Report and attach to Contractor Quality Control Daily Report.
2. Utilize attached Accessibility Inspection form to document compliance with Architectural Barriers Act Accessibility Standards (ABAAS).
3. Inspect at various stages of construction as needed to ensure finished product meets standards.
4. Submit report no later than one calendar day after inspection was performed.

F. Off-Site Inspection Reports: Submit prior to shipment.

G. If Contractor Quality Control plan and Quality Control Daily Reports are not submitted as specified, Contracting Officer may retain payments until such time plan(s) is/are accepted and implemented, or may retain payments for work completed on days with no Quality Control Daily Reports.

H. Permits, Licenses, and Certificates: For National Park Service (NPS) 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 bearing on performance of work.

1.5 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Contractors Quality Control Staff:

1. Contractor's Quality Control Supervisor may also perform other duties.

C. Installer Qualifications: Firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent indicated for Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: Firm experienced in manufacturing products or systems similar to those indicated for Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Fabricator Qualifications: Firm experienced in producing products similar to those indicated for Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

F. Professional Engineer Qualifications: Professional engineer legally qualified to practice in jurisdiction where Project is located and is experienced in providing engineering services of kind indicated (including Structural Tests and Special Inspections (STSI)). Engineering services are defined as those performed for installations of system, assembly, or products similar to those indicated for Project in material, design, and extent.

G. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing Work.

H. Testing Agency Qualifications: A Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or an independent agency with experience and capability to conduct testing and inspecting indicated, according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by Contract, is acceptable to Contracting Officer.

1. Nationally Recognized Testing Laboratory (NRTL): Nationally recognized testing laboratory according to 29 CFR 1910.7 (Code of Federal Regulations).
2. National Voluntary Laboratory Accreditation Program (NVLAP): Testing agency accredited according to National Institute of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program.
3. Measuring devices, laboratory equipment, and instruments shall be calibrated at established intervals against certified standards in accordance with NIST requirements. Measuring and testing devices shall be made available for use by Government for verification tests.

I. Factory-Authorized Service Representative Qualifications: Authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products similar in material, design, and extent to those indicated for Project.

1.6 QUALITY CONTROL

A. Contractor is responsible for testing and inspections, including Structural Tests and Special Inspections (STSI), as identified in attached STSI. Inspect and test work as needed to ensure quality of materials, workmanship, construction, finish, and functional performance are in compliance with applicable specifications, drawings, and those required by the Building Code.

1. Engage qualified testing agency to perform quality-control services.
2. Submit appropriate report for each quality-control service.
3. Testing and inspecting requested by Contractor and not required by Contract Documents are Contractor's responsibility.
4. Contracting Officer may designate test locations.

B. Manufacturer's Field Services: Where indicated, engage factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

C. Re-testing/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction of replaced work that failed to comply with Contract Documents.

D. Testing Agency Responsibilities: Cooperate with NPS and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Contracting Officer and Contractor promptly of irregularities or deficiencies observed in work during performance of services.
2. Determine location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections, State in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit 3 copies of certified written report of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase Contract Document requirements or approve or accept any portion of Work.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide:

1. Access to Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for material mixes that require control by testing agency.
7. Security and protection for samples and testing and inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality assurance and control services with minimum delay and to avoid removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS

2.1 QUALITY CONTROL PLAN

A. Quality Control Plan shall include:

1. List of personnel responsible for quality control and assigned duties. Include each person's qualifications. Include alternate(s) and qualifications.
2. Copy of letter of direction to Contractor's Quality Control Supervisor(s) outlining assigned duties and authorities designated by principal or owner.
3. Names, qualifications / accreditations, and descriptions of laboratories to perform sampling and testing, and samples of proposed report forms from laboratories.
4. Methods of performing, documenting, and enforcing quality control of work including Contractor report forms and acknowledgment of NPS forms.
5. Methods of monitoring and controlling environmental pollution and contamination as required by regulations and laws.
6. Specific discussion regarding mockups, off-site visits, receiving inspections, manufacturers representation, startup requirements, and other aspects of performance specific to Project.
7. Provisions for substantial completion(s) and final inspection(s) per Contract.

PART 3 - EXECUTION

3.1 OFF-SITE CONTROL

A. Items fabricated or assembled off-site shall be inspected for quality control at place of fabrication.

3.2 ON-SITE CONTROL

A. Notification:

1. Notify Contracting Officer at least 48 hours in advance of preparatory phase meeting.
2. Notify Contracting Officer at least 24 hours in advance of initial and follow-up phases.

B. Preparatory Phase: Perform before beginning each feature of work.

1. Review control submittal requirements with personnel directly responsible for quality assurance and quantity control of the work. As a minimum, Contractor's Quality Control Supervisor and foreman responsible for feature of work shall be in attendance.
2. Review applicable specifications sections and drawings related to feature of work.
3. Ensure copies of referenced standards related to sampling, testing, and execution for feature of work are available on site.
4. Ensure provisions have been made for field control testing.
5. Examine work area to ensure preliminary work has been completed.
6. Verify field dimensions and advise Contracting Officer of discrepancies with contract documents.
7. Ensure necessary equipment and materials are at project site and they comply with approved shop drawings and submittals.
8. Document preparatory phase activities and discussions on Contractor's Quality Control Daily Report.

C. Initial Phase:

1. As soon as work begins, inspect and test representative portion of particular feature of work for quality of workmanship.
2. Review control testing procedures to ensure compliance with contract requirements.
3. Document initial phase activities and discussions on Contractor's Quality Control Daily Report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

D. Follow-Up Phase: Inspect and test as work progresses to ensure compliance with contract requirements until completion of work.

E. Additional Preparatory and Initial Phases: Additional preparatory and initial phases may be required on same feature of work for following reasons:

1. Quality of on-going work is unacceptable.
2. Changes in quality control staff, on-site production supervision, or work crew.
3. Work on particular feature of work is resumed after substantial period of inactivity.

3.3 DOCUMENTATION

A. Maintain Quality Control Daily Reports, Daily Test Report Information Sheets, and Accessibility Inspection Reports of quality control activities and tests. (Download from DSC Workflows website > Forms/Templates/Samples/Guidelines page > Construction Forms section.)

B. Quality Control Daily Reports shall not be substituted for other written reports required under clauses of contract, such as Disputes, Differing Site Conditions, or Changes.

C. Quality Control Daily Reports shall accurately portray all work and materials. The materials shall match the materials as approved from the Construction Documents (CD) requirements. Combustible/flammable materials shall be documented as well.

3.4 ENFORCEMENT

A. Contractor shall stop work on any item or feature pending satisfactory correction of deficiency noted by quality control staff or Contracting Officer.

3.5 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams as invisible as possible.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are the Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

This page was intentionally left blank

SECTION 01 42 00 – REFERENCE STANDARDS

PART 1 - GENERAL

1.1 ENVIRONMENTAL DEFINITIONS

A. Definitions pertaining to sustainable development: As defined in ASTM E2114 and as specified herein.

B. Biobased Materials: As defined in the Farm Security and Rural Investment Act, for purposes of Federal procurement of biobased products, "biobased" means a "commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials." Biobased materials also include fuels, chemicals, building materials, or electric power or heat produced from biomass as defined by The Biomass Research and Development Act of 2000.

1. Biobased content: Amount of biobased carbon in the material or product as a percentage of weight (mass) of total organic carbon in the material or product.

C. Chain-of-Custody: Process whereby a product or material is maintained under physical possession or control during its entire life cycle.

D. Deconstruction: Disassembly of buildings for the purpose of recovering materials.

E. DFE (Design for the Environment): A technique that includes elements of resource conservation and pollution prevention as applied in various product sectors. A technique that incorporates approaches which are part of product (or assembly) concept, need and design. Considerations involve material selection, material and energy efficiency, reuse, maintainability and design for disassembly and recyclability. Refer to International Organization for Standardization (ISO) Guide 64 for additional clarification.

F. Environmentally preferable products: Products and services that have a lesser or reduced effect on the environment in comparison to conventional products and services. Refer to EPA's Final Guidance on Environmentally Preferable Purchasing Program.

G. Non-Renewable Resource: A resource that exists in a fixed amount that cannot be replenished on a human time scale. Non-renewable resources have potential for renewal only by geological, physical, and chemical processes taking place over of millions of years. Examples include iron ore, coal, and oil.

H. Perpetual Resource: A resource that is virtually inexhaustible on a human time scale. Examples include solar energy, tidal energy, and wind energy.

I. Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock. Recycled content claim shall be consistent Federal Trade Commission (FTC) Guide for Use of Environmental Marketing Claims.

J. Renewable Resource: A resource that is grown, naturally replenished, or cleansed, at a rate which exceeds depletion of the usable supply of that resource. A renewable resource can be exhausted if improperly managed. However, a renewable resource can last indefinitely with proper stewardship. Examples include trees in forests, grasses in grasslands, and fertile soil.

1.2 QUALITY ASSURANCE

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into Contract Documents to the extent referenced. Such standards are made a part of Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and standards may establish different or conflicting requirements for minimum quantities or quality levels, comply with most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Contracting Officer (CO) for decision before proceeding.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless Contract Documents include more stringent requirements, applicable construction industry standards have same force and effect as if bound or copied directly into Contract Documents to the extent referenced. Such standards are made a part of Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of Contract Documents unless otherwise indicated.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities found in Section 01 42 00 Sources for Reference Publications, Unified Facilities Guide Specifications (UFGS) (accessible via Masters website > Downloads section > click on UFGS Master (WBDG Website). Names, telephone numbers, and websites are subject to change and are believed to be accurate and up-to-date as of date of Contract Documents.

XX	EXAMPLE Association (The) www.EXAMPLE.org

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in following list. Names, telephone numbers, and websites are subject to change and are believed to be accurate and up-to-date as of date of Contract Documents.

DIN	Deutsches Institut fur Normung e.V. www.din.de	49 30 2601-3003
IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233
ICC-ES	ICC Evaluation Service, Inc. icc-es.org	(800) 423-6587 (562) 699-0543

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in following list. Names, and websites are subject to change and are believed to be accurate and up-to-date as of date of Contract Documents.

ABA & ABAAS United States Access Board	Architectural Barriers Act (ABA) Architectural Barriers Act Accessibility Standards (ABAAS) www.access-board.gov
CoE	Army Corps of Engineers www.usace.army.mil
CPSC	Consumer Product Safety Commission www.cpsc.gov
DOC	Department of Commerce www.commerce.gov
DOD	Department of Defense www.defense.gov
DOJ	Department of Justice www.justice.gov
DOE	Department of Energy www.energy.gov
EPA	Environmental Protection Agency www.epa.gov
FAA	Federal Aviation Administration www.faa.gov
FCC	Federal Communications Commission www.fcc.gov

FDA	Food and Drug Administration www.fda.gov
GSA	General Services Administration www.gsa.gov
HUD	Department of Housing and Urban Development www.hud.gov
LBL	Lawrence Berkeley National Laboratory www.lbl.gov
NCHRP	National Cooperative Highway Research Program (See TRB (Transportation Resource Board))
NIST	National Institute of Standards and Technology www.nist.gov
OSHA	Occupational Safety & Health Administration www.osha.gov
PHS	U.S. Department of Health and Human Services www.hhs.gov
RUS	Rural Utilities Service (See USDA (Department of Agriculture))
SD	State Department www.state.gov
TRB	Transportation Research Board www.nationalacademies.org/trb/transportation-research-board
USDA	Department of Agriculture www.usda.gov
USP	U.S. Pharmacopeia www.usp.org
USPS	Postal Service www.usps.com

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in following list. Names, telephone numbers, and websites are subject to change and are believed to be accurate and up-to-date as of date of Contract Documents.

ABAAS	Architectural Barriers Act Accessibility Standards www.access-board.gov
CFR	Code of Federal Regulations

	Available from Government Printing Office www.govinfo.gov/app/collection/cfr
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point www.dsp.dla.mil/Specs-Standards/
DSCC	Defense Supply Center Columbus (See FS (Federal Specification))
FED-STD	Federal Standard (See FS (Federal Specification))
FS	Federal Specification Available from Department of Defense Single Stock Point www.dsp.dla.mil/Specs-Standards/ Available from General Services Administration www.gsa.gov Available from National Institute of Building Sciences www.nibs.org
FTMS	Federal Test Method Standard (See FS (Federal Specification))
MIL	(See MILSPEC (Military Specification and Standards))
MIL-STD	(See MILSPEC (Military Specification and Standards))
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point www.dsp.dla.mil/Specs-Standards/
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/ufas *(UFAS is **only** for housing projects per Fair Housing Act. See also the Fair Housing Act Design Manual, www.huduser.gov/portal/publications/destech/fairhousing)*

1.5 ENVIRONMENTAL REFERENCE STANDARDS

A. American Forest and Paper Association:

1. Sustainable Forestry Initiative

B. American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE):

- **ASHRAE 52.2,** *Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size*
- **ASHRAE 55,** *Thermal Environmental Conditions for Human Occupancy*
- **ASHRAE 62.1,** *Ventilation for Acceptable Indoor Air Quality*

- **ASHRAE 62.2,** *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*
- **ASHRAE/IESNA 90.1,** *Energy Standard for Buildings, Except Low-Rise Residential Buildings*
- **ASHRAE 90.2,** *Energy Efficient Design of Low-Rise Residential Buildings*

C. American Association of State Highway and Transportation Officials (AASHTO):
- M288 Geotextile Specification for Highway Applications
- **MP009-06 Standard Specification for Compost for Erosion/Sediment Control (Filter Berms and Filter Socks)**
- **MP010-03 Standard Specification for Compost for Erosion/Sediment Control (Compost Blankets)**

D. American Society for Testing and Materials International (ASTM):
- A478 Standard Specification for Chromium-Nickel Stainless Steel Weaving and Knitting Wire
- A580/A580M Standard Specification for Stainless Steel Wire
- A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- B813 Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube
- C1240 Standard Specification for Silica Fume Used in Cementitious Mixtures
- C128 Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
- C131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- C1319 Standard Specification for Concrete Grid Paving Units
- C1338 Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings
- C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- C1371 Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers
- C1386 Standard Specification for Precast Autoclaved AERATED Concrete (PAAC) Wall Construction Units
- C1483 Standard Specification for Exterior Solar Radiation Control Coatings on Buildings
- C1549 Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer
- C1601 Standard Test Method for Field Determination of Water Penetration of Masonry Wall Surfaces
- C289 Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)
- C311 Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete
- C33 Standard Specification for Concrete Aggregates
- C593 Standard Specification for Fly Ash and Other Pozzolans for Use With Lime
- C595 Standard Specification for Blended Hydraulic Cements
- C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
- C67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile

- C739 Standard Specification for Cellulosic Fiber (Wood-Base) Loose-Fill Thermal Insulation
- C936 Standard Specification for Interlocking Concrete Paver Units
- C989 Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
- D1435 Standard Practice for Outdoor Weathering of Plastics
- D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 foot pound force per cubic foot (ft-lbf/ft3) (2,700 kilonewton meter per cubic meter (kN-m/m3))
- D1972 Standard Practice for Generic Marking of Plastic Products
- D198 Standard Test Methods of Static Tests of Lumber in Structural Sizes
- D2103 Standard Specification for Polyethylene Film and Sheeting
- D217 Standard Test Methods for Cone Penetration of Lubricating Grease
- D2369 Standard Test Method for Volatile Content of Coatings
- D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method
- D3792 Standard Test Method for Water Content of Coatings by Direct Injection Into a Gas Chromatograph
- D3864 Standard Guide for Continual On-Line Monitoring Systems for Water Analysis
- D3960 Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
- D4017 Standard Test Method for Water in Paints and Paint Materials by Karl Fischer Method
- D4263 Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
- D4444 Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters
- D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- D4552 Standard Practice for Classifying Hot-Mix Recycling Agents
- D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- D4716 Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- D4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Product
- D4840 Standard Guide for Sampling Chain-of-Custody Procedures
- D4887 Standard Test Method for Preparation of Viscosity Blends for Hot Recycled Bituminous Materials
- D5106 Standard Specification for Steel Slag Aggregates for Bituminous Paving Mixtures
- D5116 Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products
- D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
- D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles
- D5268 Standard Specification for Topsoil Used for Landscaping Purposes
- D5359 Standard Specification for Glass Cullet Recovered from Waste for Use in Manufacture of Glass Fiber
- D5505 Standard Practice for Classifying Emulsified Recycling Agents
- D5509 Standard Practice for Exposing Plastics to a Simulated Compost Environment

- D5512 Standard Practice for Exposing Plastics to a Simulated Compost Environment Using an Externally Heated Reactor
- D5539 Standard Specification for Seed Starter Mix
- D5957 Standard Guide for Flood Testing Horizontal Waterproofing Installations
- D5603 Standard Classification for Rubber Compounding Materials—Recycled Vulcanizate Particulate Rubber
- D5663 Standard Guide for Validating Recycled Content in Packaging Paper and Paperboard
- D5759 Standard Guide for Characterization of Coal Fly Ash and Clean Coal Combustion Fly Ash for Potential Uses
- D5792 Standard Practice for Generation of Environmental Data Related to Waste Management Activities: Development of Data Quality Objectives
- D5834 Standard Guide for Source Reduction Reuse, Recycling, and Disposal of Solid and Corrugated Fiberboard (Cardboard)
- D5851 Standard Guide for Planning and Implementing a Water Monitoring Program
- D5852 Standard Test Method for Erodibility Determination of Soil in the Field or in the Laboratory by the Jet Index Method
- D6002 Standard Guide for Assessing the Compostability of Environmentally Degradable Plastics
- D6006 Standard Guide for Assessing Biodegradability of Hydraulic Fluid
- D6007 Standard Test Method for Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber
- D6046 Standard Classification of Hydraulic Fluids for Environmental Impact
- D6081 Standard Practice for Aquatic Toxicity Testing of Lubricants: Sample Preparation and Results Interpretation
- D6108 Standard Test Method for Compressive Properties of Plastic Lumber and Shapes
- D6109 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber
- D6112 Standard Test Methods for Compressive and Flexural creep and Creep-Rupture of Plastic Lumber and Shapes
- D6117 Standard Test Methods for Mechanical Fasteners In Plastic Lumber and Shapes
- D6155 Standard Specification for Nontraditional Coarse Aggregates for Bituminous Paving Mixtures
- D6245 Standard Guide for Using Indoor Carbon Dioxide Concentrations to Evaluate Indoor Air Quality and Ventilation
- D6261 Standard Specification for Extruded and Compression Molded Basic Shapes Made from Thermoplastic Polyester (TPES)
- D6262 Standard Specification for Extruded, Compression Molded, and Injection Molded Basic Shapes of Poly(aryl ether ketone) (PAEK)
- D6270 Standard Practice for Use of Scrap Tires in Civil Engineering Applications
- D6329 Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers
- D6330 Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions
- D6345 Standard Guide for Selection of Methods for Active, Integrative Sampling of Volatile Organic Compounds in Air
- D6400 Standard Specification for Compostable Plastics

- D6435 Standard Test Method for Shear Properties of Plastic Lumber and Plastic Lumber Shapes
- D6629 Standard Guide for Selection of Methods for Estimating Soil Loss by Erosion
- D6662 Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards
- D6712 Standard Specification for Ultra-High-Molecular-Weight Polyethylene (UHMW-PE) Solid Plastic Shapes
- D6886 Standard Test Method for Speciation of the Volatile Organic Compounds (VOCs) in Low VOC Content Waterborne Air-Dry Coatings by Gas Chromatography
- D692 Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures
- D696 Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer
- D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))
- D7186 Standard Practice for Quality Assurance Observation of Roof Construction and Repair
- E1021 Standard Test Methods for Measuring Spectral Response of Photovoltaic Cells
- E1038 Standard Test Method for Determining Resistance of Photovoltaic Modules to Hail by Impact with Propelled Ice Balls
- E1039 Standard Test Method for Calibration of Silicon Non-Concentrator Photovoltaic Primary Reference Cells Under Global Irradiation
- E1040 Standard Specification for Physical Characteristics of Nonconcentrator Terrestrial Photovoltaic Reference Cells
- E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference
- E1171 Standard Test Method for Photovoltaic Modules in Cyclic Temperature and Humidity Environments
- E1333 Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Under Defined Test Conditions Using a Large Chamber
- E1362 Standard Test Method for Calibration of Non-Concentrator Photovoltaic Secondary Reference Cells
- E1433 Standard Guide for Selection of Standards on Environmental Acoustics
- E1462 Standard Test Methods for Insulation Integrity and Ground Path Continuity of Photovoltaic Modules
- E1596 Standard Test Methods for Solar Radiation Weathering of Photovoltaic Modules
- E1597 Standard Test Method for Saltwater Pressure Immersion and Temperature Testing of Photovoltaic Modules for Marine Environments
- E1609 Standard Guide for Development and Implementation of a Pollution Prevention Program
- E1686 Standard Guide for Selection of Environmental Noise Measurements and Criteria
- E1690 Standard Test Method for Determination of Ethanol Extractives in Biomass
- E1721 Standard Test Method for Determination of Acid-Insoluble Residue in Biomass
- E1755 Standard Test Method for Ash in Biomass
- E1758 Standard Test Method for Determination of Carbohydrates in Biomass by High Performance Liquid Chromatography
- E1780 Standard Guide for Measuring Outdoor Sound Received from a Nearby Fixed Source
- E1799 Standard Practice for Visual Inspections of Photovoltaic Modules

- E1802 Standard Test Methods for Wet Insulation Integrity Testing of Photovoltaic Modules
- E1821 Standard Test Method for Determination of Carbohydrates in Biomass by Gas Chromatography
- E1827 Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door
- E1830 Standard Test Methods for Determining Mechanical Integrity of Photovoltaic Modules
- E1861 Standard Guide for Use of Coal Combustion By-Products in Structural Fills
- E1918 Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field
- E1971 Standard Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings
- E1980 Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
- E1991 Standard Guide for Environmental Life Cycle Assessment of Building Materials/Products
- E2047 Standard Test Method for Wet Insulation Integrity Testing of Photovoltaic Arrays
- E2114 Standard Terminology for Sustainability Relative to the Performance of Buildings
- E2128 Standard Guide for Evaluating Water Leakage of Building Walls
- E2129 Standard Practice for Data Collection for Sustainability Assessment of Building Products
- E2397 Standard Practice for Determination of Dead Loads and Live Loads associated with Green Roof Systems
- E2398 Standard Test Method for Water Capture and Media Retention of Geocomposite Drain Layers for Green Roof Systems
- E2399 Standard Test Method for Maximum Media Density for Dead Load Analysis of Green Roof Systems
- E2400 Standard Guide for Selection, Installation, and Maintenance of Plants for Green Roof Systems
- E241 Standard Guide for Limiting Water-Induced Damage to Buildings
- E2432 Standard Guide for General Principles of Sustainability Relative to Buildings
- E408 Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques
- E413 Standard Classification for Rating Sound Insulation
- E477 Standard Test Method for Measuring Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers
- E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- E683 Standard Practice for Installation and Service of Solar Space Heating Systems for One- and Two-Family Dwellings
- E779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
- E781 Standard Practice for Evaluating Absorptive Solar Receiver Materials When Exposed to Conditions Simulating Stagnation in Solar Collectors With Cover Plates
- E782 Standard Practice for Exposure of Cover Materials for Solar Collectors to Natural Weathering Under Conditions Simulating Operational Mode
- E823 Standard Practice for Nonoperational Exposure and Inspection of a Solar Collector
- E881 Standard Practice for Exposure of Solar Collector Cover Materials to Natural Weathering Under Conditions Simulating Stagnation Mode

- E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- E903 Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres
- E948 Standard Test Method for Electrical Performance of Photovoltaic Cells Using Reference Cells Under Simulated Sunlight
- F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- F2034 Standard Specification for Sheet Linoleum Floor Covering
- F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

E. Bat Conservation International:
- Bat Approved Bat Houses

F. Carpet and Rug Institute
- Green Label & Green Label Plus Testing Programs, carpet-rug.org/testing/green-label-plus

G. Center for Resource Solutions
- Green-e program

H. Environmental Protection Agency (EPA):
- **Comprehensive Procurement Guidelines**
- **ENERGY STAR**
- **Environmentally Preferable Purchasing Program Final Guidance**
- **GreenScapes program**
- **Heat Island Initiative**
- **Indoor Air Quality Building Education and Assessment Model (I-BEAM)**
- **National Environmental Performance Track**
- **Pollution Prevention (P2)**
- **Product Stewardship Program**
- **Significant New Alternatives Policy (SNAP) Program**

I. Federal Trade Commission:
- **Guide for the Use of Environmental Marketing Claims**

J. Forest Stewardship Council:
- **Chain-Of-Custody**
- **Forest Management**

K. Green Building Initiative (GBI):
- **Green Globes - US**

L. Green Seal:
- **GC-03 Anti-Corrosive Paints**
- **GC-12 Occupancy Sensors**
- **GC-13 Split-Ductless Air-Source Heat Pumps**
- **GS-05 Compact Fluorescent Lamps**

- **GS-11 Paints**
- **GS-13 Windows**
- **GS-14 Window Films**
- **GS-31 Electric Chillers**
- **GS-32 Photovoltaic Modules**
- **GS-36 Commercial Adhesives**
- **GS-37 Industrial & Institutional Cleaners**

M. International Iron and Steel Institute:
- **CO2 Breakthrough Program**

N. International Organization of Standardization:
- **Guide 64; Guide for Inclusion of Environmental Aspects in Product Standards**
- **9660 Information processing -- Volume and file structure of CD-ROM for information interchange**
- **14001 Environmental management systems – Specification with guidance for use**
- **14004 Environmental Management Systems – General Guidelines on Principles, Systems and Supporting Techniques**
- **14020 Environmental labels and declarations – General principles**
- **14024 Environmental labels and declarations – Type I environmental labelling - Principles and procedures**
- **14040 Environmental management – Life cycle assessment – Principles and framework**

O. National Association of Home Builders:
- **Advanced Framing Techniques: Optimum Value Engineering**

P. National Institute of Building Sciences:
- **MOIST program for transfer of heat and moisture**
- **Whole Building Design Guide**

Q. National Institute of Standards and Technology:
- **BEES (Building for Environmental and Economic Sustainability) Lifecycle Decision Support Tool**

R. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
- **IAQ Guidelines for Occupied Buildings Under Construction**

S. Southcoast Air Quality Management District:
- **1168 Adhesive And Sealant Applications**

T. US Composting Council:
- Seal of Testing Assurance Program

U. US Department of Agriculture:
- **Biobased Products – Definitions and Descriptions**

V. US Green Building Council:
- **LEED™ 2009 Green Building Rating System**
- **LEED™ v4 (version 4) Green Building Rating System**

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

This page was intentionally left blank

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 DEFINITIONS

A. Permanent Enclosure: As determined by Contracting Officer (CO), permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and openings are closed with permanent construction or substantial temporary closures.

1.3 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in Contract Sum as required.

B. Water Service: No water services will be supplied by the Park. The Contractor must bring their own potable water.

C. Electric Power Service: Electric power from the existing system is available for use; however, the Contractor is responsible for running power to the construction trailer. Metering is required.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with National Electrical Contractors Association (NECA), National Electrical Manufacturers Association (NEMA), and Underwriter Laboratories (UL) standards and regulations for temporary electric service. Install service to comply with National Fire Protection Association (NFPA) 70.

B. Environmental Protection: Provide environmental protection as required by agency(ies) with jurisdiction and as indicated in Contract Documents. Coordinate with requirements of the following:

1. Regulatory Requirements
2. Noise and Acoustics Management
3. Environmental Management
4. Construction Waste Management

C. Accessible Temporary Egress: Comply with applicable provisions in the United States (U.S.) Architectural & Transportation Barriers Compliance Board’s Architectural Barriers Act Accessibility Standard (ABAAS) Accessibility Guidelines.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before NPS acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Temporary materials may be new or used, but must be adequate in capacity for required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

B. Pavement: Comply with Division 32 [Section "Asphalt Paving."] [Section "Concrete Paving."] [pavement Sections.]

C. Chain-Link Fencing: Minimum 2 inch (50 millimeters), 0.148 inch (3.76 millimeters) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 millimeter) high with galvanized steel pipe posts; minimum 2-3/8 inch (60 millimeters) OD (outside diameter) line posts and 2-7/8 inch (73 millimeters) OD corner and pull posts.

D. Portable Chain-Link Fencing: Minimum 2 inch (50 millimeters), 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 millimeters) high with galvanized steel pipe posts; minimum 2-3/8 inch (60 millimeters) OD line posts and 2-7/8 inch (73 millimeters) OD corner and pull posts, with 1-5/8 inch (42 millimeters) OD top and bottom rails. Provide [concrete] galvanized steel bases for supporting posts.

E. Safety Barrier Fence: Orange plastic fence, minimum height, 4 feet.

F. Barrier Tape: Yellow tape Imprinted with "CAUTION: CONSTRUCTION AREA," manufactured by Reef Industries, Inc., Houston, Texas, or approved equal.

G. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mil (0.25-millimeter) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

H. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 millimeters).

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Contracting Officers Field Office: Field office shall be a separate structure from Contractor's office.

1. Prefabricated, job built, or a mobile unit; excellent condition, structurally sound, non-flammable exterior construction, weather tight, minimum 300 square feet.
2. Operable windows and security screens, adjustable ventilation.
3. Restroom (minimum of lavatory and toilet, with exhaust fan if room is windowless).
4. Air conditioner and heater.
5. Interior partition with lockable door to divide office
6. Paneling or freshly painted walls, acoustical tile or painted ceilings, and resilient flooring.
7. Two exterior doors with dead bolts keyed from outside,
8. Minimum 20-square-foot landing and steps at each exterior door.

C. Storage and Fabrication Sheds: Temporary weather tight sheds or other covered facilities for storage of materials subject to weather damage. Number and size of structures shall be subject to Contracting Officer's approval.

D. Toilets: Sufficiently lighted and ventilated toilet facilities in weatherproof, sight proof, handicap accessible, sturdy enclosures with privacy locks.

1. Provide separate toilet facilities for men and women.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. Heating, Ventilation, and Air Conditioning (HVAC) Equipment: Unless Contracting Officer authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to agency(ies) with jurisdiction, and marked for intended use.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with Minimum Efficiency Reporting Value (MERV) of 8 at each return air grille in system and remove at end of construction.

C. Direct Digital Control (DDC) Internet Connection: Furnish, install and maintain a high-speed connection (Digital Subscriber Line (DSL) or similar) between the project’s DDC system and the internet through a Contractor furnished internet service provider. Contractor is responsible for maintenance of this connection and costs associated with internet service provider through warranty period of this contract. Upon completion of warranty period, service shall be transferable to the Government at which time future costs for connection will no longer be the responsibility of Contractor.

D. Contracting Officers Field Office

1. Outlets: Minimum of two, quad outlets with surge protection.
2. Refrigerator: Under counter, 3.2-cubic-foot volume with 0.8-cubic-foot freezer with dedicated power receptacle.

3. Fire Extinguisher: UL listed and FM (Fire Pump Motors) approved, minimum rating of 2-A:10-B:C, dry chemical.
4. First-Aid Kit: General office/light industrial kit which includes antiseptic wipes, bandages, disposable gloves, tape, instant cold pack, dressing pads, eye pads, scissors, and Tylenol tablets. Provide small size, such as manufactured by Johnson & Johnson, New Brunswick, New Jersey, or approved equal.
5. Two desks with five drawers each and two chairs with casters; two drafting tables (minimum 40 inches wide by 5 feet long) and two stools; drawing rack; two 2-drawer and one 4-drawer legal size locking filing cabinets with keys; 8 feet of 12 inch deep shelving; coat rack; two additional guest chairs; two desk lamps; two drafting table lamps; and a maximum/minimum thermometer.
6. Manufactured computer work station, capable of containing CPU (central processing unit), monitor, keyboard, printer; work station chair.
7. Additional tables necessary for FAX machine and copier.
8. Two 5-gallon trash cans and one 30-gallon trash can with lid.
9. Ceiling mounted general lighting fixtures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities as shown in drawings

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, NPS, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services. Acquire necessary permits.

B. Storm Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to private system indicated as directed by the agency(ies) with jurisdiction.

C. Non-potable water for construction can be provided by park.

D. Potable water is not available on site.

E. Sanitary Facilities: Provide temporary toilets, and wash facilities for use by construction personnel.

1. Place in approved locations secluded from public observation and convenient to work stations. Relocate as work progress requires.
2. Maintain and clean toilet facilities at least weekly.

3. Completely remove sanitary facilities on completion of work.
4. Toilets: Use of existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to NPS. At Substantial Completion, restore facilities to condition existing before initial use.

F. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Use of a permanent heating system will not be allowed without written authorization from the Contracting Officer. When the permanent heating system is approved for use as temporary heating, pay costs until final acceptance. A permanent heating system shall be sufficiently complete, including controls, to permit safe operation
2. Provide and maintain adequate approved facilities, as required for safety and construction requirements, during the work. Provide ample clearance around stoves, heaters, chimney and vent connections to prevent ignition of combustible material
3. Install and maintain temporary filters when air handing equipment is used for temporary heating. Install new filters before final acceptance in addition to any extra sets of filters required. Clean coils as determined by Contracting Officer.
4. Warranties for equipment used for temporary heating shall start on date of Final Acceptance.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

H. Electric Power Service: Use of existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to NPS.

1. When temporary connections are removed, restore existing utility services to original condition.

I. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install electric power service underground, unless otherwise indicated.

J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

K. Telephone Service: No telephone service is available on site for Contractor's use. Make arrangements with Telephone Company and pay costs.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 50 feet of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion. Remove structures, equipment, and furnishings, and terminate services after punch list is 100 percent completed or when directed by Contracting Officer. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Contracting Officer.

B. Contracting Officers Field Office:

1. Provide Heat, lights, power, air conditioning, temporary water pressure and sewage holding tanks.
2. Provide office, furnishings, and utility connections no later than 7 days after date of Notice to Proceed. Exact location will be determined by Contracting Officer.
3. Maintain equipment, furnishings, and structures. Provide equipment replacement elements as needed. Provide weekly cleaning services and trash disposal. Maintain and service water and sewer holding tanks as required.

C. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 31 Sections.
3. Recondition base after temporary use, including removing contaminated material, regrading, proof-rolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 32 Section "Asphalt Concrete Pavement."

D. Traffic Controls: Erect and maintain barricades, lights, danger signals, and warning signs in accordance with Manual on Uniform Traffic Control Devices (MUTCD), Part 6, latest edition.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.
3. Illuminate barricades and obstructions at night; keep safety lights burning from sunset to sunrise.
4. Adequately barricade and post open cuts in or adjacent to thoroughfares.
5. Protect pedestrian traffic by guardrails or fences.
6. When pedestrian traffic is detoured onto a roadway, provide temporary walkways with protection as required at ends and overhead. For walkways, use lumber running parallel to direction of traffic movement and provide ramps at changes of elevation.
7. Cover pipes, hoses, and power lines crossing sidewalks and walkways with troughs using beveled edge boards.

8. Install Barrier Tape where directed by Contracting Officer. Keep a minimum of two rolls on site.

E. Parking: Construction and CMR trailers, along with primary parking for construction personnel, will be located west of Building Q4. Overflow parking for construction equipment and personal vehicles will be available at the Maintenance Building. No material storage is allowed at the GLBA Maintenance Building.

F. Dewatering Facilities and Drains: Comply with requirements of the agency(ies) with jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

G. Project Identification and Temporary Signs: Provide Project identification and other signs as indicated on Drawings. Fence, barricade, or otherwise block off the immediate work area to prevent unauthorized entry.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Maintain and touchup signs so they are legible at all times.
3. Erect and maintain sufficient detour signs at road closures and along detour routes.

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of agency(ies) with jurisdiction.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Cleaning of Equipment: Contractor shall ensure prior to moving on to Project Area, equipment, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Ensure equipment has been pressure washed and is free of exotic species. Equipment shall be considered free of soil, seeds, and other debris when visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools are not required.

C. Temporary Erosion and Sedimentation Control: Refer to Section 01 57 23 "Temporary Storm Water Pollution Prevention".

D. Tree and Plant Protection: Refer to Section 01 11 00 "Summary of Work".

E. Pest Control: Follow NPS requirements to minimize attraction and harboring of rodents, roaches, and other pests and perform extermination and control procedures at regular intervals so Project will be free of pests and residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

F. Site Enclosure Fence: When excavation begins, furnish and install construction fencing to prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Locate vehicular gates to avoid interference with traffic on public thoroughfares.
3. Locate pedestrian entrance gates as required to provide controlled personnel entry.

G. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

H. Barricades, Warning Signs, and Lights: Comply with requirements of Manual on Uniform Traffic Control Devices (MUTCD), Part 6, latest edition for erecting structurally adequate barricades, including warning signs and lighting.

I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Responsible Person: Capable and qualified person shall be placed in charge of fire protection. Responsibilities shall include locating and maintaining fire protective equipment and establishing and maintaining safe torch cutting and welding procedures.
2. Tobacco Use, Smoking, and Vaping: Smoking within buildings or temporary storage sheds is prohibited.
3. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of **NPS** Check with Park; many require "burn permits" for welding.
4. Develop and supervise overall fire-prevention and -protection program for personnel at Project Site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
5. Provide temporary standpipes and hoses for fire protection. Hang hoses with warning sign stating hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
6. Hazard Control: Take necessary precautions to prevent fire during construction. Provide adequate ventilation during use of volatile or noxious substances. Ensure cleanup procedures and storage requirements are followed at close of every work session.
7. Spark Arresters: Equip gasoline or diesel powered equipment used during periods of potential fire hazards or in potential forest and grass fire locations with spark arresters approved by United States Department of Agriculture (USDA) Forest Service.

    a. Written determinations of periods and areas of potential fire hazard will be issued by Contracting Officer.

8. Buildings: Furnish a minimum of one extinguisher for each 1,500 square feet of area or major fraction thereof.

a. Travel distance from any work station to nearest extinguisher shall not exceed 75 feet.

9. Vehicles and Equipment: Provide one extinguisher on each vehicle or piece of equipment.
10. Service and Refueling Areas: Locate areas a minimum of 50 feet from buildings. Shut down equipment before refueling.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on 24-hour basis where required to achieve indicated results and avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. NPS reserves right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period.

END OF SECTION 01 50 00

This page was intentionally left blank

SECTION 01 57 19.12 – NOISE AND ACCOUSTICS MANAGEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Special requirements for noise and acoustics management during deconstruction and construction operations.

1.2 DEFINITIONS

A. Ambient noise level: The total noise associated with a given environment, being usually a composite of normal or existing sounds from all sources near and far, excluding the noise source at issue.

B. Daytime: See Work Restrictions in Section 01 11 00

C. Nighttime: All non-daytime hours.

D. Property line: The real or imaginary line along the ground surface and its vertical extension, which separates real property owned or controlled by one person from contiguous real property owned or controlled by another person or from any public right-of-way or from any public space.

E. Receiving noise area: Any real property where people live or work and where noise is heard, excluding the project or source area.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 NOISE MANGEMENT

A. Noise Control: Perform deconstruction and construction operations to minimize noise. Perform noise-producing work in less sensitive hours of the day or week as directed by the Contracting Officer CO).

B. Repetitive and/or intermittent, high-level noise: Permitted only during Daytime.

1. Do not exceed the following dB(A) limitations at 50 feet:

Sound Level in dB(A)	Time Duration of Impact Noise
70	More than 12 minutes in any hour
80	More than 3 minutes in any hour

2. Maximum permissible construction equipment noise levels at 50 feet:

EARTHMOVING	dB(A)	MATERIALS HANDLING	dB(A)
Front Loaders	75	Concrete Mixers	75
Backhoes	75	Concrete Pumps	75
Dozers	75	Cranes	75
Tractors	75	Derricks Impact	75
Scrapers	80	Pile Drivers	95
Graders	75	Jack Hammers	75
Trucks	75	Rock Drills	80
Pavers, Stationary	80	Pneumatic Tools	80
Pumps	75	Saws	75
Generators	75	Vibrators	75
Compressors	75		

C. Ambient Noise:

1. Maximum noise levels (dB (decibel)) for receiving noise area at property line shall be as follows:

a. Residential receiving area
Daytime: 65 dB
Nighttime: 45 dB

b. Commercial/Industrial receiving area
Daytime: 67 dB
Nighttime: 65 dB

c. In the event the existing local ambient noise level exceeds the maximum allowable receiving noise level (dB), the receiving noise level maximum for construction operations shall be adjusted as follows:

d. Residential receiving area: Maximum 3 additional dB above the local ambient as measured at property line.

e. Commercial/Industrial receiving area: Maximum 5 additional dB above the local ambient as measured at the property line.

3.2 FIELD QUALITY CONTROL

A. Assess potential effects of construction noise on park occupants in accordance with ASTM E1686 and as follows:

1. Ambient noise measurement: Measure at property line at a height of at least four (4) feet above the immediate surrounding surface. Average the ambient noise level over a period of at least 15 minutes.

B. Monitor noise produced from construction operations in accordance with ASTM E1780.

END OF SECTION 01 57 19.12

SECTION 01 57 23 - TEMPORARY STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.1 SUMMARY

A. Federal Regulations for controlling discharges of pollutants (including chemicals, erodible material, and trash) from municipal separate storm sewer systems, construction sites, and industrial activities, were brought under the National Pollution Discharge Elimination System (NPDES) permit process by amendments to the Clean Water Act (CWA), and promulgation of federal stormwater regulations issued by the United States Environmental Protection Agency (USEPA). The USEPA uses amount of ground disturbance as a measure of a project potential to generate pollution from erosion. NPDES Phase I regulates discharges from construction sites that disturb 5 acres or more. NPDES Phase II regulations expand existing General Permit requirements under Phase I to include/regulated discharges from construction sites that disturb land equal to or greater than one (1) acre and less than 5 acres, known as Small Construction Activity. Construction disturbances 1 acre and above typically require a formal NPDES permit and a formal Stormwater Pollution Prevention Plan (SWPPP) must be submitted to Agency(ies) with Jurisdiction for review and approval.

B. The work of this section consists of implementing measures to prevent discharges of pollutants, including temporary storm water pollution during construction activities through compliance with NPDES permit program.

C. Work of this section consists of implementing measures to Temporary Storm Water Pollution during construction activities, either through compliance with NPDES permit program.

1.2 DEFINITIONS

A. Definitions pertaining to sustainable development: As defined in ASTM E2114.

B. Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; or degrade utility of the environment for aesthetic, cultural, or historical purposes.

C. National Pollution Discharge Elimination System (NPDES) Phase I: Regulates discharges from construction sites that disturb 5 acres or more.

D. NPDES Phase II: Regulations expand existing General Permit requirements under Phase I to include and regulate discharges from construction sites that disturb land equal to or greater than one (1) acre and less than 5 acres, known as Small Construction Activity.

E. Storm Water Pollution Prevention Plan (SWPPP): Developed and implemented stormwater management measures to protect surface water from pollutants during construction activities disturbing an acre or more in compliance with federal, state, and local requirements for permit approval under NPDES program.

1.3 SUBMITTALS

A. After contract award and before pre-construction conference, prepare and submit:
   1. A SWPPP showing SWPPP satisfies Federal and State NPDES permit requirements.

B. Inspection Schedule: Submit schedule for inspection and monitoring of pollution prevention measures.

C. Inspection Schedule: Submit schedule for inspection and monitoring of storm water pollution prevention measures.

D. Erosion Control Products: Submit manufacturer's product information and installation recommendations for silt fence, filter fabric, erosion control blanket, straw bales, and other materials proposed for use on this project.

1.4 QUALITY ASSURANCE

A. Contractor shall prepare and submit a plan to Contracting Officer (CO) for review and concurrence.

B. Orientation Meeting: Contractor shall arrange and conduct an Erosion and Sediment Control meeting/briefing to inform parties, scheduled to be on-site during project, of measures to be implemented for proper erosion and sediment control (may be included as part of Pre-Construction Meeting).

   1. Installation of silt fences, storm drain protection, and other forms of erosion and sediment control shall not begin until after this meeting has occurred.

C. Orientation Meeting: Contractor shall be responsible for arranging and conducting Pollution Prevention meeting/briefing to inform parties scheduled to be on-site during project of measures to be implemented for proper pollution prevention and control (may be included as part of Pre-Construction Meeting).

   1. Installation of silt fences, storm drain protection, and other forms of pollution prevention controls shall not begin until after this meeting has occurred.

D. Pollution Prevention Manager: Contractor shall designate Pollution Prevention Manager who will be responsible for implementation, inspection, maintenance, and amendments to approved plan.

   1. When changes in approved plan are required, Pollution Prevention Manager shall prepare and certify an amendment and submit to Contracting Officer for review and concurrence.

E. Pollution Prevention and Erosion Control Manager: Contractor shall designate Pollution Prevention and Erosion Control Manager responsible for implementation, inspection, maintenance, and amendments to approved plan.

   1. Pollution Prevention and Erosion Control Manager shall be familiar with temporary storm water pollution prevention procedures and Best Management Practices and ensure emergency procedures and plan are updated as needed and available for inspection.

2. When changes in approved plan are required, Pollution Prevention and Erosion Control Manager shall prepare and certify an amendment and submit to Contracting Officer for review and concurrence.

PART 2 - PRODUCTS

2.1 UNDER-AN-ACRE POLLUTION PREVENTION PLAN

2.2 TEMPORARY STORM WATER POLLUTION PREVENTION PLAN

A. Provide SWPPP which satisfies Federal and State NPDES permit requirements and includes:

1. Site description.
2. Identification and contract information for Pollution Prevention and Erosion Control Manager.
3. Expected sequencing of operations and construction schedule.
4. Weather monitoring procedure.
5. Descriptions and details Best Management Practices for of pollution prevention and erosion controls, including dust control.
6. Pollution prevention and erosion control plans.
7. Controls for other potential onsite storm water pollutants.
8. Applicable specifications.
9. Maintenance and inspection procedures and forms.
10. Description of potential non-storm water discharges at site.
11. Notice of Intent (NOI) form.
12. Notice of Termination (NOT) form.
13. Contractor and Sub-contractor Certification forms.
14. Other record keeping forms and procedures.
15. Housekeeping Best Management Practices, including vehicle wash-down areas, protection of equipment storage and maintenance areas, and sweeping of roadways related to hauling activities.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL PROTECTION

A. Protection of Natural Resources: Comply with applicable regulations and these specifications. Preserve natural resources within project boundaries and outside limits of work performed under this Contract in their existing condition or restore to an equivalent or improved condition as approved by Contracting Officer.

B. Construction Zone: Arrange construction activities to minimize pollution (i.e., erosion, trash, etc.) to maximum practical extent.

1. Clearing, excavation, and grading shall be limited to those areas of project site necessary for construction. Minimize area exposed and unprotected.

2. Clearly mark and delineate limits of work activities.
3. Equipment shall not be allowed to operate outside limits of work or to disturb existing vegetation.
4. Excavation and grading shall be completed during dry season to maximum extent possible.
5. Material shall be stored away from locations where water is present to greatest extent practicable.

3.2 REGULATORY REQUIREMENTS

A. Permits: Contractor shall obtain required NPDES permits resulting in no impacts to scheduled work. Contractor shall account for possibility of significant lead time in scheduling and executing work.

1. Implement requirements of NPDES permit for erosion control due to storm water runoff during construction.
2. Implement good housekeeping practices, inspections and record keeping.
3. Prior to construction, Contractor and Subcontractors shall sign certifications (included in the plan) that they understand requirements of NPDES permit.
4. Subcontractors shall comply with requirements of NPDES under supervision of Contractor.
5. Accepted plan shall comply with terms and conditions of EPA permit.

B. Notice of Intent (NOI): Contractor shall file a Notice of Intent and formal SWPPP as required to the Agency(ies) with Jurisdiction.

C. Notice of Termination (NOT): After Substantial Completion of Work, file a Notice of Termination (NOT) with the Agency(ies) with Jurisdiction.

D. Contracting Officer Notification: Contractor shall notify Contracting Officer in writing and by telephone of these events:

1. Erosion and sediment control meeting/briefing.
2. Following installation of required sediment control structures.
3. Prior to removal of or modification to sediment control structures.
4. Prior to removal of sediment control structures.

3.3 TEMPORARY STORM WATER POLLUTION PREVENTION PLAN

3.4 UNDER-AN_ACRE POLLUTION PREVENTION PLAN

A. Review and Acceptance: Contractor and Contracting Officer will jointly review draft Plan and agree to needed revisions. Contractor shall incorporate revisions, sign, and submit final Plan to Contracting Officer. Final Plan will be the document enforced on the project.

1. Accepted Plan will describe and ensure implementation of practices to be used to reduce pollutants in storm water discharges.
2. Contractor shall maintain current copy of Plan and associated records and forms at jobsite throughout duration of project.

3. Plan shall be available for public inspection and inspection and use of Contracting Officer.
4. Approval of Contractor's Plan will not relieve Contractor of responsibility for compliance with applicable environmental regulations.

B. Implementation: Implement Plan as required throughout construction period and maintain erosion control elements in proper working order.

1. Do not perform clearing and grubbing or earthwork until Plan has been implemented.

C. SWPPP (including inspection forms) and data used to complete the NOI shall be provided to Contracting Officer after Substantial Completion of project.

3.5 SITE INSPECTIONS AND PLAN REVISIONS

A. Inspections: Contractor and Contracting Officer will perform a weekly inspection onsite.

1. Inspection shall include disturbed areas not completely stabilized, areas used for storage of materials, locations where vehicles enter or exit site, and other erosion and sediment controls included in the Plan.
2. Inspections shall be documented.
3. Inspection forms shall be retained onsite in Plan notebook throughout construction period.

B. Plan Revisions: It may be necessary to revise Plan during construction to make necessary improvements, revisions, or to respond to unforeseen conditions noted during construction or site inspections.

1. Plan shall specify mechanism whereby revisions may be proposed by Contractor or Contracting Officer.
2. Contractor and Contracting Officer will jointly review each revision to Plan before changes incorporated and implemented. Contractor will then provide revised copy of Plan to Contracting Officer.
3. Accepted modifications will be implemented within 7 calendar days following date of inspection when deficiencies or necessary corrections are first noted.

C. Negligence: Provide additional temporary erosion and pollution controls made necessary by Contractor's errors or negligence at no additional cost to Government.

3.6 HOUSEKEEPING AND SITE MANAGEMENT

A. Store materials onsite in conformance to Federal, state, local, and manufacturer's regulations and specifications. Use Best Management Practices to minimize risk of materials coming into contact with environmental conditions (i.e. water and wind) that could disperse them.

B. Manage solid waste in conformance to Federal, state, and local regulations. Best Management Practices should be used to minimize risk of materials coming into contact with environmental conditions (i.e. water and wind) that could disperse them.

C. Include a spill prevention and control plan with provisions placed in SWPPP.

D. Manage hazardous waste (including contaminated soil) in conformance to Federal, state, local and NPS regulations and guidelines.

3.7 EROSION CONTROL MEASURES

A. Erosion control measures shall consist of Best Management Practices for storm water discharges, including silt fencing, barrier protectors, straw bales, temporary soil retention blankets, excelsior drainage filters, sediment traps and berms.

B. Berms and excelsior drainage filters shall be used to form sediment traps and control run-on and run-off into other areas, including creeks, streams, marshes, access roads, well areas, and staging areas.

C. Erosion control measures shall be used to contain only direct precipitation in construction zone. Contained water shall be allowed to percolate into ground or drain slowly through drainage filter sediment traps.

D. Earthen sediment traps or holding ponds shall not be used unless accepted by Contracting Officer.

E. Reduce runoff velocity and direct surface runoff around and away from fuel containment, storage, and borrow areas.

F. Divert surface runoff around and away from cut and fill slopes.

G. Place drainage filters around catch basins to create sediment traps to control run-off from construction area.

H. Excess water used for dust control shall be contained within demolition areas by erosion control measures.

I. Contractor shall prevent deposition of materials onto paved areas. Contractor shall inspect paved areas for deposited materials weekly and remove materials immediately.

J. Furnish, install, maintain, and operate necessary control measures and other equipment necessary to prevent erosion as described in approved SWPPP.

K. Before work begins, sufficient equipment shall be available on site to assure operation and adequacy of erosion control system can be maintained.

3.8 MAINTENANCE OF TEMPORARY FACILITIES

A. Ensure erosion and sediment control structures remain effective throughout excavation and grading operations. Relocate structures as necessary.

B. Inspect control structures after each significant rainfall. Promptly repair breaches which occur.

C. Contractor shall remove entrapped sediment from behind excelsior drainage filter after each storm.

3.9 REPORTING

A. If a discharge occurs or if project receives written notice or order from regulatory agency, Contractor shall immediately notify Contracting Officer and shall file written report to Agency(ies) with Jurisdiction within 7 days of discharge event, notice, or order. Corrective measures shall be implemented immediately following discharge, notice, or order. The report to the Agency(ies) with Jurisdiction shall contain:

1. Date, time, location, nature of operation, and type of discharge, including cause or nature of notice or order.
2. Best Management Practices deployed before discharge event, or prior to receiving notice or order.
3. Date of deployment and type of Best Management Practices deployed after discharge event, or after receiving notice or order, including additional Best Management Practices installed or planned to reduce or prevent re-occurrence.
4. An implementation and maintenance schedule for affected Best Management Practices.

3.10 SEDIMENT DISPOSAL

A. Sediment excavated from temporary sediment control structures shall be disposed on site with general fill, or with topsoil. Sediment shall be allowed to dry out as required before reuse.

B. Contractor shall place sediment removed from traps and other structures where it will not enter a storm drain or watercourse and where it will not immediately reenter the basin.

3.11 REMOVAL OF TEMPORARY POLLUTION CONTROL MEASURES

3.12 REMOVAL OF TEMPORARY STORM WATER POLLUTION CONTROL MEASURES

A. Temporary control measures shall be removed with permission of Contracting Officer within 20 working days after final acceptance of project, and/or once grading is complete and slopes have stabilized.

END OF SECTION 01 57 23

This page was intentionally left blank

SECTION 01 67 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and environmental requirements.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number and other designation shown or listed in manufacturer's published product literature, current as of date of Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Approved Equals: Product demonstrated and approved through submittal process, or where indicated as a product substitution, to have indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Definitions pertaining to sustainable development: As defined in ASTM E2114.

C. Biobased Materials: As defined in Farm Security and Rural Investment Act, for purposes of Federal procurement of biobased products, "biobased" means a "commercial or industrial product (other than food or feed) composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials." Biobased materials also include fuels, chemicals, building materials, or electric power or heat produced from biomass as defined by The Biomass Research and Development Act of 2000.

1. Biobased content: Amount of biobased carbon in material or product as a percentage of weight (mass) of total organic carbon in material or product.

D. Chain-of-Custody: Process whereby a product or material is maintained under physical possession or control during its entire life cycle.

E. Environmentally preferable products: Products and services with lesser or reduced effect on the environment in comparison to conventional products and services. Refer to Environmental

Protection Agency's (EPA) Final Guidance on Environmentally Preferable Purchasing for more information.

F. Stewardship: Responsible use and management of resources in support of sustainability.

G. Sustainability: Maintenance of ecosystem components and functions for future generations.

1. Recycled Content Materials: Products containing pre-consumer or post-consumer materials as all or part of their feedstock. Recycled content claim shall be consistent with International Organization for Standardization (ISO) 140001 Standard for the Use of Environmental Marketing Claims.
2. Rapidly Renewable Material: Material made from plants typically harvested within a ten-year cycle.
3. Regional Materials: Materials manufactured and extracted, harvested, or recovered within a radius of 500 miles from Project location.

1.3 SUBMITTALS

A. Record Submittals as specified in – Sustainable Design Close-Out Documentation, submit:

1. Affirmative Procurement Reporting Form. Submit on form in Appendix A of this Section, or similar form as approved by Contracting Officer (CO).
2. Submit environmental data in accordance with Table 1 of ASTM E2129 for these products:

a. Masonry
b. Finish Carpentry
c. Plastic Fabrications
d. Building Insulation
e. Roofing
f. Joint Sealers
g. Wood & Plastic Doors
h. Windows
i. Skylights
j. Glazed Curtain Wall
k. Gypsum Board
l. Tile
m. Acoustical Ceilings
n. Resilient Flooring
o. Carpet
p. Wall Coverings
q. Paints & Coatings
r. Toilet Compartments
s. Loading Dock Equipment
t. Office Equipment
u. Furnishings & Accessories
v. Renewable Energy Equipment
w. Elevators
x. Plumbing fixtures and equipment.
y. HVAC equipment
z. Lighting equipment

3. Material Safety Data Sheets (MSDS): For each product required by OSHA to have a MSDS, submit an MSDS. MSDS shall be prepared within the previous five years. Include information for MSDS Sections 1 to 16 in accordance with ANSI Z400.1 and as follows:

    a. Section 1: Chemical Product and Company Identification
    b. Section 2: Composition/Information on Ingredients
    c. Section 3: Hazards Identification
    d. Section 4: First Aid Measures
    e. Section 5: Fire Fighting Measures
    f. Section 6: Accidental Release Measures
    g. Section 7: Handling and Storage
    h. Section 8: Exposure Controls/Person Protection
    i. Section 9: Physical and Chemical Properties
    j. Section 10: Stability and Reactivity Data
    k. Section 11: Toxicological Information. Include data used to determine the hazards cited in Section 3. Identify acute data, carcinogenicity, reproductive effects, and target organ effects. Provide written description of the process used in evaluating chemical hazards relative to preparation of the MSDS.
    l. Section 12: Ecological Information. Include data regarding environmental impacts during raw materials acquisition, manufacture, and use. Include data regarding environmental impacts in event of accidental release.
    m. Section 13: Disposal Considerations. Include data regarding proper disposal of the chemical. Include information regarding recycling and reuse. Indicate whether or not product is considered to be "hazardous waste" according to United States EPA Hazardous Waste Regulations 40 CFR 261 (Code of Federal Regulations).
    n. Section 14: Transportation Information. Identify hazard class for shipping.
    o. Section 15: Regulatory Information. Identify federal, state, and local regulations applicable to the material.
    p. Section 16: Other Information. Include additional information relative to recycled content, biobased content, and other information regarding environmental and health impacts. Identify the date MSDS was prepared.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in undamaged condition; in manufacturer's original sealed container or other packaging system; complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with Contract Documents. Ensure products are undamaged and properly protected.
5. Obtain materials in biodegradable or recyclable/reusable packaging which uses minimum amount of packaging possible.

C. Storage:

1. Allow for inspection and measurement of quantity or counting of units.
2. Store materials in manner to not endanger Project structure.
3. Store products subject to damage by the elements, under cover in weather tight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Store loose granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter.

1.6 PACKAGING

A. Where Contractor has option to provide one of listed products or equal, preference shall be given to products with minimal packaging and easily recyclable packaging as defined in ASTM D5834.

B. Maximize use of source reduction and recycling procedures outlined in ASTM D5834.

C. Provide minimum 45 percent post-consumer recycled content and minimum 100 percent recovered fiber content of industrial paperboard in accordance with EPA’s Comprehensive Procurement Guidelines and ASTM D5663.

D. Provide minimum 15 percent post-consumer recycled content and minimum 10 percent recovered fiber content of carrier board in accordance with EPA’s Comprehensive Procurement Guidelines and ASTM D5663.

E. Provide minimum 20 percent post-consumer recycled content and minimum 40 percent recovered fiber content of brown papers (e.g., wrapping papers and bags) in accordance with EPA’s Comprehensive Procurement Guidelines and ASTM D5663.

1.7 ENVIRONMENTALLY PREFERABLE PRODUCTS

A. Provide environmentally preferable products to greatest extent possible.

1. To greatest extent possible, provide products and materials with a lesser or reduced effect on the environment considering raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and/or disposal of the product.
2. Eliminate use of ozone depleting compounds during and after construction where alternative environmentally preferable products are available, consistent with either Montreal Protocol and Title VI or Clean Air Act Amendments of 1990, or equivalent overall air quality benefits that take into account life cycle impacts.
3. Use products meeting or exceeding EPA's recycled content recommendations for EPA-designated products. Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of total value of the materials in project.

1.8 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for product specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare written document containing appropriate terms and identification, ready for execution. Submit draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with Specifications, prepare written document using appropriate form properly executed.
3. Refer to Divisions 2 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products to comply with Contract Documents, undamaged and, unless otherwise indicated, new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types produced and used successfully in similar situations on other projects.
3. Government reserves right to limit selection to products with warranties not in conflict with requirements of Contract Documents.
4. Where products are accompanied by term "as selected," Contracting Officer will make selection.
5. Where products are accompanied by term "match sample," sample to be matched is Governments.
6. Descriptive, performance, and reference standard requirements in Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:

1. Product: Where Specifications name single product and manufacturer, provide named product that complies with requirements or approved equal.
2. Manufacturer/Source: Where Specifications name single manufacturer or source, provide product by named manufacturer or source that complies with requirements or approved equal.
3. Products: Where Specifications include list of names of both products and manufacturers, provide one of the products listed that complies with requirements or approved equal.
4. Manufacturers: Where Specifications include list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements or approved equal.
5. Available Products: Where Specifications include list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Products" Articles for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Products" Articles for consideration of an unnamed product.
7. Product Options: Where Specifications indicate sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide specified product, system, or approved equal.
8. Visual Matching Specification: Where Specifications require matching an established Sample, select product that complies with requirements and matches Architect's sample. Contracting Officers decision will be final on whether a proposed product matches.

    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

9. Visual Selection Specification: Where Specifications include phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.

    a. Standard Range: Where Specifications include phrase "standard range of colors, patterns, textures" or similar phrase, Contracting Officer will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.

b. Full Range: Where Specifications include phrase "full range of colors, patterns, textures" or similar phrase, Contracting Officer will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 APPROVED EQUAL PRODUCTS

A. Conditions: Contracting Officer will consider Contractor's request when the following conditions are satisfied. If following conditions are not satisfied, Contracting Officer will return requests without action, except to record noncompliance with these requirements:

1. Evidence proposed product does not require revisions to Contract Documents, that it is consistent with Contract Documents and will produce indicated results and is compatible with other portions of Work.
2. Detailed comparison of significant qualities of proposed product with those named in Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION

3.1 PROTECTION AFTER INSTALLATION

A. Provide adequate coverings as necessary to protect installed materials from damage resulting from natural elements, traffic, and subsequent construction. Remove when no longer needed.

END OF SECTION 01 67 00

This page was intentionally left blank

AFFIRMATIVE PROCUREMENT REPORTING FORM
Recycled Content Materials & Biobased Content Materials

Project Name: _____ Project Number: _____

Contractor Name: _____ License Number: _____

Contractor Address: _____

Product	Total $ value provided	Total $ value with recycled content Pre-consumer	Total $ value with recycled content Post-consumer	Total $ value with biobased content	Exempted indicate 1,2,3,4	Comments
Hydraulic Mulch (paper based)						
Hydraulic Mulch (wood based)						
Compost						
Parking Stops (Concrete w/ fly ash, slag cement or low cement content)						
Parking Stops (Plastic/Rubber)						
Patio Blocks/Rubber						
Patio Blocks/Plastic						
Playground Surfaces						
Concrete with fly ash						
Concrete with slag cement						
Concrete with low cement content						
Plastic lumber						
Building Insulation						
Rock Wool						
Fiber glass						
Cellulose						
Perlite Comp Board						
Plastic Rigid Foam						
Glass Fiber Reinforced Foam						

Phenolic Rigid Foam						
Ceramic tile						
Resilient flooring						
Floor Tiles/Rubber						
Floor Tiles/Plastic						
Running Tracks						
Carpet (PET)						
Paint						
Reprocessed Latex Paint White & Light Colors						
Reprocessed Latex Dark Colors						
Consolidated Latex Paint						
Toilet/Shower partitions (plastic or steel)						
Other						

CERTIFICATION

I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content.

The following exemptions may apply to the non-procurement of recycled/recovered content materials:

1. The product does not meet appropriate performance standards.
2. The product is not available within a reasonable time frame.
3. The product is not available competitively (from two or more sources).
4. The product is only available at an unreasonable price (compared with a comparable non-recycled content product.)

Signature: _____ Date: _____

END OF

AFFIRMATIVE PROCUREMENT REPORTING FORM
Recycled Content Materials & Biobased Content Materials

SECTION 01 73 40 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general procedural requirements governing execution of Work including:

1. Coordination with utility service providers
2. Construction layout
3. Field engineering and surveying
4. General installation of products
5. Progress cleaning
6. Starting and adjusting
7. Protection of installed construction
8. Correction of the Work

1.2 SUBMITTALS

A. Certificates: Submit certificate signed by land surveyor certifying location and elevation of improvements comply with requirements.

B. Landfill Receipts: Submit copy of receipts issued by landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

C. Certified Surveys: Submit two copies signed by land surveyor.

D. Quantity Surveys: Submit 2 copies showing quantities of work performed and actual construction completed in place.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: Professional land surveyor legally qualified to practice in jurisdiction where Project is located and is experienced in providing land-surveying services of kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: Existence and location of site improvements and other construction indicated as existing are not guaranteed.

1. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

2. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: Existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify existence and location of underground utilities and other construction affecting Work.

1. Before construction, verify location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 COORDINATION WITH UTILITY SERVICE PROVIDERS

A. Coordination with Utility Service Providers: Contact the following utility service providers sufficiently in advance to avoid delaying the work. Coordination includes Contractor's portion of work, testing requirements, inspections, proper handling of utility crossings, and any required repairs.

B. Existing Utilities: The National Park Service (NPS) owns all utilities within the park except for ACS, which owns the telecommunications system. The Contractor is responsible for locating all utilities before beginning work. If the Contractor impacts any NPS-owned facilities, they must repair them to their original condition at their own expense. ACS must be contacted for locating and repairing its telecommunications infrastructure if impacted by construction activities. The Contractor is responsible for locating, protecting, and coordinating with ACS as necessary.

1. Telephone Service Contact: Contact Alaska Communications Systems (ACS) to coordinate telephone service location requirements.

3.3 PREPARATION

A. Field Measurements: Take field measurements as required to fit Work properly. Recheck measurements before installing each product. Where portions of Work are indicated fit to other

construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of need for clarification of the Contract Documents caused by differing field conditions outside control of Contractor, submit request for information to Contracting Officer in accordance with Section 01 31 00 "Project Management and Coordination."

3.4 CONSTRUCTION LAYOUT

A. Verification: Verify layout information shown on Drawings, in relation to the existing benchmarks before proceeding to lay out Work. Notify Contracting Officer promptly if discrepancies are discovered.

B. General: Engage a land surveyor to lay out Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check location, level and plumb, of every major element as Work progresses.
5. Notify Contracting Officer when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the established standard.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make log available for review by National Park Service (NPS).

3.5 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning Work. Preserve and protect permanent benchmarks and control points during construction operations. Controls destroyed by Contractor will be replaced by Contractor at their expense.

1. Existing Monuments: All benchmarks, land corners, and triangulation points, established by other surveys, existing within construction area shall be preserved. If existing monuments interfere with Work, secure written permission before removing them.

B. Benchmarks: Establish and maintain a minimum of 2 permanent benchmarks on Project site, referenced to data established by survey control points. Comply with NPS requirements for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.6 INSTALLATION

A. General: Locate Work and components of Work accurately in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions for best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for best visual effect. Fit exposed connections together to form hairline joints.

H. Hazardous Materials: Use products, cleaners, and installation materials not considered hazardous.

I. Quantity surveys: Shall be conducted, and data derived from these surveys shall be used in computing quantities of work performed and actual construction completed and in place.

1. Contractor shall conduct original and final surveys and surveys for any periods for which progress payments are requested. These surveys shall be conducted under direction of a representative of the Contracting Officer, unless Contracting Officer waives requirement

in a specific instance. Government shall make such computations as are necessary to determine quantities of work performed or finally in place. Contractor shall make computations based on surveys for any periods for which progress payments are requested.

2. Promptly upon completing a survey, Contractor shall furnish originals of field notes and other records relating to survey or layout of Work to Contracting Officer. Contractor shall retain copies of all such material furnished to Contracting Officer.

3.7 PROGRESS CLEANING

A. General: Clean Project site, work areas, and common areas daily. Coordinate progress cleaning for joint-use areas where more than one Installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in National Fire Protection Association (NFPA) 241 for removal of combustible waste materials and debris at the end of every work session.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 degrees Fahrenheit (27 degrees Celsius).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to level of cleanliness necessary for proper execution of Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of Work, broom-clean or vacuum entire work area, as appropriate.
3. Contractor shall provide progress cleaning that minimizes sources of food, water, and harborage available to pests.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials not hazardous to health or property and will not damage exposed surfaces.

1. Utilize non-toxic cleaning materials and methods.

a. Comply with Green Seal Standard (GS) 37 for general purpose cleaning and bathroom cleaning.
b. Use natural cleaning materials where feasible. Natural cleaning materials include:

1) Abrasive cleaners: substitute 1/2 lemon dipped in borax.
2) Ammonia: substitute vinegar, salt and water mixture, or baking soda and water.
3) Disinfectants: substitute 1/2 cup borax in gallon water.
4) Drain cleaners: substitute 1/4 cup baking soda and 1/4 cup vinegar in boiling water.
5) Upholstery cleaners: substitute dry cornstarch.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. Clean and protect construction in progress and adjoining materials already in place during handling and installation. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations so that no part of construction completed or in progress, is subject to harmful, dangerous, damaging, or deleterious exposure during construction period.

K. Final Cleaning: At completion of Work, remove remaining waste materials, rubbish, tools, equipment, machinery and surplus materials. Clean exposed surfaces and leave Project clean and ready for occupancy.

1. Provide final cleaning in accordance with ASTM E1971.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Section 01 73 29 "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to specified condition.

C. Remove and replace damaged surfaces exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 40

This page was intentionally left blank

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Solid Waste: Garbage, debris, sludge, or other discharged material (except hazardous waste) including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations.

D. Debris: Non-hazardous solid waste generated during construction, demolition, or renovation of a structure which exceeds 2.5 inch (60 millimeter) particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders). A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if mixture is comprised primarily of debris by volume, based on visual inspection.

E. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

F. Environmental Pollution and Damage: Presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; or degrade utility of environment for aesthetic, cultural, or historical purposes.

G. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

H. Hazardous Materials: Material regulated as a hazardous material in accordance with 49 CFR 173 (Code of Federal Regulations), requires a Material Safety Data Sheet (MSDS) in accordance with 29 CFR 1910.1200, or which during end use, treatment, handling, storage, transportation or disposal meets or has components which meet or have potential to meet the definition of Hazardous Waste in accordance with 40 CFR 261.

I. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

J. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

K. Single-use plastic products: Plastic items intended to be disposed of immediately after use, including plastic and polystyrene food and beverage containers, bottles, straws, cups, cutlery, and disposable plastic bags.

1.3 PERFORMANCE REQUIREMENTS

A. General: Project shall minimize creation of construction, deconstruction, and demolition waste to protect and restore natural habitat and resources. Minimize factors contributing to waste such as over packaging, improper storage, ordering error, poor planning, breakage, mishandling, single-use plastic products, and contamination. A Waste Management Plan shall be developed to ensure that existing site and building materials are reused, salvaged, or recycled. Minimize waste disposal in landfills.

B. If waste materials encountered during deconstruction/demolition or construction phase are found to contain lead, asbestos, polychlorinated biphenyls (PCBs), (such as fluorescent lamp ballasts), or other harmful substances, they are to be handled and removed in accordance with local, state, and federal laws and requirements concerning hazardous waste.

C. Existing items and material to be removed during deconstruction/demolition phase shall be reused in construction phase of the Project. Items that cannot be reused shall be recycled. Items considered for reuse must be in refurbishable condition and must meet quality standards set forth in these specifications. Contractor shall ensure quality of the item(s) in question will meet or exceed accepted industry or trade standards for first quality commercial grade application. During construction, deconstruction, or demolition Contracting Officer (CO) may designate other objects or materials for reuse.

1.4 SUBMITTALS

A. Waste Management Plan: After award of contract and prior to scheduled Pre-Construction Conference, Contractor shall submit a draft Waste Management Plan to Contracting Officer for approval. Submit 3 copies of plan. Revise and resubmit Plan as required by Contracting Officer. Approval of Contractor’s Plan will not relieve Contractor of responsibility for compliance with applicable environmental regulations.

B. Progress Documentation: Supplemental to Waste Management Plan, document solid waste disposal, diversion, and cost/revenue analysis and submit completed worksheet on a monthly basis. See Project Waste Management Plan Worksheet Sample, attached to the end of the Division 1 Specifications, and report totals to date for column headings.

C. Waste Reduction Calculations: Before request for Substantial Completion, submit three copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

H. Qualification Data for Wate Management Coordinator.

I. Progress payment requirements:

1. With each Application for payment, submit an updated Project Waste Management Plan worksheet for solid waste disposal and diversion.
2. With each Application for Payment, submit manifests, weight tickets, receipts, and invoices specifically identifying the Project and waste material.

J. Closeout Submittals

1. With Closeout Submittals, submit a summary of a Project Waste Management Plan worksheet for solid waste disposal and diversion.

1.5 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with record of successful waste management coordination of projects with similar requirements, certified by USGBC, as waste management coordinator. Waste management coordinator may also serve as LEED™ coordinator.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Meeting: Conduct separate meeting or cover in Pre-Construction Conference and comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including:

1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review procedures for reduction of single-use plastic products on site.

6. Review waste management requirements for each trade.

PART 2 - PRODUCTS

2.1 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification and waste reduction work plan. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition/excavation, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials salvaged and reused in Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials sold to individuals and organizations, include list of names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials donated to individuals and organizations, include list of names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.
7. Reduction of single-use plastic products: Include methods for water distribution to include bottle refilling stations if available for personnel.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include:

1. Landfill tip fees per ton.
2. If diverted, tip fee savings from landfill diversion.
3. Costs of recycling, salvage, or reuse.
4. Revenue from recycling, salvage, or reuse.
5. Total cost or savings from diversion. (Calculate by using tip fee savings and subtracting costs of recycling or adding revenue from recycling.)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Contracting Officer. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during entire duration of Contract.

B. Waste Management Coordinator: Engage waste management coordinator responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Contractor shall establish contacts with local recycling and reuse companies to set up lines of responsibility. Contractor shall be responsible for coordination in terms of identifying materials, pickup schedules, and standard quality for recycled materials.

D. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

E. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

F. Separation facilities:

1. Contractor shall designate and Contracting Officer shall approve specific area or areas to facilitate separation of materials for potential reuse, salvage, recycling, and return.
2. Place waste and recycling bins near each other, and close to point of waste generation but out of traffic pattern.
3. Keep recycling and waste bin areas neat, clean, and clearly marked in order to avoid co-mingling of materials.
4. Protect bins during non-working hours from off-site contamination.
5. Check garbage dumpsters periodically for recyclables being thrown away and undocumented materials that could be recycled.

G. Materials handling procedures: Material to be recycled shall be protected from contamination and shall be handled, stored, and transported in a manner that meets requirements set by designated facilities for acceptance. Establish defined area for operations of each trade, especially woodcutting so off-cuts are kept in one area and can be sorted by dimension for future reuse.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
6. Fire hydrants being removed shall be salvaged and delivered to the Park for reuse or proper disposal as directed by the Contracting Officer.

B. Salvaged Items for Governments Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Allow for inspection if necessary.
4. Store items in secure area until delivery to Government.
5. Transport items to storage area designated by Government.
6. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: The Contractor is responsible for removing all waste and recyclable materials generated during the project from the site. This includes, but is not limited to, paper, beverage containers, construction debris, and other recyclable materials used by on-site workers. All materials must be transported to an appropriate recycling facility in accordance with local regulations. The Contractor shall ensure that recyclable materials are separated from non-recyclable waste and handled in an environmentally responsible manner throughout the project

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

    a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off ground and protect from weather.
5. Remove recyclable waste off Government property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Grind asphalt to maximum 4-inch (100 millimeter) size.

B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

1. Crush asphaltic concrete paving and screen to comply with requirements in Division 31 Section "Earth Moving".

C. Electronic Products: Ensure non-usable electronic products are reused, donated, sold, or recycled using environmentally sound management practices at end of life.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees on site.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose in landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials to accumulate on-site.
2. Remove and transport debris in manner preventing spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Government property and legally dispose of them.

END OF SECTION 01 74 19

This page was intentionally left blank

Project Waste Management Plan Worksheet Sample

National Park Service (NPS) - Denver Service Center (DSC) | 10-13-21

	A	B	C	D	E	F	G	H	I	J
Material	**Quantity Recycled (in tons)**	**Quantity Salvaged or Reused (in tons)**	**A + B = Total Quantity Diverted from Landfill**	**Quantity to Landfill (in tons)**	**C + D = Total Quantity Generated (in tons)**	**Tip Fee/Ton at Landfill**	**C x F = Tip Fee Savings resulting from Landfill Diversion**	**Cost of Recycling (R), Salvage (S), or Reuse (Re)** (Specify R, S, or Re)	**Revenue from Recycling (R), Salvage (S), or Reuse (Re)** (Specify R, S, or Re)	**G - H + I = Total Cost (-) or Savings (+) from Diversion**
Asphalt/Concrete										
Brick/Masonry/Tile										
Building Materials (doors, windows, fixtures, shingles, lumber, insulation, sheet goods, etc.)										
Carpet										
Carpet Padding, Foam Only										
Cardboard										
Ceiling Tile										
Drywall										
Glass										
Scrap Metal Aluminum										
Copper										
Steel										
Unpainted Wood & Pallets										
Yard Trimmings, Brush, Trees, Stumps, etc.										
Garbage/Trash										

Other										
Column Totals										
	Total Quantity Recycled	Total Quantity Reused or Salvaged	Total Quantity Diverted from Landfill	Total Quantity to Landfill	Total Quantity Generated		Tip Fee Savings from Diversion	Total Cost of Recycling, Salvage, or Reuse	Revenue from Recycling, Salvage, or Reuse	Total Cost (-) or Savings (+) from Diversion

Percentage Diverted = _____ (C divided by E from Column Totals). Should meet 60% diversion goal.

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including:

1. Project Record Drawings
2. Closeout Submittals
3. Substantial Completion and Final Inspection
4. Permit Closure and Transfer
5. Final Acceptance of the Work
6. Warranties

1.2 PROJECT RECORD DRAWINGS

A. Maintain one complete full-size set of contract drawings and one full-size set of vendor-supplied drawings. Clearly mark changes, deletions, and additions using National Park Service (NPS) drafting standards to show actual construction conditions. Show additions in red, deletions in green and special instructions in blue.

B. Keep record drawings current. Make record drawings available to Contracting Officer (CO) for inspection at the time of monthly progress payment requests. If project record drawings are not current, Contracting Officer may retain an appropriate amount of progress payment.

C. Submit complete record drawings on completion of total project. Include shop drawings, sketches, and additional drawings to be included in final set, with clear instructions showing the location of these drawings.

1.3 CLOSEOUT SUBMITTALS

A. A list of closeout requirements has been attached at the end of the Division 1 Specifications for your convenience. The intent is to provide an overall summary of requirements and not a comprehensive list. Terms and conditions of the contract require satisfaction of requirements of individual specification sections regardless of what is shown on the list. Submit the following before requesting final inspection:

1. Specific warranties, guarantees, workmanship bonds, final certifications, and similar documents.
2. Project Record Documents, operation and maintenance manuals, final completion construction digital images recorded on CD-R (compact disc-recordable) or DVD-R (digital video disc-recordable) with index and descriptions, and similar final record information.
3. Environmental Record Documents: as follows:
   a. Material Safety Data Sheet (MSDS) Data: As specified in Section 01 67 00

b. Final Summary of Solid Waste Disposal and Diversion: As specified in Section 01 74 19.

4. Posted Operating Instructions: As specified in individual sections. Furnish operating instructions attached to or posted adjacent to equipment. Include wiring diagrams, control diagrams, control sequence, start-up, adjustment, operation, lubrication, shut-down, safety precautions, procedures in the event of equipment failure, and other items of instruction recommended by manufacturer.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Contracting Officer. Label with manufacturer's name and model number where applicable.

   a. Special Tools: One set of special tools required to operate, adjust, dismantle, or repair equipment. Special tools are those not normally found in possession of mechanics or maintenance personnel.
6. Approved pre-functional checklists and functional performance testing reports from commissioning documentation.

7. Test and balance report.
8. Terminate and remove temporary facilities, mockups, construction tools, and similar elements from Project site, complete final cleaning requirements, including touchup painting.
9. Touch up and repair and restore marred exposed finishes to eliminate visual defects.

1.4 FINAL INSPECTION, SUBSTANTIAL COMPLETION AND ACCEPTANCE PROCEDURES

A. Request final inspection in writing when project or designated portion of project is substantially complete. Contracting Officer will proceed with inspection within 10 days of receipt of written request or will advise Contractor of items that prevent project from being substantially complete.

B. If work is determined substantially complete, following final inspection, Contracting Officer will prepare Punch List and issue a Letter of Substantial Completion.

C. If work is not determined substantially complete following final inspection, Contracting Officer will notify Contractor in writing. Contractor shall request new final inspection after completing work. Re-inspection costs may be charged against Contractor in accordance with Inspection of Construction contract clause.

D. Contractor shall complete Punch List within 30 calendar days, documented weather permitting.

E. If Contractor completes items of work on Punch List and contractually required items, Contracting Officer will issue Letter of final acceptance of work.

F. If Contractor fails to complete work within the time frame, Contracting Officer may correct work with an appropriate reduction in contract price or charge for re-inspection costs in accordance with Inspection of Construction contract clause.

1.5 PERMIT CLOSURE AND TRANSFER

A. When work covered by the permits is complete, create list of tasks required to close or transfer permits to Park. Submit to Contracting Officer for approval.

B. After substantial completion and Punch List completion, permits shall be closed and documented by Agency(ies) with Jurisdiction for the permit.

C. If responsibility for permits is to be transferred to Park, Park shall be informed of permit provisions completed and responsibilities transferring to Park staff.

1.6 WARRANTIES

A. Submittal Time: Submit written warranties on request of Contracting Officer for designated portions of Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11 inch (215 by 280 millimeters) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify product or installation. Provide typed description of product or installation, including name of product and name, address, and telephone number of Installer.
3. Identify each binder on front and spine with typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF (portable document format) file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. Provide additional copies of each warranty in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See Division 1 Specification Section "Execution" for information on cleaning agents.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Conduct final cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to dirt-free condition, free of stains, films, and foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and vision-obscuring materials. Replace chipped or broken glass and transparent materials. Polish mirrors and glass.
i. Remove labels that are not permanent.
j. Touch up, repair, and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" (Underwriters Laboratories) and similar labels, including mechanical and electrical nameplates.

k. Ensure trails and walkways are restored to equal or better visual quality as prior to construction, especially for historic paths like the Tlingit Trail or other comparable natural areas, as detailed in Section .
l. Leave Project clean and ready for occupancy.

C. Waste Disposal: Comply with requirements of Section 01 74 19 "Construction Waste Management and Disposal."

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including:

1. Manuals, general
2. Emergency manuals
3. Operation manuals for systems, subsystems, and equipment
4. Maintenance manuals for care and maintenance of water distribution system and HDPE water pipes and appurtenances

B. See Divisions 2 through 49 Sections for additional operation and maintenance manual requirements for Work in those Sections.

1.2 SUBMITTALS

A. Manual: Submit two copies of each manual in draft form or one electronic copy at least 15 days before final inspection. Contracting Officer (CO) will return copy or edit version with comments within 15 days of receipt.

B. Format: Submit operations and maintenance manuals in following format:

1. PDF (portable document format) electronic file. Assemble each manual into composite electronically indexed file. Submit on digital media acceptable to Contracting Officer.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

2. Hard copy manual: In accordance with Part 2 of this Section.

3. Correct or modify each manual to comply with Contracting Officers comments. Submit 4 copies of each corrected manual within 15 days of receipt of Contracting Officers comments.

1.3 QUALITY ASSURANCE

A. Coordinate with Section 01 91 14 "Total Building Commissioning." Commissioning Agent shall review Operation and Maintenance Manuals for commissioned systems.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize manual into separate sections for each system and subsystem, and separate sections for each piece of equipment not part of a system. Manual shall contain title page, table of contents, and manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include:

1. Project Title
2. Location
3. Park
4. Contract Number
5. Prime Contractors Name and Address
6. Date of Substantial Completion
7. Binder Volume Number

C. Table of Contents: List each product included in manual, identified by product name, indexed to content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. Assemble instructions for subsystems, equipment, and components of one system into a single binder if needed.

1. Binders: White, commercial quality, hard back, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2 by 11 inch (215 by 280 millimeter) paper; with clear plastic window sleeve on front and spine to hold label describing contents and pockets inside covers to hold folded oversize sheets.

a. Cover Sheet: Identify binders on front and spine, with project title, location, park, contract number, prime contractor's name and address, date of substantial completion, and binder volume number. Insert cover sheet into clear plastic view pocket on front of binder. Insert sheet into clear plastic view pocket on spine with title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Data: Fill binders to no more than 75 percent of capacity. Punch holes shall not obscure any data. When contents of a single tabbed section cover more than one item, provide colored paper sheets to separate the data for each item.

a. Manufacturers' Data: Provide originals for color or copyrighted data. Black and white data may be originals or clean, good quality reproductions. No copies produced by facsimile transmission and sheets with stamps, such as submittal approval stamps. Include only sheets that apply to items installed; cross out inapplicable data.
b. Vendor Furnished As-Built Drawings: Maximum 24 inch by 36 inch sheets with minimum character or lettering size of 1/8 inch. Reduced-size reproductions may be provided instead of full-size drawings if reproductions are clear and legible. If

reduced-size drawings are used, identify as "REDUCED SIZE" and provide graphic scales, if applicable.

c. Custom Data: Data supplemented by drawings and schematics necessary to describe systems adequately.
d. Equipment Data Sheet: Data, using form at end of this section.
e. Schedules: Schedules reflecting final, as-installed conditions.
f. Poorly reproduced or illegible data will be rejected.

3. Dividers: Divider sheets with Mylar reinforced edges and pre-printed numbered tabs aligned with numbers and title lines on index sheet. Include typed list of products and major components of equipment included in section on each divider, cross-referenced to Specification Section number and title of Project Manual.
4. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 EMERGENCY MANUALS

A. Content: Organize manual into separate section for type of emergency, emergency instructions, and emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component for fire, flood, gas leak, water leak, power failure, water outage, equipment failure, and chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of National Park Service (NPS) operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include instructions on stopping, shutdown instructions for each type of emergency, operating instructions for conditions outside normal operating limits, and required sequences for electric or electronic systems.

2.3 OPERATION AND MAINTENANCE MANUALS

A. Operation Requirements

1. Content: In addition to requirements in Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

2. Descriptions: Include:

    a. Product name and model number
    b. Manufacturer's name
    c. Equipment identification with serial number of each component
    d. Equipment function
    e. Operating characteristics
    f. Limiting conditions
    g. Performance curves
    h. Engineering data and tests
    i. Complete nomenclature and number of replacement parts

3. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
4. Systems and Equipment Controls: Describe sequence of operation, and diagram controls as installed.
5. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

B. Maintenance Requirements for Systems and Equipment

1. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, and equipment data sheets as described below.
2. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
3. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
4. Maintenance Procedures: Test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions, detailing essential maintenance and environmental procedures.
5. Maintenance and Service Schedules: Service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
6. Spare Parts List and Source Information: Lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
7. Warranties and Bonds: Copies of warranties and bonds and lists of circumstances and conditions that affect validity of warranties or bonds.

2.4 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include:

1. Product name and model number
2. Manufacturer's name
3. Material and chemical composition
4. Reordering information for specially manufactured products

D. Environmental Requirements

1. Identify environmentally preferable products incorporated into Project. Include: product model; manufacturer’s name, address, phone, and website; and local technical representative.

a. Verify plastic products to be incorporated into Project are labeled in accordance with ASTM D1972. Where products are not labeled, provide product data indicating polymeric information in Operation and Maintenance Manual.

1) Type 1: Polyethylene Terephthalate (PET, PETE)
2) Type 2: High Density Polyethylene (HDPE)
3) Type 3: Vinyl (Polyvinyl Chloride or PVC)
4) Type 4: Low Density Polyethylene (LDPE)
5) Type 5: Polypropylene (PP)
6) Type 6: Polystyrene (PS)
7) Type 7: Other. Use of this code indicates that package in question is made with a resin other than the six listed above or is made of more than one resin listed above and used in a multi-layer combination.

b. Describe maintenance procedures associated with environmentally preferable materials and systems. Provide cleaning recommendations in accordance with ASTM E1971 and approved Integrated Pest Management (IPM) plan.

1) Include potential environmental impacts of recommended maintenance procedures and materials.
2) Include potential indoor air quality impacts of recommended maintenance procedures and materials.
3) Where proposed maintenance procedures incorporate composting of plastics, assess potential effect of each type of plastic to be included in composting process in accordance with ASTM D5509 or ASTM D6002

c. Material Safety Data Sheets (MSDS): Include MSDSs as specified.

2. Develop environmental management programs for facility as follows:

    a. Waste management program: Develop in accordance with ASTM E1609. Maximize use of source reduction and recycling procedures outlined in ASTM D5834.
    b. Indoor Air Quality (IAQ) management program: Provide for evaluation of indoor Carbon Dioxide concentrations in accordance with ASTM D6245. Provide for evaluation of VOCs (volatile organic compounds) in indoor air in accordance with ASTM D6345.
    c. Water management program: Develop water monitoring program for surface and ground water on project site in accordance with ASTM D5851 and consistent with water management program utilized during construction operations.

E. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that affect validity of warranties or bonds.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers’ Maintenance Documentation: Manufacturers’ maintenance documentation including the following information for each component part or piece of equipment:

    1. Standard maintenance instructions and bulletins.
    2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
    3. Identification and nomenclature of parts and components.
    4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following and items detailing essential maintenance procedures:

    1. Test and inspection instructions
    2. Troubleshooting guide
    3. Precautions against improper maintenance

4. Disassembly; component removal, repair, and replacement; and reassembly instructions
5. Aligning, adjusting, and checking instructions
6. Demonstration and training video recording

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that affect validity of warranties or bonds.

1. Include procedures and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 GENERAL

A. At start of project, begin accumulating operation and maintenance data and initiate index. Install and index data in binders within 30 days after delivery of items. As custom written data and test results are produced, add to operation and maintenance data file.

B. List of Operation and Maintenance requirements has been attached at end of the Division 1 Specifications for your convenience. Intent is to provide an overall summary of requirements and not a comprehensive list. Terms and conditions of the contract require satisfaction of requirements of individual specification sections regardless of what is shown on the list.

C. Keep operation and maintenance data current. Make operation and maintenance binders available to Contracting Officer for inspection at time of monthly progress payment requests. If operation and maintenance binders are not current, Contracting Officer may retain an appropriate amount of the progress payment.

3.2 MANUAL PREPARATION

A. Manual Types

1. Emergency Manual: Assemble complete set of emergency information indicating procedures for use by emergency personnel and by NPS operating personnel for types of emergencies indicated.
2. Product Maintenance Manual: Assemble complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into Work.
3. Operation and Maintenance Manuals: Assemble complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

B. Manual Contents: Including:

1. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark sheet to identify product or component incorporated into Work. If data include more than one item in a tabular format, identify each item using appropriate references from Contract Documents. Identify data applicable to Work and delete references to information not applicable.
2. Custom Written Data: For data not in manufacturer's standard literature, provide text, drawings, and schematics specifically applicable to installed systems. Include step-by-step descriptions of operating procedures; identification of individual components and their functions; descriptions of how system components relate to one another and operate together to accomplish a common process or function; and sequence of operation for system control circuits. For seasonally operated systems, provide start-up and shutdown instructions.
3. Equipment Data Sheets: For each item of equipment included in operation and maintenance data, provide Equipment Data Sheet using form at the end of this section. For equipment consisting of a driven machine and a driver (for example, a pump and a motor), equipment data shall cover both the driven machine and the driver. For similar type equipment (for example, multiple exhaust fans of the same model and type), provide a single equipment data sheet with an attached schedule listing individual equipment items.
4. Vendor Furnished As-Built Drawings: Provide for each electrical and each mechanical control system.

    a. For each control system, provide control circuit schematic drawings. Identify each wire and terminal block number. Show terminal numbers on control devices. Show control wires and devices remote from control panel.
    b. For each control panel, provide general arrangement drawing showing location of each control component and terminal block on the panel front and interior. Include materials list of panel-mounted control components as well as field-installed control components remote from the panel, identifying components, manufacturer, model number, and initial set points or sensing ranges of devices where applicable.
    c. For packaged equipment systems, provide general arrangement drawings showing interrelationships of the various items of equipment and components.
    d. In addition to control wiring schematic, provide power wiring schematic drawing showing power flow to each motor. Identify each power conductor. Show over-current protection and motor starting devices.

C. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

Closeout and Operation & Maintenance (O&M) Requirements **Template**

National Park Service (NPS) - Denver Service Center (DSC) | 1-27-21

Topic	Specification Section	Requirement	Submittal Date	Completed	Received by Park
Project Record Drawings	01770	Final Project Record Drawings.			
System Demonstration and Training					
Tools Spare Parts Equipment					
Extra Stock					
Reports					
Keys & Keying Schedule					
O&M Data Warranties Guarantees					

Topic	Specification Section	Requirement	Submittal Date	Completed	Received by Park

This page was intentionally left blank

Closeout and Operation & Maintenance (O&M) Requirements **Sample**

National Park Service (NPS) - Denver Service Center (DSC) | 1-27-21

Topic	Specification Section	Requirement	Submittal Date	Completed	Received by Park
Project Record Drawings	01770	Final Project Record Drawings.			
System Demonstration and Training	15900	Mechanical equipment control system DDC (Direct Digital Control) training.			
	16720	Fire alarm system demonstration.			
	17000	Telecommunications system training.			
Tools Spare Parts Equipment	02515	Two curb stop wrenches with T-handles seven feet in length.			
	02512	One six inch gate valve (type used on water main).			
	02531	One ten horsepower grinder pump (type and configuration as specified).			
Extra Stock	09870	Two gallons of wall paint (forest green). One gallon of trim paint (battleship grey).			
	10800	Twelve each of wall and floor tiles used in the restrooms.			
Reports	07540	EIP and PVC (Ethylene-Interpolymer and Polyvinyl Chloride) Thermoplastic roofing manufacturer's inspection report.			
	07532	Renovation of CSPE (Chlorosulfonated Polyethylene Polymer) membrane roofing, manufacturer's inspection report.			
	15680	HVAC (heating, ventilation & air conditioning) Test and balance report.			
Keys & Keying Schedule	08710	Instructions for cylindrical lock sets, door closers, and panic exit devices.			
	08711	Instructions for card key lock system and software.			
	08710	Keying schedule.			
O&M Data Warranties Guarantees	02512	Gate valves, O&M data for gate and post indicator valves.			
	02515	O&M data for water meter.			
	02517	O&M data for fire hydrants.			
	07511	Built-up asphalt roofing with five year guarantee.			
	07620	Flashing and sheet metal with five year guarantee.			
	07810	Tubular skylights with ten year manufacturer's guarantee.			
	08211	Flush wood doors with manufacturer's two year guarantee.			
	09680	Kowski carpet with five year warranty.			
	15480	O&M data for propane water heater.			
	15733	Air cooled air condition units with manufacturer's five year guarantee on compressor and two year warranty on refrigerant loss.			

SECTION 02 41 00 – DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of removing and disposing of existing pavement, concrete curb and sidewalk along with any structures and equipment designated for removal in the construction drawings.

1.2 MATERIAL OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Contracting Officer that may be uncovered during demolition remain the property of Contracting Officer.
   1. Carefully salvage in a manner to prevent damage and promptly return to Contracting Officer.

C. Legally recycle or dispose of materials taking care to record and document with written receipts.

1.3 PRECONSTRUCTION MEETING

A. Before demolition commences, pre-demolition discussions will occur at a pre-construction meeting.

1.4 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control. Indicate proposed locations and construction of barriers.

1.5 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Contracting Officer as far as practical.

B. Hazardous Materials: It is unknown if hazardous materials will be encountered in the Work. If available, the Contracting Officer will provide Hazardous Materials Surveys prior to bid.
   1. If material suspected of containing hazardous materials are encountered, do not disturb; immediately notify Contracting Officer.

C. On-site storage or sale of removed items or materials is not permitted.

D. Arrange demolition schedule so as not to interfere with Contracting Officer's on-site operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that active underground utilities will not be disrupted before starting demolition operations.

B. If services/systems are required to be continued during work provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

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. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."

B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

C. Existing Utilities:
   1. Locate existing utilities where Project is located as specified in Section 01 11 00 “Summary of Work” and Section 01 73 40 “Execution” before site clearing and demolition.
   2. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   3. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by the Government and authorities having jurisdiction. Comply with requirements for existing services/systems interruptions specified in Section 01 11 00 "Summary of Work."

3.3 PROTECTION

A. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

B. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 50 00 "Temporary Facilities and Controls."
   1. Protect adjacent buildings and facilities from damage due to demolition activities.
   2. Protect existing site improvements, appurtenances, and landscaping to remain.

C. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION

A. General: Demolish indicated structures and site improvements completely. Use methods required to complete the Work within limitations of governing regulations.

B. Site Access and Temporary Controls: Conduct demolition and site improvements 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 streets, walks, walkways, or other adjacent occupied or used facilities without permission from Contracting Officer and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
   2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

C. Explosives: Use of explosives is not permitted.

D. Utility lines and appurtenances
   1. The Park will arrange to shut off indicated NPS owned services/systems when requested by Contractor.
   2. Arrange to shut off utilities with utility companies, if needed.
   3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems.
   4. Disconnect, demolish, remove or abandon in-place utilities and components.
      a. Existing Utility Lines/Services to Remain: Maintain utility lines/services indicated to remain and protect them against damage.
      b. Utility Lines to be Removed: Completely remove and dispose of existing lines if they interfere with installation of new lines. Provide temporary connections as needed to maintain service until new system is tested and operational. Beyond these limits, existing lines may be abandoned in-place as specified below.
      c. Utility Lines to be Abandoned: Drain piping and cap or plug piping with same or compatible piping material or concrete and leave in-place.
      d. Equipment to Be Removed: Disconnect and cap services and remove equipment.
      e. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
      f. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to the Park.
      g. Appurtenances such as valves, valve boxes, hydrants, meters and meter pits and cleanouts: All pipes and appurtenances which extend within two feet of finished grade must be completely removed and disposed of.
   5. Asbestos Cement Piping
      a. The Contractor is responsible for complying with all applicable federal, state, and local regulations for asbestos cement pipe for cutting of pipe (and disposal if required), and worker training and safety.

b. The Contractor shall properly dispose of all pipe material removed as part of this contract in accordance with local, State and Federal regulations.

E. Below-Grade Areas: Completely fill below-grade areas and voids resulting from demolition operations with satisfactory soil materials according to backfill requirements in Section 31 00 00 - Earthwork.

F. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

G. Promptly repair damage to adjacent structures caused by demolition operations.

3.5 CLEANING

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction. and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."

B. Do not burn demolished materials.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

END OF SECTION 02 41 00

SECTION 31 05 25 – UTILITY LINE MARKING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work of this section consists of furnishing and installing utility line marking.

1.2 SUBMITTALS

A. As specified in Section 01 33 23.

B. Cutsheets: Marking tape and tracer wire.

C. Samples: 24-inch strips of marking tape and 2 markers.

D. Certification that the materials used in the tape fabrication meet the requirements of this section.

PART 2 - PRODUCTS

2.1 MARKING TAPE

A. Construction: Polyethylene film, 4 mil minimum thickness, not less than 3 inches wide.

B. Imprint: 3/4-inch or larger bold black letters.

C. Legend: Identify buried utility line tape with imprints such as "Caution: Water Line Below". Repeat identification at approximately 24-inch intervals. Marking tape shall be provided for all utilities (water, electrical, etc.)

D. Background Color: Safety Precaution Blue shall be used for water lines.

2.2 TRACER WIRE

A. Install electrically continuous tracer wire with access points as described hereinto be used for locating pipe with an electronic pipe locator after installation. Tracer wire shall be installed on all water mains and services.

B. Tracer wire color shall be blue for all water construction.

C. All Tracer wire shall be #12 wire.

D. Contractor shall perform a continuity test on all tracer wire in the presence of the Contracting Officer. If the tracer wire is found to be not continuous after testing, Contractor shall repair or replace the failed segment of the wire at no additional expense to the Government.

E. Tracer Wire Installation Requirements:

1. Tracer wire shall be installed on all water mains and services. The wire shall be installed in such a manner as to be able to properly tracer all mains and services without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.
2. Tracer wire access points shall in general be no more than one thousand (1,000) feet.
3. Tracer wire shall be laid flat and securely affixed to the pipe at 10-foot intervals. The wire shall be protected from damage during the execution of the works. No

breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At service saddles, the tracer wire shall not be allowed to be placed between the saddle and the main.

4. Except for approved spliced-in connections, tracer wire shall be continuous and without splices from each tracer wire access point. Where any approved spliced in connections occur, watertight connectors shall be used to provide electrical continuity.
5. At all repair locations where there is existing tracer wire, the tracer wire shall be properly reconnected and spliced as outlined above.

PART 3 - EXECUTION

3.1 MARKING TAPE

A. Install tape in backfill directly over each buried utility line as shown. Place tape during final backfilling.

B. Where utilities are buried in a common trench, identify each line by a separate warning tape. Bury tapes side by side directly over the applicable line.

END OF SECTION 31 05 25

SECTION 31 10 00 – SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of soil stripping and stockpiling, select tree removal, and vegetative removal where necessary for the installation of the new water distribution piping, water meter manholes, and any other appurtenances.

1.2 RELATED SECTIONS

A. SECTION 31 23 00 “Earthwork”

1.3 REGULATORY REQUIREMENTS

A. Conform to Division 01 requirements for coordinating clearing work and disposal of debris.

1.4 SUBMITTALS

A. Site Clearing Plan:
   1. Submit fourteen (14) days prior to beginning any clearing and grubbing.
   2. Indicate area to be cleared including the number of trees, their diameter(s), and species.
   3. Indicate stockpile locations for topsoil.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil shall consist of natural onsite ground cover. Limited topsoil depth is estimated to be 4 inches thick; however, the extents to topsoil salvage shall be approved by the Contracting Officer.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Protection
   1. Locate and protect all above-ground and below-ground utilities, or relocate as directed by Division 01 and the Contract.
   2. Protect benchmarks and survey monuments from damage and displacement.
   3. Protect land outside of construction limits.
   4. Protect existing roads from damage.
   5. Retain, protect, and water any desirable trees or vegetation on or adjacent to the Project site using the following procedures: a. Existing trees not designated for removal should be protected before clearing and grubbing operations begin:
      a. Protection should consist of a highly visible barrier placed at or outside the drip line of the tree(s).
         1) Unless approved by the Contracting Officer (COR), no equipment, vehicles, building materials, chemicals, stockpiles, or debris shall be placed inside the protection barriers.
         2) Before the Contractor leaves the site, all existing trees which have been significantly damaged due to construction activities, as determined by the

Contracting Officer, shall be replaced and/or repaired by a certified arborist at the expense of the Contractor.

3) No changes in grade should be made within the protection area around trees.
4) Should excavation damage or break roots greater than 1 inch in diameter, make a clean saw cut through the undamaged portion of the root behind the break, perpendicular to the root.
5) If required by the Contracting Officer, hire an approved tree service to trim trees prior to beginning excavation.

6. The Contractor is responsible for damage resulting from construction operations.
7. Take reasonable care to avoid damage to streams and lakes adjacent to the construction area.
8. Preserve and protect all vegetation and ground cover not within the construction area, including areas not requiring grading, as directed.

B. Removal and Disposal
1. Complete clearing and grubbing to the limits defined by a line drawn as shown on the Contract Documents or as directed.
2. Paint cut and scarred retained trees or shrubs with an asphalt-based paint prepared specifically for tree surgery.
3. Unless otherwise provided, all merchantable timber in the clearing area not removed from the project area prior to the beginning of construction becomes the property of the Contractor.
4. Remove all brush and shrubs from the site, including the roots. Dispose of the shrubs and brush off-site at a location provided by the Contractor. Disposal of brush and shrubs by burning or burial in backfill or trenches must be approved by the Contracting Officer.
5. Strip all soils, heavy growths of grass, and sod that comprise the organic root-zone. Complete stripping to a depth of 4 inches or as recommended by the Contracting Officer (C.O.). Stockpile the stripped material to be used for backfilling in cut and fill areas or areas disturbed by construction.
6. Unless otherwise directed, remove all stumps within the clearing limits.
7. Dispose of materials at locations that comply with all Federal, State, and Local Regulations and Division 01 requirements.

C. Backfilling and Restoration
1. For areas where trees, stumps, and roots are removed, backfill the excavated areas with material that supports restoration of the site to its pre-clearing condition. The Contractor shall use topsoil from the site where available and suitable. The topsoil stockpiled during clearing operations may be used to fill in root ball areas and disturbed areas, provided the material meets the needs of restoration.
2. If the topsoil is insufficient, the Contractor shall coordinate with the NPS Terrestrial Ecologist to test and approve any additional bedding material sourced for backfilling. Only approved materials may be used.
3. The Contractor shall ensure that backfilled areas are compacted as necessary to prevent settling and ensure stable conditions for revegetation efforts.

D. Cleanup
1. Upon completion of site work and the Project, clean the entire work area. Remove all excess excavated material, rocks, boulders, brush, trees, pipe, or debris of any type from the site and dispose of it at a site acceptable to Federal, State, and Local Regulations and Division 01 requirements.

3.2 TOPSOIL

A. Topsoil within the limits of the Project shall be salvaged prior to beginning excavating, fill or hauling, operations by excavating topsoil and stockpiling the material at designated locations on drawings or as designated by Contracting Officer in a manner that will minimize sediment damage, and not obstruct natural drainage.

B. Salvaged topsoil exceeding the quantity required under the contract shall be disposed of at contractor's expense.

3.3 STOCKPILE

A. No soil stockpile shall exceed ten (10) feet in height. Topsoil stockpile must be placed at a location onsite approved by the Contracting Officer.

B. All topsoil stockpiles shall be protected from sediment transport by surface roughening, watering, and perimeter silt fencing.

C. Any topsoil stockpile remaining longer than 60 days shall be seeded with a sterile temporary cover or the approved specified final seed mixture.
   1. The sterile temporary cover basis of design is Regreen, and has the following salient characteristics:
      a. Developed for cover or nurse crop and erosion control applications where native seed is being used.
      b. A cross between annual wheat and perennial wheat grass.
      c. Does not compete with the native species during the establishment phase.
      d. A sterile hybrid that will not set viable seed in the absence of outside wheat pollen.
      e. Works with all types of soil moisture and drought tolerant.

END OF SECTION 31 10 00

This page is intentionally left blank

SECTION 31 11 01 – ROCK EXCAVATION

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Drilling, splitting, disposal, and replacement of Rock.

B. The payment for Rock Excavation requires a field evaluation of the conditions encountered during the execution of the work, prior written approval of the Contracting Officer, and potentially the use of surveying methods to determine quantities removed.

1.2 DEFINITIONS

A. Rock (General): Removal and disposal of rock material occurring as boulders with diameter larger than three feet or in beds, ledges, unstratified masses, and conglomerate deposits and which, in the opinion of the Contracting Officer, cannot be removed without the aid of systematic drilling or splitting. Drilling or splitting of difficult material in order to increase productivity will not be cause for identification of material as Rock. If blasting is required, contact COR prior to completing.

B. Mass Rock: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a single-toothed ripper drawn by a crawler tractor having a minimum draw bar pull rating of not less than 80,000 pounds usable pull (e.g., Caterpillar D-8 or larger).

1.3 SUBMITTALS

A. The Contractor shall submit to the Contracting Officer a complete list of major equipment to be used in the execution of the work, to include manufacturer's name, model number and year of manufacture. For excavating equipment, the Contractor shall also submit a copy of the manufacturer's printed performance specifications for the equipment to be used. All information shall be submitted within seven days after the issuance of the Notice to Proceed.

B. The Contractor shall submit, for approval by the Contracting Officer, a list of subcontractors to be used during any drilling or splitting operations.

C. If splitting by chemical methods is required and/or anticipated, the Contractor shall submit to the Contracting Officer complete manufacturer's product data, including standard printed information concerning the proper use, storage and disposal of the material.

1.4 PROCEDURES

A. Notification: If, during the execution of the work, the Contractor encounters material believed to be classified as Rock, he shall immediately notify the Contracting Officer, provided however that a reasonable attempt has already been made to remove the material with excavating equipment equal to, and outfitted as, that hereinbefore specified. The Contracting Officer shall promptly investigate the conditions.

B. Classification: The Contractor shall demonstrate, in the presence of the Contracting Officer or the Contracting Officer’s Representative, that the material encountered cannot be removed with the properly outfitted specified equipment. Any claims for delay in the classification of the material that result from the Contractor's failure to have the proper equipment on site will not be considered.

C. Measurement: The volume of material eligible for payment as Rock will be based on pre- and post-surveys of the excavation. All surveys will be performed by the Contracting Officer or the Contracting Officer's Representative. The following methods will be used to determine payment quantities. The measurement method, or methods, used will be selected by the Contracting Officer depending on the specific program employed by the Contractor.
   1. Direct Measurement: This method involves the performance of a survey along the exposed top surface of the Rock after the removal of overburden material.
   2. Indirect Measurement: This method involves the determination of the unexposed top surface of the Rock by monitoring the drilling of test holes in the area to be excavated. The survey will be conducted along the ground surface and the depth to the Rock surface will be determined by the measurement of the drill shaft. The spacing of test holes will not exceed fifty feet. The implementation of this method will follow the classification of Rock in test pits excavated at reasonable intervals in the area of work. The depth measurements will be confirmed by the Contracting Officer by inspection of the exposed soil/rock interface following excavation of the trench.
   3. Volume Calculations: The survey data obtained by either method will be used in conjunction with the certified record survey information of the line and grade of the finished work to determine the quantity of Rock removed. The limits of payment for trench excavation (trench width and bedding depth below pipe invert) will be based on the standard dimensions as detailed on the contract drawings and will not be measured. No allowances will be made for Rock beyond the specified payment limits for additional excavation for working space, pump sumps, drainage ditches or other like purposes.

D. Restoration: The Contractor shall restore or replace utilities, equipment, buildings, or structures damaged during rock excavation operations at no cost to the Government.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 BLASTING

A. Blasting shall not be permitted for this project.

3.2 SPLITTING

A. The splitting of Rock by mechanical methods may be used. These areas shall be identified by the Contracting Officer before the initiation of the splitting program.

3.3 DISPOSAL AND REPLACEMENT OF ROCK

A. Use excavated rock in backfilling trenches above the pipe envelope subject to the following limitations:
   1. Do not use pieces of rock larger than 6 inches.
   2. Do not allow rock quantities used in backfill in any location to result in the formation of voids.
   3. Do not place rock backfill within 16 inches of surface of finish grade or within two feet of the top of the pipe.
   4. Specified density of compacted backfill must be attainable.
   5. Do not use any rock in backfill under roadways and other paved areas.

B. Rock disposed of shall be replaced by available surplus excavation. Approved borrow to supply any deficiency of trench backfill shall be provided by the Contractor for no additional compensation.

C. If the excavated rock is considered by the Contracting Officer as acceptable material for the stabilization of slopes, creek banks, channels, etc., the rock may be used in locations where rip-rap is called for on the Drawings. This use will be considered as disposal of the excavated rock and no payment will be made for rip-rap.

END OF SECTION 31 11 01

This page was intentionally left blank

SECTION 31 11 23 – AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of placing one or more base courses composed of crushed gravel, stone or other similar materials meeting the gradation and other quality criteria specified herein. Specifically for base course under the asphalt and concrete replacement and surfacing for the gravel service road accessing the water tank.

1.2 REFERENCES

A. AASHTO - American Association of State Highway and Transportation Officials, including documents referenced therein, form a part of this Section to the extent designated herein.

1.3 SUBMITTALS

A. Submit gradations, moisture density curves and other test results for sources to be used for base materials prior to delivery to the site.

PART 2 - PRODUCTS

2.1 GENERAL

A. Furnish aggregate base material meeting the applicable aggregate quality requirements.

2.2 CRUSHED BASE MATERIAL / CRUSHED AGGREGATE

A. Consists of both fine and coarse fragments of crushed stone or crushed gravel, and/or natural gravel, and when approved, blended with sand, finely crushed stone, crusher screenings, recycled concrete and/or asphalt or other similar materials.

B. Use crushed stone or gravel consisting of hard, durable particles of fragments of stone, free of excess of flat, elongated, soft or disintegrated pieces, dirt, or other deleterious matter, and having a percent of wear of not exceeding 50 at 500 revolutions when tested under AASHTO T96.

C. Crush material so that the percentage of fractured particles in the finished product is as constant and uniform as practical. Crush to produce material where at least 35 percent of the material retained on the No. 4 sieve has at least one fractured face.

D. Incorporate all material produced in the crushing operation and passing the No. 4 mesh sieve into the base material necessary to meet the gradation requirements.

2.3 GRADATION

A. As determined by AASHTO Methods T11 and T27, furnish material for the grading specified in the contract documents including binder or filler, which may have been added at the plant or at the site, meeting the requirements of that grading in the Table of Gradations below:

TABLE OF GRADATIONS

PERCENTAGES BY WEIGHT PASSING SQUARE MESH SIEVE

Passing	¾" Minus
1 ½ Inch	
1 Inch	
¾ Inch	100
½ Inch	–
No. 4 Sieve	40 - 70
No. 10 Sieve	25 - 55
No. 200 Sieve	2 - 10

B. Up to 5% "oversized" material is permitted provided that the "oversized" material passes the screen size immediately larger than the top size specified. The produced material between the maximum screen opening and the No. 4 sieve shall be reasonable well graded.

C. That portion of the fine aggregate passing the No. 200 sieve must be less than 60 percent of that portion passing the No. 40 sieve.

D. The liquid limit for that portion of the fine aggregate passing a No. 40 sieve cannot exceed 25, nor the plasticity index exceed 6, as determined by AASHTO T89 and T90.

PART 3 - EXECUTION

3.1 GENERAL

A. Before placing the base course, smooth and shape the surface of the underlying subgrade, sub-base or base course to the cross section shown on the plans before placing the base course.

B. Do not place base course on a wet or muddy subgrade or sub-base course. Complete at least one area of finished and accepted subgrade, sub-base or underlying base before the placing of any base course.

3.2 PLACEMENT AND SPREADING

A. Mix and place the material in maximum 6 inches compacted layers unless otherwise approved. Deposit and spread each load of material on the prepared subgrade, or on a completed sub-base or base course layer continuously without interruption. Discontinue operating haul units over subgrade, or over any sub-base or base course completed if the haul units damage the subgrade, sub-base or base course.

B. Deposit and spread the material in a uniform layer, without segregation, to a loose depth so that when compacted, and making allowance for any filler to be blended on the road, the layer has the specified thickness.

C. Spread material using dump boards, spreader boxes, or vehicles equipped to distribute the material in a uniform layer. The material may be deposited in windrows mixed and spread as described below.

D. Construct each layer meeting these requirements. Blade smooth and thoroughly compact each layer as specified before placing the succeeding layer.

E. If segregation or moisture problems exist, or if the material was placed on the road in windrows, thoroughly blade-mix the material of the affected layer by alternately blading to the center and back to the edges of the street.

F. Uniformly add water, when required, on site and place in amounts required to compact the material as necessary to aid in densification and to limit segregation. Maintain an adequate water supply during the work. Assure the equipment used for watering is of the capacity and design to provide uniform water application.

3.3 FIELD DENSITY REQUIREMENTS

A. Compact placed material the full width by rolling with suitable tamping equipment or power rollers. Correct all irregularities or depressions that develop during rolling by loosening the material in these places and adding or removing material, as required.

B. Perform blading and compacting alternately as required or directed, to maintain a smooth, even, uniformly compacted surface until the final inspection. Along curbs, headers, manholes, and similar structures, and at all places not accessible to the roller, compact the base course material with suitable mechanical tampers or hand tampers to reach the compaction requirements.

C. Provide the watering and rolling required to obtain a minimum field density of 95 percent of maximum dry density as determined by AASHTO T99. No separate compensation is made for rolling and watering the base course other than the base course bid item or items listed on the contract documents.

D. Provide compaction tests at a frequency and locations defined in paragraph 1.4, A.3 within Section 31 23 00 – EARTHWORK.

END OF SECTION 31 11 23

This page was intentionally left blank.

SECTION 31 21 00 – TRENCH EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes excavation, trenching and backfilling for pipelines and appurtenances and:
   1. Site preparation, removal and disposal of debris from the excavation.
   2. Handling and storing materials for fill and backfill.
   3. Bracing, shoring and trench protection.
   4. Construction dewatering.
   5. Backfill, subgrade preparation.
   6. Final grading, site dressing and cleanup.

1.2 RELATED SECTIONS

A. The following is a list of SPECIFICATIONS which may be related to this section:
   1. Section 31 00 00 – Earthwork
   2. Section 31 10 00 – Site Clearing
   3. Section 33 12 13 – Water Distribution Systems

1.3 REFERENCES

A. Retain first paragraph below to prevent claims for unforeseen temporary facilities costs.

B. Current publications listed below form a part of this specification:

AASHTO T99	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5-lb (2.5kg) Rammer and 12-inch (305mm) Drop
ASTM D698	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5-lb (2.5kg) Rammer and 12-inch (305mm) Drop
AASHTO T310 / (ASTM D6938)	In-place density and water content of the soil and soil aggregate by Nuclear Method (Shallow Depth)
AASHTO T27 / (ASTM C136)	Sieve Analysis of Fine and Coarse Aggregate
AASHTO T89	Determining the Liquid Limit of Soils
AASHTO T90	Determining the Plastic Limit and Plasticity Index of Soils
ASTM D4318	Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils

1.4 SUBMITTALS

A. Material Submittals:
   1. Material quality test results including Type 1 Bedding gradation and plasticity index and Type 2 Bedding gradation.
   2. On-site and off-site borrow soils for laboratory maximum density and optimum moisture testing as specified in Section 31 00 00 “Earthwork.”

1.5 TESTING

A. Field Density Testing:
   1. In-place field density tests for quality assurance are at Owner expense meeting AASHTO T310 (ASTM D6938), Nuclear Densometer Methods. Quality assurance field density testing frequency is at the discretion of the Contracting Officer.
   2. Re-testing failing areas is at the expense of the Contractor.

3. At the direction of the Contracting Officer, provide necessary equipment and labor to excavate and replace materials for test holes up to 5 feet deep into the compacted backfill to allow testing below the surface of any layers covered without inspection and approval by the Contracting Officer.

B. Laboratory Maximum Density and Optimum Moisture:
   1. Quality assurance tests will be made by the Contracting Officer for each on-site natural soil or each source of off-site material, including borrow material, to determine the laboratory maximum density values and optimum compaction moisture content according to AASHTO T-99 or ASTM D698.

1.6 PREINSTALLATION CONFERENCE

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

PART 2 - PRODUCTS

2.1 PIPE BEDDING MATERIALS

A. Pipe Bedding and Backfill
   1. Pipe bedding material shall be a minimum of 6 inches placed beneath the pipe. The bedding shall extend a minimum of 12 inches to a maximum of 24 inches on either side of the pipe.
   2. Pipe bedding and embedment material shall consist of either ASTM C33 (gradation 67), graded gravel, or uniformly graded pea gravel. The allowable gradation for each material is provided below:

Sieve Size (Percent Passing by Weight)										
Material	1-inch	¾-inch	½-inch	⅜-inch	No. 4	No. 8	No.16	No.20	No. 100	No. 200
ASTM C33 (Gradation 67)	100	90-100	-	20-55	0-10	-	-	0	-	-
Graded Gravel	-	100	90-100	40-100	0-30	0-10	0-5	-	-	-
Uniformly Graded Pea Gravel	-	-	-	100	70-100	25-90	5-80	-	1-15	0-5
NOTES: Fraction passing the No. 4 sieve should have a liquid limit less than 25 and a plasticity index less than 5.										

2.2 TRENCH BACKFILL MATERIALS

A. Materials from Trench Excavation:
   1. Backfill material obtained from trench excavations must be free of cinders, ash, refuse, organic or frozen material, boulders, or other deleterious materials. Backfill materials and placement are further described in the Execution Section of this specification.

B. Imported Backfill Material:
   1. Imported backfill material is from borrow source(s) outside the Project limits and is used when, in the opinion of the Contracting Officer, an adequate volume of suitable backfill material is not available within the Project limits.
   2. Imported Backfill Materials must comply with the requirements of Section 2.2, A.

2.3 BLUE BOARD INSULATION

A. Insulation board shall be closed-cell extruded polystyrene boards (commonly known as blue boards) with minimum dimensions as shown in the Drawings. Insulation board shall be a minimum 2 inch thickness, have a 100 psi compressive strength, and an R-Value of at least 10.

2.4 DETECTABLE BURIED WARNING TAPE & TRACER WIRE

A. Detectable buried warning tape is to have a minimum 6 inch width and 5 mil thickness and a solid aluminum core running the full length and width of the tape enclosed in a color coded inert plastic jacket, impervious to alkalis, chemical reagents and solvents in the soil. The tape is to meet APWA/ULCC Color Code requirements and is to have a maximum 36 inch imprint.

B. Tracer Wire: Tracer wire to be twelve (12) gauge minimum solid copper with thermoplastic insulation recommended for direct burial. Wire connectors shall be watertight to provide electrical continuity.

PART 3 - EXECUTION

3.1 PROTECTION OF EXISTING PROPERTIES

A. General:
   1. Take precautions to protect all adjoining private and public property and facilities, including underground and overhead utilities, curbs, sidewalks, driveways, structures, and fences. Restore or replace all disturbed or damaged facilities to its original condition at Contractor's expense.
   2. Contact utility owners using the Alaska One Call System for utility locates before starting work. Protect the utilities exposed during the work and prevent damaging underground utilities adjacent to excavations. Immediately notify the Utility of any construction damage. Repairs of damage to marked utilities are at the expense of the Contractor.
   3. Protect existing water and sewer mains and water and sewer services from freezing at all times during construction.

B. Existing Utilities:
   1. NPS owns all utilities on the project site except for ACS (telecom) facilities. In the event that any existing NPS utilities are impacted by the Contractor's work, the Contractor shall be responsible for repairing any damaged NPS facilities. The Contractor is also responsible for locating and protecting NPS utilities during the course of construction.

2. For ACS (telecom) facilities, the Contractor is responsible for contacting ACS to have their utilities located and protected. If ACS facilities are impacted during construction, the Contractor shall notify ACS and arrange for repairs to be made by ACS. The Contractor shall bear the cost for any damage caused to ACS facilities.
3. The Contractor shall coordinate with the designated COR for any NPS utility issues. NPS will not be responsible for locating NPS utilities, and it is the Contractor's responsibility to ensure all utilities are properly located, protected, and repaired if damaged.

C. Existing Structures:
1. Prevent damage to existing buildings or structures in the work area. Repair all construction related damage to the satisfaction of the Contracting Officer.

D. Existing Overhead Utilities:
1. Use extreme caution to avoid conflict, contact or damage to overhead utilities during the work.

E. Exploratory Excavation:
1. Location of existing buried public utilities may need to be verified by exploratory excavation before construction. Work related to exploratory excavation is incidental and will not be paid for separately.
2. Exercise care to prevent damaging all utilities and repair any utility damage caused by exploratory excavation.

F. Pavement Removal and Stripping
1. Where trench excavation or appurtenant structure excavation requires removing curb and gutter, concrete sidewalks, asphalt concrete pavement (ACP), or Portland cement concrete pavement, cut the concrete or pavement in a straight line parallel to the excavation's edge using a spade-bitted air hammer, concrete saw, or other suitable equipment to produce a straight, square, and clean break. Re-cut edges broken during construction, before concrete or paving operations.
2. For trenches passing through existing pavement, cut the pavement along a neat vertical line at least 12 inches (30 cm) from the trench edge. Where the neat line cut is less than 3 feet (0.9 m) from the edge of the existing pavement, remove and replace the entire pavement section between the trench and the edge of the pavement.
3. For shoulder ACP repairs, the minimum required width for pavement removal and repair shall be 3 feet or as determined in coordination with the COR based on field conditions and project requirements.
4. Dispose of the asphalt concrete and/or Portland cement concrete debris off-site according to applicable state and local regulations

G. When excavating across existing paved roads or other developed surfaces, remove the surfacing material full depth and stockpile for inclusion as trench backfill or legally dispose of the surfacing material.

H. When excavating across cultivated or grassy areas, remove and conserve topsoil, and stockpile for future reuse on the Project according to Section 31 10 00, “Site Clearing”.

I. Reseed as specified all established vegetated areas cut by trenching or damaged during the construction as specified in Section 32 92 19, “Seeding,” to the satisfaction of the Contracting Officer.

3.2 TRENCH EXCAVATION

A. General:
   1. Meet current OSHA Safety and Health Standards for all excavation, trenching, shoring, and related work.
   2. Excavate at the specified locations for pipeline installations and appurtenant structures.
   3. Crossings under sidewalks or curbs may be made by tunneling, if approved by the Engineer. If a portion of a sidewalk or curb is removed, use a concrete saw to make joints, compact the backfill as specified, and replace the removed section with new concrete sidewalk or curb.
   4. During excavation, stockpile backfill materials away from the trench banks to assure trench wall stability. Stockpile excavated materials on only one side of the trench without obstructing existing fire hydrants, valves, manholes and other appurtenances. Assure surface drainage of adjoining areas is unobstructed. Coordinate with the Contracting Officer about where trench stockpiles will be located.
   5. Remove and dispose of all excess or unsuitable excavated materials.
   6. Prevent surface water from flowing into excavations. Promptly remove all water accumulating in trench excavations. Do not permit water to accumulate in any open trench. Remove and re-lay all pipe out of alignment or grade caused by trench flooding.
   7. Grade the trench bottoms to the specified lines and grades. Assure bedding material provides uniform bearing and support for each pipe section along its entire length. Excavate for bell and joints after the trench bedding is graded, limiting the excavation to the required length, depth, and width for making the particular type of joint used. Backfill over-excavations with Type 2 Bedding Material.
   8. The use of trench digging machinery is permitted, except in places where its operation is likely to cause damage to existing structures or features, in which case hand methods are to be employed.

B. Trench Dimensions:
   1. Excavate the trench according to dimensions indicated on the Drawings.

C. Soft or Unsuitable Trench Subgrade:
   1. When soft or unstable material is encountered at the trench subgrade which will not uniformly support the pipe, excavate the material to the depth directed by the Contracting Officer and backfill to trench subgrade elevation with Type 2 Pipe Bedding.

D. Site Damage Caused by Equipment:
   1. Restore all areas disturbed by construction equipment to original condition.

E. Shoring, Bracing, and Sheeting:
   1. Provide all shoring, bracing and tight sheeting required to prevent caving and protect workers, meeting current Occupational Safety and Health Act Requirements, and to protect adjacent property and structures.

F. Excavation for Appurtenances:
   1. Make excavations for manholes, structures and other appurtenances of the size and depth to permit compacting of backfill on all sides to the specified density. The requirements for removing water and other applicable portions of these specifications apply to excavation for appurtenances.

3.3 DEWATERING

A. Remove all ground water encountered in trench excavations. Do not place pipe, bedding or backfill materials below the groundwater elevation established by dewatering operations. The cost of dewatering operations is considered a part of the excavation cost.

B. Water pumped from dewatering operations must be filtered to ensure it is clear of sediment and debris prior to being discharged into any streams, water bodies, or areas such as Bartlett Cove. The Contractor shall ensure that all discharge complies with applicable water quality standards and any requirements set forth by the COR.

3.4 EXCAVATION STABILITY AND SAFETY

A. The stability of construction excavations and associated worker safety, including slope geometry and shoring/bracing considerations, are the responsibility of the Contractor. Meet current OSHA regulations.

3.5 TRENCH FILLING AND BACKFILLING

A. General:
   1. Backfill all trenches as specified immediately after grade, alignment and pipe jointing has been inspected and approved by the Contracting Officer.

B. Pipe Bedding Placement:
   1. Type 1 Bedding:
      a. Place Type 1 Pipe Bedding material 6 inches below the bottom of the pipe, around the pipe, and to 6” above the top of the pipe. Place in maximum lifts of 6 inches, using hand operated or other compaction methods without damaging or disturbing the pipe. Thoroughly compact each layer. Use special care to assure compaction under the pipe haunches.
      b. Place backfill material in equal lifts on both sides of the pipe for the full trench width. Take care to prevent migration of Type 1 Bedding into surrounding soils during placement and compaction.
   2. Type 2 Pipe Bedding:
      a. Use Type 2 Pipe Bedding described in Part 2 Products specified to replace unsuitable material encountered in the trench bottom, placing it from the bottom of the Type 1 Bedding material to the depth required to adequately support the pipe.

C. Trench Backfill:
   1. After the pipe bedding materials are placed and compacted as specified, backfill the trench. Use non-organic backfill material free of cinders, ash, refuse, organic or frozen material, boulders, or other deleterious materials. From the top of the Type 1 Pipe Bedding to 6 inches below the ground surface, or to the subgrade elevation, material containing rock up to 4 inches in the greatest dimension may be used.
   2. Watering:
      a. Apply uncontaminated water, when required, at the locations and in the amounts required to compact the backfill material to the specified requirements. Maintain an adequate water supply during the work. Assure the equipment used for watering is of the capacity and design to provide uniform water application.
      b. Apply water during the work to control dust and to maintain all embankment and base courses in a damp condition in accordance with these contract documents.
      c. Water sources are defined in Section 01 50 00.

1) Remove, replace, and re-compact backfill in trenches where settlement has occurred as directed by the Contracting Officer at the Contractor's expense.
2) Place trench backfill in maximum 8 inch compacted lifts within 3 percent of optimum moisture content, and compact to at least 95 percent of maximum dry density determined by AASHTO T99 or by ASTM D698.

D. Replacement of Unsuitable Backfill Material:
1. Remove and dispose of excavated soils that are saturated, contain deleterious materials or have characteristics that, in the opinion of the Contracting Officer, render the soils unsuitable as backfill.
2. Replace unsuitable soils with material obtained from trench excavations within the Project limits at the expense of the Contractor.
3. Place and compact all imported material according to the applicable backfill specification requirements.

E. Backfill of Appurtenances:
1. Place and compact backfill for appurtenances to finished grade around manholes, valve boxes and other underground items without disturbing appurtenance alignments.
2. Meet the backfill material, placement, and compaction requirements specified for the adjoining trench.

3.6 DETECTABLE BURIED WARNING TAPE

A. Provide warning tape as described in Part 2 – Products. Bury tape a maximum 18 inches (45 cm) below finish surface grade.

3.7 TRACER WIRE

A. Install electrically continuous tracer wire with access points as described hereinto be used for locating pipe with an electronic pipe locator after installation. Tracer wire shall be installed on all water and sewer mains and services.

B. Tracer wire color shall be blue for all water construction and green for all sewer construction.

C. Contractor shall perform a continuity test on all tracer wire in the presence of the Contracting Officer, or representative of the CO. If the tracer wire is found to be not continuous after testing, Contractor shall repair or replace the failed segment of the wire at no additional expense to the Owner.

D. Tracer Wire Installation Requirements:
1. Tracer wire shall be installed on all water and sewer mains and services. The wire shall be installed in such a manner as to be able to properly tracer all mains and services without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.
2. Tracer wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be laid in the trench below the pipe and pipe bedding being installed to ensure that the wire is not damaged during future repair operations. The tracer wire shall be securely bonded together at all wire joints with a watertight connector to provide electrical continuity, and it shall be accessible at all tracer wire access points.
3. Tracer wire access points shall in general be no more than five-hundred (500) feet and at every manhole or to the nearest water valve box.

4. Tracer wire shall be laid flat and securely affixed to the pipe at 10-foot intervals. The wire shall be protected from damage during the execution of the works. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At service saddles, the tracer wire shall not be allowed to be placed between the saddle and the main.
5. Except for approved spliced-in connections, tracer wire shall be continuous and without splices from each tracer wire access point. Where any approved spliced in connections occur, water tight connectors shall be used to provide electrical continuity.
6. At all repair locations where there is existing tracer wire, the tracer wire shall be properly reconnected and spliced as outlined above.

3.8 BLUE BOARD INSULATION

A. Insulation board shall be placed in locations and at depths as shown on the Drawings or as directed by the Contracting Officer.

B. Prior to placement of the polystyrene blue boards, bedding material shall be placed around the pipe as shown on the Drawings and specified in this Section. The insulation boards shall be placed on the cover material with the long side parallel to the centerline of the water main. The boards shall be placed in a staggered arrangement to eliminate continuous transverse joints.

C. The first lift of backfill material shall consist of 6 inches of bedding material, which shall be end or side dumped onto the insulation board and spread in such a manner that construction equipment does not operate directly on the insulation. In locations where end or side dumping is not feasible due to accessibility constraints, the bedding material shall be placed manually or with equipment suitable for the area to prevent damage to the insulation. This layer shall be compacted with equipment that exerts a contact pressure of 70 to 80 psi.

3.9 CLEANUP

A. As work progresses, remove debris and complete to finish grade each portion of the work.

B. Once the work is complete, clear debris and finish the entire site to smooth, uniform slopes presenting a neat and workmanlike appearance. Remove and dispose of all rocks brought to the surface during excavation or backfilling.

3.10 TIME AND DISTANCE OF OPEN TRENCHES

A. Perform the work so that trenches will remain open the minimum time required to accomplish the work.

B. Install temporary escape ramps at both ends of any trench left exposed overnight, during weekends, or in periods when workers are absent to facilitate the safe exit of unintentionally trapped wildlife. These temporary escape ramps should be constructed and positioned according to the guidance provided by the Contracting Officer.

C. Do not begin trench excavating until appropriate compaction equipment is at the excavation site.

3.11 ROADWAY CLOSURE AND TRAFFIC CONTROL

A. The Contractor shall ensure that the Park Road remains open at all times to Law Enforcement, Emergency Medical Services (EMS), and Park Operations. Any work requiring road closure must be planned and executed to minimize disruption.

B. If a full closure is necessary, only a 1/2 width closure shall be allowed, with one lane remaining open at all times for traffic flow.

C. The Contractor shall submit a detailed traffic control plan to the COR for approval prior to commencing work. The plan must include measures to ensure safe and continuous access for Law Enforcement, EMS, and Park Operations during construction activities.

D. The traffic control plan shall adhere to applicable traffic safety standards, including but not limited to MUTCD (Manual on Uniform Traffic Control Devices) and any other federal, state, or local regulations.

E. If road work affects access for emergency or operational purposes, the Contractor shall immediately notify the COR and provide a plan for rerouting or clearing access as necessary.

END OF SECTION 31 21 00

This page was intentionally left blank

SECTION 31 23 00 – EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section includes but is not necessarily limited to:
   1. Excavation, fill, and backfill, as indicated or required, including compaction.
   2. Excavation, as required, to the lines and grades indicated on the Construction Drawings.
   3. Excavation and offsite disposal of unsuitable or on-site disposal of excess materials Excavation shall include removal and satisfactory disposal of all unclassified material encountered throughout the site.
   4. Rough grading, including placement, moisture conditioning, and compaction of fills and backfill.
   5. Placement of base and subbase course materials under structures, pavements, sidewalks, curbs and gutters, including compaction.
   6. The removal, hauling and stockpiling of suitable excavated materials for subsequent use in the work. Stockpiling shall include protection to maintain materials in a workable condition.
   7. Re-handling, hauling, and placing of stockpiled materials for use in refilling, filling, backfilling, grading, and such other operations.
   8. Protect and preserve all existing buildings, pavements, and utilities to remain.
   9. Furnishing and installing all sheeting, shoring, and bracing of structural and trench excavations and its satisfactory removal, unless otherwise directed to have it remain in place.
   10. Environmental controls.
   11. Providing products in sufficient quantities to meet the project requirements.
   12. Obtain all required permits, licenses, and approvals of appropriate authorities having jurisdiction, prior to commencing the work of this Section.

1.2 RELATED SECTIONS

A. Carefully examine all of the Contract Documents for requirements which affect the work in this Section. Other Specification Sections which directly relate to the work of this Section include, but are not limited to, the following:
   1. Section 01 57 23 – TEMPORARY STORM WATER POLLUTION PREVENTION
   2. Section 03 31 00 – CONCRETE FOR SITE IMPROVEMENTS
   3. Section 03 35 00 – CONCRETE SIDEWALKS
   4. Section 31 10 00 – SITE CLEARING
   5. Section 31 21 00 – TRENCH EXCAVATION
   6. Section 32 11 23 – AGGREGATE BASE COURSE
   7. Section 32 92 19 – SEEDING
   8. Section 33 12 13 – WATER DISTRIBUTION SYSTEMS

1.3 LAWS AND REGULATIONS

A. Work shall be accomplished in accordance with regulations of local, county, state and federal agencies or utility company standards as they apply.

1.4 QUALITY ASSURANCE

A. The Contractor shall retain and pay for the services of an independent testing and inspection firm and/or a Geotechnical Consultant to perform on-site observation and testing during the various phases of the construction operations. The scope of services shall be determined by the Contractor and the independent testing and inspection firm and/or the Geotechnical Consultant and submitted to the Contracting Officer (CO) for approval. The Government reserves the right to modify or waive the services of the independent testing and inspection firm and/or the Geotechnical Consultant. The services of an independent testing firm and/or Geotechnical Consultant may include, but are not necessarily limited to, the following:
   1. Observation during excavation and grading to verify soil conditions, assess compliance with project specifications, and ensure proper preparation of subgrades for structural support.
   2. Laboratory testing and analysis of fill materials as specified herein and proposed by the Contractor for incorporation into the Work.
   3. Observation of construction and performance of water content, gradation, and compaction tests at a frequency and locations that the independent testing and inspection firm and/or the Geotechnical Consultant may require. The results of these tests will be submitted to the Government, CO, and Contractor on a timely basis so that action can be taken to remedy indicated deficiencies. During the course of construction, the independent testing and inspection firm and/or the Geotechnical Consultant will advise the Government in writing if, at any time in their opinion, the Work hereunder is of unacceptable quality. Failure of the independent testing and inspection firm and/or the Geotechnical Consultant to give notice shall not excuse the Contractor from latent defects discovered in their work.
   4. The Contractor shall make provisions for allowing observations and testing of Contractor's work by the independent testing and inspection firm and/or the Geotechnical Consultant.
   5. The presence of the independent testing and inspection firm and/or the Geotechnical Consultant does not include supervision or direction of the actual work of the Contractor, and his employees or agents. Neither the presence of the independent testing and inspection firm and /or the Geotechnical Consultant, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

B. Costs related to retesting due to unacceptable qualities of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Government, and the costs thereof will be deducted by the Government from the Contract Sum.

1.5 SUBMITTALS

A. Submit, in an airtight container for the testing laboratory, a 50-pound sample of each type of off-site fill material and on-site backfill material that is to be used at the site. Submit samples a minimum of one week prior to use of proposed material at the site. Submit samples to the testing laboratory and/or the Geotechnical Consultant (copy of these transmittal forms shall be simultaneously sent to CO) or if no testing laboratory and/or Geotechnical Consultant is identified, then the CO shall be the recipient of the samples. Use of these proposed materials by the Contractor prior to testing and approval shall be at the Contractor's risk.

B. Laboratory maximum density and optimum moisture testing for any material planned to be compacted.

C. The CO will be responsible for the approval or rejection of the suitability of all materials.

D. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the project requires approval of the CO.

1.6 COORDINATION

A. Prior to start of earthwork the Contractor shall arrange an on-site meeting with the CO, or representative of the CO, the independent testing firm, and/or the Geotechnical Consultant for the purpose of establishing the Contractor's schedule of operations and scheduling observation and testing procedures and requirements.

B. As construction proceeds, the Contractor shall be responsible for notifying the CO prior to the start of earthwork operations requiring observation and/or testing.

PART 2 - PRODUCTS

2.1 ON-SITE EMBANKMENT

A. Fill and backfill materials are to consist of natural soil free from organic matter, frozen material, refuse, construction debris or other man-made items. Obtain approval from the CO for all fill before placing and use only the fill from designated borrow areas.

B. IMPORTED BORROW MATERIALS (FOR EMBANKMENTS IN-PLACE)

1. Imported backfill material is from borrow source(s) outside the project limits and is used when an adequate volume of suitable backfill material is not available within the project limits. Imported Backfill Materials must comply with the requirements of Section 2.1.A, and meet the following gradation requirement:

Sieve Opening	% Passing
3 Inch	100
No. 4	25-60
No. 200	12 Max.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Clearing and grubbing shall comply with Section 31 10 00.

3.2 EXCAVATIONS

A. General Definitions

1. Unclassified Materials. Unclassified excavation includes the satisfactory removal and disposal of all materials (except contaminated materials defined below) encountered regardless of the nature of the materials and shall be understood to include, but not be limited to, blast rock, bedrock, earth, hardpan, fill, foundations, pavements, curbs, piping, railroad track and ties, cobblestones, footings, bricks, concrete, abandoned drainage and utility structures, and debris. Drilling, blasting, excavation, and disposal of rock shall be considered unclassified excavation and shall be included as a part of the Contract Price, with no separate payment items for its excavation and handling.

2. Rock Excavation. Rock excavation for payment shall be defined as sound and solid masses, layers, or ledges of mineral matter in place and of such hardness and texture that, when it is encountered:
    a. Cannot be loosened by three passes of a ripper tooth mounted on the larger of a tracked backhoe of at least 25,000 pounds operating weight and 75 horsepower or the largest backhoe being utilized on the job by the Contractor.
    b. In the opinion of the Contracting Officer, cannot be excavated without drilling, ripping equipment or other specialized equipment.
3. Where rocks occur as boulders that are smaller than the larger of: (1) 2 cubic yards in volume or (2) the volume that can be readily handled by the largest backhoe being utilized on the job by the Contractor, they shall be considered incidental to excavation and not defined as rock excavation.

B. Site General Requirements
1. Control the grading so that ground is pitched to prevent water from running to excavated areas, damaging other structures, or adjacent properties.
2. Where soil has been softened or eroded by flooding, equipment, traffic, or placement during unfavorable weather, or such other conditions, it shall be removed and replaced by the Contractor with suitable material, and at no time or cost to the Government.
3. Exercise care to preserve the material below and beyond the lines of excavation. Where excavation is carried out below indicated grade or beyond the lines of excavation, Contractor shall backfill and compact the over-excavation with structural fill to the indicated grade, at no additional time or cost to the Government and at the direction of the CO.
4. Provide sheeting, shoring and bracing to complete and protect all excavated areas, as required for safety and compliance with OSHA. Costs for sheeting, shoring, and bracing shall be included as a part of the Contract Price for completing the work and Government shall make no separate payment for this work. Sheeting, shoring and bracing shall be designed by a registered professional engineer and approved by the Contracting Officer prior to construction.
5. Excavated materials unsuitable for reuse, surplus excavated rock, and surplus excavated soil not used to fulfill requirements of the Contract, shall become the property of the Contractor and shall be removed from the site in accordance with the regulations and requirements of all municipalities or agencies having jurisdiction over the disposal sites and the route between the project and the disposal sites.
6. Limits of excavation are such that all unsuitable material shall be removed to firm natural ground in the manner specified below. In building areas, unsuitable materials shall be removed to a distance of five feet (5') beyond the building lines or within the area defined by a one horizontal to one vertical (1H:1V) line sloping down from outside bottom edge of exterior footings to firm natural ground, whichever is greater. Limits of unsuitable material excavation also apply to areas below exterior column footings. All abandoned pipes within building areas shall be removed and the excavations shall be properly backfilled.
7. Unsuitable materials which are classified as organics such as peat, trash, fill, stumps, debris, material determined to be hazardous, and topsoil and subsoil when determined by CO to be unacceptable for incorporation into the work.
8. All suitable material, as determined by the CO, may be reused on the site provided it meets the gradation requirements for the given materials in the information of fill sections, embankments, subgrades, backfills, etc.

9. Do not over excavate below proposed design grades for the purpose of obtaining borrow for use off-site.

C. Proof Rolling
   1. Prior to placing compacted fills, the Contractor shall proof roll the natural grades to remain. Where materials of low density are indicated by rutting or weaving under the compactor, the Contractor may be required to make up to three (3) additional complete coverages of the area with the compactor as determined by the CO. The cost of all proof rolling shall be included in the Contract Price. If materials of low density are encountered that cannot be compacted to the extent necessary to support the proposed embankment fills as determined by the CO, the Contractor shall remove those materials and replace them with compacted fill.
   2. Alternately, an initial layer of fill may be allowed to form a working platform. The need, manner of construction, and thickness of such a layer shall be subject to approval of the CO and the layer will be permitted only where the lack of support is, as determined by the CO, not due to deficient ditching, grading or drainage practices, or where the embankment could be constructed in the approved manner by the use of different equipment or procedures. Thickness of up to eighteen inches (18") may be permitted for such a layer.

3.3 TRENCH EXCAVATION

A. Trench Excavation shall comply with Section 31 21 00.

3.4 ROCK EXCAVATION

A. Excavate rock in accordance with Section 31 11 01 - Rock Excavation.

B. During trench excavations, solid rock may be encountered. Blasting will not be allowed. Excavation shall not be classified as rock excavation without prior approval of the CO.

C. Excavate and remove rock by hand or mechanical method, which includes:
   1. Drill holes and use expansive tools, wedges, and mechanical disintegration compound to fracture rock.
   2. Remove by mechanical methods.
   3. Break rock using trenchers, hydraulic breakers, rippers or other specialized equipment.

D. Cut away rock at bottom of excavation to form level bearing.

E. All drill holes, tool marks, etc. made during partial rock removal shall be removed upon completion.

F. Remove shaled layers to provide sound and unshattered base for structures including sanitary water distribution manholes.

G. In utility trenches, excavate to 6 inches below invert elevation of pipe and 16 inches wider than pipe diameter.

H. Remove excavated materials from site unless they can otherwise be used suitably in other areas.

I. Where removal of a boulder results in a void below the desired elevation of the intended excavation, backfilling of the void shall be handled in the same manner as the replacement of unsuitable excavated material.

3.5 PREPARATION OF EXCAVATION BOTTOMS

A. General Rock Subgrade Areas
   1. Rock surfaces to receive backfill shall have a maximum slope of four (4) horizontal to one (1) vertical.

B. Pavement Areas
   1. Loose rock is covered with 6 inches (6") of crushed stone or choke stone; and
   2. Proof-roll subgrade with a vibratory roller or a fully loaded ten-wheeled dump truck. Soft or hard areas and other objectionable material (stumps, wood, organics) shall be excavated and backfilled with compacted structural fill.
   3. Prior to the placement of blast rock fill over a bedrock subgrade, voids in the rock surface shall be choked off with appropriately graded choke stone or crushed stone to prevent migration of fines into fractures, and as approved by the CO.

3.6 BACKFILLING AND PLACEMENT OF FILL MATERIALS

A. Site
   1. Dewater subgrade areas prior to filling.
   2. Compaction by puddling or jetting is prohibited.
   3. Control groundwater and surface runoff to minimize disturbance of exposed natural ground surface, previously placed and compacted fill and material being placed.
   4. Soil fill moisture shall be maintained at an acceptable working range to allow for proper compaction.
   5. Do not place fill on frozen ground.
   6. Do not place frozen fill.
   7. Place fill in uniform horizontal layers and compact immediately after placement. Where the horizontal layer meets a rising slope, the layer shall be keyed into the slope by cutting a bench during spreading of preceding lift.
   8. To the extent that is practical, each layer of fill shall be compacted to the specific density the same day it is placed.
   9. Slope fill surfaces at the end of each day to provide for free surface drainage.
   10. Protect structures and pipes from damage during backfilling operations. Repair damage at no cost to Government.
   11. Placement of fill shall not begin prior to observation and approval of subgrade conditions by CO.
   12. Protect tanks, foundations, footings, and waterproofing during backfilling. Repair damage at no cost to Government.
   13. Prior to backfilling between foundation wall and sheeting, remove unsuitable material, including rubbish, organic materials, or other debris. Do not commence filling operations until conditions have been observed by CO.
   14. Provide shoring, sheeting, and bracing of excavations as required to assure complete safety against collapse of the earth at the site of excavations. Alternatively, lay back excavations to suitable slope when approved by the Contracting Officer.
   15. Upon completion of the work, the final ground surface shall be left in a firm, unyielding, true, uniform condition free from ruts. Repair disturbed areas caused equipment traffic at no cost to Government.

B. Equipment

1. Compaction equipment used in open areas where space permits shall consist of vibratory rollers, fully loaded ten-wheel dump trucks, pneumatic compactors, or other similar equipment.
2. Compaction equipment for fill against foundation walls and in other confined areas shall be accomplished by means of drum-type, power-driven, hand-guided vibratory compactors operating at 2,000 cycles per minute, or by hand-guided vibratory plate tampers.

3.7 BACKFILLING AGAINST STRUCTURES

A. New water service connections to the existing service lines shall be made 5' horizontally from the exterior of the existing structure. The existing buildings shall be protected during excavation and backfilling of the service line trench and backfill material, equipment, or other construction operations or materials shall not touch or harm the existing building envelopes.

B. Backfilling against masonry or concrete (new structures) shall only be done when approved. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been satisfactorily completed, any leakage tests or other testing of the structures shall be made by the Contractor, as required by the CO, at the Contractor's expense.
   1. After the satisfactory completion of leakage tests and the satisfactory completion of any other required work in connection with the structures, the backfilling around the structures shall proceed using suitable and approved excavation material. The best of the backfill material shall be used for backfilling within 2 feet (2') of the structure. Just prior to placing backfill, the areas shall be cleaned of all excess construction material and debris and the bottom of excavations shall be in a thoroughly compacted condition.

C. Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures.
   1. During backfilling operations, care shall be exercised that the equipment used will not overload the structures in passing over and compacting these fills. Except as otherwise specified or directed, backfill shall be placed in layers not more than 6 inches (6") in loose depth and each layer of backfill shall be compacted thoroughly and evenly using approved types of mechanical equipment. Each pass of the equipment shall cover the entire area of each layer of backfill.

D. In compacting and other operations, the Contractor shall conduct his operations in a manner to prevent damage to structures due to passage of heavy equipment over and adjacent to structures. Repair damage made by the Contractor, at no additional cost to the Government.

E. After backfilling the Contractor shall maintain the surfaces of backfill areas in good condition so as to present a smooth surface at all times level with adjacent surfaces. The Contractor shall repair any subsequent settling over backfilled areas immediately, in a manner satisfactory to the CO, and such maintenance shall be provided by the Contractor for the life of this Contract, at no additional cost to the Government.

F. The finished subgrade of the filled excavations upon which pavements are to be constructed shall not be disturbed by traffic of other operations and shall be

maintained in a satisfactory condition until the finished courses are placed. The storage or stockpiling of materials on finished subgrade will not be permitted.

G. Uniformly smooth grade all areas to be graded, as indicated including excavated sections and all areas disturbed as a result of the Contractor's operations. The finished surfaces shall be reasonably smooth, compacted and free from surface irregularities.

3.8 COMPACTION

A. Compaction Requirements

1. Provide compaction testing at a frequency and locations defined in paragraph 1.4, A.3 of this Section.
2. The degree of compaction is expressed as a percentage of the maximum dry density at optimum moisture content as determined by ASTM D1557, Method C. The compaction requirements are as follows:

Area	Minimum Degree of Compaction
Below footings, structures, manholes	95%
Below concrete sidewalk, curb & gutter	95%
Pavement base course[i]	95%
Pavement subbase[i]	95%
General fill below pavement subbase	95%
Lawn areas	90%

[i]Includes pavement base and subbase courses within trenching limits under future pavement to be completed by FHWA's Contractor outside of the scope of this project.

3. Compaction percentages are based on the laboratory derived Maximum Density Values.

B. Moisture Control

1. Fill that is too wet for proper compaction shall be harrowed or otherwise dried to a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill.
2. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.
3. In no case shall fill be placed over material that is frozen. No fill material shall be placed, spread, or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.

C. Lift Thickness of Material

1. Structural Fill and Sand Borrow. Place in layers not to exceed 12 inches (12") in thickness when utilizing heavy compaction equipment, and 6 inches (6") when utilizing light hand-operated compaction equipment.
2. Common Fill. Place in layers not to exceed 12 inches (12") in thickness when utilizing heavy compaction equipment, and 8 inches (8") when utilizing light hand-operated compaction equipment.

D. Placing Conserved Topsoil

1. Placing Conserved Topsoil shall comply with Section 31 10 00.

E. Finish
   1. Upon completion of the work, ground surface shall be left in a firm, unyielding, true, uniform condition, free of ruts.

END OF SECTION 31 23 00

This page was intentionally left blank

SECTION 32 01 01 – TREE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of labor and material requirements necessary to protect and repair trees all existing trees within the construction limits unless identified for removal on the Drawings.

1.2 REFERENCES

A. The Contractor shall comply with applicable requirements and recommendations of the most current versions of the following standards and guidelines. Where these guidelines conflict with other specified requirements, the more restrictive requirement shall govern.
   1. ANSI Z133.1-2006: American National Standard for Tree Care Operations.
   2. ANSI A300: Tree, Shrub, and Other Woody Plant Management – Standard Practices.
   3. Guide for Plant Appraisal – Current Edition: Authored by the Council of Tree and Landscape Appraisers; published by the International Society of Arboriculture.

1.3 GENERAL REQUIREMENTS

A. The Contracting Officer will conduct daily observation of Contractor's work during critical phases of the project near trees that are marked for protection. The Contractor shall notify the Contracting Officer at least two (2) weeks prior to when such observations will be needed.

B. If it appears that the completion of the construction may cause damage to the branches of any tree, the Contractor shall notify the Contracting Officer. The Contracting Officer will make a determination as to whether such damage is imminent.

C. Areas with potential tree impacts must be identified in advance. The National Park Service (GLBA) will conduct a site walk with an arborist to assess impacts and determine appropriate actions. Any necessary tree removals must occur outside of the migratory bird nesting window from April 15 – July 15.

D. To prevent or minimize soil compaction, designated routes for equipment and foot traffic by work crews shall be determined prior to commencing construction activities.

E. Materials and supplies shall not be stockpiled or stored within the tree protection area or within locations where damage to trees, shrubs, or roots may occur. Under no circumstances shall any objects or materials be leaned against or supported by a tree's trunk, branches, or exposed roots.

1.4 DEFINITIONS

A. Critical Root Zone: Shall be defined as the tree protection area encompassing one and one half (1.5) minimum to two (2) times the distance between the truck and drip line.

B. Drip Line: The outermost edge of the tree's canopy or branch spread. The area within a tree's drip line is all the ground under the total branch spread.

C. Tree Protection Area: The tree protection area should consist of the ground encompassing the critical root zone. Areas of ground covered by pavement, buildings, or other permanent structures where the presence of roots is minimal or negligible are excluded.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. This section provides standards and guidelines for the retention and protection of trees and shrubs throughout the duration of construction.

3.2 DEMOLITION OF EXISTING INFRASTRUCTURE

A. Caution shall be used during demolition to minimize injury to tree root systems.

B. Breaking of the existing concrete and asphalt for removal shall be done in a manner that will minimize ground disturbance and vibration.

C. Curbs and sidewalks within designated tree protection areas shall be removed by hand. When removing existing sidewalks and curbs, care shall be taken to avoid injury to roots located under, over, or adjacent to the paved surfaces.

3.3 CONSTRUCTION OF NEW INFRASTRUCTURE

A. The following procedures shall be used when constructing new infrastructure:
   1. Protect exposed roots from contamination by materials and concrete.
   2. Locate concrete washout areas away from roots and tree protection areas.
   3. After proper pruning, as needed, cover exposed roots within thirty (30) minutes to minimize desiccation. Roots may be covered with soil, mulch, or moistened burlap, and shall be kept moist during the period until the final grade is established.
   4. In areas where roots have to be removed for construction of water services, roots shall be severed prior to excavation to eliminate unnecessary tearing of roots by equipment, refer to subsection 3.4 – Root Pruning.
   5. Concrete or chemicals spilled within tree protection areas shall be completely removed. Contaminated soil shall be completely removed at the time of the spill and removed by hand and/or air spade tool without disturbance to root systems.

3.4 ROOT PRUNING

A. Tree roots shall not be pruned or cut unless their removal is unavoidable or absolutely necessary. The Contracting Officer shall be notified prior to any operation known or suspected to involve cutting of roots.

B. Upon approval by the Contracting Officer, prior to excavation, water or sewer pipe installation, removal of sidewalk, or other activity that will result in removal of soil and tree roots, all tree roots within a designated area will be pruned to a depth of fourteen inches (14”). Pruning shall be done by hand with approved pruning tools.

3.5 TREE PROTECTION FENCING

A. Prior to construction the Contractor shall clearly mark trees planned to be removed. All tree removals shall be coordinated with, and approved by, the Contracting Officer, for Natural Resources and Historic Preservation. All other existing unmarked trees within the construction limits shall be protected.

B. The Contractor shall protect trees identified by the Contracting Officer by placing an approved protective fencing around the drip line of the tree, or at a location approved by the Contracting Officer, to protect from accidental damage due to construction activities.

C. Tree protection fences shall be constructed of one of the following:
   1. Colored (orange), molded plastic construction fencing – forty-eight inches (48”) in height.
   2. Orange sediment control fencing, a minimum of 48” in height, securely installed with steel posts spaced as required to maintain stability. The fencing shall be properly tensioned and maintained throughout construction to ensure continuous protection.

D. Tree protection fencing shall be installed prior to any site activity and shall remain until its removal is authorized by the Contracting Officer.

3.6 ROOT AND BRANCH DAMAGE

A. All root or branch damage shall be reported to the Contracting Officer immediately.

END OF SECTION 32 01 01

This page was intentionally left blank.

SECTION 32 12 16 – ASPHALT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This work is the production and placement of plant mix asphalt concrete pavement for use in paving and repairing asphalt roads and parking lots damaged due to utility trenching.

B. Hot plant mix asphalt concrete is a mineral aggregate and asphalt material mixed at a central hot plant meeting these specifications and placed in one or more courses on a newly prepared or existing street roadway and/or parking lot in accordance with the contract documents.

1.2 REFERENCES

A. The Contractor shall comply with all applicable requirements and recommendations of the most current versions of the following standards and guidelines. Where these guidelines conflict with other specified requirements, the more restrictive requirement shall govern.

PART 2 - PRODUCTS

2.1 GENERAL

A. The Asphalt Concrete Surface Course must have at least a 3-bin separation, when continuous flow mixing types of plants are used. When a drum dryer is used with a weight batching system from dry bins, separate and stockpile the crushed aggregate into two sizes.

B. The specific type and grading of aggregate shall be consistent with those used on other local, state, or federal projects with similar type construction as is outlined for this project. Submit proposed aggregate gradation to the Contracting Officer for approval. Aggregate types and grades are described in this specification.

C. The furnishing of asphalt materials for use in asphaltic concrete mixes shall meet the requirements for the particular grade specified in the contract documents. The types and grades are described in this specification.

D. Prepare pavement course to conform to the lines, grades, thickness and typical cross sections shown in project documents and plans, and shall be rolled, finished, and approved by the Contracting Officer before the placement of the next course.

2.2 PLANT MIX AGGREGATES

A. Furnish aggregates from acceptable sources approved by the Contracting Officer.

B. Furnish test data as outlined in this section on each source to be used for acceptance by the Contracting Officer.

C. Designation of the sources of supply and the acceptability of the material there from, does not extend to the grading of the material as it may naturally come from the pit or crusher. Adjust the crusher and screens to remove certain portions of the material as may be necessary to furnish gravel that will comply with the specifications in the contract. No additional compensation will be allowed for such adjustment of the equipment or the rejection of waste. It is understood that the Contracting Officer may order procurement of material from any portion of any area designated as a pit site and may reject portions of the deposit as unacceptable.

D. Aggregate materials shall not contain more than 1.5% by weight of clay lumps, shale, or coal, nor shall lightweight particles exceed 3.5% by weight. No combination of clay, shale, coal, or lightweight particles shall exceed 3.5% by weight. Do not use Scoria (fired clay). Aggregate materials shall conform to the grading stipulated in the contract documents. Use reasonable care in the selection of material in a pit so that uniform product will be produced at all times. No compensation will be allowed for such stripping of the pit as may be required in order that satisfactory material may be secured.

E. Aggregate used shall consist of gravel, crushed to the specified size, crushed stone, composed of hard durable pebbles or stone fragments, reclaimed asphalt pavement, and finely crushed stone filler, sand or natural clean material, or other fine mineral material. The portion of the material retained on the No. 4 sieve (4.74 mm) will be called coarse aggregate and that passing the No. 4 sieve (4.74 mm) and retained on the #200 sieve (0.075) will be called fine aggregate. The material passing the #200 (0.075 mm) will be called mineral filler. The reclaimed asphalt pavement shall be removed from its original location and reduced by suitable means to such particle size as may be required for use in hot plant mix asphalt concrete.

F. For all gradings of fine aggregate, including any blended fine aggregate and mineral filler, passing a No. 40 sieve (0.425 mm), shall have a liquid limit not exceeding 25 and a plasticity index of not more than 6.

G. Produce coarse aggregate retained on the No. 4 sieve (4.74 mm) having a minimum of 50% by weight of particles with at least one mechanically fractured face. The coarse aggregate shall not exceed 40% wear at 500 revolutions.

H. Preliminary acceptance of aggregates proposed for use may be made at the point of production. Final acceptance will be made only after tests of the aggregates are complete and in place.

I. Surface Course Asphalt Plant Mix Aggregate:

TABLE 1
REQUIREMENTS FOR GRADING OF SURFACE COURSE AGGREGATE

Percentage by Weight Passing Job Mix Target Bands		
Sieve Size	% Passing	Job Mix Tolerance
1" (25.0 mm)	100	...
3/4" (19.0 mm)	91-93	± 7
1/2" (12.5 mm)	76-89	± 7
3/8" (9.5 mm)	61-79	± 7
No. 4 (4.75mm)	41-54	± 6
No. 10 (2.00 mm)	31-39	± 6
No. 40 (0.425mm)	16-27	± 5
No. 200 (0.075 mm)	4-7	± 2

1. The above gradation bands represent the job mix target limits, which determine the suitability of aggregate for use. The final job mix target gradation must be within the specified bands and uniformly graded from coarse to fine and not vary from the low limits on one screen to the high limits on the adjacent screen, or vice versa. The final job mix gradation limits are established by applying the job mix tolerances to the job mix targets.

2.3 ASPHALT BINDER MATERIAL

A. Furnish (PGAB) PB 58-22 Asphalt binder material to be used as specified in the contract documents that meet the type and grade specified requirements in this section in Table 2.

B. The percentage of asphalt by weight, to be added to the aggregate will be, generally, between 4 and 8 percent of the weight of the total mix. The mix design will establish the exact percentage of asphalt in the mix, based upon preliminary laboratory tests, sieve analysis and grading and character of the aggregate furnished within the specification limits. No claim is allowed for the payment for rejecting any batch or load of mixture containing an excess or deficient amount of asphalt binder varying more than 0.4 of a percent from the fixed mix design percentage.

C. Obtain Contracting Officer's approval of the asphalt material source before shipments are made to any project. The source of supply cannot change after work is started unless approved in writing by the Contracting Officer. The Contracting Officer is not liable for the quantity shipped.

D. Samples of asphalt binder material may be taken, as directed by the Contracting Officer, and placed in uncontaminated one-quart containers. When sampled, these shall be taken from the tanker car or truck at the point of delivery on the project and submitted to the Contracting Officer.

E. All transport vehicles must be equipped with a spigot or gate valve installed in either: (1) the unloading line, (2) in the tanker at the centerline on the tank, (3) in the pressure line from the unloading pump, or other locations approved by the Contracting Officer. Assure the spigot or gate valve has a diameter of between 3/8 inch and 3/4 inch. The spigot valve must be located to prevent contamination from plant dust or other contaminants.

F. The supplier furnishing the asphalt binder material shall inspect each tanker car or truck before it is loaded and ship only in clean, uncontaminated, fully insulated cars or trucks, sealed after loading by the supplier.

G. The material supplier shall issue, in duplicate, a certificate showing full compliance with the specifications for the designated grade of material, together with the following information. Project number, date of shipment, source of the material, car or truck initial and number, destination, gross quantity loaded, loading temperature, and net quantity in gallons at 60°F or tons, whichever unit of measurement is stipulated. Assure the certificate of compliance accompanies the shipment and is furnished to the Contracting Officer. The certificate, signed by the supplier representative, must also certify that the conveyance vessel was inspected and found to be free of contaminating material.

H. The certificate of compliance is the basis for tentative acceptance and use of the material. Samples taken according to applicable sampling methods and retained by the Contracting Officer may be tested at the Owner's discretion. Failure of the asphalt material to meet these specifications may result in rejection of the entire, associated work. If rejected, remove and replace rejected work.

TABLE 2
PERFORMANCE GRADED ASPHALT BINDER (PGAB)

Performance Grade	PG 58		PG 64		Test Methods
	-22	-28	-22	-28	
Average 7-day Maximum Pavement Design Temperature, °C	<58		<64		
Minimum Pavement Design Temperature, °C	>-22	>-28	>-22	>-28	
Original Binder					

Flash Point Temp.: Minimum °C	230				AASHTO T48
Viscosity: Maximum, 3 Pa-s (3000 cP), Test Temp, °C	135				ASTM D4402
Dynamic Shear: G* / sin delta, Minimum, 1.00 kPa Test Temp @ 10 rad / s, °C	58		64		AASHTO TP5
Rolling Thin Film Oven (AASHTO T240) or Thin Film Oven (T179) Residue					
Mass Loss, Maximum, %	1.0				AASHTO T240
Dynamic Shear: G* / sin delta, Minimum, 2.20 kPa Test Temp @ 10 rad / s, °C	58		64		AASHTO TP5
Pressure Aging Vessel Residue (AASHTO PP1)					
PAV Aging Temp, °C	100		100		AASHTO PP1
Dynamic Shear: G* / sin delta, Minimum, 5000 kPa Test Temp @ 10 rad / s, °C	22	19	25	22	AASHTO TP5
Creep Stiffness [a]: S, Minimum, 300 MPa m-value, Minimum, 0.300 Test Temp, @ 60 sec, °C	-12	-18	-12	-18	AASHTO TP1
Direct Tension [a]: Failure Strain, Minimum, 1.0%, Test Temp @ 1.0 mm/min. °C	-12	-18	-12	-18	AASHTO TP3

1. If creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. The m-value requirement must be satisfied in both cases.

I. Apply asphalt material at temperatures that assure uniform mixing or spreading. Application temperature ranges for each grade of material should be accompanied with the mix design. Application temperature for mixing applications will be in accordance with the mix design.

J. Upon request by the Contracting Officer, furnish the Contracting Officer and/or laboratory (responsible for completing the mix design) with data or a report showing the temperature-viscosity relationship of each asphalt binder used on the project. Assure this data covers the range of temperatures used for mixing and compaction. In addition, the Contracting Officer may request a complete set of test results from Table 2 for each grade used on the project.

2.4 HYDRATED LIME FOR ASPHALT CONCRETE

A. Mineral filler may be incorporated in the asphalt concrete mixture. Furnish hydrated lime as filler when specified. Assure it is free of lumps and extraneous material and meets the following gradation requirements as per ASTM D242:

Sieve #	% Passing
#30 (0.60mm)	100%
#80 (0.180mm)	95 – 100%
#200 (0.075mm)	70 – 100%

B. Assure the hydrated lime meets paragraph 2 (chemical composition) and paragraph 7(a) requirements (chemical analysis) of ASTM C1097.

C. Where required, the mineral filler will be effectively mixed with the hot plant mix asphaltic concrete.

2.5 COMPOSITION OF MIXES:

A. General
1. Submit to the Contracting Officer for approval a mix design for each mix required on the project. Assure the job-mix formula is within the gradation limits in Part 2 Products in this Section.
2. Have the job-mix formula prepared by an independent testing laboratory approved by the Contracting Officer. The requirements of ASTM D-3666 are the guidelines for testing laboratory approval. The cost of the job-mix formula(s) is at Contractor expense.
3. Keep the job mix formula current and contain the following minimum information:
   a. Gradation of all constituent aggregates.
   b. Specific gravity of constituent aggregates and asphalt cement.
   c. Source of supply of all materials and grade of asphalt cement.
   d. Marshall design curves for stability, unit weight, flow and volumetric requirements (VMA and total voids) at asphalt contents below and above optimum (four points minimum).
   e. Measured voidless (Rice's) specific gravity used in voids computations.
   f. Composite aggregate grading.
   g. Recommended asphalt cement content.
   h. Marshall compactive effort (50 blows).
   i. Date of mix design (job mix formula).
   j. Index of retained strength.
4. In addition to the job mix formula, all asphalt concrete surfacing mix submittals will have laboratory tests indicating that the Tensile Strength Ratio (TSR) as determined by AASHTO T-283, is at least 70%. Test shall be performed at 7.0 +/- 1% air voids and shall include the freeze cycle.

B. Asphalt Concrete Surface Course
1. The maximum permissible variation from the job-mix formula within the specification limits is as follows:
   a. Aggregate Gradation……Within Job Mix Tolerances
   b. Asphalt ……± 0.4 percent*
   c. Temperature of Mix ……± 20° F
      * This tolerance will be permitted only if the job mix parameter curves indicate that the corresponding Marshall design limits are not exceeded.

2. Produce Hot Plant Mix Asphalt Concrete Base Courses having the following characteristics as measured by AASHTO T245, ASTM D6726 & D6927 "Resistance to Plastic Flow of Bituminous Mixtures by means of the Marshall Apparatus":
   a. Number of compaction blows, each end of specimen..... 50
   b. Stability, minimum 1200
   c. Flow .....8 - 18
   d. Air voids, percent.....3 - 5
   e. Percent voids in mineral aggregate (minimum) ..... See Table 3

TABLE 3 REQUIRED VOIDS IN MINERAL AGGREGATE (VMA)	
Nominal particle size (table 2)	Voids in Mineral Aggregate, Min.
3/8 - inch (9.5 mm)	14
½ - inch (12.5 mm)	13
3/4 - inch (19.0 mm)	12
1 - inch (25.0 mm)	11
1 ½ - inch (37.5 mm)	10
Nominal maximum particle size is one size larger than the first sieve to retain more than 10 percent.	

PART 3 - EXECUTION

3.1 CRUSHING

A. Crushing Equipment
   1. Fit crushing plant-screening equipment, when required, with blowers or other devices capable of removing excess and undesirable fines.

B. Screening Plants
   1. Screening plants consist of a revolving trommel screen, shaker screen, vibrating screen, or other devices capable of removing oversize material, excess and undesirable fines.

C. Scales
   1. Furnish scales, when required, satisfactory to the Contracting Officer. Test and certify scales prior to their use on the project and as often thereafter as the Contracting Officer may consider necessary to ensure their accuracy. Have on hand not less than ten, 50-pound weights for testing scales.

3.2 MATERIAL HANDLING

A. All work involved in clearing and stripping pits and quarries, including handling unsuitable material encountered, are performed with no additional compensation being allowed for this work. The pits as utilized shall immediately be opened so as to expose the vertical faces of the various strata of acceptable material and, unless otherwise directed, the material shall be secured in successive vertical cuts extending through all the exposed strata.

B. Provide, unless otherwise specified, material containing as large a proportion as possible of crushed aggregate. Combine the crushed material with the screened material to obtain a uniform product.

C. No material will be accepted which is loaded into hauling units in a segregated condition or which does not meet the required grading. In case the material deposit contains sand or other material in excess of the specification gradation requirements, or of an unacceptable quality, such excess or undesirable material shall be removed and disposed of prior to crushing, or during screening operations, if crushing is not required.

D. Provide a storage bin of ample capacity to ensure uniform quality and delivery of material. Loading of trucks directly from the conveyor belt, from the crusher or screening plant will not be permitted.

3.3 STOCKPILES

A. Grub and clean sites as directed by the Contracting Officer for aggregate stockpiles prior to storing aggregates. Assure the site is firm, smooth and well drained. Maintain a bed of aggregate suitable to avoid the inclusion of soil or foreign material.

B. Build up coarse aggregate stockpiles in tiers of not more than 4 feet (1.2 m) in thickness. Assure each tier is completely in place before the next tier is placed. Do not allow material to “cone” down over the next lower tier.

C. Dumping, casting or pushing over the sides of stockpiles will be prohibited, except in the case of the fine aggregate stockpiles.

D. Space stockpiles of different gradations of aggregate far enough apart, or separated by suitable walls or partitions, to prevent the mixing of the aggregates.

E. Any methods of stockpiling aggregate, which allows the stockpile to become contaminated with foreign matter or causes excessive degradation of the aggregate, will not be permitted. Excessive degradation will be determined by sieve tests of samples taken from any portion of the stockpile over which equipment has operated and failure of such samples to meet all grading requirements for the aggregate discontinuance of such stockpiling procedures.

F. Transfer the aggregate from the stockpiles in such a manner that uniform grading of the material is preserved.

G. Stockpiling of material for use in asphalt concrete will not be permitted in the Park. Requirements pertaining to stockpiles is referring to stockpiles at the source of the asphalt concrete pavement.

3.4 CONVEYOR STOCKPILING

A. Materials stockpiled by conveyors shall be deposited in a succession of merging- cone piles. Do not drop material over 12 feet nor allow cones to exceed 12 feet in height. Cones should be leveled to a thickness of approximately 4 feet prior to starting another tier.

3.5 TRUCK STOCKPILING

A. Materials stockpiled by trucks shall construct the stockpile in tiers approximately 4 feet in thickness. Complete each tier before the next tier is started.

3.6 ASPHALT MIXING PLANTS

A. Use mixing plants of either the weight batching type, the continuous flow mixing type, or drum dryer type. Use drum dryer mixers specifically designed and constructed for producing hot mix.

B. Equip all plants with approved conveyors, power units, aggregate handling equipment, aggregate screens and bins that are coordinated and operated to produce a uniform mixture within the specified job mix tolerances.

C. Use batch-type plants having a minimum batch production capacity of 2,000 pounds. Use continuous flow or drum dryer plants having a minimum production capacity of 60 tons per hour. These capacity requirements may be modified if specified in the Contract Documents.

D. Stop production and remove from the project mixing plants that fail to continuously produce a mixture meeting requirements as specified.

3.7 INSPECTION AND CONTROL OF ASPHALT MIXING PLANT

A. For verification of weights and measures, character of materials and determination of temperatures used in the preparation of the paving mixes, the Owners Representative or his

authorized representatives will, at all times, have access to all portions of the mixing plant, aggregate plant, storage yards and other facilities for producing and processing the materials for the work. All sampling and testing of processed and unprocessed material is performed in accordance with the provisions of the Contract Documents.

3.8 MIX DESIGN

A. The Contractor's independent testing agency shall provide the Contracting Officer with a gradation analysis of the completed mix to assure that the materials being produced and used are within the tolerances of the mix design and the specifications of the mix being used.

3.9 SAMPLING AND TESTING FOR ACCEPTANCE

A. Sampling and testing of aggregates or other constituent materials will be performed by the independent testing agency at a frequency determined by the Contracting Officer. Marshall field control is performed under AASHTO T245, ASTM D6926 & D6927. Field density testing is by core testing for acceptance purposes. Densities to conform to Part 3 Section 3.27 of this specification. Gradations to be within the job mix gradation limits. Oil content to be within 0.4 percent of the Marshall Mix Design.

B. Samples will be used to verify compliance with the requirements set forth in this Section. If there is a dispute, a third party testing firm may be retained by the Owner for additional testing.

3.10 WEATHER LIMITATIONS

A. When the moisture in the stockpiled aggregate or the dryer adversely affects the quality of mix production, normal plant operations, or when pools of water are observed on the base, mixing and placing of hot-mix asphalt is prohibited.

B. Do not place asphalt hot-mix surface course mixture when the air temperature is less than 40ºF and rising. Do not place asphalt upon a surface which is frozen or that has a temperature of less than 32ºF (0ºC). Do not place paving on excessively wet or muddy surfaces, during rainfall, or in standing water.

3.11 SURFACE PREPARATION

A. Assure the area to be paved is true to line and grade and has a dry and properly prepared surface before starting paving operations. Assure the surface is free from all loose screenings and other loose or foreign material. Allow the Contracting Officer to inspect the prepared surface before paving.

3.12 NEW WORK

A. For new work, meet the surface preparation requirements in Sections 31 00 00 EARTHWORK and 32 11 23 AGGREGATE BASE COURSE.

B. Before paving, proof-roll the base with equipment having at least one 18 kip single axle load or equivalent. Excavate and replace areas that yield or crack under these wheel loads as directed. This does not replace or relax the base or subgrade compaction requirements.

C. Paint the surfaces of curbs and gutters, vertical faces of existing pavements and all structures in contact with asphalt mixes with a thin coating of asphaltic material to provide a water-tight joint.

3.13 PATCHING

A. Weather Limitations
   1. Follow procedures set out in Section 3.10.

B. Surface Preparations

1. Assure the area to be paved is true to line and grade, is dry and properly prepared surface before starting paving operations. Clean the surface of all loose screenings and other loose or foreign material.
2. Before paving, proof roll the base. Areas that yield excessively or crack under such wheel loads will be excavated and replaced, to correct yielding and cracking problems. This does not replace the base or subgrade compaction requirements. Cut the edge of existing pavements against which additional pavement is to be placed straight and vertical.
3. Minimum standards for patching new or existing pavement include the following:
    a. Neatly cut all asphalt edges using an asphalt saw.
    b. Cut asphalt edges to form as regular a patch shape as practical and should, in general, approximate a rectangle.
    c. Cut asphalt edges at least 12 inches wider than the trench width on each side of trench excavations; and, in general, be cut parallel to the street centerline for mainline construction and perpendicular to the street centerline for service lateral construction.
4. Remove and replace asphalt surface widths of less than 3 feet.

C. Compaction
1. Compact to a density equal to or greater than 92 percent of Maximum Theoretical Density (RICE) as determined by ASTM D2041.

3.14 TRANSPORTATION OF MIX

A. Transport the mix in vehicles cleaned of all foreign material which may affect the mix. The truck beds must be painted, or sprayed with a lime-water, soap or detergent solution at least once a day or as often as required. After this operation, elevate the truck bed and thoroughly drain it, with no excess solution being permitted. Dispatch the vehicles so that all material delivered is placed in daylight, unless the Contracting Officer approves artificial light. Deliver material to the paver at a uniform rate and in amount well within the capacity of the paving and compacting equipment.

3.15 SPREADING AND FINISHING:

A. Spread and finish meeting the following requirements:
1. The maximum lift thickness is 2 inches for surface courses

3.16 MECHANICAL PAVERS

A. Spread and strike off the base and surface courses with a mechanical paving machine. Operate the paving machine so that material does not accumulate and remain along the sides of the receiving hopper.

B. Do not use equipment, which leaves tracks or indented areas, which cannot be corrected in normal operation, produces flushing or other permanent blemishes, or fails to produce a satisfactory surface.

C. As soon as the first load of material has been spread, check the texture of the unrolled surface to determine its uniformity. Segregation of materials is not permitted. If segregation occurs, suspend spreading operation until the cause is determined and corrected.

D. Offset transverse joints in succeeding courses at least 2 feet. Offset longitudinal joints at least 6 inches.

E. Correct all irregularities in alignment left by the paver by trimming directly behind the machine. Immediately after trimming, thoroughly compact the edges of the course by tamping. Avoid distorting the pavement during this operation.

F. Assure edges against which additional pavement is to be placed is straight and approximately vertical. Use a lute or covered rake immediately behind the paver, when required, to obtain a true line and vertical edge. Correct all irregularities in the surface of the pavement course directly behind the paver. Remove excess material forming high spots by a shovel or lute. Fill low areas with hot mix and smooth it with the back of a shovel being pulled over the surface. Fanning of material over such areas is not permitted.

3.17 MOTOR GRADER

A. When motor graders are used for the spreading of leveling courses, place the material on the roadbed so that the proper amount of material is available. Spread the mix to the required thickness, line and grade, with a uniform surface texture, while at a workable temperature.

3.18 HAND SPREADING

A. In small areas where the use of mechanical finishing equipment is not practical, the mix may be spread and finished by hand, if so directed by the Contracting Officer. Wood or steel forms, approved by the Contracting Officer, rigidly supported to assure correct grade and cross section, may be used. In such instances, measuring blocks and intermediate strips must be used to obtain the required cross-section. Perform hand placing carefully. Uniformly distribute the material to avoid segregation of the coarse and fine aggregate. Broadcasting of material is not permitted. During the spreading operation, loosen and uniformly distribute all material using lutes or covered rakes. Reject material that has formed into lumps and does not break down readily. Following placing and before rolling, check the surface with templates and straightedges and correct all irregularities.

B. Maintain on the project heating equipment for keeping hand tools free from asphalt. Exercise caution to prevent heating that may burn the material. Assure the temperature of the tools when used is not greater than the temperature of the mix being placed. Use heat only to clean hand tools; petroleum oils or solvents are not permitted.

3.19 COMPACTION

A. Furnish the number of rollers necessary to provide the specified pavement density. During rolling, keep the roller wheels moist to avoid picking up the material.

B. After the longitudinal joints and edges have been compacted, start rolling longitudinally at the sides and progress toward the center of the pavement. For transverse graded streets, begin rolling on the low side and progress to the high side, overlapping passes by at least one-half the width of rollers and uniformly lapping each preceding pass. Operate the rollers at a slow, uniform speed with the drive roll or wheel nearest the paver. Do not exceed 3 miles per hour.

C. Do not quickly change the line of rolling reversing direction suddenly. If rolling displaces the material, re-work the area using lutes or shovels and restore it the original grade of the loose material before re-rolling. Do not permit heavy equipment or rollers to stand on the finished surface before it has been compacted and has thoroughly cooled.

D. When paving in single width, roll the first lane placed as follows:
   1. Transverse joints
   2. Outside edge
   3. Initial or breakdown rolling, beginning on the low side and progressing toward the high side
   4. Second rolling, same procedures as 3
   5. Finish rolling

E. When paving in echelon, or abutting a previously placed lane, perform the longitudinal joint rolling the same as transverse joint rolling.

F. When paving in echelon, leave 2 or 3 inches of the edge unrolled, which the second paver can match unrolled. Then the joint between the lanes can be rolled together. Do not leave edges exposed more than 15 minutes without being rolled.

G. In laying a surface mix adjacent to any finished area, place it high enough so that, when compacted, the finished surface is true and uniform.

H. On slight grades, check gutters with a straightedge and test with running water to assure drainage to the planned outlet.

I. The average density shall be equal to or greater than 93 percent of the Maximum Theoretical Density (RICE) as determined by ASTM D2041 and no individual sample shall be less than 92 percent of maximum density.

3.20 TRANSVERSE JOINTS

A. Construct and compact transverse joints to provide a smooth riding surface. Joints will be straight edged and string lined to assure smoothness and true alignment.

B. Joint formed with bulkheads to provide a straight line and vertical face will be checked with a straightedge before fresh material is placed against it to complete the joint. If bulkheads are not used to form the joint and the roller is permitted to roll over the edge of the new material, locate the joint line in back of the rounded edge the distance required to provide a true surface and cross-section. If a joint has been distorted by traffic or by other causes, trim it to line. Paint the joint face with a thin coating of asphalt before the fresh material is placed against it.

C. Place the material against the joints vertical face with the paving machine positioned so that the material overlaps the edge of the joint 1 to 2 inches. Maintain a uniform depth of the overlapped material. Remove and dispose of the coarse aggregate in the overlapped material that dislodged during raking.

D. Position rollers on the previously compacted material transversely so that no more than 6 inches of the rolling wheel rides on the edge of the joint. Operate the roller to pinch and press the mix into place at the transverse joint. Continue rolling along this line, shifting position gradually across the joint, in 6 to 8-inch increments, until the joint has been rolled by entire width of the roller wheel.

E. Keep the number of transverse joints to a minimum. When paving single width and maintaining traffic, pave one lane no farther than one block. Complete all lanes to the same station at the end of each paving day. When paving in echelon, bring the lanes up even as is practical.

3.21 LONGITUDINAL JOINTS

A. Roll longitudinal joints directly behind the paving operation. Assure the first lane placed is true to line and grade and has a vertical face. Place the material in the lane being paved up firmly against the face of the previously placed lane. Position the paver during spreading to assure the material overlaps the edge of the lane previously placed by 1 inch to 2 inches. Uniformly maintain the width and depth of the overlapped material at all times. Keep the paver aligned with the line or markings placed along the joint for alignment purposes. Before rolling, remove and dispose of the coarse aggregate in the material overlapping the joint.

B. Shift rollers onto the previously placed lane so that not more than 6 inches of the roller wheel rides on the edge of the fine material left by brooming. Operate the rollers to compact the fines gradually across the joint. Continue rolling until a compacted, neat joint is obtained. When the abutting lane is not placed in the same day, paint the joint with a very thin coating of asphalt before placing the abutting lane. If the joint is distorted during the day's work by traffic or by other causes, carefully trim the edge of the lane to a neat line.

3.22 EDGES

A. Roll the pavement edges concurrently with or immediately after rolling the longitudinal joint.

B. Exercise care in consolidating the course along the entire length of the edges. In rolling pavement edges, extend the roller wheels 2 to 4 inches beyond the pavement edge.

3.23 BREAKDOWN ROLLING

A. Immediately begin breakdown rolling following the rolling of the longitudinal joint edges. Operate rollers as close to the paver as required to obtain density without causing undue displacement. Operate the breakdown roller with the drive roll or wheel nearest the finishing machine. The Contracting Officer may make exceptions when working on steep slopes or super-elevated curves.

3.24 SECOND ROLLING

A. Assure the second rolling follows the breakdown rolling as close as possible while the paving mix is still at a temperature that will provide the specified density.

3.25 FINISH ROLLING

A. Perform the finish rolling while the material is still warm enough to remove roller marks. If necessary, the Contracting Officer may require the use of pneumatic-tired rollers. Complete finish rolling the same day the mixture is placed.

B. In places inaccessible to standard rollers, perform compaction using trench rollers or others to meet the specified compaction requirements. Operate the trench roller as directed until the course is compacted. Hand, manual or mechanical tamping may be used in such areas if it is proved to the Contracting Officer that the operation will provide the specified density.

3.26 SHOULDERS

A. Where paved shoulders or curbs are not specified, do not place the shoulder material against the pavement edges until the surface course rolling is completed. Take care to prevent distortion of the pavement edge from specified line and grade. When shoulders are paved (except in conjunction with the traveled way paving), cold joint construction procedure is required to assure a tight bond at the joint.

B. When the rolling of the surface has been completed and the edges have been thoroughly compacted, immediately place shoulder material against the edges and roll it.

3.27 DENSITY AND SURFACE REQUIREMENTS

A. The average mat density shall be equal to or greater than 93 percent of the maximum density as determined by ASTM D2041 and no individual sample shall be less than 92 percent of maximum (RICE) density, prepared as specified in Part 2-Products in this section and made from plant mix meeting the job-mix formula. Verification of maximum density as determined by ASTM D2041 from plant produced material during production is recommended.

B. Produce a final surface that is uniform in texture and meets the line and grade specified. Before final acceptance of the Project or during the progress of the work, the Contracting Officer will inspect the thickness of all courses. Repair or replace all unsatisfactory work.

C. Assure density and thickness meets the plans and specifications. During compaction, preliminary tests to aid in controlling the thickness, may be performed by inserting a flat blade, correctly graduated, through the material to the top of the previously placed base, or by other approved methods.

D. In checking compacted depth, the cutting of the test holes, refilling with acceptable materials and proper compaction shall be performed by the Contractor's testing agency.

E. For testing the surface on all courses, a 10-foot straightedge will be used with the centerline of the straightedge placed parallel to the roadway centerline.

F. Any variations that exceed 5/16-inch in 10 feet for base course and 1/4-inch in 10 feet for surface course must be corrected. Correct irregularities that may develop before the completion of rolling by loosening the surface mix and removing or adding materials as is required. If any irregularities or defects remain after the final compaction, remove the surface course and place and compact new material to a true and even surface. All minor surface projections, joints and minor honeycombed surfaces must be rolled smooth to grade, as directed.

G. Remove and replace areas of new pavement requiring patching as directed. Patching material will be tested for meeting specifications. The cost of testing is at Contractor expense.

3.28 PAVEMENT AND MATERIAL TESTING REQUIREMENTS

A. The Contractor's testing agency will provide initial core samples of asphalt surface courses to check in place density and compacted depth. The cores must be 4-inch diameter. Materials and acceptance tests will be made by the Owner's independent testing agency to determine the Contractor's compliance with the specifications. A minimum of three core samples will be required. Locations of cores will be designated in the field by the Contracting Officer. Hot asphalt concrete mix will be used to backfill the holes. Alternative materials may be approved by the Contracting Officer.

B. Materials failing to meet the tests specified may be retested if approved and as directed by the Contracting Officer. Re-testing will be performed by the Contractor's testing agency, at the Contractor's expense. If there is a dispute, a third-party testing firm may be retained by the contractor for additional retesting for the Contracting Officer review and consideration.

C. The costs of the following tests are at Contractor expense:
   1. Initial aggregate quality tests
   2. Job-Mix Formula
   3. Any tests the Contractor requires to control his crushing, screening, or other construction operations.
   4. Re-testing of failing tests

D. Correct all pavement composition, field density, or thickness, deficiencies at Contractor expense.

E. The field density and thickness of the pavement is determined by measuring the cores tested. The actual thickness must be no less than 1/4-inch from the specified thickness.

F. When the measurement of any core is less than the plan thickness by more than the allowable deviation, the actual thickness of the pavement in this area may be determined by taking additional cores at intervals of parallel to the centerline in each direction from the affected location. Continue in each direction until a core is found which is not deficient by more than the allowable deviation. The Contracting Officer will evaluate areas found deficient in thickness and determine which areas warrant removal. Remove and replace the areas with asphaltic concrete of the thickness shown on the plans. Additional coring is considered as re-testing of failing areas.

3.29 COLD PATCH PREPERATION

A. Surface Preparation:

1. Given the high likelihood of wet conditions, ensure the area to be patched is as dry as possible. Use blowers or other drying methods if necessary. Surface water can prevent proper adhesion of the cold mix.
2. Apply a tack coat of emulsified asphalt to improve adhesion between the existing surface and the cold mix, especially in damp conditions.

B. Application:
1. In Southeast Alaska, cold mix asphalt should be placed in thinner lifts than in drier climates to allow for better compaction and quicker curing, especially considering the cool and wet conditions.
2. Compact immediately after placement to reduce the impact of rain or moisture on the curing process.

C. Curing:
1. Curing times may be longer due to cooler temperatures and high humidity. Consider applying a temporary protective cover (such as sand or an additional layer of aggregate) to prevent washing out if rain is expected shortly after application.
2. Traffic should be kept off the newly patched area for a longer period to allow for adequate curing in the damp environment.

END OF SECTION 32 12 16

SECTION 32 91 19 – TOPSOIL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The work of this section consists of placing stripped topsoil from the site on a previously prepared subgrade.

1.2 RELATED WORK

A. Section 01 35 13 – Archeological Protection

B. Section 31 00 00 – Earthwork

C. Section 31 10 00 – Site Clearing

1.3 DELIVERY, STORAGE AND HANDLING

A. Use all on-site stockpiled topsoil. Any imported topsoil must be certified weed free. Do not place topsoil in frozen, wet, or muddy conditions.

PART 2 - PRODUCTS

2.1 ON-SITE TOPSOIL

A. Stripped and stockpiled as specified in Sections 31 00 00 – Earthwork and 31 10 00 – Site Clearing.

PART 3 - EXECUTION

3.1 PLACING TOPSOIL

A. Scarify compacted subgrade to a depth of six inches to provide appropriate rooting medium for re-vegetation unless otherwise directed by Contracting Officer. Place topsoil to a minimum depth of 1-foot on the sides and 1.5-feet in the middle (as shown on the plans). Spread evenly, hand raking areas inaccessible to machine grading.

3.2 FINISH AND FINE GRADING

A. Transitional Areas: At any transitional point or line where the slope intersects another, such as from a sloping area or berm to a level area, a smooth and gentle transition shall be made. There shall be no abrupt changes in grade unless specifically noted otherwise.

END OF SECTION 32 91 19

This page was intentionally left blank.

SECTION 32 92 19 – SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies requirements for turf establishment and seeding for repair to vegetated areas impacted by construction, including but not limited to new hydrant and pipe locations. Work includes:
   1. Spreading, and fine grading of salvaged native topsoil.
   2. Preparation of seedbeds for use by NPS to self-perform seeding following fine grading and seedbed preparation.
   3. Maintenance of seeded areas.

1.2 RELATED SECTIONS

A. Sections which directly relate to the Work of this Section include:
   1. Section 01 57 23 – Temporary Storm Water Pollution Prevention.
   2. Section 31 00 00 – Earthwork.
   3. Section 31 10 00 – Site Clearing.

1.3 QUALITY ASSURANCE

A. All work shall be performed by personnel experienced in lawn installation under the full-time supervision of a qualified foreman.

B. Work shall be coordinated with all other trades on site.

1.4 INSPECTION FOR ACCEPTANCE

A. Conditions of Acceptance:
   1. Acceptance shall be given for the entire portion of the fine graded, prepared seed bed, areas. No partial acceptance will be given.
   2. Following seeding by NPS staff, the vegetated areas shall not exhibit signs of damage from erosion, washouts, gullies, or other causes.
   3. Pavement surfaces and site improvements adjacent to vegetated areas shall be clean and shall be free of spills or overspray from placing or handling of topsoil and seeding operations.

B. Inspection and Acceptance:
   1. Upon written request of the Contractor, the Contracting Officer's Representative will inspect all fine graded, seedbed prep, areas to determine completion of work. This request must be submitted at least five days prior to the anticipated inspection date.
   2. If the fine graded areas are not acceptable, the Contracting Officer's Representative will indicate corrective measures to be taken and shall extend the maintenance period as necessary for the completion of the work. The Contractor shall request a second inspection of the areas after corrective measures have been accomplished. This process shall be repeated until the total fine graded, seedbed prepped, areas being inspected is acceptable.
   3. When the fine graded areas are acceptable and ready for seeding by NPS, a meeting of the Contractor and Contracting Officer's Representative will be arranged to accept the work. A final inspection will be a part of this meeting. At this meeting, the Contractor shall be furnished with a written acceptance of the area being

approved. The Contractor shall turn over maintenance of the vegetated areas to the Contracting Officer at this meeting.

C. Site Cleanup
   1. The Contractor shall leave the site in a clean and neat condition. Final acceptance will not be granted until this condition is met.

PART 2 - PRODUCTS

2.1 SOILS

A. Salvage native topsoil prior to site excavation and redistribute directly to the areas of disturbance to preserve native seed sources. Stockpiling of topsoil is not permitted. Topsoil shall be kept near its original source and not intermixed between different site areas (e.g., tank area and Tlingit Trail area) to maintain the integrity of native seed banks.

2.2 WATER

A. Water shall be furnished by the Contractor, suitable for irrigation, and free from ingredients harmful to plant life. Hoses and other watering equipment required for the work shall be furnished by the Contractor.

2.3 SEED

A. NPS will provide all seed material and self-perform seeding activities where additional seeding is necessary beyond natural regrowth.

PART 3 - EXECUTION

3.1 SEEDBED PREPARATION

A. Grade all disturbed areas to finish grades as indicated on the Drawings. When no grades are shown, areas shall have a smooth and continual grade between existing or fixed controls and elevations shown on Drawings. Roll, scarify, and rake as required to obtain uniform, even vegetated surfaces. All areas shall slope to drain. Finish grades shall be approved by the Contracting Officer.

B. Immediately after final grading, redistribute salvaged native topsoil directly onto disturbed areas to a minimum depth of 4 inches, or to a depth matching existing undisturbed conditions in the area of work. Subsoil shall be cleaned of debris and stones larger than 2 inches prior to topsoil placement.

C. Install erosion control blankets over all areas where topsoil has been placed to promote natural regrowth and minimize erosion in accordance with Section 01 57 23 – Temporary Storm Water Pollution Prevention and Section 31 00 00 - Earthwork.

D. Coordinate with the Contracting Officer to ensure final grading and soil stabilization measures are completed in a timely manner to allow for optimal conditions for natural regrowth.

3.2 SEEDING

A. Natural regrowth from salvaged topsoil is the preferred method of revegetation. Where additional seeding is determined necessary, NPS staff will perform seeding activities.

3.3 MAINTENANCE AND PROTECTION

A. Maintenance of stabilized areas by the Contractor shall begin immediately after erosion control blankets are installed and/or seeding is performed by NPS. Maintenance includes watering, disease and insect pest control, repair of all erosion damage, and any other procedures required to ensure normal, vigorous, and healthy growth. Maintenance shall continue until final acceptance of the work.

B. Maintenance shall also include all temporary protection fences, barriers, signs, and all other work incidental to proper maintenance.

C. Stabilized areas shall be maintained in a continuous moist condition, satisfactory for promoting natural regrowth and/or good germination and growth of seeded areas until acceptance.

END OF SECTION 32 92 19

This page was intentionally left blank

SECTION 33 12 13 – WATER DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work described in this Section is for water lines and appurtenances required to replace the water main and provide services.

B. Furnish all water main pipe and fittings meeting the Contract Documents or specified as follows.

C. Furnish and install valves for water mains, together with related appurtenances.

D. Furnish and install water services, including water service piping, electrofusion tapping saddles, and related items.

1.2 RELATED SECTIONS

A. Sections which directly relate to the work of this Section include:
   1. Section 31 05 25 – Utility Line Marking
   2. Section 31 21 00 – Trench Excavation
   3. Section 33 31 23 – Fusible High-Density Polyethylene (HDPE) Pipe & Fittings

1.3 CERTIFICATIONS

A. Furnish a manufacturer's certification covering all pipe and fittings, certifying that the pipe and fittings meet applicable specifications.

1.4 REFERENCES

A. The current publications listed below form a part of this specification:

ANSI B16.1	Tapping Sleeves
ASTM PE3406-3408	Polyethylene Pressure Pipe
AWWA B300	Hypochlorite for Disinfecting
AWWA B301	Liquid Chlorine for Disinfecting
AWWA C500	Gate Valves
AWWA C502	Fire Hydrants
AWWA C509	Gate Valves
AWWA C651	Disinfecting Water Mains

1.5 SUBMITTALS

A. Submit to the Contracting Officer's Representative manufacturer's printed recommendations and installation instructions for the type of pipe construction being specified under this contract.

B. Submit to the Contracting Officer's Representative the contractor or subcontractor certification and performance history for the installation of fusible HDPE water main pipe.

C. Submit to the Contracting Officer's Representative manufacturer's information on the fittings and valves to be used on the project. Fittings and valves must be approved by the Contracting Officer's Representative before installation.

D. Submit to the Contracting Officer's Representative the detailed Utility Interruption Plan, including the schedule, duration of proposed interruptions, and compliance with

specified shutdown hours. The plan must address temporary utility services and ensure continuous operation during interruptions.

E. Submit to the Contracting Officer's Representative a Potable Water Plan, providing a detailed strategy for maintaining potable water access during construction. The plan must break down solutions by segment and address water delivery during utility shutdowns.

F. Submit to the Contracting Officer's Representative the Disinfection Plan, which must outline the process for complying with AWWA N6.2 disinfection requirements following utility interruptions.

PART 2 - PRODUCTS

2.1 GENERAL

A. Furnish Water Main pipe and fittings as specified in the Construction Drawings and Contract Documents, and meeting the material and testing requirements of this Section. Furnish fittings and service line piping meeting the material and testing requirements of this Section. Pipe strength classifications are shown on the Plans.

B. References made to ASTM, ANSI, AWWA, USASI or AASHTO designations are the latest revision at the time of call for bids.

C. All piping, services, valves, and fittings that will come in contact with potable water must be NSF-61 certified.

2.2 PIPE MATERIALS

A. Furnish the water distribution pipe specified in the contract documents meeting the materials and testing requirements as outlined in Section 33 31 23 – "Fusible High-Density Polyethylene (HDPE) Pipe & Fittings."

2.3 TAPPING SLEEVES AND VALVES

A. Use electrofusion tapping saddles:
   1. An electrofusion tapping saddle is used to tap into a HDPE mine.
   2. Electrofusion tapping saddle fittings made from PE100 material with a precisely molded energizing coil of wire, ensuring uniform melting for a strong electrofusion joint and the minimization of welding and cooling times.
   3. Assure electrofusion tapping saddle fitting has a class 125, ANSI B16.1 outlet flange, are rated for a minimum 150 psi (1030 kPa) working pressure and contain a threaded test plug on the neck or body of the tapping sleeve. Assure gaskets are manufacturers' standard for use in potable water systems. Assure tapping valves meet the applicable requirements for gate valves, as outlined in this section, with inlets compatible with the electrofusion tapping saddle and outlet.

2.4 CORPORATION STOPS

A. Furnish brass corporation stops with inlet end to meet tapping requirements and flared outlet for copper tubing or pressure coupling for polyethylene tubing.

2.5 SERVICE CONNECTIONS

A. Clamp-On Service Connections
   1. Furnish flat, double strap, bronze metal service clamps with Neoprene gaskets and corporation stop threads. Ensure clamps designed for HDPE provide full support

around the pipe circumference. The bearing area of the clamp must evenly distribute the load along the pipe's axis to prevent distortion when tightened.

2. Use clamps specifically designed for HDPE pipes, which may feature a wider bearing area and design modifications to accommodate HDPE's flexibility and expansion characteristics.

B. Fusible Service Connections:

1. For HDPE service connections that require fusion, use compatible fusion fittings designed for HDPE pipe. Ensure that the fusion equipment and procedures conform to the manufacturer's recommendations and industry standards for HDPE pipe fusion.
2. Fusible service connections should provide a continuous, leak-proof joint that matches the performance of the HDPE pipe. Follow all fusion guidelines, including temperature, pressure, and time requirements, to ensure a proper and durable connection.

2.6 CURB STOPS

A. Furnish curb stops with bronze plug, tee head with arch style pattern and screw box mount.

2.7 CURB BOXES

A. Furnish extension type curb boxes having a 6 ½ foot (2 meters) extended length.

2.8 VALVES

A. Gate Valves

1. General Requirements:
2. Furnish iron body gate valves with either a resilient seat or double disc configuration and non-rising stems. The design, construction, and pressure rating must meet AWWA C500 or AWWA C509 requirements, as well as the following specifications.

B. Stem Seals

1. Ensure stem seals are double "O" ring seals capable of being replaced above the stem collar while the valve is under pressure and in the full open position.

C. Underground Installation

1. Furnish gate valves for underground installation with a 2-inch (50 mm) square operating nut for key operation. All valves must open counterclockwise.
2. Provide gate valves with either push-on joints, mechanical joints, or fusible joints for pipe connections. Ensure fusible joints are compatible with HDPE pipe and follow the manufacturer's fusion procedures for a leak-proof connection.

2.9 VALVE BOXES

A. Furnish cast iron valve boxes, 5-1/4 inch (13 cm) diameter, adjustable valve boxes with the required base for the valve size used. Assure valve boxes are screw type and of the specified length for the pipe bury. Assure the valve box cast iron cover has an arrow indicating the opening direction and stamped with the word "Water".

2.10 FIRE HYDRANTS

A. Furnish fire hydrants meeting AWWA C502; "Standard Specifications for Fire Hydrants for Ordinary Water Works Service", and the Contract requirements.

B. Furnish hydrants with 5-1/4-inch (13 cm) valve openings, 6-inch (15 cm) mechanical joint, flanged or push-on inlet, one pumper connection and two, 2-½-inch (63 cm) hose connections. Assure hose nozzle threads meet ASA Specification B26 for National Fire Hose Coupling Screw Threads, 7- ½ threads per inch. Assure pumper nozzle size and threads match NPS's existing pattern. Furnish National Standard operating nut. Furnish hydrants opening counter clockwise and having an arrow on the hydrant top designating the opening direction.

C. Furnish "Compression" type hydrants with safety flange and safety stem coupling above the ground line permitting repair without shutting off the water. Assure hydrants are of the dry top design with two or more "O" rings sealing the water from the operating mechanism. Assure the operating mechanism is automatically lubricated from a sealed, self-contained lubricating reservoir.

D. Paint the hydrant portion above the ground line meeting NPS standards. Furnish hydrants for 3-foot bury.

2.11 METER

A. Furnish a meter meeting the requirements specified in the Plans, and approved by the Contracting Officer, furnish all fitting and necessary appurtenances required for installation of the meter.

2.12 SERVICE BENDS, TEES, UNIONS, PIPE TRANSITIONS & FITTINGS

A. Furnish bends, tees, unions, pipe transitions, and fittings meeting the Plans and Contract Documents.

B. Bends, tees, unions, pipe transitions, and/or fittings may be fusible or mechanical and shall be manufactured specifically for the application specified on the Plans.

2.13 TRACER WIRE & DETECTION TAPE

A. Furnish tracer wire meeting the requirements of Section 31 05 25 – "Utility Line Marking".

B. Furnish metal detectable polyester warning tape, blue in color, with black text reading "CAUTION BURIED WATER LINE BELOW", 2" wide minimum, meeting the requirements specified in the Plans.

2.14 AIR VACUUM RELEASE VALVES

A. General Requirements:
   1. Type and Function:
      a. Furnish air vacuum release valves designed to automatically release air and allow air to enter the pipeline during filling and draining operations, preventing vacuum conditions that could damage the pipeline.
      b. The valves should be equipped with a float mechanism that seals automatically when the pipeline is under pressure.
   2. Construction:
      a. The valve body shall be constructed of corrosion-resistant materials such as bronze, stainless steel, or composite materials.
      b. The valve shall include a stainless steel or brass float, and the seat shall be designed to prevent dirt and debris from affecting the operation.
   3. Specifications:

a. The valve shall be sized to match the pipeline diameter and flow requirements, with a minimum orifice size of [insert size, e.g., 1 inch (25 mm)] to ensure effective air release.
b. Pressure rating shall be compatible with the pipeline pressure, typically up to [insert pressure rating, e.g., 150 psi (1,035 kPa)].

4. Installation:
   a. Install air vacuum release valves at high points in the pipeline where air accumulation is likely. Ensure that the valve is easily accessible for maintenance.
5. Manufacturer:
   a. Approved manufacturers include Val-Matic, M&H Valve, AVK, APCO, or approved equal. Verify compatibility with the pipeline system and local standards.

2.15 BLOWOFFS

A. General Requirements:
   1. Type and Function:
      a. Furnish blowoff valves designed to facilitate the draining of water from the pipeline for maintenance, inspection, and emergency purposes. Blowoffs shall allow for the controlled release of water and the flushing of debris from the pipeline.
   2. Construction:
      a. The blowoff valve shall be constructed of durable, corrosion-resistant materials such as cast iron, ductile iron, or stainless steel.
      b. The valve shall include a shutoff mechanism and a blowoff nozzle or outlet to direct the flow of water during operation.
   3. Specifications:
      a. The valve shall be sized to match the pipeline diameter and flow requirements, with an orifice size capable of handling the expected flow rate.
      b. The valve shall have a pressure rating compatible with the pipeline pressure
   4. Installation:
      a. Install blowoff valves at low points in the pipeline to facilitate drainage and ensure that the valve is located in an accessible position for operation and maintenance.
      b. Provide adequate protection against freezing, especially in colder climates.
   5. Manufacturer:
      a. Approved manufacturers include Mueller Co., Ford Meter Box Company, or American Cast Iron Pipe Company (ACIPCO) or approved equal. Ensure compatibility with the pipeline system and local standards.

PART 3 - EXECUTION

3.1 TRENCH EXCAVATION AND BACKFILL FOR WATER MAINS

A. This work includes all excavation, backfilling, disposal of surplus and unsuitable material, and all work incidental to trench construction, including excavation for valves, fittings, thrust blocks or other pipeline structures.

B. Perform this work in accordance with Section 31 21 00 – “Trench Excavation”

3.2 PIPE INSTALLATION FOR WATER MAINS & SERVICES

A. Perform this work in accordance with Section 33 31 23 – "Fusible High-Density Polyethylene (HDPE) Pipe & Fittings"

3.3 TESTING, CLEANING & DISINFECTING WATER MAINS, VALVES & FITTINGS

A. Hydrostatic and Leakage Testing
   1. Perform hydrostatic and leakage testing in accordance with AWWA C600. Once the pipe is laid and backfilled, test for at least 2 hours, all newly laid pipe, or any valved section, to a hydrostatic pressure of at least 1.5 times the normal operating pressure at the test point or 1.25 times the normal operating pressure at the highest point along the test section.
   2. Slowly fill the pipe with water, purging all air, and apply the test pressure using a pump hooked up so that the pressure and leakage can be measured. To purge the pipe of air during the test, it is necessary to tap the pipe at its highest point if permanent air vents, water services, hydrants, etc. are not located at the high points. Use corporation stops for this purpose. Furnish the pump connections, gauges, stops, and all necessary apparatus for testing.
   3. Disassemble and reassemble all joints showing leakage after thorough cleaning. Remove and replace all cracked or defective pipes or fittings discovered in during the pressure test with sound material and repeat the test.
   4. Conduct the leakage test concurrently with the pressure test for 2 hours. Leakage is defined as the quantity of water supplied into the pipe, or any valved section thereof, necessary to maintain pressure within 5 PSI of the pressure test after the pipe has been filled with water and purged of air.
   5. 5. The pipe installation will be rejected if the leakage exceeds that determined by the following formula in which L equals the allowable leakage in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge:

$$L = \frac{SD(P)^{1/2}}{133{,}200}$$

   6. Should any test of pipe laid disclose leakage exceeding that specified above, locate and repair the defective joints until the leakage is within the specified allowance.
   7. Conduct the pressure and leakage tests in the presence of the Contracting Officer's Representative.
   8. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallon per hour per inch of nominal valve size is allowed. Repair all visible leaks regardless of the amount of leakage.
   9. Pressure test tapping sleeves after installation and before tapping.

B. Cleaning Water Mains
   1. Before chlorination, except when hypochlorite tablets are used, flush the mains thoroughly after the pressure and leakage test are completed.
   2. It is understood that such flushing removes only the lighter solids and cannot be relied upon to remove heavy material allowed to get into the main during laying. Use a minimum flushing velocity in the main of 2.5 feet per second. If no hydrant is installed at the end of the main, provide a tap of the size to produce a velocity in the main of at least 2.5 feet per second. Table 1 shows the rates of flow required to produce a velocity of 2.5 feet per second in various size pipes.

TABLE 1 REQUIRED FLOW AND OPENINGS TO FLUSH PIPELINES[1/]						
	Flow Required to Produce 2.5 fps (approx.)	Size of Tap (inch)			Hydrant Outlet	
		1	1-1/2	2		
Pipe Dia. Inches (cm)	Velocity in Main, gpm (epm)	Number of taps On pipe [2]			Number	Size Inches (mm)
4 (10)	100 (380)	1			1	2-1/2 (63)
6 (15)	200 (760)		1		1	2-1/2 (63)
8 (20)	400 (1510)		2	1	1	2-1/2 (63)
10 (25)	600 (2270)		3	2	1	2-1/2 (63)
12 (30)	900 (3400)			2	2	2-1/2 (63)
16 (41)	1600 (6060)			4	2	2-1/2 (63)

[1] With a 40 psi (267 kPa) pressure in the main with the hydrant flowing to atmosphere, a 2 ½ inch (63 mm) hydrant outlet will discharge approximately 1000 gpm (3786 epm) and a 4 ½ inch(114 mm) hydrant nozzle will discharge approximately 2500 gpm (9463 epm).

[2] Number of taps on pipe based on discharge through 5 feet (1.5 meters) of galvanized iron (GI) pipe with on 90° elbow.

3. Exercise extreme care and conduct a thorough inspection during the water main laying to prevent and detect small stones, pieces of concrete, particles of material, or other foreign material that may have entered the mains. To remove this material, flush and inspect all hydrants on the lines to assure that the entire valve operating mechanism of each hydrant is in good condition.

C. Disinfecting Water Mains
   1. General
      a. Disinfect the water mains subject to the approval of the Contracting Officer's Representative in accordance with AWWA C651, "Disinfecting Water Mains", and these specifications, before placing the main in service. Keep the interior of all pipe, fittings and appurtenances free from dirt, heavy and foreign particles.
   2. Forms of Chlorine
      a. Chlorine must be NSF-60 certified.
      b. The forms of chlorine that may be used, subject to the approval of the Contracting Officer's Representative, are:
         1) Liquid chlorine containing 100 percent available chlorine under pressure in steel containers. Meet AWWA B301 requirements and use only in combination with appropriate gas-flow chlorinators and ejectors.
         2) Sodium hypochlorite in liquid form containing approximately 5 to 15 percent available chlorine. Meet AWWA B300 requirements.
         3) Calcium Hypochlorite in granular form or in 5g tablets containing approximately 65 percent available chlorine by weight. Meet AWWA B300 requirements.
   3. Methods of Chlorination
      a. Three (3) methods of chlorination may be used. The tablet method gives an average chlorine dose of approximately 25 mg./L; the continuous feed method gives a 24-hour chlorine residual of not less than 10 mg./L; and the slug method provides a three hour exposure of not less than 50 mg./L free chlorine:

1) Tablet Method
   a) This method may be used if the pipes and appurtenances are kept clean and dry during construction.
   b) During construction, place calcium hypochlorite granules at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500-foot intervals. Use the quantity of granules shown in Table 2
   c) Warning: Do not use this procedure on solvent welded plastic or on screwed joint steel pipe because of fire or explosion hazard from the reaction of the joint compounds with the calcium hypochlorite.

TABLE 2
OUNCES OF CALCIUM HYPOCHLORITE GRANULES TO BE PLACE AT BEGINNING OF MAIN AND AT EACH 500-FOOT (150 METER) INTERVAL

Pipe Diameter Inches (cm)	Calcium Hypochlorite Granules oz.
4 (10)	0.5
6 (15)	1.0
8 (20)	2.0
12 (30)	4.0
16 and larger (41)	8.0

   d) During construction, place 5 g calcium hypochlorite tablets in each section of pipe and also place one tablet in each hydrant, hydrant branch and other appurtenance. Use the number of 5g tablets for each pipe section required to provide a minimum chlorine concentration of 25 mg/L. Attach tablets to the inside of the pipe using an adhesive such as Permatex No. 1 or equal. Assure no adhesive is on the tablet except on the broad side attached to the surface of the pipe. Attach all the tablets at the inside top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, mark their position on the section so it can be readily determined that the pipe is installed with the tablets at the top.
   e) When installation has been completed, fill the main with water at a velocity not exceeding 1 fps. Take precautions to assure that air pockets are eliminated. Leave this water in the pipe for at least 24 hours. If the water temperature is less than 41°F, leave the water in the pipe for at least 48 hours. Position valves so that the chlorine solution in the main being treated will not flow into water mains in active service.
2) Continuous Feed Method
   a) Before chlorinating, fill the main with water to eliminate air pockets and flush as specified above.
   b) Use water from the existing distribution system or other approved source of supply to flow at a constant, measured rate into the newly laid water main. At a point not more than 10 feet downstream from the beginning of the new main, assure water entering the new main receives chlorine fed at a minimum 25 mg/L free chlorine. To assure

that this concentration is provided, measure the chlorine concentration at regular intervals.

c) During chlorine application, position valves so that the chlorine solution in the main being treated does not flow into water mains in active service. Do not stop chlorine application until the entire main is filled with chlorinated water. Retain the chlorinated water in the main for at least 24 hours, operating all valves and hydrants in the section treated to disinfect the appurtenances. At the end of the 24-hour period, the treated water in all portions of the main must have a minimum free chlorine residual of 10 mg/L free chlorine.

d) The preferred equipment for applying liquid chlorine is a solution feed vacuum operated chlorinator to mix the chlorine gas in solution water, in combination with a booster pump for injecting the chlorine gas solution water into the main to be disinfected. It is recommended that direct feed chlorinators not be used. Hypochlorite solutions may be applied to the water main with a chemical feed pump designed for feeding chlorine solutions.

e) If approved, an optional continuous feed method utilizing calcium hypochlorite granules may be used. Place the granules in the pipe sections as specified under the Tablet Method.

3) Slug Method

a) Before chlorinating, preliminary flush the main as specified herein.

b) Use water from the existing distribution system or other approved source of supply to flow at a constant measured rate into the newly laid water main.

c) Not more than 10 feet downstream from the beginning of the new main, add chlorine to the water entering the new main at a constant rate that the water will have a minimum 100 mg/L free chlorine. Measure this concentration at regular intervals. Apply the chlorine continuously and for the time required to develop a solid column or "slug" of chlorinated water that will, as it moves through the main, expose all interior surfaces to a 100 mg/L for at least 3 hours.

d) Measure the free chlorine residual in the slug as it moves through the main. If at any time it drops below 50 mg/L stop the flow and relocate the chlorination equipment at the head of the slug, and as flow is resumed, add chlorine to restore the free chlorine in the slug to not less than 100 mg/L.

e) As the chlorinated water flows past fittings and valves, operate related valves and hydrants to disinfect appurtenances and pipe branches

4) Final Flushing

a) After the retention period, flush the chlorinated water from the main until chlorine measurements show that the concentration in the water leaving the main is not higher than that in the system, or is acceptable for domestic use.

b) Chlorinated water discharged during flushing operation must be collected in a water truck and properly disposed of off-site.

D. Bacteriological Tests

1. After final flushing and before the water main is placed in service, test a sample, or samples, collected from the main(s) for turbidity and organisms. Collect at least one sample from the new main and one from each branch.

2. Redisinfection
    a. If the initial disinfection fails to produce approved bacteriological or turbidity samples, re-flush and resample the main. If check samples show bacterial contamination, re-chlorinate the main until approved results are obtained.
3. Swabbing
    a. Where connections are made to existing piping and the connections are not disinfected along with the newly installed main, swab or spray the interior of all pipe and fittings used in making the connections with a 1 percent hypochlorite solution before installation.

3.4 WATER AND SEWER MAIN SEPARATION

A. Maintain a minimum 18” vertical separation and/or 10’ horizontal separation between water mains and sanitary sewer mains. Because both the water mains and sanitary sewer mains are set on grade for drainage purposes, vertical adjustments at unforeseen crossings will likely not be possible. A deviation request including proposed alternate protection if this situation is encountered must be filed with the Montana Department of Environmental Quality.

3.5 FIRE HYDRANTS

A. Set all hydrants plumb with the pumper nozzle facing the street. Set the hydrant with the ground line at the location indicated by the hydrant manufacturer.

B. Provide drainage at the hydrant base by placing clean gravel under and around it. Place gravel at least 1 foot (30 cm) on all sides from the base of the hydrant to at least 6 inches (15 cm) above the drain opening. Brace the hydrant against unexcavated earth at the trench end with concrete backing as detailed on the plans. Furnish hydrants with the specified gate valves. Install hydrants meeting the requirements of the Drawings, or as specified by the Contracting Officer.

3.6 SERVICE LINE INSTALLATION

A. Provide all work and materials for the complete service line installation, including trench excavation and backfill; making the water main tap; furnishing and installing the corporation stop, curb stop and box, service clamp where necessary, and service line with fittings to make the connections to the stops. Bend the service line adjacent to the water main into a figure “S” in a horizontal or vertical plane to avoid a rigid connection.

3.7 VALVES

A. Set and joint gate valves to the pipe as specified for pipe laying and jointing. Set valves with operating nut vertical. Center and plumb valve boxes over the operating nut to prevent shock or stress being transmitted to the valve.

B. Valve Boxes
    1. Center and plumb boxes over the operating nut. Set valve box tops flush with the ground surface or street surfacing.
    2. 2. Place bedding gravel around all water main valves and under the valve box bottom to drain any water entering the valve box.

C. Valve Thrust Blocks
    1. When specified, install valves with thrust blocks and anchor rods meeting the requirements shown on the Plans.

3.8 METER

A. Provide and install a complete meter assembly and all internal meter pit components as shown on the Plans and as directed by the Contracting Officer.

END OF SECTION 33 12 13

This page was intentionally left blank

SECTION 33 31 23 – FUSIBLE HIGH-DENSITY POLYETHYLENE (HDPE) PIPE & FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section specifies high density polyethylene (HDPE) pipe and fittings, including acceptable fusion technique and practice, and safe handling and storage.

B. Pipe and Fitting Suppliers shall furnish high density polyethylene (HDPE) pipe and fittings conforming to all applicable standards and procedures as referenced in this specification and meeting all applicable testing and material properties as described by the applicable standards referenced in this specification or as required within this specification.

1.2 QUALITY ASSURANCE

A. REFERENCES:

a. This section contains references to the following documents. They are a part of this section to the extent referenced in this specification. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of a conflict between the requirements of this section and those of the referenced documents, the requirements of this specification shall prevail.

b. Unless otherwise specified, references to documents shall mean the latest published edition of the referenced document in effect at the time of construction.

ASTM D1603	Standard Test Method for Carbon Black in Olefin Plastics
ASTM D2774	Standard Practice for Underground Installation of Thermoplastic Pressure Piping
ASTM D3035	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
ASTM D3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM D4218	Standard Test method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
ASTM F2164	Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure

ASTM F2206	Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
ASTM F2620	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
AWWA C651	Disinfecting Water Mains
ANSI/AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100mm) through 65 In. (1,600 mm), for Water Distribution and Transmission
AWWA M55	Manual of Water Supply Practices, PE Pipe-Design and Installation
NSF/ANSI 61	Drinking Water System Components–Health Effects
PPI TR-4	PPI Listing of Hydrostatic Design Basis (HDB), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength Ratings for Thermoplastic Piping Materials for Pipe
PPI TR-46	Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of High-Density Polyethylene Pipe

B. MANUFACTURER REQUIREMENTS
1. High density polyethylene (HDPE) pipe and fittings shall be manufactured in accordance with the following standards:
   a. ASTM D3035 – ½ in through 24-in pipe.
   b. ASTM F714 – 3-in through 54-in pipe.
   c. AWWA C901 – 1/2 In. (130mm) through 3 In. (76 mm) pipe and tubing.
   d. AWWA C906 – 4 In. (100 mm) through 65 In (1,600 mm) pipe and fabricated fittings.
   e. ASTM D3261 – butt fusion fittings and flange adapters.
   f. ASTM F1055 – electrofusion couplings.
   g. ASTM F2206 – fabricated fittings.

C. FUSION TECHNICIAN REQUIREMENTS
1. Each Fusion Technician shall be separately qualified to make each type and size of fusion joint. Fusion joint types are butt fusion, saddle fusion and electrofusion. Qualification to make one type or size of fusion joint shall not qualify a Fusion Technician to make a different type or size of fusion joint.
2. Each Fusion Technician making butt fusion joints shall be qualified to make butt fusion joints in accordance with ASTM F2620. Qualification shall have occurred not more than 12 months before performing fusion joining on site in accordance with this specification. Qualification shall be a documented demonstration of proficiency by making joints in accordance with ASTM F2620 that are proved to be satisfactory by destructive testing in accordance with ASTM F2620.
3. Each Fusion Technician making electrofusion fitting joints shall be qualified to make electrofusion fitting joints in accordance with ASTM F1290 and the

electrofusion fitting manufacturer's recommended procedure. Qualification shall have occurred not more than 12 months before performing on-site fusion joining in accordance with this specification. Qualification shall be a documented demonstration of proficiency by making joints in accordance with ASTM F1290 and the electrofusion fitting manufacturer's recommended procedure that are proved to be satisfactory by destructive testing in accordance with ASTM F1290 and the electrofusion fitting manufacturer's recommended procedure.

D. APPROVED SUPPLIERS:
   1. Pipe and fitting suppliers shall be approved by the CO or its representative:

E. WARRANTY
   1. Pipe and fitting suppliers shall provide a one-year warranty covering defects in product material and workmanship. A successful pressure test or pressure leak test prior to the expiration of the warranty period shall not relieve the supplier of warranty responsibility for the full warranty term.
   2. Fusion providers shall provide a one-year warranty from the date of installation acceptance covering defects in fusion joining workmanship that shall provide for remaking defective butt fusion, saddle fusion or electrofusion joints. A successful pressure test or pressure leak test prior to the expiration of the warranty period shall not relieve the installer of warranty responsibility for the full warranty term.

1.3 SUBMITTALS

A. The following information shall be submitted by pipe and fitting suppliers:
   1. Name of the pipe manufacturer and a list of the piping and quantities to be provided by manufacturer.
   2. Name(s) of fitting manufacturer(s) and lists of fittings and quantities to be provided by manufacturer.
   3. Pipe and fitting product data indicating conformance with this specification, applicable standards, and warranty provisions, including written documentation regarding any intended variance from this specification and applicable standards.
   4. At the time of shipment, the supplier shall provide certified documentation of pipe and fitting conformance with this specification and applicable pipe and fitting standards specified herein.

B. The following information shall be submitted by Fusion Providers:
   1. Documentation that each Fusion Technician has met requirements for joining proficiency for each type of fusion joint performed by the Fusion Technician under this specification.
   2. Documentation of conformance with this specification and applicable standards, including written documentation regarding any intended variance from this specification and applicable standards. This will include fusion joint warranty information and recommended project specific fusion parameters, including criteria logged and recorded by data logger.
   3. The following AS-RECORDED DATA is required from the Contractor and/or Fusion Provider:
      a. Fusion reports for each fusion joint performed on the project, including joints that were rejected. Submittals of the Fusion Technician's joint reports are required as requested by the government or COR. Specific requirements of the Fusion Technician's joint report shall include:
         1) Pipe or fitting size and DR or pressure class rating.
         2) Fusion equipment size and identification.

3) Fusion Technician Identification.
4) Job Identification Number.
5) Fusion Number.
6) Fusion joining parameters.
7) Ambient Temperature.

PART 2 - PRODUCTS

2.1 PRESSURE POTABLE WATER PIPE AND FITTINGS

A. PE4710 pipe and fitting material (compound):
1. PE4710 material (compound) shall conform to material requirements specified in ASTM D3035, AWWA C906, ASTM D3261, ASTM F1055 and ASTM F2206 as applicable for the pipe or fitting. PE4710 material shall meet the requirements of ASTM D3350 and shall meet or exceed a cell classification of 445574 per ASTM D3350.
2. PE4710 material compound shall have a hydrostatic design stress (HDS) rating for water at 73°F (23°C) of not less than 1000 psi that shall be listed in PPI TR-4 in the name of the pipe manufacturer.
3. PE4710 material compound shall have a hydrostatic design basis (HDB) rating at 140°F (60°C) of not less than 1000 psi that shall be listed in PPI TR-4 in the name of the pipe manufacturer.
4. PE4710 pipe and fitting material compound in PE4710 pipe and fittings shall contain color and ultraviolet (UV) stabilizer meeting the requirements of Code C or E per ASTM D3350. Code C material shall contain 2 to 3 percent carbon black to provide indefinite protection against UV degradation when material from the pipe is tested in accordance with ASTM D1603 or ASTM D4218. Code E material used for coextruded OD color stripes or a coextruded ID color layer shall contain sufficient UV stabilizer to protect the pipe against UV degradation for at least 24 months of unprotected outdoor exposure. Coextruded color PE compound material shall be PE4710 pipe material compound, varying only by color and UV stabilizer.
5. Clean rework materials derived from pipe production by the same manufacturer are acceptable as part of a blend with new material for the production of new pipe provided that the rework material is the same PE4710 material designation as the new material compound to which it is added. Finished products containing rework material shall meet the requirements this specification.
6. Qualification for potable water pipe. PE4710 compounds shall be tested and certified as suitable for use with potable water in accordance with requirements that are no less restrictive than the applicable requirements in NSF/ANSI 61.

B. PE4710 pipe and butt fusion fittings shall have plain ends for butt fusion.

C. PE4710 pipe:
1. Nominal straight lengths of 3 inch and larger pipe shall be 40 ft. or 50 ft.
2. Nominal coil lengths of 4-inch and smaller pipe shall be 500 ft. Longer or shorter coils such as 800 ft for 4-inch pipe, 1000 ft for 3-inch pipe, or 2000 ft for 2 inch or smaller pipe shall be acceptable.
3. Pipe shall be black and DR11 (200 psi rating).
4. Pipe shall be permanently marked using heated indent printing including:
   a. Nominal size and sizing system, e.g., IPS or DIPS
   b. DR or SDR

c. Standard Designation, material designation, and pressure rating or pressure class for water at 73°F:
    1) Marking the Standard Designation on the pipe shall serve as the manufacturer's certification that the pipe has been manufactured, sampled and tested and has been found to comply with the requirements of the standard.
d. NSF-61 mark certifying suitability for potable water use.
e. Manufacturer's Trademark or trade name, e.g., "WL Plastics".

D. PE4710 fittings:
1. PE4710 butt fusion, saddle fusion, electrofusion and fabricated fittings shall be manufactured from PE4710 material (compound) in accordance with this specification.
2. PE4710 fittings shall comply with ASTM D3261 for molded butt fusion and saddle fusion fittings, flange adapters and MJ adapters, or shall comply with AWWA C906 for fabricated butt fusion fittings or shall comply with ASTM F1055 for electrofusion fittings.
3. PE4710 fittings shall comply with the marking requirements of ASTM D3261 for molded butt and saddle fusion fittings, flange adapters and MJ adapters or shall comply with the marking requirements of AWWA C906 for fabricated butt fusion fittings or shall comply with the marking requirements of ASTM F1055 for electrofusion fittings:

    a. Marking shall include the NSF-61 mark verifying suitability for potable water use.
4. PE4710 fittings shall have pressure class ratings not less than the pressure class rating of the pipe to which they are joined.

2.2 FUSION JOINTS

A. Unless otherwise specified, PE4710 pipe and fittings shall be assembled in the field with butt fusion, saddle fusion or electrofusion joints. ASTM F2620 and the pipe manufacturer's recommended procedure (WL Plastics WL101) shall be observed for butt fusion and saddle fusion joints. ASTM F1290 and the electrofusion fitting manufacturer's recommended joining procedure shall be observed for electrofusion joints.

B. Field butt fusion, saddle fusion and electrofusion joints shall be made by Fusion Technicians that are qualified in accordance with this specification to make the specific fusion joint type.

C. Field fusion joints shall be recorded and documented in accordance with this specification.

2.3 CONNECTIONS AND FITTINGS FOR PRESSURE APPLICATIONS

A. Connections shall be defined in conjunction with the linking of project piping, as well as the tie-ins to other piping systems.

B. Mechanical Fittings:
1. Acceptable mechanical fittings for use with PE4710 pipe and fittings shall be mechanical fittings that are qualified by the mechanical fitting manufacturer for use with HDPE pipe and fittings.

2. Mechanical fittings for use with HDPE pipe shall provide restraint against longitudinal separation that is inherent to the design of the joint. Mechanical joints that do not provide restraint against pull-out or push-off are prohibited.
3. Mechanical connections to non-HDPE devices and appurtenances shall be by bolted flange adapter or MJ adapter. Flange adapter and MJ adapter connections shall be assembled, installed and tightened in accordance with flange adapter or MJ adapter manufacturer's instructions. Flange bolt tightening shall be in accordance with PPI TN-38.

C. Gasketed, Push-On Fittings:
1. Gasketed push-on fittings shall be fitted with external mechanical restraints that span across the joint and are assembled in accordance with restraint manufacturer's instructions:
a. Thrust blocking does not provide acceptable restraint and is prohibited.
b. Where plain-end PE4710 pipe is assembled with push-on fittings, the PE4710 pipe end shall be fitted with electrofusion restraints so that external mechanical restraint may be secured to the PE4710 pipe.
2. Where PE4710 pipe is connected to gasketed mechanical joint fittings or appurtenances, the connection shall be made by butt fusing a PE4710 MJ Adapter to the PE4710 pipe and connecting the PE4710 MJ Adapter to the mechanical joint fitting or appurtenance.

D. Sleeve-Type Couplings:
1. Sleeve-type mechanical couplings shall be manufactured for use with HDPE pipe and shall be restrained as indicated on the drawings and in these specifications. Unrestrained sleeve-type couplings are prohibited.

E. Expansion and Flexible Couplings:
1. Expansion-type mechanical couplings are prohibited.

F. Connection Hardware:
1. Bolts and nuts for buried service shall be made of non-corrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21.11, regardless of any other protective coating.

PART 3 - EXECUTION

3.1 DELIVERY AND OFF-LOADING

A. All piping shall be bundled or packaged for transportation by commercial carrier to the site.

B. Before off-loading, pipe shall be inspected for damage. Any pipe damaged in shipment shall be assessed and either accepted or rejected as directed by the government or COR, and the pipe supplier shall be notified of rejected pipe within 7 days of delivery at the site. Rejected pipe shall be quarantined for disposition. Each pipe shipment shall be checked for quantity and proper pipe size, color, and type.

C. Pipe shall be off-loaded and handled in accordance with the pipe manufacturer's instructions and AWWA M55.

3.2 HANDLING AND STORAGE

A. Pipe lengths should be placed and stored on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.

B. Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch or otherwise abrade the piping in any way. Use of hooks, chains, wire rope or any other handling device which creates the opportunity to damage the surface of the pipe is strictly prohibited.

C. Covering or shading of PE4710 pipe and fittings against exposure to ultraviolet light from sunlight is not required. Black HDPE pipe and fittings will provide continuous service in an outdoor exposure environment without degradation. (Ref: https://plasticpipe.org/pdf/tr-18_weatherability_thermo_pipe_systems.pdf).

3.3 FUSION PROCESS

A. General
   1. Butt and saddle fusion of PE4710 pipe and fittings shall be in accordance with ASTM F2620 and the manufacturer's recommended joining procedure.
   2. Electrofusion of PE4710 pipe and fittings shall be performed in accordance with ASTM F1290 and the electrofusion fitting manufacturer's recommended procedure.
   3. PE4710 pipe and fittings shall be fused by qualified fusion technicians, as documented by the fusion provider. Training records for qualified fusion technicians shall be available to government or COR upon request.
   4. As each fusion joint is constructed, pressure, time and temperature parameters shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine. Joint data shall be submitted as part of the As-Recorded information, in accordance with this specification.
   5. Butt fusion machines shall incorporate the following properties, including the following elements:
      a. HEAT PLATE – Heat plates and the non-stick coatings on heating surfaces shall be in good condition without heating surface gouges or scratches. The non-stick coating shall be intact, clean and free of any contamination. Heater controls and temperature indicators shall function properly, and electrical cords and connections shall be in good condition. The heat plate shall maintain a uniform and consistent temperature on all areas of the heating surfaces on both sides of the heat plate.
      b. CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi for hydraulic fusion machines. Clamps shall be in good condition with proper inserts for the pipe size being fused.
      c. GENERAL MACHINE – Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.
      d. DATA LOGGER – The current version of the pipe supplier's recommended and compatible software shall be used. Protective case shall be utilized for the hand held wireless portion of the unit. Data logger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.
   6. Other equipment specifically required for fusion processes shall include the following:
      a. Pipe rollers shall be used to support pipe to either side of the butt fusion machine and provide for vertical and lateral pipe alignment straight through the butt fusion machine.
      b. A protective enclosure that provides for full machine motion of the clamps, heat plate, fusion assembly and carriage shall be provided for fusion in

inclement and/or windy weather. Pipe ends shall be covered or blocked where open pipe ends could allow prevailing winds to blow through the pipe.

c. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

B. Joint Recording:

1. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine that shall register and/or record the parameters required by the manufacturer and these specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

3.4 INSTALLATION

A. The PE4710 pipe and fittings shall be installed such that PE4710 pipe curvature is not less than the minimum bending radius recommended by the pipe manufacturer.

3.5 MAKING CONNECTIONS TO NON-PE4710 PIPING SYSTEMS

A. Approximate locations for non-PE4710 piping systems are shown on the drawings or detailed in the specifications. Prior to making connections into existing piping systems, the Contractor shall:

1. Verify the actual field location, size, piping material and service of non-PE4710 piping systems.
2. Obtain all required non-PE4710 piping manufacturer(s) approved fittings (i.e., saddles, sleeve type couplings, flanges, tees, etc., as shown).
3. Have installed all temporary pumps and/or pipes in accordance with established connection plans.
4. Have on hand pipe stoppers, blind flanges or other devices to seal a valve or appurtenance that fails to seal properly. When applied to pressure rated valves or appurtenances, all such devices shall be pressure rated equal to or greater than the pressure rating of the valve or appurtenance to which they are attached.

B. Where PE4710 pipe connects in-line to unrestrained gasketed push-on piping, the end of the PE4710 pipe shall be anchored in-line within 10 ft of the connection to restrict longitudinal movement of the PE4710 pipe:

1. The PE4710 pipe shall be fitted with a PE4710 wall anchor or electrofusion flex restraints.
2. The PE4710 wall anchor or electrofusion flex restraints shall be encased in reinforced concrete that is sufficient to withstand Poisson effect longitudinal loads in accordance with AWWA M55 In-Line Anchoring.

C. Unless otherwise approved by the COR, new piping systems shall be completely assembled and successfully tested prior to making connections to non-PE4710 piping.

3.6 PIPE SYSTEM CONNECTIONS

A. Pipe connections shall be installed per applicable standards and regulations, as well as per the connection manufacturer's recommendations and as indicated on the drawings. Pipe connections to structures shall be installed per applicable standards and regulations, as well as per the connection manufacturer's recommendations.

3.7 TESTING

A. Testing shall comply with all local building codes, statutes, standards, local jurisdiction, and laws.

B. Segments of the pipe may be tested separately in accordance with standard testing procedure, as approved by the government or COR.

C. Hydrostatic Leakage Testing:
   1. Hydrostatic leakage testing shall comply with ASTM F2164. Joint leakage and any defective materials and/or workmanship shall be repaired or replaced by the Contractor at no additional cost to the Government.
   2. Pneumatic (compressed air) leakage testing of PE4710 pressure piping is prohibited.

END OF SECTION 33 31 23

This page was intentionally left blank

SECTION 33 61 13 – ARCTIC PRE-INSULATED HDPE PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the requirements for furnishing and installing factory pre-insulated high-density polyethylene (HDPE) piping for water distribution systems.

B. The work includes pre-insulated pipe, fittings, insulation, jacketing, and related accessories, as well as installation, jointing, and testing requirements.

1.2 REFERENCES

A. The following standards shall apply to the materials and installation of pre-insulated piping:
   1. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
   2. ASTM C591 – Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation
   3. AWWA C901 – Polyethylene (PE) Pressure Pipe and Tubing, 1/2 Inch Through 3 Inch, for Water Service
   4. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fittings, 4 Inch Through 65 Inch, for Waterworks
   5. NFPA 24 – Standard for the Installation of Private Fire Service Mains and Their Appurtenances
   6. NSF 61 – Drinking Water System Components – Health Effects

1.3 SUBMITTALS

A. The Contractor shall submit the following for approval prior to procurement and installation:
   1. Product data sheets, including material properties, insulation thickness, and performance characteristics.
   2. MANUFACTURERS' installation instructions.
   3. Shop drawings showing pipe layout, fittings, and jointing details.
   4. Third-party test reports demonstrating compliance with this specification.
   5. Certificates of compliance from the manufacturer for all materials.

1.4 **QUALITY ASSURANCE**

A. The pre-insulated piping system shall be manufactured by an established company with at least five (5) years of experience in producing pre-insulated HDPE pipe.

B. The Contractor shall comply with all federal and state regulations applicable to the installation of underground piping.

C. All fusion joining shall be performed by technicians certified in HDPE butt fusion welding.

1.5 **DELIVERY, STORAGE, AND HANDLING**

A. Pipes and fittings shall be delivered to the site with protective end caps to prevent contamination.

B. Materials shall be stored on dunnage at least 6 inches above grade and protected from UV exposure.

C. Piping components shall not be dropped, dragged, or handled in a manner that could cause damage.

PART 2 - PRODUCTS

2.1 PRE-INSULATED HDPE PIPING SYSTEM

A. The system shall be Polycor HDPE by Thermacor Process Inc. or approved equal.

B. The pre-insulated piping system shall consist of:
   1. Carrier Pipe: High-density polyethylene (HDPE), conforming to ASTM D3350, manufactured with extra high molecular weight polyethylene compounds, and meeting standard dimensional ratio (SDR) wall thickness in IPS sizes.
      a. Pressure ratings shall range from 50 psi (SDR-32.5) to 255 psi (SDR-7.3) at 73°F.
      b. Operating temperature shall be from -50°F and lower, to +140°F with appropriate design factors.
   2. Insulation:
      a. Rigid, 90-95% closed-cell polyurethane foam insulation.
      b. Minimum density of 2.0 to 3.0 lb/ft³.
      c. Thermal conductivity (K-Factor) of 0.16.
      d. Minimum insulation thickness of 1 inch.
      e. Conforming to ASTM C591.
   3. Jacketing:
      a. Extruded black high-density polyethylene (HDPE).
      b. Minimum wall thickness:
         1) 100 mils for jackets ≤ 12”
         2) 125 mils for jackets > 12” to 24”
         3) 150 mils for jackets > 24”
      c. Inner surface of HDPE jacket shall be oxidized via corona treatment, flame treatment, or other approved method to ensure adhesion between jacket and foam.

2.2 JOINTING AND FITTINGS

A. Straight Run Joints:
   1. Butt fusion welded.
   2. Field insulated using urethane foam to the specified thickness.
   3. Jacketed with heat shrink tape.

B. Fittings:
   1. HDPE carrier pipe fittings shall be butt fusion welded.
   2. Field or factory insulated at the Engineer’s option.
   3. Factory-manufactured fittings shall have PE fitting covers welded to the jackets.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The pre-insulated piping system shall be fabricated from factory-insulated straight pipe sections and fittings.

B. Pipes shall be supplied in 40-foot double-random lengths where practical.

C. Pipe ends shall be cut square in preparation for butt fusion welding.

3.2 JOINING METHODS

A. Butt Fusion Welding:
   1. Performed using an authorized butt fusion welding machine preheated to the correct temperature.
   2. Heating surfaces shall be clean and free of contaminants before joining.
   3. Misaligned, improperly fused, or questionable joints shall be removed and redone.

B. Transitions:
   1. Transition to other piping materials shall be made using suitable flanged or mechanical adapters.

3.3 TRENCHING AND BACKFILLING

A. A. Trenching shall be at least two (2) feet deeper than the top of the pipe and no less than eighteen (18) inches wider than the combined O.D. of all piping systems.

B. A minimum of 24 inches of compacted backfill shall be placed over the pipe to meet H-20 highway loading requirements.

C. Trench bottom shall include 6 inches of sand, pea gravel, or approved backfill material as a cushion.

D. All field cutting shall be performed in accordance with manufacturer’s instructions.

3.4 TESTING

A. Prior to backfilling, a hydrostatic pressure test shall be performed as follows:
   1. Test shall be conducted in accordance with the Engineer’s specifications.
   2. Expansion Phase: Initial pressurization at 1.5 times the operating pressure for three (3) hours, with make-up water added as needed.
   3. Test Phase: Pressure reduced by 10 psi and held for one (1) hour.
   4. A pressure drop of more than 5% of the target test pressure indicates failure and requires corrective action.
   5. If the test cannot be completed within eight (8) hours, the system shall be depressurized and allowed to relax before reattempting.
   6. The piping system shall be restrained to prevent movement in the event of failure.

3.5 FIELD SERVICES

A. If required by project specifications, a manufacturer-certified field service technician shall be available to inspect unloading, storage, joint installation, pressure testing, and backfilling procedures.

END OF SECTION 33 61 13

This page was intentionally left blank