



**US Army Corps
of Engineers®**
New England District

W912WJ-23-Q-0001

OPERATORS QUARTERS DEMOLITION

**Mansfield Hollow Dam
Mansfield, Connecticut**

**Construction Solicitation
and Specifications**

October 2022

**DEMOLISH OPERATORS QUARTERS
BUILDING
Mansfield Hollow Dam
Mansfield, Connecticut
STATEMENT OF WORK
Solicitation Number: W912WJ23Q0001**

A. General Description of the Work to be Performed

The general description below is given to indicate the approximate scope of this project only. It does not limit the work required under the project documents.

1. Location and Background of Mansfield Hollow Dam Facility.

Mansfield Hollow Dam is a flood damage mitigation project situated on the Natchaug River, 5.3 miles above its confluence with the Willimantic River in the Towns of Windham (Tolland County) and Chaplin (Windham County), Connecticut. It is operated as part of a system and in conjunction with five other Corps of Engineer flood control reservoirs in the Thames River basin: Buffumville Lake, Hodges Village Dam, West Thompson Lake, East Brimfield Lake and Westville Lake.

2. Description of Work.

This project includes, but is not limited to, the demolition of the existing operator's quarters building and site work to provide water and utility connections for recreational vehicle use in the future. There is an existing septic tank and leech field onsite that the Contractor shall protect from damage during demolition.

Electrical and site work shall include the following:

- Disconnect the service conductors at the existing utility pole;
- Demolish the electric service feeder conductors between the utility pole and the Operators Quarters
- Provide a new underground, direct buried electrical conduit and feeder conductors from the existing utility pole to a new electric utility meter located adjacent to the existing garage;
- Provide a new power panel inside the garage. The new feeder conductors shall be connected to this new power panel. The power panel will feed miscellaneous loads inside the garage and a new RV pedestal located adjacent to the utility meter.
- Provide new well pressure tank, pump controller, pressure switch and pump power/control wiring to be compatible and integrated with the existing submerged water well pump. Provide all required components for a complete and operational well water system that meets all code requirements and the operational requirements of the newly proposed system.
- Provide a new water line from existing well to existing utility building, and then provide new waterline exiting the utility building down to the existing garage. Install a Government-furnished frost-free spigot; connect the new water line to this spigot.

Both the RV pedestal and the frost-free spigot will be Government furnished equipment (valued at \$531). Refer to Government furnished equipment attachment for more information. The new water line and electrical feeder will be utilized by recreational vehicles overseeing the government property.

A hazardous material survey was conducted in 2021 and is attached at the end of this SOW. The presence of asbestos was found in the kitchen linoleum (approximately 170 SF); however, this has already been

removed and is not part of this contract. The survey also noted that the lead paint present in the house is below the EPA's threshold so no lead abatement work will be required prior to demolition. Black mold is present on the second floor. The basement contains existing mechanical & electrical equipment typical to a residential home. Demolition and disposal of existing mechanical and electrical equipment is included in the scope of this contract. An oil tank in the basement will be removed under a separate contract before the demolition of this contract.

3. Work Site. The site of the work is on a US Army Corps of Engineers Facility, in Mansfield Center, Connecticut. All rules and regulations of the Facility covering general safety, security, site access, sanitary requirements, pollution control and traffic regulations shall be observed by the Contractor. Information regarding these requirements is outlined below and may be obtained by contacting the Contracting Officer, who will provide such information or assist in obtaining same from appropriate authorities.

4. Security. The Contractor shall report any vandalism, suspicious activities or devices to the Contracting Officer or local police as soon as possible. The Contracting Officer will notify the Contractor of any heightened security measures and will expect vigilant monitoring of equipment, grounds and security fencing while working. At a heightened security posture, there may be work areas that are restricted or work may come to a complete stop. The Contracting Officer will notify the Contractor of these restricted areas, and work may be delayed or restricted or will be performed in these areas under the direct supervision of U.S. Army Corps of Engineers personnel. The Contractor may return to the site only with the written approval of the Contracting Officer.

At the close of each workday, Government facilities, equipment, and materials shall be secured. The Contractor shall be responsible for maintaining a secure construction site and ensure the area of the scope of this contract is secure at all times during and after work hours.

All project work and conduct of construction activity shall comply with security requirements, regulations, and policies as directed by the Contracting Officer.

All personnel, vehicles, and construction equipment entering or exiting U.S. Army Corps of Engineers grounds may be subjected to a search.

No alcoholic beverages or drugs are allowed on U.S. Army Corps of Engineers grounds. If a Contractor employee(s) is found in violation, coordination shall be conducted for the removal of the violator(s) from Government property, at no additional cost to the Government.

5. Identification of Equipment and Tools. Affix to Contractor or Subcontractor owned machinery, motor vehicles, equipment, and tools, clearly legible identification showing the Contractor's or Subcontractor's name, and where space permits, address and telephone number, so as to distinguish them from Government-owned items, and can be returned to the rightful owner if inadvertently left on Government property.

6. Contractor's Responsibility. The Contractor shall furnish all plant, labor, equipment and materials and carry out all operations as necessary to accomplish the work of this project as described in this document and on the contract drawings.

7. Commencement, Prosecution and Completion of Work. The Contractor shall commence work under

this contract within 15 days after the date of receipt of the Notice to Proceed, shall prosecute the work diligently, employing ample personnel and sufficient equipment, and shall complete the entire work within the period of performance.

The time included for completion shall include final cleanup of the project site. Additional restrictions concerning the prosecution and completion of work are as follows:

- a. The Contractor shall attend a Preconstruction Conference prior to the start of on-site construction work (see paragraph entitled "Preconstruction Conference", below).
- b. The on-site work is restricted to 0700 (7:00 AM) to 1530 (3:30 PM), Monday through Friday (see Paragraph B.14 "Hours of Operation" for additional information).

8. Superintendence by the Contractor. At all times during the performance of the contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the worksite a competent project superintendent who is satisfactory to the Contracting Officer and has the authority to act for the Contractor.

The qualified superintendent, and competent alternate, shall be capable of reading, writing, and conversing fluently in the English language.

The project superintendent must have a minimum of five years of experience in construction with at least two of those years as a superintendent on projects similar in size and complexity. The individual must be familiar with the requirements of EM 385-1-1 and have experience in the areas of hazard identification and safety compliance. The individual must be capable of interpreting a critical path schedule and construction drawings. The qualification requirements for the alternate superintendent are the same as for the project superintendent. The Contracting Officer may request proof of the superintendent's qualifications at any point in the project if the performance of the superintendent is in question.

The project superintendent is primarily responsible for managing and coordinating day-to-day production and schedule adherence on the project. The superintendent is required to attend quality control meetings.

The project superintendent shall maintain a physical presence at the site at all times and be responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer. Failure to comply with these requirements shall be deemed as cause for a non-compensatory stoppage and suspension of work until the deficiency is remedied.

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to insure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

9. Licensed Contractor. The Contractor shall be licensed as a General Contractor. All subcontractor's performing work shall be licensed for their respective discipline.

10. Contractor Personnel Conduct. The Contractor personnel's conduct shall not reflect discredit upon the Government. Contractor shall ensure that personnel present a professional appearance. Contractor's employees shall observe and comply with all local policies and procedures concerning fire, safety, environmental protection, sanitation, security, and possession of firearms or other lethal or illegal weapons or substance. Contractor is responsible for ensuring that any Contractor employees providing services under this contract conduct themselves and perform services in a professional, safe, and responsible manner. The Contractor shall remove from the job site any employee for reasons of misconduct or security. The Contractor shall ensure no Contractor employees conduct political related activities or events on Government Property.

11. Traffic Regulation and Control. During construction the Contractor shall provide access as necessary to maintain traffic and to provide vehicle access to all structures in the project area. The Contractor shall maintain and protect traffic on all affected roads during the construction period, except as otherwise specifically directed by the Contracting Officer. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

12. Access to the Project Site. Access to the project site is currently available for construction. The Contractor shall be responsible for providing and maintaining access necessary for his equipment and plant to and from the work site.

13. Construction Site Plan. Prior to the start of work, the Contractor shall submit a site plan showing the locations and dimensions of temporary facilities including layouts and details, equipment and material storage areas, access and haul routes, avenues of ingress/egress to fenced areas (e.g., the assigned storage and staging area), details of the fence installation (if used), and the number of trailers to be used. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas. The plan shall also show where temporary utility hook-ups are to be located, if required, and how grounding of equipment and trailers will be achieved, as appropriate. A storage and staging area will be available to the Contractor on the Mansfield Hollow Dam facility property and will be discussed at the Preconstruction Conference. Any items removed from the property shall be recycled to the furthest extent possible.

14. Hours of Operation. On site work hours are as stated in Part A.7.b, above. The Contractor will not be permitted to perform on-site work on Saturdays, Sundays, or legal holidays, unless otherwise authorized by the Contracting Officer. The exclusion of work on Saturdays, Sundays, and legal holidays has been considered in computing the performance time of this contract. The following legal holidays are observed:

January 1st
3rd Monday in January
3rd Monday in February
Last Monday of May
June 19th
July 4th

1st Monday of September
2nd Monday of October
November 11th
4th Thursday of November
December 25th

When one of the above designated legal holidays falls on a Sunday, the following Monday will be observed as a legal holiday. When a legal holiday falls on a Saturday, the preceding Friday is observed as a holiday.

Work outside the hours of operation requires Contracting Officer approval. The request to work outside the hours of operation shall be made in writing to the Contracting Officer 10 calendar days prior to such work to allow arrangements to be made by the Government. The request application shall include specific dates, hours, location, type of work to be performed, contract number and project title, and names of all individuals who will be working outside the hours of operations. If work is performed during periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

15. Progress Schedule. The initial project schedule shall be in the form of a chart graphically indicating the sequence proposed to accomplish each work feature or operation pursuant to FAR Clause 52.236-15 "Schedules for Construction Contracts". Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The chart shall be prepared to show the starting and completion dates of all work features on a linear horizontal time scale beginning with date of Notice to Proceed and indicating calendar days to completion. The scheduling of the entire project is required. Provide a schedule that is a forward planning as well as a project monitoring tool. The Contractor shall indicate on the chart the important work features or operations that are critical to the timely overall completion of the project. Key dates for such important work features and portions of work features are milestone dates and shall be so indicated on the chart. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, as appropriate to the project, and is not limited to, the following characteristics and requirements to determine appropriate level of detail:

- a. Activity Durations
- b. Design and Permit Activities
- c. Procurement Activities
- d. Mandatory Tasks
 - i. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).
 - ii. Submission, review and acceptance of features requiring design completion and submission, review and acceptance of design packages.
 - iii. Submission of mechanical/electrical/information systems layout drawings.

- iv. Long procurement activities
- v. Submission and approval of O & M manuals.
- vi. Submission and approval of as-built drawings.
- vii. Submission and approval of installed equipment lists.
- viii. Submission and approval of test data, and reports
- ix. Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, acceptance, design reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE), etc.

This schedule will be the medium through which the timeliness of the Contractor's construction effort is appraised. Anticipated adverse weather delay days shall be included in the schedule.

Submit the Initial Project Schedule for approval within 30 calendar days after notice to proceed is issued. No payment will be made for work items not fully detailed in the Project Schedule.

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

An updated schedule showing actual progress shall be submitted monthly and with each pay request. Changes to the base-line schedule shall be outlined in a narrative describing the reason for the change.

16. Rate of Progress. Should the Contractor fail to maintain a satisfactory rate of progress in accordance with the Contractor's approved progress schedule, the Contracting Officer may require that additional personnel and equipment be placed on the work and weekend and overtime work be performed, in order that the work be brought up to schedule and maintained, at no additional cost to the Government.

17. Preconstruction Conference. The Contracting Officer will conduct a Preconstruction Conference after receipt of Notice to Proceed by the Contractor and prior to the start of on-site construction activities. The date, time, and place for this conference shall be mutually agreed upon by the Contractor and the Contracting Officer. It is mandatory that the Contractor's project site supervisory personnel assigned to this project attend the conference; no personnel substitutions will be permitted. The purpose of the conference is to review contract requirements and to establish a working relationship between the Contractor's Staff and the U.S. Army Corps of Engineers personnel who will be closely associated with the project. During the conference, the Contracting Officer's Representative will inform the Contractor

concerning job safety, hazardous materials, project phasing, work hour restrictions, traffic control, quality control, labor relations, and environmental protection. The Preconstruction Conference will be arranged by the Contracting Officer.

18. Material Substitutions. This contract is based on the materials and methods as shown on the contract drawings and as described in this document. The Contractor shall not substitute materials or methods unless such substitution has been specifically approved in writing by the Contracting Officer.

19. Quality Control. The Contractor shall establish a three-phase quality control system (the three phases are described below) to perform sufficient inspection of all items of work, including that of any subcontractors, to ensure conformance to this document with respect to materials, workmanship, construction, finish and functional performance. The system shall cover all construction operations, both onsite and offsite. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest-level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

The Quality Control Manager shall be a construction person with a minimum of three years in related work. This Quality Control Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The Quality Control Manager shall be assigned as System Manager but may have other duties in addition to quality control. The QC Manager may also serve as the Site Safety and Health Officer (SSHO) as delineated in Paragraph B6, below, and may have other duties in addition to site safety and health, but may not be the Contractor's Site Superintendent.

The Contractor shall employ three phase Quality Control as follows:

Preparatory Phase. This phase is performed prior to beginning work after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Maintain and make available in the field for use by Government personnel until final acceptance of the work.
- b. Review of the contract drawings.
- c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. Examination of required materials, equipment, and sample work to assure that they are

on hand, conform to approved shop drawings or submitted data, and are properly stored.

- g. Review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies
- i. Discussion of the initial control phase.
- j. The Government must be notified at least 24 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the Quality Control Manager and attended by the superintendent. Document the results of the preparatory phase actions on a daily Quality Control Report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

Initial Phase. This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

- a. Check work to ensure that it is in full compliance with contract requirements.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government must be notified at least 24 hours in advance of beginning the initial phase.

Follow-up Phase. Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the quality control documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

20. Quality Assurance. All items of work not addressed in the contract documents shall be completed in strict accordance with the manufacturers' specifications.

The Government is not obligated to inspect the Contractor's work, or to protect the Contractor from the consequences of its work. Government inspections are a general examination of the Contractor's conduct and workmanship and are solely for the purpose of the Government. Government-designated Quality Assurance Representatives (QARs) do not have the authority to accept work, nor is a

Government inspection to be construed as conclusive.

Government agents including QARs and project engineers are not authorized to change the contract without the written approval of the Contracting Officer; this lack of authority extends to all situations in which the action of these agents could be construed as constituting a change.

The quality of workmanship is subject to audit by Government or Government-designated QARs at any time during the contract. The Contractor shall cooperate fully and provide all information necessary for this audit.

The Contractor shall submit all requests for changes in writing to the Contracting Officer. Do not proceed with changes without possession of written authorization of the Contracting Officer.

The Contractor shall not conceal any work unless the Contracting Officer has approved all items of work which are to be concealed. The Contractor shall notify the Contracting Officer of its intention to conceal work at least 24 hours in advance of concealment.

21. Utilities. The Government will furnish electricity from existing points of supply, free of charge. The Contractor shall make his own investigations as to the suitability of this supply for use on this project. Electricity required in the prosecution of the work in excess of that available from existing points of supply shall be furnished by the Contractor at his own expense. The Contractor shall conserve government furnished electricity.

There will be no Government furnished water available at the project site. The Contractor shall supply all water needed in the prosecution of the work.

22. Utility Outages and Interruptions. Make utility outages and interruptions, if required, during hours that will cause least impact to daily operations. Coordinate all utility outages and interruptions, and utility cutovers with the Contracting officer.

Where applicable, Utility Outage/Interruption Requests and Utility Cutover Requests shall be submitted in writing at least 15 calendar days in advance of the date desired for outages, interruptions, and cutovers; include at least one alternate date. Services shall not be interrupted or cutover until permission of the requested hours and dates is received from the Contracting Officer. The request(s) shall include the following information: Location(s) of outages and interruption(s), hours and dates of interruption(s), and which facilities, utilities and services are affected. The Contractor is cautioned that outages and/or interruptions may not be granted on the date(s) requested.

Interruptions shall be defined as any Contractor operation that interferes with services such as, but not limited to, buildings systems, heating and cooling equipment, electrical service, medical equipment, water, sanitary sewer, fire alarms, telephone service and data, interior and exterior lighting, generators, or roads.

Ensure that new utility lines are complete, except for the final connection or cutover before interrupting existing utility service(s).

The Contractor shall not be entitled to additional or overtime payment for utility outages, interruptions, and connections required to be performed outside the regular work hours.

The Contractor shall notify the Contracting Officer in writing at least 7 calendar days in advance of cancellation of any utility outage/interruption and utility cutovers requests.

23. Temporary Electrical Equipment and Connections. The Contractor, at his own expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines. All required temporary electrical equipment and lines shall be furnished, installed, connected, and maintained by the Contractor according to EM 385-1-1, Section 11.E, NFPA 241, and NFPA 70, Article 305-6(b), "Assured Equipment Grounding Conductor Program". All temporary equipment and lines shall be removed prior to final acceptance of the work. Materials and equipment need not be new, but must be in good repair and serviceable condition. Periodic inspections of systems and devices will be made by the Contractor at intervals not to exceed one week.

24. Location of Underground Facilities. Should excavation of any sort become necessary, obtain necessary digging permits prior to the start of excavation. Verify the elevations of existing piping, utilities, or any type of underground obstruction in locations to be impacted by the work. For excavation work in Connecticut, call "Dig Safe" at 811. Notification shall not be earlier than 30 days prior, or later than 3 days prior, to the planned excavation.

25. Environmental Protection. The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

a. Environmental Protection Plan: Prior to commencing construction activities or delivery of materials and equipment to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

b. Obtaining and complying with all environmental permits and commitments, required by Federal, State, Regional, and local environmental laws and regulations is the Contractor's responsibility.

c. Fuels and Lubricants: Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with State, and local laws and regulations. Storage of fuel on the project site is not allowed. Fuel shall be brought to the project site each day that work is performed. Storage and usage of lubricants and daily fueling of machinery and equipment shall occur at least 50 feet from any drainage inlets,

water bodies (rivers, streams, lakes), environmentally sensitive areas (wetlands, vernal pools).

26. Waste Management. The Contractor shall provide on-site containers for the collection of demolition debris, waste materials, construction debris, and rubbish. The Contractor shall clean the project site on a daily basis to prevent the accumulation of waste materials and rubbish resulting from construction activities. The Contractor shall transport all solid waste off of the project site and dispose of it in compliance with Federal, State and local requirements for solid waste disposal. Upon completion of the construction work, the project site shall be returned to its pre-work condition.

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.

Submit monthly documentation showing total amount, by weight, of construction debris diverted from landfills as a percentage of all construction debris on the project. The Contractor shall divert a minimum of 60 percent of waste and construction debris from landfill disposal. Include in documentation the total solid waste generated in tons, the total solid waste diverted from landfill in tons, and the total cost of the solid waste generated.

A Waste Management Plan shall be submitted within 15 days after Notice to Proceed and not less than 10 days before the preconstruction meeting. The plan shall demonstrate how the project waste diversion goal shall be met and shall include the following:

- a. Name of individuals on the Contractor's staff responsible for waste prevention and management.
- b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
- c. Description of the regular meetings to be held to address waste management.
- d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
- e. Characterization, including estimated types and quantities, of the waste to be generated.
- f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
- g. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.

Revise and resubmit the Waste Management Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting

Officer.

27. Contract Drawings and Information Drawings. Contract drawings showing the work to be performed under this contract and information drawings showing the original construction of the facility and related items are included with this document.

28. Photographs. Photographs showing the existing conditions of the Operators Quarters building are included in this document. The photographs are attached for informational purposes only. The Contractor shall make his own investigations of existing conditions in the field prior to the start of work. The Contractor shall be responsible for any errors which could have been avoided by such investigations.

29. Damages. The Contractor shall exercise caution and follow sound construction practices in the conduct of the work to avoid construction-related damage to existing features to remain.

30. Sequence of Work and Work Plan. Coordinate the sequence of work with the requirements of Paragraph 15 "Progress Schedule". The Contractor shall submit a written Work Plan describing how sequence requirements shall be met and the methods and equipment required to accomplish the work and provide the required environmental and worker protection. In the work plan, the Contractor shall also include a step-by-step procedure describing the means and methods proposed to install the new water tank and water utility lines in the Utility building. The work plan shall also include a list of components that are proposed to be installed as new and ones that are being refurbished, and a sketch documenting the proposed path for the new water lines and the proposed locations for the concrete slab cut. The work plan shall be submitted to the Contracting Officer for approval prior to starting any of the onsite work.

31. Contractor's Receipt of Supplies. The Contractor shall be responsible for all arrangements for the receipt of materials and supplies at the job site. Government personnel are not permitted to receive or sign for items delivered to the site.

32. Storage Area. The storage area for use by the Contractor, for work and storage of equipment, materials, and trailers during the life of this contract is shown on the contract drawings. Storage areas will also be discussed at the Preconstruction Conference. The Contractor shall confine its storage area to the limits as designated or approved by the Contracting Officer and shall be responsible for the security of the area. Upon completion of the contract, and at no additional cost to the Government, remove all equipment and materials, except as otherwise specified, and restore the site to its original condition as approved by the Contracting Officer.

Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the storage area in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the storage area at the end of each workday.

The Contractor may construct a temporary six-foot-high galvanized chain link fence around trailers and materials at the storage/staging area if desired. Galvanized chain-link fence shall have a minimum height of six feet. The fence posts shall have concrete bases placed on the ground surface. Except for equipment and materials which are in support of ongoing work on any given day or unless such equipment or materials are assigned a separate and distinct storage area by the Contracting Officer away

from the vicinity of the construction site but within the project site boundaries, equipment and materials shall be stored and placed inside the temporary chain-link fencing, if used.

Trailers, if utilized by the Contractor for administrative or material storage purposes, shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the project site.

The temporary six-foot-high chain link fence, if used, shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

33. Restoration of Storage Area and Other Areas. Upon completion of the project remove barricades, temporary utilities, sanitation facilities, construction vehicles, materials and equipment, temporary chain-link fencing if used, and any other temporary equipment, materials, or products from within and around the work areas and temporary storage areas. Clean and repair damage caused by installation or removal of temporary materials, equipment, or utilities. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition, including pavement repair, or top soil and seeding as necessary.

34. Contractor Use of Premises. Work shall be restricted to the areas of the work shown on the contract drawings, access routes to the work site, and to storage areas assigned to this Contractor. Access to the project site is currently available for construction traffic. The Contractor shall be responsible for providing and maintaining access necessary for his equipment and plant to and from the work site.

35. Protection and Security of Property and Personnel. Protection to Contractor personnel or their equipment cannot be provided by the Government at the worksite nor at the travel routes to/from the worksite.

The Contractor shall protect all workmen, civilian and Government personnel and the general public from injury. The Contractor shall coordinate and schedule all work with the Contracting Officer.

The Contractor shall conduct all work so as to cause the least interference possible with the normal activities of the Mansfield Hollow Dam facility and surrounding areas.

36. Subcontractors and Personnel Contacts. Furnish a list of contact personnel of the Contractor and subcontractors, including addresses and telephone numbers. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

37. Work Limits. Work shall be restricted to the immediate area of the Mansfield Hollow Dam Operators Quarters building, in addition to storage areas assigned to this Contractor. Travel through any other parts of the installation or into any other buildings by Contractor personnel will not be permitted unless under escort by a Government employee.

38. Damaged Property. Work shall proceed in a manner which will minimize disturbance or risk of damage to surrounding structures, interior finishes, personal belongings, equipment, or infrastructure. The Contractor shall repair such items damaged by the Contractor in the course of carrying out the work at no additional cost to the Government. All repairs shall match adjacent similar existing items in all aspects. All replacements will be in kind.

39. Emergency Contacts. The Contractor shall have competent personnel trained and capable of dealing with minor personnel injuries. Contractor personnel shall immediately notify their supervisor of any accident requiring emergency medical treatment. The Contractor shall, in turn, notify the Contracting Officer within 4 hours of the incident.

Emergency medical treatment and services for Contractor personnel is the responsibility of the Contractor. The Contractor shall call 911 for medical assistance or other emergencies requiring assistance.

The Contractor shall provide a list of emergency contacts to be used in the event of an emergency. The list shall include the contact names, addresses, and telephone numbers. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

40. Cleaning Up. The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by work under this contract. At the end of each work day and upon the completion of all work, the Contractor shall leave interior and exterior property in the condition in which it was found just prior to start of work.

41. No Smoking Policy. Smoking is prohibited within and outside of all buildings on the Mansfield Hollow Dam facility site, except in designated smoking areas. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines. The Contracting Officer will identify designated smoking areas.

42. Snow Removal. The Contractor shall be responsible for snow removal in their assigned exterior storage area(s).

43. Sanitary Facilities. In accordance with Section 2 of EM 385-1-1, provide, maintain, and make available to all workers provisions for sanitation. Maintain these provisions at all times without nuisance. Upon completion of the work, all sanitary provisions and facilities shall be removed from the premises by the Contractor, leaving the premises clean and free from nuisance.

In accordance with Section 2, Subpart 02.C of EM 385-1-1, provide, maintain, and make available to all workers an adequate supply of potable water for both drinking and personal cleansing. During hot weather, provide cool drinking water.

In accordance with Section 2, Subpart 02.E of EM 385-1-1, provide, maintain, and make available to all workers adequate minimum field-type portable toilets. Portable toilets shall be properly secluded from public observation in such a manner as required or approved by the Contracting Officer. Periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Include provisions for pest control and elimination of odors. Any penalties and/or fines associated with improper discharge of wastewater shall be the responsibility of the Contractor. Government toilet facilities will not be provided.

44. Sustainability. All reasonable efforts shall be made to use recycled, recovered and biobased materials in the execution of this work. Deliverables shall be printed double-sided on paper that contains post-consumer fiber content. To the extent feasible, materials with recycled content per EPA-Designated Recovered Materials Requirements as described at <https://www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products> shall be used. Also the Contractor shall meet the USDA-Designated Biopreferred Program requirements at <https://biopreferred.gov/BioPreferred/faces/pages/ProductCategories.xhtml> as feasible.

45. Cooperation with Others. During the life of this contract, other Contractors may be performing operations in the general area where work under this contract is being performed. The Contractor shall cooperate with others in all respects wherever necessary for the better prosecution of the work. As far as practicable, all persons working in the vicinity shall have equal rights to the use of all transportation facilities and grounds within the limitations specified in the CONTRACT CLAUSES. The obligation of the Contractor under this contract shall include jointly planning and scheduling the work, on a cooperative basis, with other Contractors in order to minimize delays and interferences. The Contractor shall so arrange his operations as to not interfere with other work in progress. In case of dispute or disagreement regarding use of transportation and storage facilities and rights of access, the decision of the Contracting Officer shall govern.

46. Preparation of Record Drawings. Maintain at the job site one set of full-size contract drawings marked to show all deviations which have been made from the contract drawings, including buried or concealed construction and utility features revealed during the course of construction. Record the horizontal and vertical location of all buried utilities that differ from the contract drawings. These drawings shall be available for review by the Contracting Officer at all times. Upon completion of the work, submit the original marked set of prints to the Contracting Officer for approval. Requests for partial payments will not be approved if the marked prints are not current, and request for final payment will not be approved until the marked prints are submitted to and approved by the Contracting Officer. In the event there are no changes to the drawings, the Contractor shall submit a clean copy of the design documents stamped "RECORD DRAWINGS" to the Contracting Officer for approval.

The entries shall be made in the job site set of prints at the time field changes are made, pertinent information collected, or need for corrections established, as a continuing process during the life of the contract. As revised drawings are issued by the Contracting Officer, revised prints shall be introduced into the set to replace the superseded drawings and all applicable notations previously made on the superseded drawings transferred to the current prints. Carefully prepared sketches, not less than 8-1/2 inch by 11 inch, may be used to depict changes or added information in lieu of notations on the actual prints. Staple sketches to the prints affected by the change. All plan views, sections, elevations, profiles, diagrams, details, or schedules affected by a change shall be marked up as required to reflect the change. All notations or changes made on the prints shall be in sufficient detail to clearly depict the change. Colored pens or pencils shall be used to make notations on the record prints as follows:

Red pen or pencil shall be employed to indicate added or corrected work or information.

Green pen or pencil shall be used to show the deleted or incorrectly depicted work or information.

Blue or black pen or pencil shall be used to show information not to be recorded on the drawings

but included on the marked-up prints for explanatory or clarification purposes for the benefit of the Contracting Officer.

B. Safety

1. Accident Prevention Plan. Prior to the start of on-site work, the Contractor shall prepare an Accident Prevention Plan (APP) specific to the activities being performed. The APP shall include an Activity Hazard Analysis (AHA) as described in Paragraph 4 below. All work shall be conducted in accordance with the APP, the U.S. Army Corps of Engineers Safety and Health requirements Manual (EM 385-1-1, 2014 edition), and all applicable Federal, State, and local safety and health requirements. A copy of EM 385-1-1 can be accessed electronically at Headquarters USACE website under publications using the following

link: https://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_385-1-1.pdf

The APP shall detail how safety and health will be managed during the project. The APP shall address the requirements of applicable Federal, State and local safety and health laws, rules, and regulations. The Contractor shall comply with Federal Acquisition Regulation Clause No. 52.236-13 for Accident Prevention, which is added by reference. Special attention shall focus on the requirements of EM 385-1-1, specifically Section 01.A.12 through 01.A.17, Figure 1-2 AHA, and Appendix A, (Minimum Basic Outline for Accident Prevention Plan). The APP shall be developed by a qualified person. The Contractor shall be responsible for documenting the qualified person's credentials. Work shall not proceed until the APP has been reviewed by the Government Designated Authority (GDA) and deemed acceptable for use on the project.

The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract, the penalties for noncompliance, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

The Contractor shall conduct a safety meeting at the project site on the first day of work, whenever a new activity or phase of work begins, or at least weekly during the progress of work. All safety meetings shall be documented. A copy of a suggested weekly safety meeting form will be provided by the Contracting Officer's Representative. Records of the safety briefings shall be submitted to the GDA weekly.

2. Silica Exposure Control Plan. Submit a Silica Exposure Control Plan if cutting, sawing, grinding, drilling, and crushing stone, rock, concrete, brick, block, and mortar activities are to be performed. Develop the written Silica Exposure Control Plan in accordance with applicable OSHA standards (29 CFR 1926) and any other Federal, State and local regulatory requirements. The plan shall be developed by a qualified person. Provide the name and qualifications, training, and experience of the qualified person. The Exposure Control Plan shall detail how potential exposure to workers and adjacent areas will be kept below allowable limits. Submit the plan to the Contracting Officer 15 days prior to initiating work where silica exposure is a potential. Where tasks are performed indoors or in an enclosed area, exhaust ventilation shall be provided as needed to minimize the accumulation of visible

airborne dust. If the dust is exhausted inside the building or in an area outside where building occupants or the general public may be exposed, the system must incorporate HEPA-filtration. If the building ventilation system provides air to an area where "restricted work" is being performed, the building air returns shall be blanked or closed while such work is in progress. A "temporary restricted area" must be established where tasks performed in accordance with Table 1 of 29 CFR 1926.1153 require that respiratory protection be used, or where tasks are performed that are not listed in Table 1, and where no historic or objective data exists to prove exposures will be below the action level. Temporary Restricted Areas must be designated with signs, barriers, or other effective means that will ensure unauthorized persons do not enter. If such work is performed in occupied buildings, dust barriers shall be installed as necessary to isolate the restricted area.

3. Fall Protection Program. The Fall Competent Person shall establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSP Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

a. Training. Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards and using personal fall protection equipment. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSP Z359.2 in the AHA.

b. Fall Protection Equipment and Systems. Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M, ASSP Z359.0, ASSP Z359.1, ASSP Z359.2, ASSP Z359.3, ASSP Z359.4, ASSP Z359.6, ASSP Z359.7, ASSP Z359.11, ASSP Z359.12, ASSP Z359.13, ASSP Z359.14, ASSP Z359.15, ASSP Z359.16 and ASSP Z359.18.

c. Additional Personal Fall Protection Measures. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

d. Personal Fall Protection Equipment. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabineers must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 1633 kg 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The

maximum free fall distance when using fall arrest equipment must not exceed 1.8 m 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. Equip all full body harnesses with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

e. Horizontal Lifelines (HLL). Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

f. Guardrails and Safety Nets. Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

g. Rescue and Evacuation Plan and Procedures. When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must be in accordance with the requirements of EM 385-1-1, ASSP Z359.2, and ASSP Z359.4.

4. Activity Hazard Analysis (AHA). An AHA shall be submitted for each major phase of work. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform the work. The analysis shall define all activities to be performed, identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on a phase of work until the AHA has been accepted by the GDA. A preparatory meeting shall be conducted by the Contractor to discuss the AHA contents with all engaged in the activity. The preparatory meeting shall be conducted by the prime Contractor and shall include all subcontractors and Government on-site representatives. The AHA shall be continuously reviewed and revised to address changing site conditions or operations as appropriate.

5. Accident Reporting. Notification and Reporting Requirements. All accidents and near miss incidents shall be investigated by the Contractor. All work-related recordable injuries, illnesses and property damage accidents (excluding on-the-road vehicle accidents), in which the property damage exceeds \$5,000.00, shall be verbally reported to the GDA within 4 hours of the incident. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be

investigated in depth to identify all causes and to recommend hazard control measures.

Notification shall include the following: Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies.

The contractor shall complete the USACE Accident Report ENG Form 3394 (available from the Contracting Officer's Representative). ENG Form 3394 shall be submitted to the GDA within five days of the incident.

The Contractor shall complete the "USACE Contractor Monthly Summary Record of Injuries/Illness and Work Hour Exposure" (for prime and its subcontractors) (available from the Contracting Officer's Representative). The form shall be submitted to the GDA no later than close of business on the 10th calendar day of the following month. The method of transmission by the prime contractor to the GDA shall be electronically.

6. Site Safety and Health Officer (SSHO). The Contractor shall designate one individual as the SSHO. Documentation of SSHO qualifications shall be submitted for approval prior to initiating work. The SSHO shall have:

- a. A minimum of five years of experience in implementing safety and health programs at similar projects;
- b. Documented experience in personal protective equipment;
- c. Working knowledge of construction safety procedures as well as Federal and state occupational safety and health regulations.
- d. Completion of the 30-hour OSHA Construction Safety class or as an equivalent, 30 hours of formal construction safety and health training covering the subjects of the 30-hour course.

The SSHO may have other duties in addition to site safety and health, but may not be the Contractor's Site Superintendent.

7. Safety Briefings. The Contractor shall conduct a safety meeting at the project site on the first day of work, whenever a new activity or phase of work begins, or at least weekly during the progress of work. All safety meetings shall be documented. A copy of a suggested weekly safety meeting form will be provided by the Contracting Officer's Representative. Records of the safety briefings shall be submitted to the GDA weekly.

8. Equipment. The Contractor shall submit to the Contracting Officer's Representative a current written safety inspection for all heavy equipment proposed for use on this contract. The Contractor,

upon award of the contract, will be required to make available for suitability and safety compliance inspection all equipment proposed for use to perform the work of this contract. Equipment shall be made available for inspection by the Government Representative five working days prior to the start of construction. Any additional equipment added during the prosecution of the work shall also be made available for inspection prior to its use on the project. The Contractor shall keep equipment available for inspection by the Contracting Officer's Representative during the construction process. Equipment not accepted by the Contracting Officer's Representative should be repaired or replaced by the Contractor.

If a crane will be used, Contractor shall provide personnel who meet the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators and Signal Persons. Proof of current qualification shall be provided to the GDA prior to initiating work onsite. If a Critical Lift as defined in EM 385-1-1, Section 16.H.01, is required, the contractor shall provide a Critical Lift Plan using Form 16-3 of EM 385-1-1.

11. Prime Contractor's Superintendent. The Prime Contractor's superintendent shall take an active role in enforcing the safety requirements by participation in safety conferences, hazard analysis (see B.4), tool box meetings, walk-through inspections, correction of violations, etc., and including that of the subcontractor's work.

12. Fire Extinguishers. Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with EM 385-1-1 and NFPA 10.

C. General and Administrative Submittals Required

1. Items for Submission. The Contractor shall submit the items identified below for approval to the Contracting Officer. Government acceptance, as defined in EM 385-1-1, is required for safety related submittals (identified below with an "S" after the submittal name). The Contractor shall submit an electronic PDF copy and five paper copies of each submittal item (unless otherwise indicated) using a completed ENG FORM 4025-R cover sheet (a blank copy of this form is attached at the end of these specifications). The Contractor will be informed at the Preconstruction Conference to send all submittals to either the project Resident Office or to the project Area Engineer Office, or other office, as applicable.

2. Preconstruction Submittals: The following submittals shall be made by the Contractor and review action completed by the Contracting Officer prior to the commencement of work at the site.

Initial Progress Schedule: In accordance with the contract clauses, the Contractor shall, within 30 days after receipt of Notice to Proceed (NTP), or as otherwise determined by the Contracting Officer, submit for approval a practicable Initial Project Schedule. When changes are authorized that result in contract time extensions, the Contractor shall submit a revised project schedule for approval by the Contracting Officer.

Accident Prevention Plan (S): The Contractor shall prepare an Accident Prevention Plan (APP) specific to the activities being performed. It shall include an Activity Hazard Analysis (AHA) for each major phase of work, including a Site Specific Fall Protection and Prevention Plan.

Silica Exposure Control Plan (S): The Contractor shall prepare a Silica Exposure Control Plan specific to the activities being performed.

SSHO Qualifications (S): Documentation of SSHO qualifications shall be submitted.

Safety Inspection for all Heavy Equipment (S): The Contractor shall submit a current written safety inspection for all heavy equipment proposed for use on this contract

Construction Site Plan: Prior to the start of work, the Contractor shall submit a site plan showing the locations and dimensions of temporary facilities.

Work Plan (S): The Contractor shall submit a written Work Plan describing the methods and equipment required to accomplish the work and provide the required environmental and worker protection. In the work plan, the Contractor shall also include a step-by-step procedure describing the means and methods proposed to install the new water tank and water utility lines in the Utility building. The work plan shall also include a sketch documenting the proposed path for the new water lines and the proposed locations for the concrete slab cut. The work plan shall be submitted to the Contracting Officer for approval prior to starting any of the onsite work.

Environmental Protection Plan: The Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer.

Waste Management Plan: The Contractor shall submit a Waste Management Plan for review and approval by the Contracting Officer.

Fall Prevention Plan: The Fall Protection Plan shall be developed by a Fall Competent Person, as detailed in Part B Safety, Paragraph 3.

3. Other Submittals. The following submittals shall be made by the Contractor to allow sufficient time for review action to be taken by the Contracting Officer and to comply with the approved Project Schedule, as appropriate.

Accident Reports (S)

Monthly Summary Record of Injuries/Illness and Work Hour Exposure (S)

Periodic Schedule Updates: An updated schedule showing actual progress shall be submitted monthly or with each pay request.

Monthly Documentation of Construction Debris Diverted.

Utility Outage/Interruption Requests.

Utility Cutover Requests.

Record Drawings.

Safety Briefings.

4. Approved Submittals. The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and

other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Quality Control requirements of this contract is responsible for the satisfactory construction of all work. The Government reserves 21 calendar days for review and approval action on all submittals from the time of receipt of the submittal by the Government. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

5. Disapproved Submittals. The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice shall be given promptly to the Contracting Officer.

D. Technical Submittals Required

Technical submittals required are described in the individual specification sections with this SOW. The Contractor shall follow the procedures outlined in Part C above when making technical submittals.

E. Technical Requirements

All technical requirements describing the work of this project are shown and described on the contract drawings and in appropriate specification sections within this SOW.

F. Delivery, Handling and Storage

As appropriate, materials shall be delivered to the project site in the manufacturer's original packaging with the brand and item identification reference clearly marked. Components shall be stored in a dry location that is adequately ventilated, free from dust, water, or other contaminants, and which is easily accessible for inspection and handling.

G. Material Warranties

The Contractor shall note that a Warranty of Construction is required for this project for a period of 1 year from the date of final acceptance of the work, in accordance with the Contract Clauses. In addition, manufacturer's standard performance guarantees or warranties that extend beyond a 1-year period shall be provided, as appropriate.

H. Coordination

Liaison with the U.S. Army Corps of Engineers, New England District, by the Contractor shall be maintained for the duration of the project by communication with the Contracting Officer's Representative assigned to this project. All Contractor project related questions, comments, clarifications, etc. shall be directed to the Contracting Officer's Representative for action.

I. References

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP Z359.0 (2018) Definitions and Nomenclature Used for Fall Protection and Fall Arrest

ASSP Z359.1 (2016) The Fall Protection Code

ASSP Z359.2 (2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program

ASSP Z359.3 (2019) Safety Requirements for Lanyards and Positioning Lanyards

ASSP Z359.4 (2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components

ASSP Z359.6 (2016) Specifications and Design Requirements for Active Fall Protection Systems

ASSP Z359.7 (2019) Qualification and Verification Testing of Fall Protection Products

ASSP Z359.11 (2014) Safety Requirements for Full Body Harnesses

ASSP Z359.12 (2019) Connecting Components for Personal Fall Arrest Systems

ASSP Z359.13 (2013) Personal Energy Absorbers and Energy Absorbing Lanyards

ASSP Z359.14 (2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems

ASSP Z359.15 (2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems

ASSP Z359.16 (2016) Safety Requirements for Climbing Ladder Fall Arrest Systems

ASSP Z359.18 (2017) Safety Requirements for Anchorage Connectors for Active Fall Protection Systems

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241 (2009) Standard for Safeguarding Construction, Alteration, and Demolition Operations

NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3 2014) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM-385-1-1 (2014) Safety and Health Requirements Manual, U.S. Army Engineering Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.1153 Respirable Crystalline Silica

29 CFR 1926.500 Fall Protection

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Demolish Operators Quarters Building

BIDDING SCHEDULE

Refer to Section 01 22 00 MEASUREMENT AND PAYMENT.

Item No.	Description	Quantity	Unit	Unit Price	Amount
<u>BASE BID</u>					
0001	Demolition of Operators Quarters Building	1	Job	Job	\$ _____
0002	Electrical Work Allowance	1	Job	Job	\$ 5,000.00
TOTAL ESTIMATED AMOUNT, BASE BID ITEMS					\$ _____

TOTAL ESTIMATED AMOUNT, BASE BID AND OPTIONAL ITEMS \$ _____

Note 1: Bidders must bid all items. The work will be awarded as a whole to one bidder. Offers will be evaluated and the low bidder determined by the Total Estimated Amount for Line Items 0001 and 0002. The minimum work awarded will be the Base Bid work.

Note 2: All work shall be completed within the time period specified in Section 00 80 00 SPECIAL CONTRACT REQUIREMENTS, Subpart COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK (APR 1984) FAR 52.211-10.

Note 3: Identify a point of contact e-mail for all correspondence related to this bid: _____@_____.

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SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 JOB PAYMENT ITEMS

Payment items for the work of this contract for which contract job payments will be made are listed in the BIDDING SCHEDULE and described below. The job price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.2 BIDDING SCHEDULE - PAYMENT ITEMS

Payment items for the work of this contract on which the contract progress payments will be based are listed in the BIDDING SCHEDULE and are described below. All costs for items of work, which are not specifically mentioned to be included in a particular Bidding Schedule job payment item, shall be included in the listed item most closely associated with the work involved.

Base Bid Item

- a. Item Number 0001, "Demolition of Operators Quarters Building".

All costs for labor, equipment, and materials for all demolition work in accordance with the SOW, plans and specifications.

Unit of Measure: Job.

- b. Item Number 0002, "Electrical Work Allowance".

The electrical allowance of \$5000.00, is specified to pay for electrical work associated with power disconnect, and shall be included in the lump sum bid under this Item.

Unit of Measure: Job.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

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SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g., ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)
2111 Wilson Blvd, Suite 400
Arlington, VA 22201
Ph: 703-524-8800
Internet: <http://www.ahrinet.org>

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)
520 N. Northwest Highway
Park Ridge, IL 60068
Ph: 847-699-2929
E-mail: customerservice@assp.org
Internet: <https://www.assp.org/>

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 W. Quincy Avenue
Denver, CO 80235 USA
Ph: 303-794-7711 or 800-926-7337
Fax: 303-347-0804
Internet: <https://www.awwa.org/>

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: <https://www.astm.org/>

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 and 501 Hoes Lane

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Piscataway, NJ 08854-4141
Ph: 732-981-0060 or 800-701-4333
Fax: 732-981-9667
E-mail: onlinesupport@ieee.org
Internet: <https://www.ieee.org/>

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)
3050 Old Centre Ave. Suite 101
Portage, MI 49024
Ph: 269-488-6382
Fax: 269-488-6383
Internet: <https://www.netaworld.org/>

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)
3 Bethesda Metro Center, Suite 1100
Bethesda, MD 20814
Ph: 301-657-3110
Fax: 301-215-4500
Internet: <https://www.necanet.org/>

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 900
Arlington, VA 22209
Ph: 703-841-3200
Internet: <https://www.nema.org>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 800-344-3555
Fax: 800-593-6372
Internet: <https://www.nfpa.org>

NSF INTERNATIONAL (NSF)
789 North Dixboro Road
P.O. Box 130140
Ann Arbor, MI 48105
Ph: 734-769-8010 or 800-NSF-MARK
Fax: 734-769-0109
E-mail: info@nsf.org
Internet: <http://www.nsf.org>

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)
1320 North Courthouse Road, Suite 200
Arlington, VA 22201
Ph: 703-907-7700
Fax: 703-907-7727
E-mail: marketing@tiaonline.org
Internet: <https://www.tiaonline.org/>

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
<http://www.wbdg.org/ffc/army-coe/standards>
Order Other Documents from:
Official Publications of the Headquarters, USACE
E-mail: hqpublications@usace.army.mil
Internet: <http://www.publications.usace.army.mil/>
or

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<https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/>

U.S. DEFENSE LOGISTICS AGENCY (DLA)
Andrew T. McNamara Building
8725 John J. Kingman Road
Fort Belvoir, VA 22060-6221
Ph: 877-352-2255
E-mail: dlacontactcenter@dla.mil
Internet: <http://www.dla.mil>

U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8884
E-mail: PA@ams.usda.gov
Internet: <https://www.ams.usda.gov/>
Order Other Publications from:
USDA Rural Development
Rural Utilities Service
STOP 1510, Rm 5135
1400 Independence Avenue SW
Washington, DC 20250-1510
Phone: (202) 720-9540
Internet:
<https://www.rd.usda.gov/about-rd/agencies/rural-utilities-service>

U.S. DEPARTMENT OF DEFENSE (DOD)
Order DOD Documents from:
Room 3A750-The Pentagon
1400 Defense Pentagon
Washington, DC 20301-1400
Ph: 703-571-3343
Fax: 215-697-1462
E-mail: customerservice@ntis.gov
Internet: <https://www.ntis.gov/>
Obtain Military Specifications, Standards and Related Publications
from:
Acquisition Streamlining and Standardization Information System
(ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: <https://assist.dla.mil/online/start/>; account
registration required
Obtain Unified Facilities Criteria (UFC) from:
Whole Building Design Guide (WBDG)
National Institute of Building Sciences (NIBS)
1090 Vermont Avenue NW, Suite 700
Washington, DC 20005
Ph: 202-289-7800
Fax: 202-289-1092
Internet:
<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc>

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U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-564-4700
Internet: <https://www.epa.gov>
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6060 or 1-800-363-2068
Fax: 703-605-6880
TDD: 703-487-4639
E-mail: info@ntis.gov
Internet: <https://www.ntis.gov/>

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)
Order for sale documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: <https://www.gpo.gov/>
Order free documents from:
U.S. Department of Transportation
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591
Ph: 866-835-5322
Internet: <https://www.faa.gov/>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Internet: <https://www.archives.gov/>
Order documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: <https://www.gpo.gov/>

UNDERWRITERS LABORATORIES (UL)
2600 N.W. Lake Road
Camas, WA 98607-8542
Ph: 877-854-3577 or 360-817-5500
E-mail: CustomerExperienceCenter@ul.com
Internet: <https://www.ul.com/>
UL Directories available through IHS at <https://ihsmarkit.com/>

PART 2 PRODUCTS

Not used

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PART 3 EXECUTION

Not used

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DEMOLITION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI Guideline K (2009) Guideline for Containers for Recovered Non-Flammable Fluorocarbon Refrigerants

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP A10.6 (2006) Safety & Health Program Requirements for Demolition Operations - American National Standard for Construction and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25 (Jun 2000; Reaffirmed Oct 2010) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders
<http://www.aviation.dla.mil/UserWeb/aviationengineerir>

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M (2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures

MIL-STD-129 (2014; Rev R; Change 1 2018; Change 2 2019) Military Marking for Shipment and Storage

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1 (2015; Rev L) Obstruction Marking and Lighting

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61 National Emission Standards for Hazardous

Demolish Operators Quarters Building

Air Pollutants

40 CFR 82

Protection of Stratospheric Ozone

49 CFR 173.301

Shipment of Compressed Gases in Cylinders
and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 Definitions

1.2.1.1 Demolition

Demolition is the process of wrecking or taking out any load-supporting structural member of a facility together with any related handling and disposal operations.

1.2.1.2 Demolition Plan

Demolition Plan is the planned steps and processes for managing demolition activities and identifying the required sequencing activities and disposal mechanisms.

1.2.2 Demolition Plan

Prepare a Demolition Plan and submit proposed demolition, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Coordinate with Waste Management Plan in accordance with Statement of work Part A, Section 26 Waste Management. Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by Contracting Officer prior to work beginning.

1.2.3 General Requirements

Do not begin demolition until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes recycling of materials. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the building. The work includes demolition and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not

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overload pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.3.1 Construction Limits and Protection

Do not disturb areas beyond the extent indicated or necessary for demolition and installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove snow, dust, dirt, and debris from work areas daily.

1.3.2 Trees

Protect trees within the project site which might be damaged during demolition, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.3.3 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor.

1.3.4 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition, work performed under this contract.

1.4 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with the SOW, part C "General and Administrative Submittals Required.":

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SD-01 Preconstruction Submittals

Demolition Plan; G, RO

Existing Conditions

Survey; G, RO

SD-07 Certificates

Notification; G, RO

SD-11 Closeout Submittals

Receipts

1.6 QUALITY ASSURANCE

Submit timely notification of demolition projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA), State's environmental protection agency, local air pollution control district/agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSP A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.6.1 Dust and Debris Control

Prevent the spread of dust and debris in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.

1.7 PROTECTION

1.7.1 Traffic Control Signs

a. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

Provide a minimum of 2 FAA type L-810 steady burning red obstruction lights on temporary structures (including cranes) over 100 feet, but less than 200 ft, above ground level. The use of LED based obstruction lights are not permitted. For temporary structures (including cranes) over 200 ft above ground level provide obstruction lighting in accordance with FAA AC 70/7460-1. Light construction and installation shall comply with FAA AC 70/7460-1. Lights shall be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer. Maintain the temporary services during the period of construction and remove only after permanent services have been installed and tested and are in operation.

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1.7.2 Protection of Personnel

Before, during and after the demolition work continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.8 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.9 EXISTING CONDITIONS

Before beginning any demolition work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

- a. Remove existing structures indicated to be removed.
- b. Demolish structures in a systematic manner from the top of the structure to the ground. Complete demolition work above each tier or floor before the supporting members on the lower level are disturbed. Demolish concrete and masonry walls in small sections. Remove structural framing members and lower to ground by means of derricks, platforms hoists, or other suitable methods as approved by the

Demolish Operators Quarters Building

Contracting Officer.

- c. Locate demolition equipment throughout the structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.
- d. Building, or the remaining portions thereof, not exceeding 80 feet in height may be demolished by the mechanical method of demolition.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities, as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the Contracting Officer.

3.1.3 Paving and Slabs

Remove concrete and asphaltic concrete paving and slabs including aggregate base as indicated. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the Contracting Officer. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.4 Miscellaneous Metal

Scrap metal shall become the Contractor's property. Recycle scrap metal as part of demolition operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility, in accordance with the Waste Management Plan.

3.1.5 Locksets on Swinging Doors

Remove all locksets from all swinging doors indicated to be removed and disposed of. Deliver the locksets and related items to a designated location for receipt by the Contracting Officer after removal.

3.1.6 Mechanical Equipment and Fixtures

Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Disconnect mechanical equipment and fixtures at fittings. Remove service valves attached to the unit. Do not remove equipment until approved.

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3.1.6.1 Preparation for Storage

Remove water, dirt, dust, and foreign matter from units; tanks, piping and fixtures shall be drained; interiors, if previously used to store flammable, explosive, or other dangerous liquids, shall be steam cleaned. Seal openings with caps, plates, or plugs. Secure motors attached by flexible connections to the unit. Change lubricating systems with the proper oil or grease.

3.1.6.2 Piping

Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. If the piping that remains can become pressurized due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve shall be attached to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and residues are removed. Box prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Wrap sprinkler heads individually in plastic bags before boxing. Classify piping not designated for salvage, or not reusable, as scrap metal.

3.1.6.3 Ducts

Classify removed duct work as scrap metal.

3.1.6.4 Fixtures, Motors and Machines

Remove fixtures, motors and machines associated with plumbing, heating, air conditioning, refrigeration, and other mechanical system installations.

3.1.7 Electrical Equipment and Fixtures

Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.

3.1.7.1 Fixtures

Remove electrical fixtures. Incandescent, mercury-vapor, and fluorescent lamps and fluorescent ballasts manufactured prior to 1978 shall be removed and disposed of in accordance with local, state and federal regulations.

3.1.7.2 Electrical Devices

Remove switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items.

3.1.7.3 Wiring Ducts or Troughs

Remove wiring ducts or troughs. Dismantle plug-in ducts and wiring troughs into unit lengths.

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3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition work in areas occupied by structures to be demolished until all demolition in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials and equipment to be reused or relocated to prevent damage, and reinstall as the work progresses. Coordinate the re-use of materials and equipment with the re-use requirements in accordance with Statement of work Part A, Section 26 Waste Management. Capture re-use of materials in the diversion calculations for the project.

3.3.3 Salvaged Materials and Equipment

Remove materials and equipment that are to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site.

- a. Salvage items and material to the maximum extent possible.
- b. Store all materials salvaged for the Contractor as approved by the Contracting Officer and remove from Government property before completion of the contract. Coordinate the salvaged materials with tracking requirements in accordance with Statement of work Part A, Section 26 Waste Management. Capture salvaged materials in the diversion calculations for the project.
- c. Remove salvaged items to remain the property of the Government in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers.
- d. Remove historical items in a manner to prevent damage. Deliver the following historical items to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.
- e. Remove and capture all Class I ODS refrigerants in accordance with the Clean Air Act Amendment of 1990.

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3.3.4 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting AHRI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be removed from Government property and disposed of in accordance with 40 CFR 82. Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82. Submit Receipts or bills of lading, as specified. Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

3.3.4.1 Special Instructions

No more than one type of ODS is permitted in each container. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

- a. Activity name and unit identification code
- b. Activity point of contact and phone number
- c. Type of ODS and pounds of ODS contained
- d. Date of shipment
- e. National stock number (for information, call (804) 279-4525).

3.3.5 Transportation Guidance

Ship all ODS containers in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), 49 CFR 173.301, and DOD 4000.25-1-M.

3.3.6 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material. Dispose of unsalvageable and non-recyclable combustible material off the site.

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and

Demolish Operators Quarters Building

local regulations as contractually specified in the Waste Management Plan. Storage of removed materials on the project site is prohibited.

3.5.2 Burning on Government Property

Burning of materials removed from demolished structures will not be permitted on Government property.

3.5.3 Removal from Government Property

Transport waste materials removed from demolished structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

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SECTION 26 20 00

INTERIOR DISTRIBUTION SYSTEM

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

- | | |
|-----------|---|
| ASTM B1 | (2013) Standard Specification for
Hard-Drawn Copper Wire |
| ASTM B8 | (2011; R 2017) Standard Specification for
Concentric-Lay-Stranded Copper Conductors,
Hard, Medium-Hard, or Soft |
| ASTM D709 | (2017) Standard Specification for
Laminated Thermosetting Materials |

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

- | | |
|----------|---|
| IEEE 81 | (2012) Guide for Measuring Earth
Resistivity, Ground Impedance, and Earth
Surface Potentials of a Ground System |
| IEEE 100 | (2000; Archived) The Authoritative
Dictionary of IEEE Standards Terms |

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

- | | |
|----------|--|
| NETA ATS | (2021) Standard for Acceptance Testing
Specifications for Electrical Power
Equipment and Systems |
|----------|--|

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)

- | | |
|-------------|--|
| NECA NEIS 1 | (2015) Standard for Good Workmanship in
Electrical Construction |
|-------------|--|

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

- | | |
|------------|--|
| ANSI C12.7 | (2014) Requirements for Watthour Meter
Sockets |
| ANSI C80.1 | (2020) American National Standard for
Electrical Rigid Steel Conduit (ERSC) |
| NEMA 250 | (2020) Enclosures for Electrical Equipment
(1000 Volts Maximum) |
| NEMA ICS 1 | (2000; R 2015) Standard for Industrial |

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Control and Systems: General Requirements

NEMA TC 2	(2020) Standard for Electrical Polyvinyl Chloride (PVC) Conduit
NEMA TC 3	(2021) Polyvinyl Chloride (PVC) Fittings for Use With Rigid PVC Conduit and Tubing
NEMA TC 14	(2002) Standard for Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
NEMA Z535.4	(2011; R 2017) Product Safety Signs and Labels

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 70E	(2021) Standard for Electrical Safety in the Workplace

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.147	The Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.303	Electrical, General

UNDERWRITERS LABORATORIES (UL)

UL 6	(2007; Reprint Sep 2019) UL Standard for Safety Electrical Rigid Metal Conduit-Steel
UL 44	(2018; Reprint May 2021) UL Standard for Safety Thermoset-Insulated Wires and Cables
UL 50	(2015) UL Standard for Safety Enclosures for Electrical Equipment, Non-Environmental Considerations
UL 67	(2018; Reprint Jul 2020) UL Standard for Safety Panelboards
UL 83	(2017; Reprint Mar 2020) UL Standard for Safety Thermoplastic-Insulated Wires and Cables
UL 467	(2013; Reprint Jun 2017) UL Standard for Safety Grounding and Bonding Equipment
UL 486A-486B	(2018; Reprint May 2021) UL Standard for Safety Wire Connectors
UL 486C	(2018; Reprint May 2021) UL Standard for Safety Splicing Wire Connectors

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UL 489	(2016; Rev 2019) UL Standard for Safety Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
UL 510	(2020) UL Standard for Safety Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
UL 514B	(2012; Reprint May 2020) Conduit, Tubing and Cable Fittings
UL 651	(2011; Reprint Mar 2020) UL Standard for Safety Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL 719	(2015; Reprint Jul 2021) UL Standard for Safety Nonmetallic-Sheathed Cables
UL 854	(2020) Standard for Service-Entrance Cables

1.2 DEFINITIONS

Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, are as defined in IEEE 100.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with the SOW:

SD-02 Shop Drawings

Panelboards; G, DO

Marking Strips Drawings; G, DO

Circuit Breakers; G, DO

Meter Base Only; G, DO

Surge Protective Devices; G, DO

SD-06 Test Reports

600-volt Wiring Test; G

Grounding System Test; G

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "must" had been

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substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Provide equipment, materials, installation, and workmanship in accordance with NFPA 70 unless more stringent requirements are specified or indicated. NECA NEIS 1 shall be considered the minimum standard for workmanship.

1.4.2 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship and:

- a. Have been in satisfactory commercial or industrial use for 2 years prior to bid opening including applications of equipment and materials under similar circumstances and of similar size.
- b. Have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period.
- c. Where two or more items of the same class of equipment are required, provide products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1.4.2.1 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

1.4.2.2 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site are not acceptable.

1.5 MAINTENANCE

1.6 WARRANTY

Provide equipment items supported by service organizations that are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

As a minimum, meet requirements of UL, where UL standards are established for those items, and requirements of NFPA 70 for all materials, equipment, and devices.

2.2 CONDUIT AND FITTINGS

Conform to the following:

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2.2.1 Rigid Metallic Conduit

2.2.1.1 Rigid, Threaded Zinc-Coated Steel Conduit

ANSI C80.1, UL 6.

2.2.2 Rigid Nonmetallic Conduit

PVC Type EPC-40 in accordance with NEMA TC 2, UL 651, or fiberglass conduit, in accordance with NEMA TC 14.

2.2.3 Fittings for Metal Conduit, EMT, and Flexible Metal Conduit

2.2.3.1 Fittings for Rigid Metal Conduit

Threaded-type. Split couplings unacceptable.

2.2.4 Fittings for Rigid Nonmetallic Conduit

NEMA TC 3 for PVC, and UL 514B.

2.3 CABINETS, JUNCTION BOXES, AND PULL BOXES

UL 50; volume greater than 100 cubic inches, NEMA Type 1 enclosure; sheet steel, hot-dip, zinc-coated. Where exposed to wet, damp, or corrosive environments, NEMA Type 3R.

2.4 WIRES AND CABLES

Provide wires and cables in accordance applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Do not use wires and cables manufactured more than 12 months prior to date of delivery to site.

2.4.1 Conductors

Provide the following:

- a. Conductor sizes and capacities shown are based on copper, unless indicated otherwise.
- b. Conductors No. 8 AWG and larger diameter: stranded.
- c. Conductors No. 10 AWG and smaller diameter: solid.
- d. Conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3: stranded unless specifically indicated otherwise.
- e. All conductors: copper.

2.4.1.1 Minimum Conductor Sizes

Provide minimum conductor size in accordance with the following:

- a. Branch circuits: No. 12 AWG.
- b. Class 1 remote-control and signal circuits: No. 14 AWG.
- c. Class 2 low-energy, remote-control and signal circuits: No. 16 AWG.

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- d. Class 3 low-energy, remote-control, alarm and signal circuits: No. 22 AWG.

2.4.2 Color Coding

Provide color coding for service, feeder, branch, control, and signaling circuit conductors.

2.4.2.1 Ground and Neutral Conductors

Provide color coding of ground and neutral conductors as follows:

- a. Grounding conductors: Green.
- b. Neutral conductors: White.
- c. Exception, where neutrals of more than one system are installed in same raceway or box, other neutrals color coding: white with a different colored (not green) stripe for each.

2.4.2.2 Ungrounded Conductors

Provide color coding of ungrounded conductors in different voltage systems as follows:

- a. 208/120 volt, three-phase
 - (1) Phase A - black
 - (2) Phase B - red
 - (3) Phase C - blue
- b. 480/277 volt, three-phase
 - (1) Phase A - brown
 - (2) Phase B - orange
 - (3) Phase C - yellow
- c. 120/240 volt, single phase: Black and red

2.4.3 Insulation

Unless specified or indicated otherwise or required by NFPA 70, provide power and lighting wires rated for 600-volts, Type XHHW conforming to UL 44, except that grounding wire may be type TW conforming to UL 83. Where equipment or devices require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

2.4.4 Bonding Conductors

ASTM B1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

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2.4.5 Service Entrance Cables

Service Entrance (SE) and Underground Service Entrance (USE) Cables, UL 854.

2.4.6 Nonmetallic Sheathed Cable

UL 719, Type NM or NMC.

2.5 SPLICES AND TERMINATION COMPONENTS

Do not splice unless specifically called out on the plans or where otherwise approved via RFI. UL 486A-486B for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires: insulated, pressure-type in accordance with UL 486A-486B or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.6 PANELBOARDS

Provide panelboards in accordance with the following:

- a. UL 67 and UL 50 having a short-circuit current rating as indicated.
- b. Panelboards: circuit breaker-equipped.
- c. Designed such that individual breakers can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as means of obtaining clearances as required by UL.
- d. "Specific breaker placement" is required in panelboards to match the breaker placement indicated in the panelboard schedule on the design drawings. If it is not possible to match "specific breaker placement" during construction, obtain Government approval prior to device installation.
- e. Main breaker: "separately" mounted "above" or "below" branch breakers.
- f. Where "space only" is indicated, make provisions for future installation of breakers.
- g. Directories: indicate load served by each circuit in panelboard.
- h. Directories: indicate source of service to panelboard (e.g., Panel PA served from Panel MDP).
- i. Type directories and mount in holder behind transparent protective covering.
- j. Panelboards: listed and labeled for their intended use.
- k. Panelboard nameplates: provided in accordance with paragraph FIELD FABRICATED NAMEPLATES.

2.6.1 Enclosure

Provide panelboard enclosure in accordance with the following:

- a. UL 50.

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- b. Cabinets mounted outdoors or flush-mounted: hot-dipped galvanized after fabrication.
- c. Cabinets: painted in accordance with paragraph PAINTING.
- d. All cabinets: NEMA 3R raintight with conduit hubs welded to the cabinet.
- e. Front edges of cabinets: form-flanged or fitted with structural shapes welded or riveted to the sheet steel, for supporting the panelboard front.
- f. All cabinets: fabricated such that no part of any surface on the finished cabinet deviates from a true plane by more than 1/8 inch.
- g. Holes: provided in the back of indoor surface-mounted cabinets, with outside spacers and inside stiffeners, for mounting the cabinets with a 1/2 inch clear space between the back of the cabinet and the wall surface.
- h. Flush doors: mounted on hinges that expose only the hinge roll to view when the door is closed.
- i. Each door: fitted with a combined catch and lock latch.
- j. Keys: two provided with each lock, with all locks keyed alike.
- k. Finished-head cap screws: provided for mounting the panelboard fronts on the cabinets.

2.6.2 Panelboard Buses

Support bus bars on bases independent of circuit breakers. Design main buses and back pans so that breakers may be changed without machining, drilling, or tapping. Provide isolated neutral bus in each panel for connection of circuit neutral conductors. Provide separate ground bus identified as equipment grounding bus per UL 67 for connecting grounding conductors; bond to steel cabinet.

2.6.3 Circuit Breakers

UL 489, thermal magnetic-type having a minimum short-circuit current rating equal to the short-circuit current rating of the panelboard in which the circuit breaker will be mounted. Breaker terminals: UL listed as suitable for type of conductor provided. Series rated circuit breakers and plug-in circuit breakers are unacceptable.

2.6.3.1 Multipole Breakers

Provide common trip-type with single operating handle. Design breaker such that overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B, and C, respectively.

2.7 LOCKOUT REQUIREMENTS

Provide circuit breakers, disconnecting means, and other devices that are electrical energy-isolating capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy

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in accordance with 29 CFR 1910.147, NFPA 70E and 29 CFR 1910.303. Comply with requirements of Division 23, "Mechanical" for mechanical isolation of machines and other equipment.

2.8 GROUNDING AND BONDING EQUIPMENT

2.8.1 Ground Rods

UL 467. Ground rods: cone pointed copper-clad steel, with minimum diameter of 3/4 inch and minimum length 10 feet. Sectional type rods may be used for rods 20 feet or longer.

2.9 MANUFACTURER'S NAMEPLATE

Provide on each item of equipment a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

2.10 FIELD FABRICATED NAMEPLATES

Provide field fabricated nameplates in accordance with the following:

- a. ASTM D709.
- b. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified or as indicated on the drawings.
- c. Each nameplate inscription: identify the function and, when applicable, the position.
- d. Nameplates: melamine plastic, 0.125 inch thick, white with black center core.
- e. Surface: matte finish. Corners: square. Accurately align lettering and engrave into the core.
- f. Minimum size of nameplates: one by 2.5 inches.
- g. Lettering size and style: a minimum of 0.25 inch high normal block style.

2.11 WARNING SIGNS

Provide warning signs for flash protection in accordance with NFPA 70E and NEMA Z535.4 for switchboards, panelboards, industrial control panels, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized. Provide field installed signs to warn qualified persons of potential electric arc flash hazards when warning signs are not provided by the manufacturer. Provide marking that is clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

2.12 FIRESTOPPING MATERIALS

Provide firestopping materials, supplied from a single domestic manufacturer, consisting of commercially manufactured, asbestos-free,

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nontoxic products FM APP GUIDE approved, or UL listed, for use with applicable construction and penetrating items, complying with the following minimum requirements:

2.12.1 Fire Hazard Classification

Material shall have a flame spread of 25 or less, and a smoke developed rating of 50 or less, when tested in accordance with ASTM E84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resistance or by a nationally recognized testing laboratory.

2.12.2 Toxicity

Material shall be nontoxic and carcinogen free to humans at all stages of application or during fire conditions and shall not contain hazardous chemicals or require harmful chemicals to clean material or equipment.

2.12.3 Fire Resistance Rating

Firestop systems shall be UL Fire Resistance listed or FM APP GUIDE approved with "F" rating at least equal to fire-rating of fire wall or floor in which penetrated openings are to be protected.

2.12.3.1 Through-Penetrations

Firestopping materials for through-penetrations, as described in paragraph SUMMARY, shall provide "F", "T" and "L" fire resistance ratings in accordance with ASTM E814 or UL 1479. Fire resistance ratings shall be as follows:

2.12.4 Material Certification

Submit certificates attesting that firestopping material complies with the specified requirements. For all intumescent firestop materials used in through penetration systems, manufacturer shall provide certification of compliance with UL 1479.

2.13 METER BASE ONLY

ANSI C12.7. Provide NEMA Type 3R, box-mounted socket, ringless, having jaws compatible with requirements of a class: 200 and Form: 2S self contained watthour meter. Provide gray plastic closing cover and bypass links. Provide manufacturers standard enclosure color unless otherwise indicated.

2.14 FACTORY APPLIED FINISH

Provide factory-applied finish on electrical equipment in accordance with the following:

- a. NEMA 250 corrosion-resistance test and the additional requirements as specified herein.
- b. Interior and exterior steel surfaces of equipment enclosures: thoroughly cleaned followed by a rust-inhibitive phosphatizing or equivalent treatment prior to painting.
- c. Exterior surfaces: free from holes, seams, dents, weld marks, loose scale or other imperfections.

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- d. Interior surfaces: receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer's standard practice.
- e. Exterior surfaces: primed, filled where necessary, and given not less than two coats baked enamel with semigloss finish.
- f. Equipment located indoors: ANSI Light Gray, and equipment located outdoors: ANSI Light Gray.
- g. Provide manufacturer's coatings for touch-up work and as specified in paragraph FIELD APPLIED PAINTING.

PART 3 EXECUTION

3.1 FIRESTOPPING

3.1.1 PREPARATION

Areas to receive firestopping must be free of dirt, grease, oil, or loose materials which may affect the fitting or fire resistance of the firestopping system.

3.1.2 INSTALLATION

Completely fill void spaces with firestopping material regardless of geometric configuration, subject to tolerance established by the manufacturer. Install firestopping in accordance with manufacturer's written instructions. Provide tested and listed firestop systems in the following locations, except in floor slabs on grade:

- a. Penetrations of duct, conduit, tubing, cable and pipe through floors and through fire-resistance rated walls, partitions, and ceiling-floor assemblies.
- b. Other locations where required to maintain fire resistance rating of the construction.

3.1.3 INSPECTION

For all projects, the firestopped areas shall not be covered or enclosed until inspection is complete and approved by the Contracting Officer. Inspect the applications initially to ensure adequate preparations (clean surfaces suitable for application, etc.) and periodically during the work to assure that the completed work has been accomplished according to the manufacturer's written instructions and the specified requirements.

3.2 INSTALLATION

Electrical installations, including weatherproof and hazardous locations and ducts, plenums and other air-handling spaces: conform to requirements of NFPA 70 and to requirements specified herein.

3.2.1 Underground Service

Underground service conductors and associated conduit: continuous from service entrance equipment to outdoor power system connection.

3.2.2 Service Entrance Identification

Service entrance disconnect devices, switches, and enclosures: labeled and identified as such.

3.2.2.1 Labels

Wherever work results in service entrance disconnect devices in more than one enclosure, as permitted by NFPA 70, label each enclosure, new and existing, as one of several enclosures containing service entrance disconnect devices. Label, at minimum: indicate number of service disconnect devices housed by enclosure and indicate total number of enclosures that contain service disconnect devices. Provide laminated plastic labels conforming to paragraph FIELD FABRICATED NAMEPLATES. Use lettering of at least 0.25 inch in height, and engrave on black-on-white matte finish. Service entrance disconnect devices in more than one enclosure: provided only as permitted by NFPA 70.

3.2.3 Wiring Methods

Provide insulated conductors installed in rigid steel conduit, rigid nonmetallic conduit, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Grounding conductor: separate from electrical system neutral conductor. Provide insulated green equipment grounding conductor for circuit(s) installed in conduit and raceways. Shared neutral, or multi-wire branch circuits, are not permitted with arc-fault circuit interrupters. Minimum conduit size: 1/2 inch in diameter for low voltage lighting and power circuits. Vertical distribution in multiple story buildings: made with metal conduit in fire-rated shafts, with metal conduit extending through shafts for minimum distance of 6 inches. Firestop conduit which penetrates fire-rated walls, fire-rated partitions, or fire-rated floors in accordance with paragraph FIRESTOPPING, above.

3.2.3.1 Pull Wire

Install pull wires in empty conduits. Pull wire: plastic having minimum 200-pound force tensile strength. Leave minimum 36 inches of slack at each end of pull wire.

3.2.4 Conduit Installation

Unless indicated otherwise, conceal conduit under floor slabs and within finished walls, ceilings, and floors. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

3.2.4.1 Restrictions Applicable to Nonmetallic Conduit

a. PVC Schedule 40.

- (1) Do not use where subject to physical damage, including but not limited to, mechanical equipment rooms, electrical equipment rooms, fire pump rooms, and where restrictions are applying to both PVC Schedule 40 and PVC Schedule 80.

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- (2) Do not use above grade, except where allowed in this section for rising through floor slab or indicated otherwise.

b. PVC Schedule 40 and Schedule 80.

- (1) Do not use where subject to physical damage, including but not limited to, hospitals, power plant, missile magazines, and other such areas.
- (2) Do not use in hazardous (classified) areas.
- (3) Do not use in penetrating fire-rated walls or partitions, or fire-rated floors.

-

3.2.4.2 Restrictions Applicable to Flexible Conduit

Use only as specified in paragraph FLEXIBLE CONNECTIONS. Do not use when the enclosed conductors must be shielded from the effects of High-altitude Electromagnetic Pulse (HEMP).

3.2.4.3 Underground Conduit

PVC, Type EPC-40. Convert nonmetallic conduit, PVC Schedule 40 or 80, to rigid, or IMC, steel conduit before rising above grade.

3.2.4.4 Conduit Support

Support conduit by pipe straps, wall brackets, threaded rod conduit hangers, or ceiling trapeze. Plastic cable ties are not acceptable. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Do not exceed one-fourth proof test load for load applied to fasteners. Provide vibration resistant and shock-resistant fasteners attached to concrete ceiling. Do not cut main reinforcing bars for any holes cut to depth of more than 1 1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems: supported independently of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Do not share supporting means between electrical raceways and mechanical piping or ducts. Coordinate installation with above-ceiling mechanical systems to assure maximum accessibility to all systems. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations. For conduits greater than 2 1/2 inches inside diameter, provide supports to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction.

3.2.4.5 Directional Changes in Conduit Runs

Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free

clogged conduits of obstructions.

3.2.4.6 Locknuts and Bushings

Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Provide locknuts with sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70.

3.2.5 Nonmetallic Sheathed Cable Installation

Where possible, install cables concealed behind ceiling or wall finish. Thread cables through holes bored on approximate centerline of wood members; notching of end surfaces is not permitted. Provide sleeves through concrete or masonry for threading cables. Install exposed cables parallel to or at right angles to walls or structural members. Protect exposed nonmetallic sheathed cables less than 4 feet above floors from mechanical injury by installation in conduit or tubing. When cable is used in metal stud construction, insert plastic stud grommets in studs at each point through which cable passes, prior to installation of cable.

3.2.6 Conductor Identification

Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, provide color coding by factory-applied, color-impregnated insulation. For conductors No. 4 AWG and larger diameter, provide color coding by plastic-coated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves.

3.2.6.1 Marking Strips

Provide marking strips for identification of power distribution, control, data, and communications cables in accordance with the following:

- a. Provide white or other light-colored plastic marking strips, fastened by screws to each terminal block, for wire designations.
- b. Use permanent ink for the wire numbers
- c. Provide reversible marking strips to permit marking both sides, or provide two marking strips with each block.
- d. Size marking strips to accommodate the two sets of wire numbers.
- e. Assign a device designation in accordance with NEMA ICS 1 to each device to which a connection is made. Mark each device terminal to which a connection is made with a distinct terminal marking corresponding to the wire designation used on the Contractor's schematic and connection diagrams.
- f. The wire (terminal point) designations used on the Contractor's wiring diagrams and printed on terminal block marking strips may be according to the Contractor's standard practice; however, provide additional wire and cable designations for identification of remote (external) circuits for the Government's wire designations.

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- g. Prints of the marking strips drawings submitted for approval will be so marked and returned to the Contractor for addition of the designations to the terminal strips and tracings, along with any rearrangement of points required.

3.2.7 Splices

Do not splice unless specifically called out on the plans or where otherwise approved via RFI. Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.

3.2.8 Electrical Penetrations

Seal openings around electrical penetrations through fire resistance-rated walls, partitions, floors, or ceilings in accordance with paragraphs "FIRESTOPPING" in this section.

3.2.9 Grounding and Bonding

Provide in accordance with NFPA 70. Ground exposed, non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, grounding conductor of nonmetallic sheathed cables, and neutral conductor of wiring systems. Make ground connection to driven ground rods on exterior of building. Bond additional driven rods together with a minimum of 4 AWG soft bare copper wire buried to a depth of at least 12 inches. Interconnect all grounding media in or on the structure to provide a common ground potential.

3.2.9.1 Ground Rods

Provide ground rods and measure the resistance to ground using the fall-of-potential method described in IEEE 81. Do not exceed 25 ohms under normally dry conditions for the maximum resistance of a driven ground. If this resistance cannot be obtained with a single rod, additional rods, spaced on center. Spacing for additional rods must be a minimum of 10 feet. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, notify the Contracting Officer who will decide on the number of ground rods to add.

3.2.9.2 Grounding Connections

Make grounding connections which are buried or otherwise normally inaccessible, by exothermic weld.

- a. Make exothermic welds strictly in accordance with the weld manufacturer's written recommendations. Welds which are "puffed up" or which show convex surfaces indicating improper cleaning are not acceptable. Mechanical connectors are not required at exothermic welds.

3.2.9.3 Resistance

Maximum resistance-to-ground of grounding system: do not exceed 5 ohms under dry conditions. Where resistance obtained exceeds 5 ohms, contact Contracting Officer for further instructions.

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3.2.10 Equipment Connections

Provide power wiring for the connection of motors and control equipment under this section of the specification. Except as otherwise specifically noted or specified, automatic control wiring, control devices, and protective devices within the control circuitry are not included in this section of the specifications and are provided under the section specifying the associated equipment.

3.2.11 Government-Furnished Equipment

Contractor rough-in, install and make connections to Government-furnished equipment to make equipment operate as intended, including providing miscellaneous items such as plugs, receptacles, wire, cable, conduit, flexible conduit, and outlet boxes or fittings.

3.2.12 Repair of Existing Work

Perform repair of existing work, demolition, and modification of existing electrical distribution systems as follows:

3.2.12.1 Workmanship

Lay out work in advance. Exercise care where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.

3.2.12.2 Removal of Existing Electrical Distribution System

Removal of existing electrical distribution system equipment includes equipment's associated wiring, including conductors, cables, exposed conduit, surface metal raceways, boxes, and fittings, back to equipment's power source as indicated.

3.2.13 Surge Protective Devices

Connect the surge protective devices in parallel to the power source, keeping the conductors as short and straight as practically possible. Maximum allowed lead length is 3 feet avoiding 90 degree bends. Do not locate surge protective devices inside a panelboard or switchboard enclosure.

3.3 FIELD FABRICATED NAMEPLATE MOUNTING

Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two sheet-metal screws or two rivets.

3.4 WARNING SIGN MOUNTING

Provide the number of signs required to be readable from each accessible side. Space the signs in accordance with NFPA 70E.

3.5 FIELD APPLIED PAINTING

Paint electrical equipment as required to match finish of adjacent

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surfaces or to meet the indicated or specified safety criteria. Where field painting of enclosures for panelboards, load centers or the like is specified to match adjacent surfaces, to correct damage to the manufacturer's factory applied coatings, or to meet the indicated or specified safety criteria, provide manufacturer's recommended coatings and apply in accordance to manufacturer's instructions.

3.6 FIELD QUALITY CONTROL

Furnish test equipment and personnel and submit written copies of test results. Give Contracting Officer 5 working days notice prior to each test(s). Where applicable, test electrical equipment in accordance with NETA ATS.

3.6.1 Devices Subject to Manual Operation

Operate each device subject to manual operation at least five times, demonstrating satisfactory operation each time.

3.6.2 600-Volt Wiring Test

Test wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of 1,000 volts DC for 600 volt rated wiring and 500 volts DC for 300 volt rated wiring per NETA ATS to provide direct reading of resistance. All existing wiring to be reused must also be tested.

3.6.3 Grounding System Test

Test grounding system to ensure continuity, and that resistance to ground is not excessive. Test each ground rod for resistance to ground before making connections to rod; tie grounding system together and test for resistance to ground. Make resistance measurements in dry weather, not earlier than 48 hours after rainfall. Submit written results of each test to Contracting Officer, and indicate location of rods as well as resistance and soil conditions at time measurements were made.

3.6.4 Phase Rotation Test

Perform phase rotation test to ensure proper rotation of service power prior to operation of new or reinstalled equipment using a phase rotation meter. Follow the meter manual directions performing the test.

-- End of Section --

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SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D698	(2012; E 2014; E 2015) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))
ASTM D1140	(2017) Standard Test Methods for Determining the Amount of Material Finer than 75- μ m (No. 200) Sieve in Soils by Washing
ASTM D1556/D1556M	(2015; E 2016) Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (2700 kN-m/m ³)
ASTM D2216	(2019) Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2487	(2017; E 2020) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846.3-3

(1999, Third Edition, Update III-A) Test
Methods for Evaluating Solid Waste:
Physical/Chemical Methods

1.2 DEFINITIONS

1.2.1 Degree of Compaction

Degree of compaction is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D1557, for general soil types, abbreviated as percent laboratory maximum density.

1.2.2 Hard Materials

Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Borrow Site Testing; G, RO

Fill and Backfill

Select Material

Density Tests

Moisture Content Tests

Copies of all laboratory and field test reports within 24 hours of the completion of the test.

1.4 DELIVERY, STORAGE, AND HANDLING

Perform in a manner to prevent contamination or segregation of materials.

1.5 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Hard materials and rock will not be encountered.

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- d. Suitable backfill and bedding material in the quantities required is not available at the project site.
- e. Blasting will not be permitted. Remove material in an approved manner.

1.6 REQUIREMENTS FOR OFF SITE SOIL

Soils brought in from off site for use as backfill shall be tested for petroleum hydrocarbons, BTEX, PCBs and HW characteristics (including toxicity, ignitability, corrosivity, and reactivity). Backfill shall not contain concentrations of these analytes above the appropriate State and/or EPA criteria, and shall pass the tests for HW characteristics. Determine petroleum hydrocarbon concentrations by using appropriate State protocols. Determine BTEX concentrations by using EPA SW-846.3-3 Method 5035/8260B. Perform complete TCLP in accordance with EPA SW-846.3-3 Method 1311. Perform HW characteristic tests for ignitability, corrosivity, and reactivity in accordance with accepted standard methods. Perform PCB testing in accordance with accepted standard methods for sampling and analysis of bulk solid samples. Provide borrow site testing for petroleum hydrocarbons and BTEX from a grab sample of material from the area most likely to be contaminated at the borrow site (as indicated by visual or olfactory evidence), with at least one test from each borrow site. For each borrow site, provide borrow site testing for HW characteristics from a composite sample of material, collected in accordance with standard soil sampling techniques. Do not bring material onsite until tests results have been received and approved by the Contracting Officer.

1.7 QUALITY CONTROL

1.7.1 Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

2.1.1 Satisfactory Materials

Any materials classified by ASTM D2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP, free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location. Reuse of suitable excavated soils as backfill.

2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory

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materials. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 2 inches. The Contracting Officer shall be notified of any contaminated materials.

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in [ASTM D2487](#) as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM, GP-GM, GW-GM, SW-SM, SP-SM, and SM shall be identified as cohesionless only when the fines are nonplastic. Materials classified as GM and SM will be identified as cohesive only when the fines have a plasticity index greater than zero.

2.1.4 Common Fill

Approved, unclassified soil material with the characteristics required to compact to the soil density specified for the intended location.

2.1.5 Backfill and Fill Material

[ASTM D2487](#), classification GW, GP, GM, SW, SP, SM, with a maximum [ASTM D4318](#) liquid limit of 35, maximum [ASTM D4318](#) plasticity index of 12, and a maximum of 25 percent by weight passing [ASTM D1140](#), No. 200 sieve. Reuse of suitable excavated soils as backfill.

2.1.6 Select Material

Provide materials classified as GW, GP, SW, or SP by [ASTM D2487](#) where indicated. The liquid limit of such material shall not exceed 35 percent when tested in accordance with [ASTM D4318](#). The plasticity index shall not be greater than 12 percent when tested in accordance with [ASTM D4318](#), and not more than 35 percent by weight shall be finer than No. 200 sieve when tested in accordance with [ASTM D1140](#). Reuse of suitable excavated soils as backfill.

2.2 GRAVEL SURFACE COURSE

Stone for Gravel Surface Course material shall be in accordance with the State Specifications for Fine Aggregate, Section M.05 and be sized to meet the gradation requirements as specified under M.05.01.

2.3 GRAVEL BASE COURSE

Stone for Gravel Base Course material shall be in accordance with the State Specifications for Coarse Aggregate, Section M.05 and be sized to meet the gradation requirements as specified under M.05.01.

2.4 GEOTEXTILE FABRIC

Geotextile Fabric used for unpaved gravel drives shall be non-woven Polypropylene that is stable within a pH range of 2 to 13, and satisfies the requirements as outlined in AASHTO M-288-06 for Class 2 stabilization and separation applications. Prior to ordering geotextile fabric, the Contractor shall confirm that its use is appropriate for the intended application.

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2.5 SAND

Clean, coarse-grained sand classified as ASTM C-33 sand.

2.6 STRUCTURAL FILL

Structural fill shall meet the requirements of State Standard M.05.01.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Drainage and Dewatering

Provide for the collection and disposal of surface and subsurface water encountered during construction.

3.1.1.1 Drainage

So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, dikes, swales, and other drainage features and equipment as required to maintain dry soils, prevent erosion and undermining of foundations. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.

3.1.1.2 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material.

3.1.2 Underground Utilities

Location of the existing utilities as shown on the drawings is approximate. The Contractor shall physically verify the location and elevation of the existing utilities prior to starting construction.

3.1.3 Machinery and Equipment

Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. Repair, or remove and

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provide new pipe for existing or newly installed pipe that has been displaced or damaged.

3.2 SURFACE PREPARATION

3.2.1 Stripping Topsoil

Strip suitable soil from the site where excavation or grading is as shown and stockpile separately from other excavated material. Material unsuitable for use as topsoil shall be stockpiled and used for backfilling. Locate topsoil so that the material can be used readily for the finished grading. Where sufficient existing topsoil conforming to the material requirements is not available on site, provide borrow materials suitable for use as topsoil. Protect topsoil and keep in segregated piles until needed.

3.2.2 Unsuitable Material

Remove vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath paved areas or concrete slabs.

3.3 EXCAVATION AND TRENCHING

3.3.1 General

a. Mechanical equipment shall not be used in locations where its operation would cause damage to existing buildings and utilities, or structures above or below ground.

b. Prior to the start of work, the Contractor shall field verify all dimensions and locations for the layout of the new conduit ductbanks.

c. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown shall be removed as directed. Refill with satisfactory material and compact to 95 percent of ASTM D1557 maximum density. Unless specified otherwise, refill excavations cut below indicated depth with satisfactory material and compact to 95 percent of ASTM D1557 maximum density. Satisfactory material removed below the depths indicated, without specific direction of the Contracting Officer, shall be replaced with satisfactory materials to the indicated excavation grade. Determination of elevations and measurements of approved overdepth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Contracting Officer.

3.3.2 Trench Width

Width of trenches for direct bury conduit ductbanks shall be excavated to the minimum specified width, as shown on sheet E-501, that will provide adequate working space/clearance for safe and proper conduit installation. The trench width shall be sufficient to allow for the installation of the specified conduit arrangement, proper cover, and, if deemed necessary by the site conditions, depth or soil type, any applicable shoring.

3.3.3 Trench Depth

Depth of trenches for direct bury conduit ductbanks shall be excavated to

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the specified depth, as shown on sheet E-501, that will provide adequate working space/clearance for safe and proper conduit installation. The trench depth is dependent upon the slope of the area, conduit slope, obstacles, and other possible utilities. The trench depth shall be sufficient to allow for the installation of the specified conduit arrangement, proper cover, and if deemed necessary by the site conditions, an applicable cushioning bed.

3.3.4 Trench Bottom

Mechanical excavation shall be stopped above the final grade elevation and the remaining material carefully hand excavated so that the conduit ductbank is constructed on a firm, undisturbed, native earth bed. Trench bottoms with unsuitable materials such as peat, vegetation, cinders, rubble or any other conditions that will not provide solid support of the conduit ductbank shall not be permitted. Unsuitable material shall be removed and replaced and compacted with satisfactory material. Uniformity along the length of the trench bottom shall be maintained to avoid differential settlement of, and possible damage to, the conduit ductbank.

3.3.5 Excavated Materials

Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work required or shall be separately stockpiled if it cannot be readily placed. Satisfactory material in excess of that required for the permanent work and all unsatisfactory material shall be disposed of as specified in Paragraph DISPOSITION OF SURPLUS MATERIAL.

3.4 SUBGRADE PREPARATION

Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as directed by the Contracting Officer. The surface shall be scarified to a depth of 6 inches before the fill is started. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When subgrades are less than the specified density, the ground surface shall be broken up to a minimum depth of 6 inches, pulverized, and compacted to the specified density. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Minimum subgrade density shall be as specified herein.

3.5 FILLING AND BACKFILLING

Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.

3.5.1 Backfill and Fill Material Placement

Provide for paved areas and under concrete slabs, except where select material is provided. Place in 6 inch lifts. Do not place over wet or

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frozen areas. Place backfill material adjacent to structures as the structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against the structure.

3.5.2 Select Material Placement

Place in 6 inch lifts. Do not place over wet or frozen areas. Backfill adjacent to structures shall be placed as structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against structure.

3.5.3 Trench Backfilling

Backfill as rapidly as construction, testing, and acceptance of work permits. Under paved areas place and compact backfill over conduit ductbanks in 6 inch compacted lifts to bottom of subbase and in pervious areas in 6 inch compacted lifts to one foot over conduit ductbanks. All backfill material within 12 inches of the concrete encasements or conduits shall be free from stones larger than 2 inches, organic material, debris, rubble, and/or any sharp edges which may cause damage to the concrete envelop or conduit. The balance of backfill shall be free of solid material greater than 4 inches, maximum dimension. Backfill material shall be adequately compacted in 6-inch lifts. Peat, cinders, rubble, frozen and organic material are not suitable backfill material. Flowable fill may not be used without prior approval by the Contracting Officer. When conduits are to be direct buried, sand shall be placed under, around and over the conduits as shown on E-501 and shall be placed so as not to damage or alter the alignment of conduits. The balance of backfill shall be free of solid material greater than 4 inches, maximum dimension. Backfill material shall be adequately compacted in twelve inch (12") lifts..

3.5.4 Structural Fill

Compacted structural fill shall be structural fill placed in lifts no greater than 12" and compacted to 95% of the maximum dry density.

3.6 BORROW

Where satisfactory materials are not available in sufficient quantity from required excavations, approved borrow materials shall be obtained as specified herein.

3.7 COMPACTION

Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required.

3.7.1 General Site

Compact underneath areas designated for vegetation and areas outside the 5 foot line of the paved area or structure to 85 percent of [ASTM D1557](#).

3.7.2 Concrete Slabs

Compact top 12 inches of subgrades to 95 percent of [ASTM D1557](#). Compact select material to 95 percent of [ASTM D1557](#).

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3.7.3 Adjacent Area

Compact areas within 5 feet of structures to 90 percent of ASTM D1557.

3.7.4 Paved Areas

Compact top 12 inches of subgrades to 95 percent of ASTM D1557. Compact fill and backfill materials to 95 percent of ASTM D1557.

3.8 FINISH OPERATIONS

3.8.1 Grading

Grade areas to drain water away from structures. Maintain areas free of trash and debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

3.8.2 Protection of Surfaces

Protect newly backfilled, graded, and topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes. The Contractor shall install silt fences around the filled site to help minimize erosion impacts. The contractor shall plant the filled site following the demolition and the contractor shall use the standar erosion control seed mix or recieve aproval to use a seed mix of their choosing.

3.9 DISPOSITION OF SURPLUS MATERIAL

Remove from Government property surplus or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber.

3.10 FIELD QUALITY CONTROL

3.10.1 Sampling

Take the number and size of samples required to perform the following tests.

3.10.2 Testing

Perform one of each of the following tests for each material used. Provide additional tests for each source change.

3.10.2.1 Fill and Backfill Material Testing

Test fill and backfill material in accordance with ASTM C136/C136M for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D4318 for liquid limit and for plastic limit; ASTM D698 or ASTM D1557 for moisture density relations, as applicable.

3.10.2.2 Select Material Testing

Test select material in accordance with ASTM C136/C136M for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D698 or ASTM D1557 for moisture density relations, as applicable.

3.10.2.3 Density Tests

Test density in accordance with ASTM D1556/D1556M, or ASTM D6938. When ASTM D6938 density tests are used, verify density test results by performing an ASTM D1556/D1556M density test at a location already ASTM D6938 tested as specified herein. Perform an ASTM D1556/D1556M density test at the start of the job, and for every 10 ASTM D6938 density tests thereafter. Test each lift at randomly selected locations every 2000 square feet of existing grade in fills for structures and concrete slabs, and every 2500 square feet for other fill areas and every 2000 square feet of subgrade in cut. Include density test results in daily report.

Bedding and backfill in trenches: One test per 50 linear feet in each lift.

3.10.2.4 Moisture Content Tests

In the stockpile, excavation or borrow areas, a minimum of two tests per day per type of material or source of materials being placed is required during stable weather conditions. During unstable weather, tests shall be made as dictated by local conditions and approved moisture content shall be tested in accordance with ASTM D2216. Include moisture content test results in daily report.

-- End of Section --

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SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C655	(2009) Field Dechlorination
AWWA C800	(2014) Underground Service Line Valves and Fittings
AWWA C906	(2015) Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) through 65 In., (1,575 mm) for Water Distribution and Transmission
AWWA M55	(2020; 2nd Ed) PE Pipe - Design and Installation
AWWA C111/A21.11	(2017) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA B300	(2018) Hypochlorites
AWWA B301	(2018) Liquid Chlorine
AWWA C651	(2014) Standard for Disinfecting Water Mains

ASTM INTERNATIONAL (ASTM)

ASTM B61	(2015) Standard Specification for Steam or Valve Bronze Castings
ASTM B62	(2017) Standard Specification for Composition Bronze or Ounce Metal Castings
ASTM D2774	(2012) Underground Installation of Thermoplastic Pressure Piping
ASTM D3035	(2015) Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
ASTM F402	(2005; R 2012) Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings
ASTM F714	(2021a) Standard Specification for

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Polyethylene (PE) Plastic Pipe (DR-PR)
Based on Outside Diameter

ASTM F2164 (2018) Standard Practice for Field Leak
Testing of Polyethylene (PE) and
Crosslinked Polyethylene (PEX) Pressure
Piping Systems Using Hydrostatic Pressure

NSF INTERNATIONAL (NSF)

NSF 372 (2016) Drinking Water System Components -
Lead Content

NSF/ANSI 14 (2020) Plastics Piping System Components
and Related Materials

NSF/ANSI 61 (2020) Drinking Water System Components -
Health Effects

1.2 DEFINITIONS

1.2.1 Water Service Lines

Water service lines include water piping from the existing stub at the utility building to the proposed location of the frost free spigot at the point indicated on the contract drawings, specific materials, methods of joining and any appurtenances deemed necessary for a satisfactory system.

1.2.2 Additional Definitions

For additional definitions refer to the definitions in the applicable referenced standard.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with the SOW, Part C. "General and Administrative Submittals Required":

SD-01 Preconstruction Submittals

Connections; G, RO

SD-03 Product Data

Pipe, Fittings, Joints and Couplings; G, RO

Disinfection Procedures; G, RO

SD-06 Test Reports

Bacteriological Samples; G

Leakage Test

SD-07 Certificates

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Pipe, Fittings, Joints and Couplings

SD-08 Manufacturer's Instructions

Polyethylene (PE) Pipe

1.4 QUALITY CONTROL

1.4.1 Regulatory Requirements

Comply with NSF/ANSI 14 or NSF/ANSI 61 and NSF 372 for materials for potable water systems; comply with lead content requirements for "lead-free" plumbing as defined by the U.S. Safe Drinking Water Act effective January 2014. Provide materials bearing the seal of the National Sanitation Foundation (NSF) for potable water service.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling and in accordance with manufacturer's instructions. Store materials on site in enclosures or under protective covering. Store plastic piping, jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves, and other accessories free of dirt and debris.

1.5.2 Handling

Handle pipe, fittings, valves, and other accessories in accordance with manufacturer's instructions and in a manner to ensure delivery to the trench in sound undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make repairs if coatings or linings are damaged. Do not place other material, hooks, or pipe inside a pipe or fitting after the coating has been applied. Inspect the pipe for defects before installation. Carry, do not drag pipe to the trench. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. Clean the interior of pipe and accessories of foreign matter before being lowered into the trench and keep them clean during laying operations by plugging. Replace defective material without additional expense to the Government. Store rubber gaskets, not immediately installed, under cover or out of direct sunlight.

Handle PE pipe, fittings, and accessories in accordance with AWWA M55.

PART 2 PRODUCTS

2.1 MATERIALS

Provide all materials in accordance with AWWA C800 and as indicated herein. Provide valves and fittings with pressure ratings equivalent to the pressure ratings of the pipe.

2.1.1 Pipe, Fittings, Joints And Couplings

Submit manufacturer's standard drawings or catalog cuts, except submit both drawings and cuts for push-on and rubber-gasketed bell-and-spigot

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joints. Include information concerning gaskets with submittal for joints and couplings.

2.1.1.1 Plastic Piping

2.1.1.1.1 Polyethylene (PE) Pipe

AWWA C906, ASTM D3035, PE4710, material designation code CC2 with a minimum Pressure Class 200 (DR11) with ductile iron outside diameter (DIOD).

2.1.1.1.1.1 Fittings For PE Pipe

AWWA C906, AWWA M55, ASTM D3035, molded and manufactured to comply with ASTM F714.

2.1.1.1.1.2 Joints and Jointing Materials

Mechanical Joint: AWWA C111/A21.11 DIOD Mechanical joint adapter and gaskets for mechanical joints for joint connections between pipe and metal fittings, valves, and other accessories.

2.1.2 Disinfection

Chlorinating materials are to conform to: Chlorine, Liquid: AWWA B301; Hypochlorite, Calcium and Sodium: AWWA B300.

2.2 ACCESSORIES

2.2.1 Tracer Wire for Nonmetallic Piping

Provide a continuous bare copper or aluminum wire not less than 0.10 inch in diameter in sufficient length over each separate run of nonmetallic pipe.

2.2.2 Water Service Line Appurtenances

2.2.2.1 Curb or Service Stops

Ground key, round way, inverted key type; made of lead-free bronze, ASTM B61 or ASTM B62; and compatible with the working pressure of the system. Provide compatible ends for connection to the service piping. Cast an arrow into body of the curb or service stop indicating direction of flow.

2.2.2.2 Service Clamps

Provide single or double flattened strap type service clamps used for repairing damaged cast-iron, steel or PVC pipe with a pressure rating not less than that of the pipe being repaired. Provide clamps with a galvanized malleable-iron body with cadmium plated straps and nuts and a rubber gasket cemented to the body.

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PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Connections to Existing System

Perform all connections to the existing water system in the presence of the Contracting Officer.

3.1.2 Operation of Existing Valves

Do not operate valves within or directly connected to the existing water system unless expressly directed to do so by the Contracting Officer.

3.1.3 Earthwork

Perform earthwork operations in accordance with Section 31 23 00 EXCAVATION AND FILL.

3.2 INSTALLATION

Install all materials in accordance with the applicable reference standard, manufacturers instructions and as indicated herein.

3.2.1 Piping

3.2.1.1 General Requirements

Install pipe, fittings, joints and couplings in accordance with the applicable referenced standard, the manufacturer's instructions and as specified herein.

3.2.1.1.1 Tracer Wire

Install a continuous length of tracer wire for the full length of each run of nonmetallic pipe. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.

3.2.1.1.2 Penetrations

Provide ductile-iron or Schedule 40 steel wall sleeves for pipe passing through walls of valve pits and structures. Fill annular space between walls and sleeves with rich cement mortar. Fill annular space between pipe and sleeves with mastic.

3.2.1.2 Polyethylene (PE) Piping

Install PE pipes in accordance with AWWA M55 and ASTM D2774.

3.2.1.3 Plastic Service Piping

Install pipe and fittings in accordance with the paragraph GENERAL REQUIREMENTS and with the applicable requirements of ASTM D2774 , unless otherwise specified. Handle solvent cements used to join plastic piping in accordance with ASTM F402.

3.2.1.3.1 Jointing

Make plastic pipe joints to other pipe materials in accordance with the

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recommendations of the plastic pipe manufacturer.

3.2.2 Disinfection

Prior to disinfection, provide disinfection procedures, proposed neutralization and disposal methods of waste water from disinfection as part of the disinfection submittal. Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C651. Disinfect new water piping using the AWWA C651. Ensure a free chlorine residual of not less than 10 parts per million after 24 hour holding period and prior to performing bacteriological tests.

3.2.3 Flushing

Perform bacteriological tests prior to flushing. Flush solution from the systems with domestic water until maximum residual chlorine content is within the range of 0.2 to 0.5 parts per million, the residual chlorine content of the distribution system, or acceptable for domestic use. Use AWWA C655 neutralizing chemicals.

3.2.4 Blowoff Valve Assemblies

Install blowoff valve assemblies as indicated on the drawings or in accordance with the manufactures recommendations. Install discharge fitting on the end of riser pipe to direct the flow of water so as to minimize damage to surrounding areas.

3.3 FIELD QUALITY CONTROL

3.3.1 Tests

Notify the Contracting Officer a minimum of five days in advance of hydrostatic testing. Coordinate the proposed method for disposal of waste water from hydrostatic testing. Perform field tests, and provide labor, equipment, and incidentals required for testing. Provide documentation that all items of work have been constructed in accordance with the Contract documents.

3.3.1.1 Leakage Test

For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

For PE perform leak testing in accordance with ASTM F2164.

3.3.1.2 Bacteriological Testing

Perform bacteriological tests in accordance with AWWA C651 Option B. Analyze samples by a certified laboratory, and submit the results of the bacteriological samples.

3.3.1.3 Tracer Wire Continuity Test

Test tracer wire for continuity after service connections have been completed and prior to final pavement or restoration. Verify that tracer wire is locatable with electronic utility locating equipment. Repair breaks or separations and re-test for continuity.

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3.4 SYSTEM STARTUP

Water mains and appurtenances must be completely installed, disinfected, flushed, and satisfactory bacteriological sample results received prior to permanent connections being made to the active distribution system. Obtain approval by the Contracting Officer prior to the new water piping being placed into service.

3.5 CLEANUP

Upon completion of the installation of water lines and appurtenances, remove all debris and surplus materials resulting from the work.

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3.9.1.2 Grounding System

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SECTION 33 71 02

UNDERGROUND ELECTRICAL DISTRIBUTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

- | | |
|----------------------|---|
| IEEE 81 | (2012) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System |
| IEEE C2 | (2017; Errata 1-2 2017; INT 1 2017) National Electrical Safety Code |
| IEEE Stds Dictionary | (2009) IEEE Standards Dictionary: Glossary of Terms & Definitions |

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

- | | |
|----------|--|
| NETA ATS | (2021) Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems |
|----------|--|

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

- | | |
|-----------|---|
| NEMA TC 2 | (2020) Standard for Electrical Polyvinyl Chloride (PVC) Conduit |
| NEMA TC 9 | (2020) Standard for Fittings for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installation |

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- | | |
|---------|---|
| NFPA 70 | (2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code |
|---------|---|

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

- | | |
|---------|---|
| TIA-758 | (2012b) Customer-Owned Outside Plant Telecommunications Infrastructure Standard |
|---------|---|

U.S. DEPARTMENT OF AGRICULTURE (USDA)

- | | |
|--------------------|---------------------------------------|
| RUS Bull 1751F-644 | (2002) Underground Plant Construction |
|--------------------|---------------------------------------|

UNDERWRITERS LABORATORIES (UL)

UL 486A-486B	(2018; Reprint May 2021) UL Standard for Safety Wire Connectors
UL 510	(2020) UL Standard for Safety Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
UL 514B	(2012; Reprint May 2020) Conduit, Tubing and Cable Fittings
UL 651	(2011; Reprint Mar 2020) UL Standard for Safety Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings

1.2 DEFINITIONS

- a. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, are as defined in IEEE Stds Dictionary.
- b. In the text of this section, the words conduit and duct are used interchangeably and have the same meaning.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with the SOW

SD-06 Test Reports

Field Acceptance Checks and Tests; G

1.4 QUALITY ASSURANCE

1.4.1 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products must have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period must include applications of equipment and materials under similar circumstances and of similar size. The product must have been for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items must be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1.4.1.1 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

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1.4.1.2 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site are not acceptable, unless specified otherwise.

PART 2 PRODUCTS

2.1 CONDUIT, DUCTS, AND FITTINGS

2.1.1 Plastic Conduit for Direct Burial and Riser Applications

UL 651 and NEMA TC 2, EPC-40 as indicated.

2.1.2 Fittings

2.1.2.1 PVC Conduit Fittings

UL 514B, UL 651.

2.1.2.2 PVC Duct Fittings

NEMA TC 9.

2.2 LOW VOLTAGE INSULATED CONDUCTORS AND CABLES

2.2.1 In Duct

Cables must be single-conductor cable.

2.2.2 Cable Marking

Insulated conductors must have the date of manufacture and other identification imprinted on the outer surface of each cable at regular intervals throughout the cable length.

Identify each cable by means of a fiber, laminated plastic, or non-ferrous metal tags in each manhole, handhole, junction box, and each terminal. Each tag must contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

Color code conductors. Provide conductor identification within each enclosure where a tap, splice, or termination is made. Conductor identification must be by color-coded insulated conductors, plastic-coated self-sticking printed markers, colored nylon cable ties and plates, heat shrink type sleeves, or colored electrical tape. Properly identify control circuit terminations. Color must be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals may be white with a different colored (not green) stripe for each. Color of ungrounded conductors in different voltage systems are as follows:

- a. 120/240 volt, single phase: Black and red

2.3 LOW VOLTAGE WIRE CONNECTORS AND TERMINALS

Provide a uniform compression over the entire conductor contact surface. Use solderless terminal lugs on stranded conductors.

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- a. For use with copper conductors: UL 486A-486B.

2.4 TAPE

2.4.1 Insulating Tape

UL 510, plastic insulating tape, capable of performing in a continuous temperature environment of 80 degrees C.

2.4.2 Buried Warning and Identification Tape

Provide detectable tape in accordance with Section 31 23 00 EXCAVATION AND FILL.

2.5 PULL ROPE

Plastic or flat pull line (bull line) having a minimum tensile strength of 200 pounds.

PART 3 EXECUTION

3.1 INSTALLATION

Install equipment and devices in accordance with the manufacturer's published instructions and with the requirements and recommendations of NFPA 70 as applicable. In addition to these requirements, install telecommunications in accordance with TIA-758 and RUS Bull 1751F-644.

3.2 CABLE INSPECTION

Inspect each cable reel for correct storage positions, signs of physical damage, and broken end seals prior to installation. If end seal is broken, remove moisture from cable prior to installation in accordance with the cable manufacturer's recommendations.

3.3 UNDERGROUND FEEDERS SUPPLYING BUILDINGS

Terminate underground feeders supplying building at a point 5 feet outside the building and projections thereof, except that conductors must be continuous to the terminating point indicated. Coordinate connections of the feeders to the service entrance equipment with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Provide PVC, Type EPC-40 conduit from the supply equipment to a point 5 feet outside the building and projections thereof. Protect ends of underground conduit with plastic plugs until connections are made.

3.4 UNDERGROUND CONDUIT AND DUCT SYSTEMS

3.4.1 Requirements

Run conduit in straight lines except where a change of direction is necessary. Provide numbers and sizes of ducts as indicated. The bell end of the conduits that enter manholes and handholes must be flush with the wall.

Perform changes in ductbank direction as follows:

- a. Short-radius manufactured 90-degree duct bends may be used only for

pole or equipment risers, unless specifically indicated as acceptable.

- b. The minimum manufactured bend radius must be 18 inches for ducts of less than 3 inch diameter, and 36 inches for ducts 3 inches or greater in diameter.
- c. As an exception to the bend radius required above, provide field manufactured longsweep bends having a minimum radius of 25 feet for a change of direction of more than 5 degrees, either horizontally or vertically, using a combination of curved and straight sections. Maximum manufactured curved sections allowed for use in field manufactured longsweep bend: 30 degrees.

3.4.2 Treatment

Keep ducts clean of concrete, dirt, or foreign substances during construction. Make field cuts requiring tapers with proper tools and match factory tapers. Use a coupling recommended by the duct manufacturer whenever an existing duct is connected to a duct of different material or shape. Store ducts to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Thoroughly clean ducts before being laid. Store plastic ducts on a flat surface and protected from the direct rays of the sun.

3.4.3 Conduit Cleaning

As each conduit run is completed, for conduit sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs. For conduit sizes less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs.

3.4.4 Conduit and Duct Without Concrete Encasement

Depths to top of the conduit must be not less than 24 inches below finished grade. Provide not less than 3 inches clearance from the conduit to each side of the trench. Grade bottom of trench smooth; where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches, fill and tamp level with original bottom with sand or earth free from particles, that would be retained on a 1/4 inch sieve. The first 6 inch layer of backfill cover must be sand compacted as previously specified. The rest of the excavation must be backfilled and compacted in 3 to 6 inch layers. Provide color, type and depth of warning tape as specified in Section 31 23 00 EXCAVATION AND FILL.

3.4.5 Duct Sealing

Seal all electrical penetrations for radon mitigation, maintaining integrity of the vapor barrier, and to prevent infiltration of air, insects, and vermin.

3.5 CABLE PULLING

Test existing duct lines with a mandrel and thoroughly swab out to remove foreign material before pulling cables. Pull cables down grade with the feed-in point at the manhole or buildings of the highest elevation. Use

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flexible cable feeds to convey cables through manhole opening and into duct runs. Do not exceed the specified cable bending radii when installing cable under any conditions, including turnups into switches, transformers, switchgear, switchboards, and other enclosures. Cable with tape or wire shield must have a bending radius not less than 12 times the overall diameter of the completed cable. If basket-grip type cable-pulling devices are used to pull cable in place, cut off the section of cable under the grip before splicing and terminating.

3.5.1 Cable Lubricants

Use lubricants that are specifically recommended by the cable manufacturer for assisting in pulling jacketed cables.

3.6 GROUNDING SYSTEMS

NFPA 70 and IEEE C2, except provide grounding systems with a resistance to solid earth ground not exceeding 25 ohms.

3.6.1 Grounding Electrodes

Provide cone pointed driven ground rods driven full depth plus[6 inches][12 inches], installed to provide an earth ground of the appropriate value for the particular equipment being grounded.

If the specified ground resistance is not met, provide an additional ground rod in accordance with the requirements of NFPA 70 (placed not less than 6 feet from the first rod). Should the resultant (combined) resistance exceed the specified resistance, measured not less than 48 hours after rainfall, notify the Contracting Officer immediately.

3.6.2 Grounding Connections

Make grounding connections which are buried or otherwise normally inaccessible, by exothermic weld or compression connector.

- a. Make exothermic welds strictly in accordance with the weld manufacturer's written recommendations. Welds which are "puffed up" or which show convex surfaces indicating improper cleaning are not acceptable. Mechanical connectors are not required at exothermic welds.
- b. Make compression connections using a hydraulic compression tool to provide the correct circumferential pressure. Tools and dies must be as recommended by the manufacturer. An embossing die code or other standard method must provide visible indication that a connector has been adequately compressed on the ground wire.

3.6.3 Grounding Conductors

Provide bare grounding conductors, except where installed in conduit with associated phase conductors. Ground cable sheaths, cable shields, conduit, and equipment with No. 6 AWG. Ground other noncurrent-carrying metal parts and equipment frames of metal-enclosed equipment. Ground metallic frames and covers of handholes and pull boxes with a braided, copper ground strap with equivalent ampacity of No. 6 AWG.

3.7 EXCAVATING, BACKFILLING, AND COMPACTING

Provide in accordance with NFPA 70 and Section 31 23 00 EXCAVATION AND FILL.

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3.7.1 Reconditioning of Surfaces

3.7.1.1 Unpaved Surfaces

Restore to their original elevation and condition unpaved surfaces disturbed during installation of duct. Preserve sod and topsoil removed during excavation and reinstall after backfilling is completed. Replace sod that is damaged by sod of quality equal to that removed. When the surface is disturbed in a newly seeded area, re-seed the restored surface with the same quantity and formula of seed as that used in the original seeding, and provide topsoiling, fertilizing, liming, seeding, sodding, sprigging, or mulching.

3.8 CAST-IN-PLACE CONCRETE

3.8.1 Sealing

When the installation is complete, seal all conduit and other entries into the equipment enclosure with an approved sealing compound. Seals must be of sufficient strength and durability to protect all energized live parts of the equipment from rodents, insects, or other foreign matter.

3.9 FIELD QUALITY CONTROL

3.9.1 Performance of Field Acceptance Checks and Tests

Perform in accordance with the manufacturer's recommendations, and include the following visual and mechanical inspections and electrical tests, performed in accordance with NETA ATS.

3.9.1.1 Low Voltage Cables, 600-Volt

Perform tests after installation of cable, splices and terminations and before terminating to equipment or splicing to existing circuits.

a. Visual and Mechanical Inspection

- (1) Inspect exposed cable sections for physical damage.
- (2) Verify that cable is supplied and connected in accordance with contract plans and specifications.
- (3) Verify tightness of accessible bolted electrical connections.
- (4) Inspect compression-applied connectors for correct cable match and indentation.
- (5) Visually inspect jacket and insulation condition.
- (6) Inspect for proper phase identification and arrangement.

b. Electrical Tests

- (1) Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 1000 volts dc for one minute.
- (2) Perform continuity tests to insure correct cable connection.

3.9.1.2 Grounding System

a. Visual and mechanical inspection

Inspect ground system for compliance with contract plans and specifications.

b. Electrical tests

Perform ground-impedance measurements utilizing the fall-of-potential method in accordance with IEEE 81. On systems consisting of interconnected ground rods, perform tests after interconnections are complete. On systems consisting of a single ground rod perform tests before any wire is connected. Take measurements in normally dry weather, not less than 48 hours after rainfall. Use a portable ground resistance tester in accordance with manufacturer's instructions to test each ground or group of grounds. The instrument must be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground rod or grounding systems under test. Provide site diagram indicating location of test probes with associated distances, and provide a plot of resistance vs. distance.

3.9.2 Follow-Up Verification

Upon completion of acceptance checks and tests, show by demonstration in service that circuits and devices are in good operating condition and properly performing the intended function. As an exception to requirements stated elsewhere in the contract, the Contracting Officer must be given 5 working days advance notice of the dates and times of checking and testing.

.... -- End of Section --

SUBMITTAL REGISTER

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION		CONTRACTOR										CONTRACT NO.							
Demolish Operators Quarters Building																			
(a)	(b)	(c)	(d)	(e)	(f)	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION	APPROVING AUTHORITY				(r)					
						(g)	(h)	(i)		(j)	(k)	(l)	(m)		(n)	(o)	(p)	(q)	
A C T I V I T Y T R A N S M I T T A L N O S P E C S E C T																			
	02 41 00	SD-01 Preconstruction Submittals		1.2.2	G RO														
		Demolition Plan																	
		Existing Conditions		1.9															
		Survey		1.9	G RO														
		SD-07 Certificates																	
		Notification		1.6	G RO														
		SD-11 Closeout Submittals																	
		Receipts		3.3.4															
		26 20 00	SD-02 Shop Drawings																
		Panelboards		2.6	G DO														
		Marking Strips		3.2.6.1	G DO														
		Circuit Breakers		2.6.3	G DO														
		Meter Base Only		2.13	G DO														
		Surge Protective Devices			G DO														
		SD-06 Test Reports																	
		600-volt Wiring Test		3.6.2	G														
		Grounding System Test		3.6.3	G														
	31 23 00	SD-06 Test Reports																	
		Borrow Site Testing		1.6	G RO														
		Fill and Backfill		3.10.2.1															
		Select Material		3.10.2.2															
		Density Tests		3.10.2.3															
		Moisture Content Tests		3.10.2.4															
	33 11 00	SD-01 Preconstruction Submittals																	
		Connections		3.1.1	G RO														
		SD-03 Product Data																	

CONTRACT NO.

SUBMITTAL FORM, Jan 96

SUBMITTAL FORM 4025-R

For use of this form, see ER 415-1-10; the proponent agency is CECW-CE.

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)

TO:	FROM:	CONTRACT NO.	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
-----	-------	--------------	--

SPECIFICATION SEC. NO. (Cover only one section with each transmittal)	PROJECT TITLE AND LOCATION	THIS TRANSMITTAL IS FOR: (Check one)
		<input type="checkbox"/> FIO <input type="checkbox"/> GA <input type="checkbox"/> DA <input type="checkbox"/> CR <input type="checkbox"/> DA/CR <input type="checkbox"/> DA/GA

[illegible]

I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME OF CONTRACTOR	SIGNATURE OF CONTRACTOR
--------------------	-------------------------

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (<i>List by item No.</i>)	NAME AND TITLE OF APPROVING AUTHORITY	SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.
3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.
4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.
5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.
6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing the detailed reason for the variation.
7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.
8. When submittal items are transmitted, indicate the "Submittal Type" (*SD-01 through SD-11*) in column c of Section I.
 Submittal types are the following:

SD-01 - Preconstruction	SD-02 - Shop Drawings	SD-03 - Product Data	SD-04 - Samples
SD-07 - Certificates	SD-08 - Manufacturer's Instructions	SD-09 - Manufacturer's Field Reports	SD-10 - O&M Data
			SD-11 - Closeout
9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

A -- Approved as submitted. B -- Approved, except as noted on drawings. Resubmission not required. C -- Approved, except as noted on drawings. Refer to attached comments. Resubmission required. D -- Will be returned by separate correspondence. E -- Disapproved. Refer to attached comments.	F -- Receipt acknowledged. X -- Receipt acknowledged, does not comply with contract requirements, as noted. G -- Other action required (<i>Specify</i>) K -- Government concurs with intermediate design. (<i>For D-B contracts</i>) R -- Design submittal is acceptable for release for construction. (<i>For D-B contracts</i>)
--	---
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.

SITE PHOTOGRAPHS



Figure 1 – Exterior of Home



Figure 2 – Exterior of Home



Figure 3 – Exterior of Home & Existing Garage to Remain



Figure 4 – Exterior of Home



Figure 5 – Exterior of Home (overhead power, telecom & cable)



Figure 6 – Exterior of Home



Figure 7 – Garage to Remain



Figure 8 – Approximate Septic Location



Figure 9 – Septic

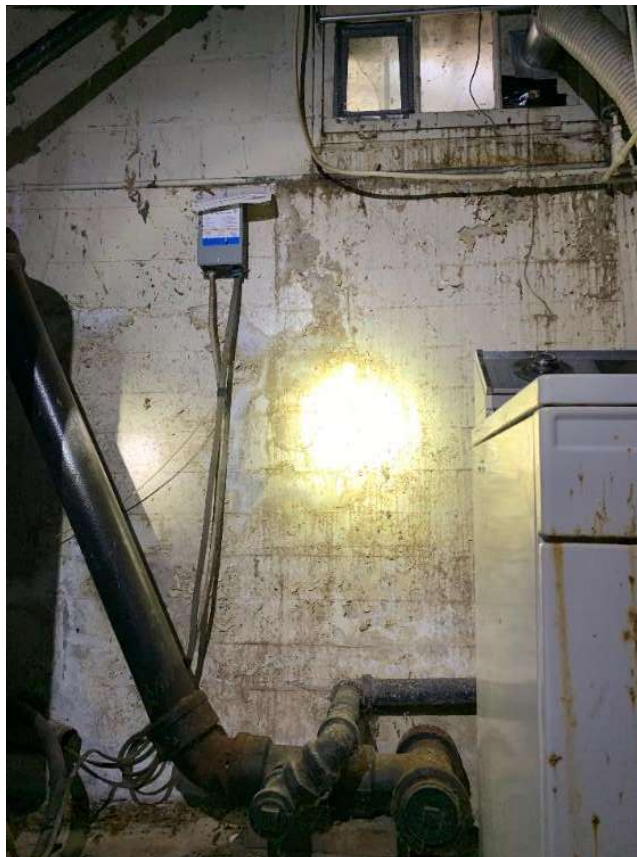


Figure 10 – Basement Septic Connection



Figure 11 – First Floor Restroom



Figure 12 – Home Interior



Figure 13 – Home Interior



Figure 14 – 2nd Floor Restroom (water damage)



Figure 15 – 2nd Floor Ceiling (black mold)



Figure 16 – 2nd Floor Ceiling (black mold)



Figure 17 – Basement Equipment



Figure 18 – Basement Oil Tank



Figure 19 – Basement Equipment



Figure 20 – Basement Equipment



Figure 21 – Utility Building, Location of Water Pipe Connection



Figure 22 – Approximate Location of New Electric Panel in Garage

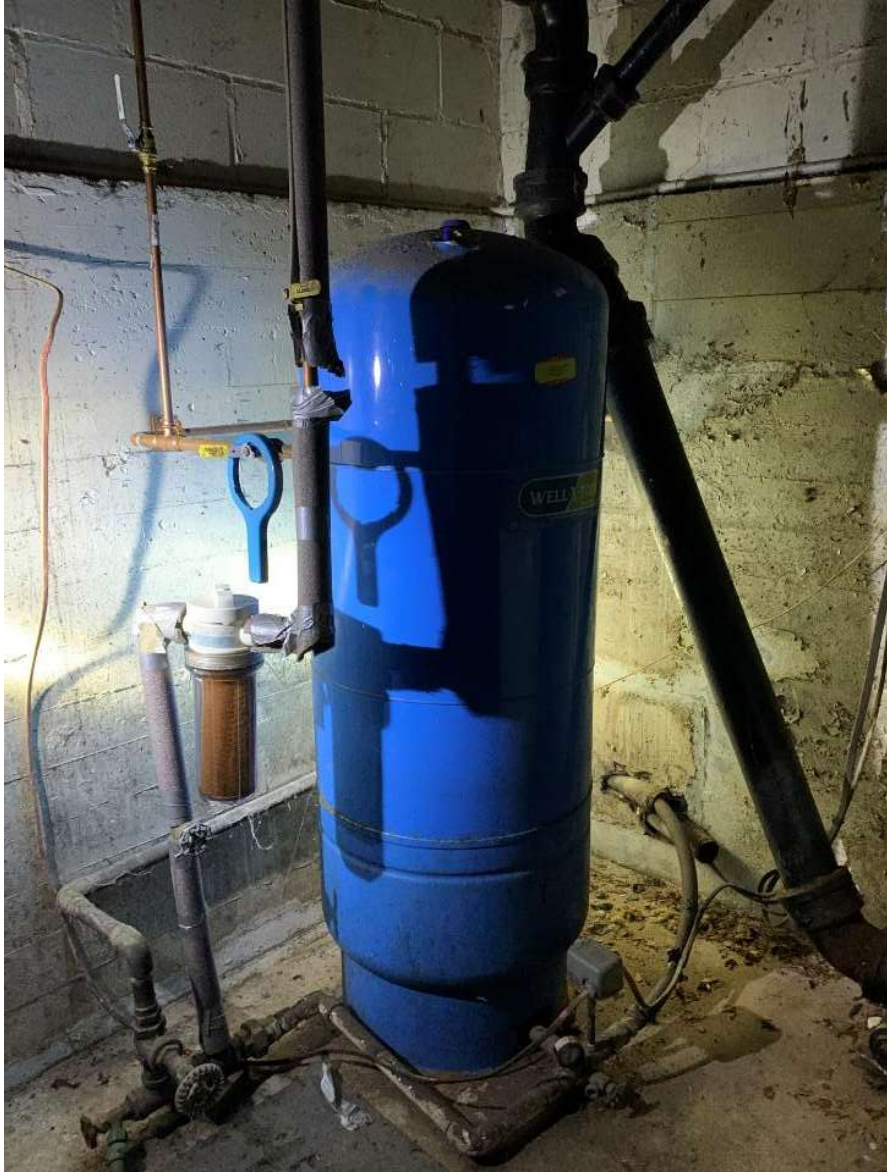


Figure 23 – Existing Water Pressure Tank (to be demolished)

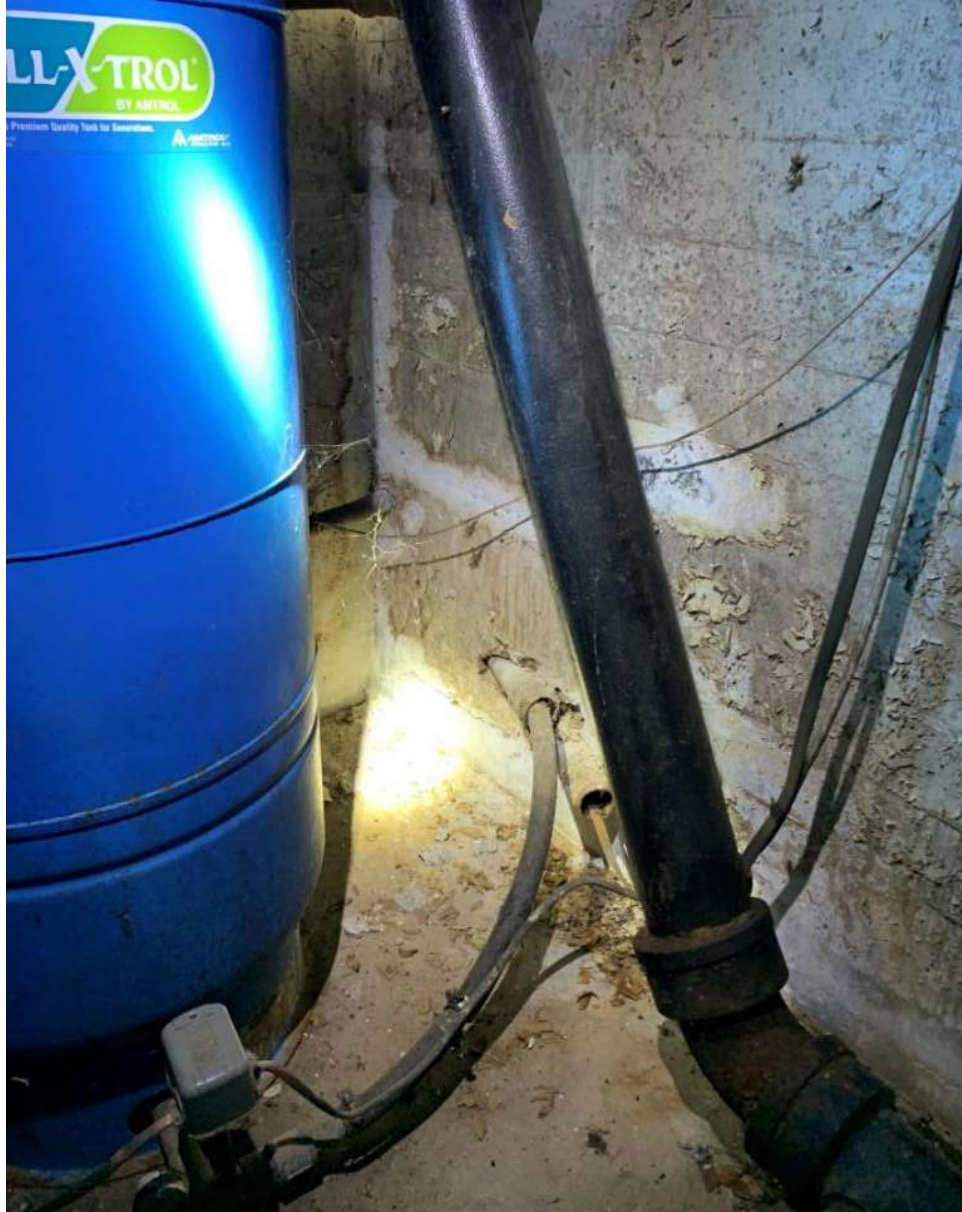


Figure 24 – Existing Water Pressure Tank (to be demolished)



Figure 25 – Existing Pump Control Box (to be demolished)



Figure 26 – Existing Well



Figure 27 – View from Utility Building Looking Towards Existing Operators Quarters (to be demolished)

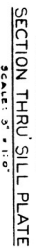
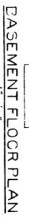
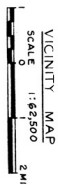
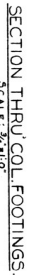


Figure 28 – Exterior of Utility Building (location of water line penetration)



Figure 29 – View from Existing Operators Quarters (to be demolished) Looking Towards Utility Building

RECORD DRAWINGS



REVISION	DATE	DESCRIPTION	BY

OFFICE OF ENGINEERS, U. S. ARMY
 DISTRICT ENGINEER, BOSTON
 NEW ENGLAND DIVISION
 NEW ENGLAND AREA
 BOSTON, MASS.

THAMES RIVER FLOOD CONTROL
 MANSFIELD HOLLOW DAM
 MOVING FIELD OFFICE
 PLAINS AND DETAILS
 MATCHAUG RIVER
 CONNECTICUT

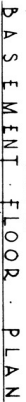
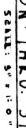
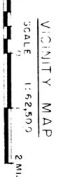
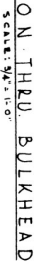
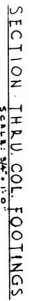
PREPARED BY: *James H. [Signature]*
 CHECKED BY: *[Signature]*
 DATE: FEB. 1952

C. E. RICHMOND, JR.
 DIST. ENGINEER, BOSTON

TOTAL NO. DRAWINGS: 1 SPEC. NO. OF SHEETS: 1 OF 11

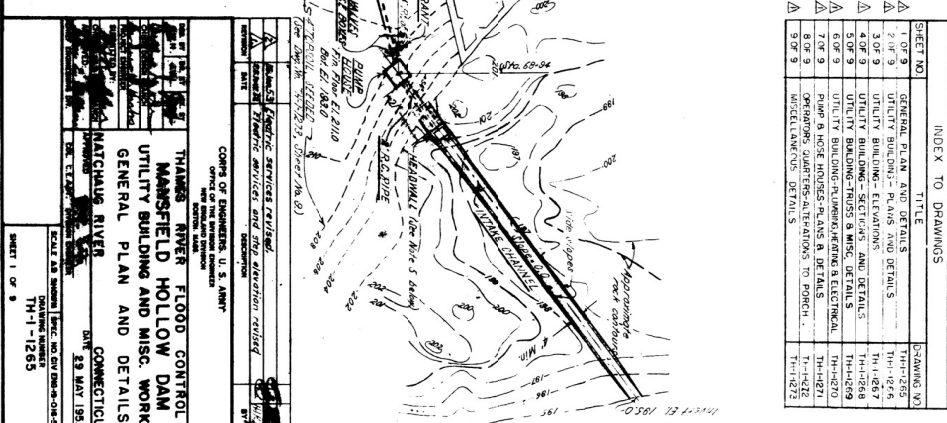
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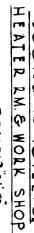
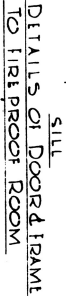
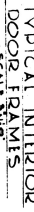
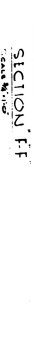
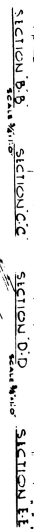
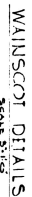
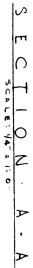
SHEET 1 OF 1

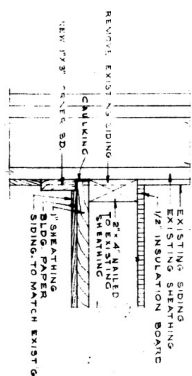


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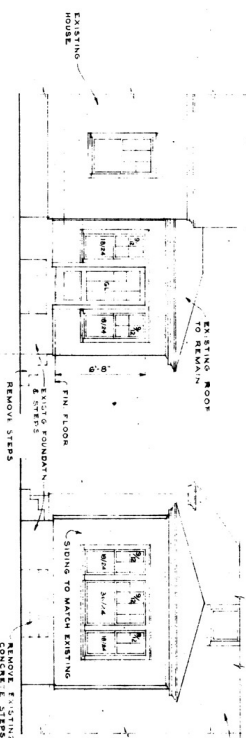
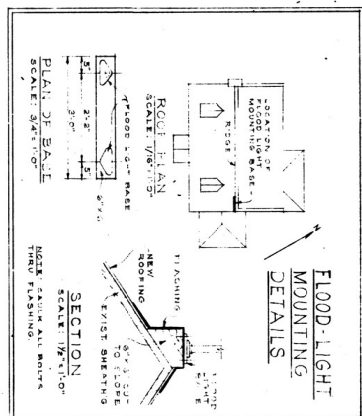
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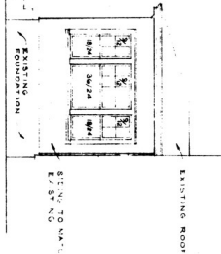
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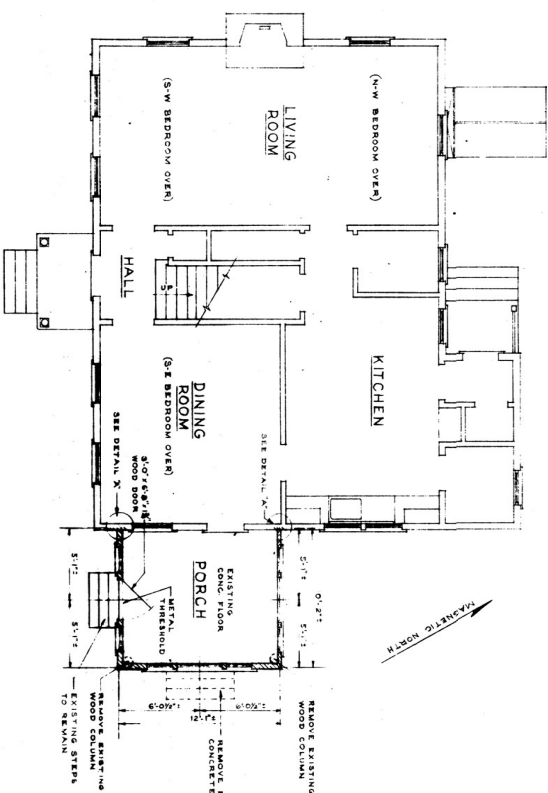
FRONT

SIDE

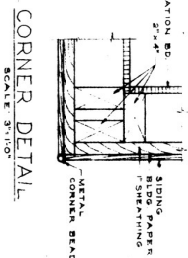
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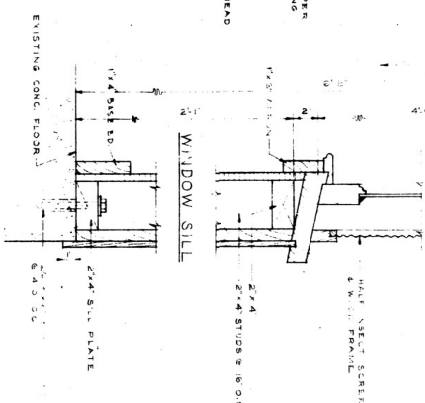
REAR



FIRST FLOOR PLAN
SCALE: 1/4"=1'-0"



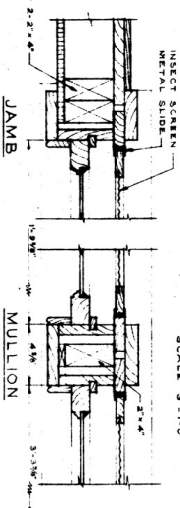
CORNER DETAIL
SCALE: 3/4"=1'-0"



WINDOW SILL

WINDOW HEAD

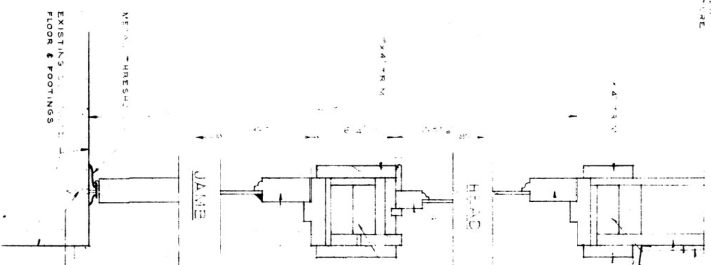
TYPICAL WALL SECTION
AT WINDOW
SCALE: 3/4"=1'-0"



JAMB

MULLION

WINDOW DETAILS
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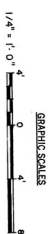
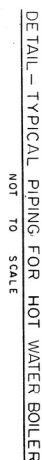
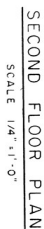
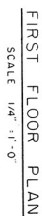


DOOR SECTION
SCALE: 3/4"=1'-0"

NOTE:
CONTRACTOR TO VERIFY ALL DIMENSIONS AND
CONDITIONS IN THE FIELD.

REVISION	DATE	DESCRIPTION
1	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
2	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
3	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
4	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
5	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
6	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
7	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
8	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
9	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT
10	28 MAY 1992	THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM UTILITY BUILDING AND MISC. WORK OPERATORS QUARTERS ALTERATIONS TO PORCH MATCHAUG RIVER CONNECTICUT

SCALE: AS SHOWN
TH-1-1272
SHEET 8 OF 9



DATE OF INFO: 05-86
JTS: 4-1-1
CLASSIFICATION: UNCLASSIFIED
AUTHORITY: 101-101
REMARKS: 101-101
PROJECT NUMBER: 101-101
NATHAN RIVER
CONNECTICUT

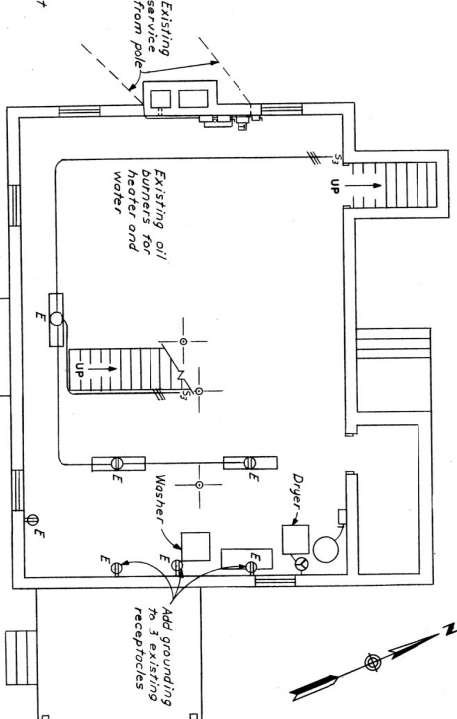
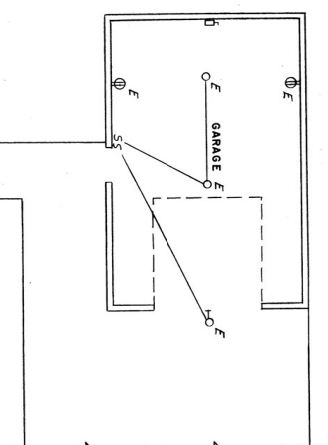
**MANSFIELD HOLLOW LAKE
OPERATORS QUARTERS
MODIFICATIONS TO HEATING SYSTEM**

PLANS AND DETAIL	CONNECT
HAUG RIVER	

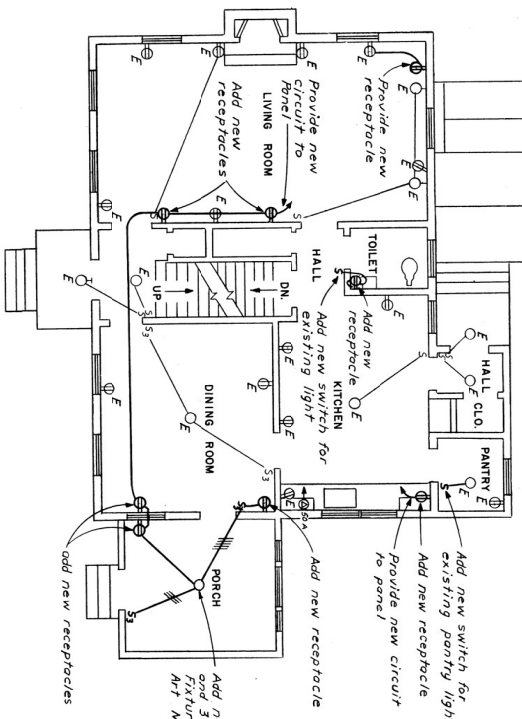
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APR 11 1977
U.S. DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D.C. 20535

CHIEF, ENGINEERING DIVISION	
SCALE 1/4" = 1' - 0"	SPEC. NO. DACW33-77-R
DRAWING NUMBER	

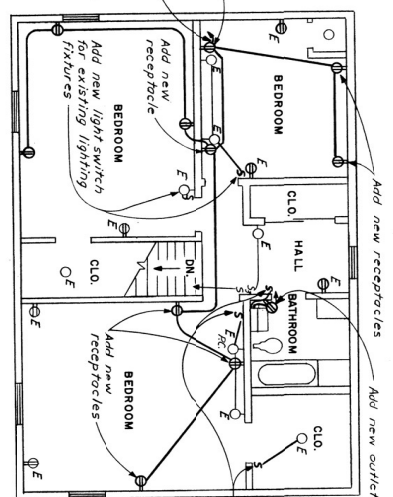
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SHEE



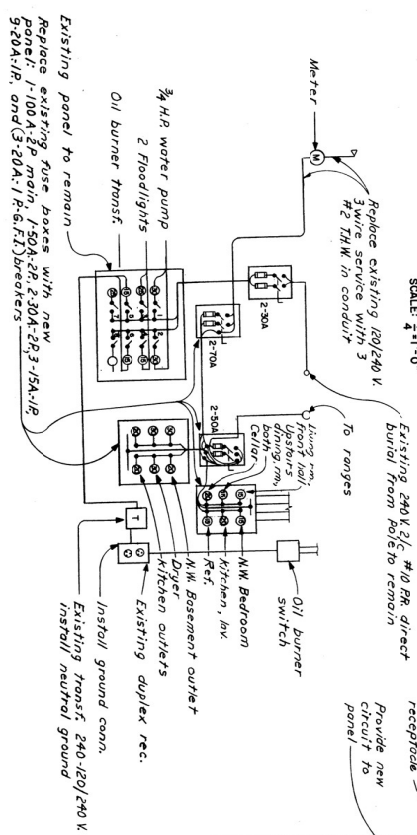
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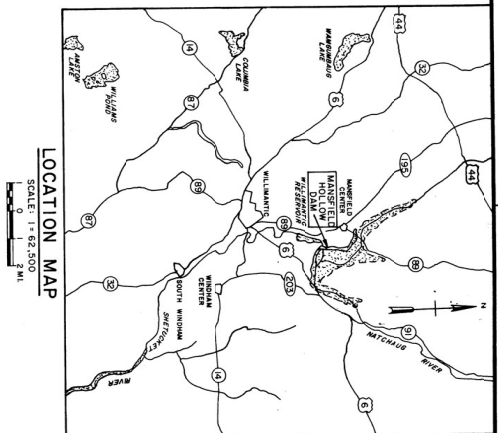
FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"



WIRING DIAGRAM
NOT TO SCALE



LOCATION MAP
SCALE: 1" = 0.2500

- NOTES:**
- Existing circuits in two existing panels shown with existing fuses each and electric range shall be transferred to new overhead panel and existing main panel shall be modified as necessary to put first and second floor new, bathroom receptacle, kitchen receptacle and existing receptacle near basement sink on this new three new breakers with ground fault protection THW in conduit.
 - Add wiring for new circuits and circuit modifications using #12 copper romex with 5. New receptacles shall be 15 ampere, 120 volt, duplex grounding type. 15 ampere, 120 volt, A.C. breakers shall be 15 ampere, 120 volt, A.C. breakers.
 - Prepare new panel directory identifying use and location of all circuits, the requirements of the National Electrical Code, NFPA-70-1981.

NEW	EXISTING	DESCRIPTION
⊕	⊕	DUPLEX RECEPTACLE
S	S	S.P. SWITCH
S ₁	S ₁	THREE WAY SWITCH
○	○	WALL FIXTURE
○	○	CEILING OUTLET
○	○	FLUORESCENT FIXTURE
○	○	DISCONNECT SWITCH
○	○	PLUG FUSE, SIZE AS NOTED
○	○	TRANSFORMER



THAMES RIVER FLOOD CONTROL MANSFIELD HOLLOW DAM OPERATORS QUARTERS ELECTRICAL MODIFICATIONS PLANS AND WIRING DIAGRAM	
APPROVED: <i>[Signature]</i> DATE: JAN. 1982	SCALE: AS SHOWN DRAWING NUMBER: THA - 54 SHEET: 1

HAZARDOUS MATERIALS SURVEY REPORT



Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, Connecticut 06340

www.mysticair.com

maq2@aol.com

800 247-7746

November 10, 2021

Michelle Cucchi, Park Ranger
US Army Corps of Engineers
Mansfield Hollow Road
Willimantic, CT 06226

Re: **Pre-Demolition Asbestos Survey and Lead TCLP Analysis (11/4/21)**
Cape House
141 Mansfield Hollow Road
Mansfield, CT

Dear Michelle:

As requested, Mystic Air Quality Consultants, Inc. conducted a pre-demolition survey of accessible materials at the location noted above on November 4th, 2021. This survey was conducted by State of Connecticut licensed asbestos inspector Steve Alfano, (license #001093) to determine the presence of asbestos-containing materials. The samples were analyzed at Environmental Hazards Services (NVLAP # 101882-0) in Virginia.

In addition to the asbestos survey, a composite or TCLP sample was collected and analyzed for lead to determine if the demolition materials would have to be considered lead waste. The sample analysis was also performed by Environmental Hazards Services.

Summary of the findings-

Upon testing by polarized light microscopy, the following materials were found to be asbestos containing:

<u>Sample #s</u>	<u>Material/Location</u>	<u>Estimated Affected Area</u>
14-16	Linoleum & Mastic/Kitchen Floor	170 sq. ft.

Non-asbestos containing materials-

The roster of suspect materials (Enclosure 3), lists the materials tested. Those that are not already referred to as asbestos containing or assumed asbestos, can be categorized as non-asbestos containing materials.

Implications of the findings-

As required by state and federal regulations prior to demolition, all the asbestos-containing materials will need to be removed by a licensed asbestos abatement contractor employing trained and certified personnel who follow all pertinent asbestos abatement regulations.



Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, Connecticut 06340

www.mysticair.com

maq2@aol.com

800 247-7746

Limitations of the survey-

The survey included destructive testing of floors, wall cavities, and exterior brick and foundation mastics, above ceilings, and roofing core samples. There may be other materials that become evident during your demolition activity. Should the requisite EPA/OSHA competent person working for the contractor discover such materials they will need to be tested for asbestos content so determinations of their abatement and disposal (if required) can be made.

Lead TCLP Analysis results-

The results of the TCLP analysis indicate that, subsequent to demolition, the building materials do not need to be disposed of as lead waste. The results of the samples were below the EPA's TCLP standard of 5 mg/l for lead.

Please do not hesitate to contact us with questions relating to the sample results and any subsequent work that may be performed for your company. We thank you for the opportunity to conduct this survey.

Sincerely,

Christopher J. Eident CIH, CSP, RS
CEO

- Enclosure 1: Asbestos Lab Results
- Enclosure 2: Chain of Custody
- Enclosure 3: Roster of Suspect Materials
- Enclosure 4: Lead TCLP Results and Chain of Custody
- Enclosure 5: Daily Job Log



Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Asbestos Bulk Analysis Report

Report Number: 21-11-01065

Client: Mystic Air Quality Consultants
1204 North Road Rt.117
Groton, CT 06340

Received Date: 11/05/2021

Analyzed Date: 11/08/2021

Reported Date: 11/08/2021

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Client Number:
07-2564

Fax Number:
860-449-8860

Laboratory Results

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-11-01065-001	1		Gray Brittle; Brown Fibrous; Inhomogeneous	NAD	20% Fibrous Glass 80% Non-Fibrous
21-11-01065-002	2		Gray Brittle; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-003	3		Gray Brittle; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-004	4		Beige Paint-Like; Off-White Fibrous; White Brittle; Inhomogeneous	NAD	25% Cellulose 75% Non-Fibrous
21-11-01065-005	5		Off-White Fibrous; White Brittle; Brown Granular; Inhomogeneous	NAD	10% Cellulose 90% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 07-2564

Report Number: 21-11-01065

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-11-01065-006	6		Beige Paint-Like; Off-White Fibrous; White Brittle; Brown Granular; Inhomogeneous	NAD	20% Cellulose 80% Non-Fibrous
21-11-01065-007	7		Beige Paint-Like; Off-White Fibrous; White Brittle; Brown Granular; Inhomogeneous	NAD	15% Cellulose 85% Non-Fibrous
21-11-01065-008	8		White Brittle; Brown Granular; Inhomogeneous	NAD	8% Cellulose 92% Non-Fibrous
21-11-01065-009	9		Beige Paint-Like; White/Gray Granular; Inhomogeneous	NAD	2% Cellulose 3% Hair 95% Non-Fibrous
21-11-01065-010	10		Beige Paint-Like; White/Gray Granular; Inhomogeneous	NAD	2% Cellulose 3% Hair 95% Non-Fibrous
21-11-01065-011	11		Beige Paint-Like; White Granular; Inhomogeneous	NAD	1% Cellulose 99% Non-Fibrous
21-11-01065-012	12		Beige Paint-Like; White Granular; Inhomogeneous	NAD	1% Cellulose 99% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 07-2564

Report Number: 21-11-01065

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-11-01065-013	13		Beige Paint-Like; White Granular; Inhomogeneous	NAD	1% Cellulose 99% Non-Fibrous
21-11-01065-014A	14	Linoleum	Beige Vinyl-Like; Gray Fibrous; Inhomogeneous	20% Chrysotile	80% Non-Fibrous
Total Asbestos: 20%					
Chrysotile present in fibrous backing.					
21-11-01065-014B	14	Mastic I	Tan Adhesive; Homogeneous	2% Chrysotile	98% Non-Fibrous
Total Asbestos: 2%					
Possible contamination from fibrous backing.					
21-11-01065-014C	14	Flooring	Brown Vinyl-Like; Brown Fibrous; Inhomogeneous	NAD	25% Cellulose 75% Non-Fibrous
21-11-01065-014D	14	Other *	Brown Adhesive; Black/Brown Fibrous; Inhomogeneous	NAD	55% Cellulose 45% Non-Fibrous
*Mastic II/Felt. Unable to separate materials.					
21-11-01065-015A	15	Linoleum		Did Not Analyze (Positive Stop)	
21-11-01065-015B	15	Mastic I		Did Not Analyze (Positive Stop)	
21-11-01065-015C	15	Flooring	Brown Vinyl-Like; Brown Fibrous; Inhomogeneous	NAD	25% Cellulose 75% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 07-2564

Report Number: 21-11-01065

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-11-01065-015D	15	Other *	Brown Adhesive; Black/Brown Fibrous; Inhomogeneous	NAD	55% Cellulose 45% Non-Fibrous
*Mastic II/Felt. Unable to separate materials.					
21-11-01065-016A	16	Linoleum		Did Not Analyze (Positive Stop)	
21-11-01065-016B	16	Mastic I		Did Not Analyze (Positive Stop)	
21-11-01065-016C	16	Flooring	Brown Vinyl-Like; Brown Fibrous; Inhomogeneous	NAD	25% Cellulose 75% Non-Fibrous
21-11-01065-016D	16	Other *	Brown Adhesive; Black/Brown Fibrous; Inhomogeneous	NAD	55% Cellulose 45% Non-Fibrous
*Mastic II/Felt. Unable to separate materials.					
21-11-01065-017A	17	Flooring	Green/Gray/Black Vinyl-Like; Homogeneous	NAD	5% Synthetic 95% Non-Fibrous
21-11-01065-017B	17	Mastic	Clear Adhesive; Homogeneous	NAD	5% Cellulose 95% Non-Fibrous
21-11-01065-018A	18	Flooring	Green/Gray/Black Vinyl-Like; Homogeneous	NAD	5% Synthetic 95% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 07-2564

Report Number: 21-11-01065

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-11-01065-018B	18	Mastic	Clear Adhesive; Homogeneous	NAD	5% Cellulose 95% Non-Fibrous
21-11-01065-019A	19	Flooring	Green/Gray/Black Vinyl- Like; Homogeneous	NAD	5% Synthetic 95% Non-Fibrous
21-11-01065-019B	19	Mastic	Clear Adhesive; Homogeneous	NAD	5% Cellulose 95% Non-Fibrous
21-11-01065-020A	20	Ceramic Tile	White/Off-White Cementitious; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-020B	20	Grout	Off-White Granular; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-020C	20	Mortar	Gray Granular; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
21-11-01065-021A	21	Ceramic Tile	White/Off-White Cementitious; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-021B	21	Grout	Off-White Granular; Homogeneous	NAD	100% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 07-2564

Report Number: 21-11-01065

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-11-01065-021C	21	Mortar	Gray Granular; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
21-11-01065-022A	22	Ceramic Tile	White/Off-White Cementitious; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-022B	22	Grout	Off-White Granular; Homogeneous	NAD	100% Non-Fibrous
21-11-01065-022C	22	Mortar	Gray Granular; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
21-11-01065-023	23		Green Aggregate; Black Tar-Like; Fibrous; Inhomogeneous	NAD	25% Fibrous Glass 75% Non-Fibrous
21-11-01065-024	24		Green Aggregate; Black Tar-Like; Fibrous; Inhomogeneous	NAD	25% Fibrous Glass 75% Non-Fibrous
21-11-01065-025	25		Green Aggregate; Black Tar-Like; Fibrous; Inhomogeneous	NAD	25% Fibrous Glass 75% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 07-2564

Report Number: 21-11-01065

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
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QC Sample: 41-M22019-2

QC Blank: SRM 1866 Fiberglass

Reporting Limit: 1% Asbestos

Method: EPA Method 600/R-93/116, EPA Method 600/M4-82-020

Analyst: Keleigh King

Reviewed By Authorized Signatory:

Melissa Kanode

Melissa Kanode
QA/QC Clerk

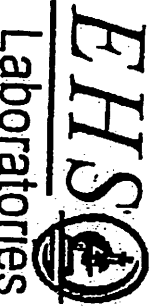
The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Each distinct component in an inhomogeneous sample was analyzed separately and reported as a composite. Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714 NVLAP #101882-0 VELAP 460172. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), (for enhanced detection capabilities) for materials regulated by EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

400 Point Count Analysis, where noted, performed per EPA Method 600/R-93/116 with a Reporting Limit of 0.25%.

* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND: NAD = no asbestos detected



Asbestos Chain-of-Custody

Environmental Hazards Services, LLC
www.ehsllc.com 7469 Whitepine Rd
(800)347-4010 Richmond, VA
(804)275-4907 (fax) 23237



21-11-01065
Due Date:
11/10/2021
(Wednesday)
AE

25 PM

ENCLOSURE 2 PAGE 1 OF 1

Company Name: Mystic Air Quality Consultants Address: 1204 North Rd., Groton, CT 06340
Phone: 860 449 8903 Fax: 860 449 8903 E-mail: maq2@aol.com
Project Name and Address: 141 Amstfield Hollow Rd
City/State/Zip: Groton, Ct. 06340
Accl. Number: 07-2564
Collected by: Steve Attaw Signature: [Signature] Mystic Air Client: U.S. Army Corps of Engineers
Turn around time: Standard ☒ One day (will call ahead)

No.	Client's Sample No.	Date Collected	PLM Analysis	Other Analysis Specify	Material Description	Sample Location	Comments
1	1-3	11/4/21	<input checked="" type="checkbox"/>		Flue cement	Boiler	Pos. Stop
2	4-8		<input checked="" type="checkbox"/>		Plaster wall	Thermostat	
3	9-13		<input checked="" type="checkbox"/>		Plaster ceiling	Thermostat	
4	14-16		<input checked="" type="checkbox"/>		Limestone floor	Kitchen	
5	17-19		<input checked="" type="checkbox"/>		Limestone floor	Downstairs Bathroom	
6	20-22		<input checked="" type="checkbox"/>		Ceramic Tile	Upstairs Bathroom	
7	23-25		<input checked="" type="checkbox"/>		Shingles	ROOF	
8							
9							
10							
11							
12							
13							
14							
15							

Released by: Steve Attaw Signature: [Signature] Date: 11/4/21
Received by: Tina Bloom Signature: [Signature] Date: 11/5/21 1:05 PM

SUSPECT ASBESTOS CONTAINING MATERIALS ROSTER

SITE: 141 Mansfield Hollow Rd. Mansfield, CT

DATE: 11/11/21

X Demo Pre-Reno Limited & Directed

[illegible]

COMMENTS: 774-230-0206 - Michelle

Inspector: Steve Albano

Page of

Mystic Air Quality is an AIHA Accredited Lab FAX: 860 449 8860





Lead TCLP Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Report Number: 21-11-01069

Client: Mystic Air Quality Consultants
1204 North Road Rt.117
Groton, CT 06340

Received Date: 11/05/2021
Analyzed Date: 11/09/2021
Reported Date: 11/09/2021

Project/Test Address: 141 Mansfield Hollow Rd; Mansfield, CT

Client Number:
07-2564

Fax Number:
860-449-8860

Laboratory Results

Lab Sample Number	Client Sample Number	Sample Description	Sample Weight (g)	Concentration ppm (mg/L)	Narrative ID
21-11-01069-001	1	Building Debris/Paint	100	<0.50	

Regulatory Limit: 5.0 mg/L

Reporting Limit: 0.50 mg/L

Method: EPA SW846 1311/3010A/7000B

Analyst: Elaine King

Reviewed By Authorized Signatory:

Melissa Kanode

Melissa Kanode
QA/QC Clerk

Method EPA SW846 1311 recommends 100g for analysis.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. All internal quality control requirements associated with the batch were met, unless otherwise noted. Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714.

Legend g = gram ppm = parts per million mg/L = milligrams per liter

Pg _____ of _____

LAB USE ONLY – BELOW THIS LINE

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

1 Pb TCLF



Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, Connecticut 06340

www.mysticair.com magc2@aol.com 800 247-7746 860 449-8903

DAILY JOB LOG

Client: US Army Corp of Engineers

Site Supervisor: _____

Site Location: 141 Mansfield Hollow Rd Mansfield CT

Containment Location: _____

GENERAL OBSERVATIONS:

Abol GO-Site - Pre-Demo lead & Asbestos Survey. Location is 2 story Cape all
hardwood floors besides kitchen & bathroom walls & ceilings sampled along with floor cement. No visible
chipped flooring. Asbestos sampled as well. All rooms accounted for. TCI also taken.

Tracking # _____

8162-343T-9187

HYGIENIST'S
NAME: Sylvia Malone

HYGIENIST'S
SIGNATURE: _____

TIME ON SITE: _____
TIME OFF SITE: _____

Mystic Air Quality is an AIHA-LAP, LLC Accredited Lab

FAX: 860 449 8860

**GOVERNMENT FURNISHED
EQUIPMENT**

4

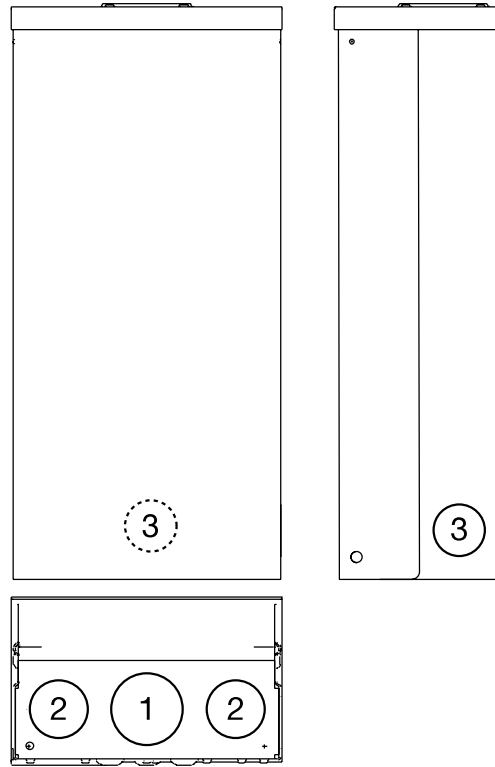
MILLENNIUM
SERIES
SURFACE MOUNT
POWER OUTLETS

Surface Mount Power Outlet

125 Amps | *Unmetered* | 120/240 VAC



U5000-XL-75



Specifications

- UL listed 125 Amps, 120/240 Volt, 1Ø power outlet.
- Short circuit current withstand rating 10,000 RMS symmetrical amperes.
- Type 3R welded enclosure for durable outdoor use.
- Enclosure constructed with galvanized 16 gauge steel.
- ANSI 61 grey polyester powder coat finish.
- Convenient concentric knock-out configurations and mounting embosses.
- Hub opening with closure plate allows for meter retrofit.
- Wire terminations accept copper or aluminum conductors for loop feed wiring.
Line: (2) 1/0-#12 Ground: (2) 1/0-#14 & (4) #6-#14 Neutral: (2) 1/0-#14 & (4) #6-#14
- Six circuit plated copper interior accepts standard plug-in type circuit breakers. Rated up to 125 Amps.
- Three position self-grounded receptacle bridge accepts most standard NEMA receptacles with mounting plates.
- Components factory wired with stranded copper wire.
- Lockable hinge cover and dead front are removable for installation and maintenance. Stay-open hinge cover has safety interlock on dead front. Dead front cover must be removed before hinge cover can be removed.



Please consult serving utility for their requirements prior to ordering or installing, as specifications and approvals vary by utility, and may require local electrical inspector approval. All installations must be installed by a licensed electrician and must comply with all national and local codes, laws and regulations. Milbank reserves the right to make changes in specifications and features shown without notice or obligation.

Surface Mount Power Outlet





125 Amps | Unmetered | 120/240 VAC

5
MILLENNIUM
SERIES
SURFACE MOUNT
POWER OUTLETS



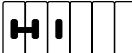

125 Amps | Surface Mount Power Outlets

Catalog Number	Receptacle Configuration	Circuit Breaker Configuration	Loop Feed	Connectors - Line	Dimensions			Knockouts		
					D"	W"	H"	1	2	3
U5000-XL	—	—	Yes	(2) 1/0-#12	5½	8⅞	19¼	2	1½	1¼
U5000-XL-332	A	W	Yes	(2) 1/0-#12	5½	8⅞	19¼	2	1½	1¼
U5000-XL-41	B	X	Yes	(2) 1/0-#12	5½	8⅞	19¼	2	1½	1¼
U5000-XL-55	C	Y	Yes	(2) 1/0-#12	5½	8⅞	19¼	2	1½	1¼
U5000-XL-75	D	Z	Yes	(2) 1/0-#12	5½	8⅞	19¼	2	1½	1¼

Receptacle Configurations

A	B	C	D
			
(2) TT30R, (1) 5-20R GFI	(1) TT30R, (1) 5-20R GFI	(1) 14-50R, (1) 5-20R GFI	(1) 14-50R, (1) TT30R, (1) 5-20R GFI

Circuit Breaker Configurations

W	X	Y	Z
			
(2) 30A, 1P, 120V (1) 20A, 1P, 120V	(1) 30A, 1P, 120V (1) 20A, 1P, 120V	(1) 50A, 2P, 120/240V (1) 20A, 1P, 120V	(1) 50A, 2P, 120/240V (1) 30A, 1P, 120V (1) 20A, 1P, 120V

Notes

- 20 Amps GFI receptacles are weather resistant and tamper resistant.

Please consult serving utility for their requirements prior to ordering or installing, as specifications and approvals vary by utility, and may require local electrical inspector approval. All installations must be installed by a licensed electrician and must comply with all national and local codes, laws and regulations. Milbank reserves the right to make changes in specifications and features shown without notice or obligation.

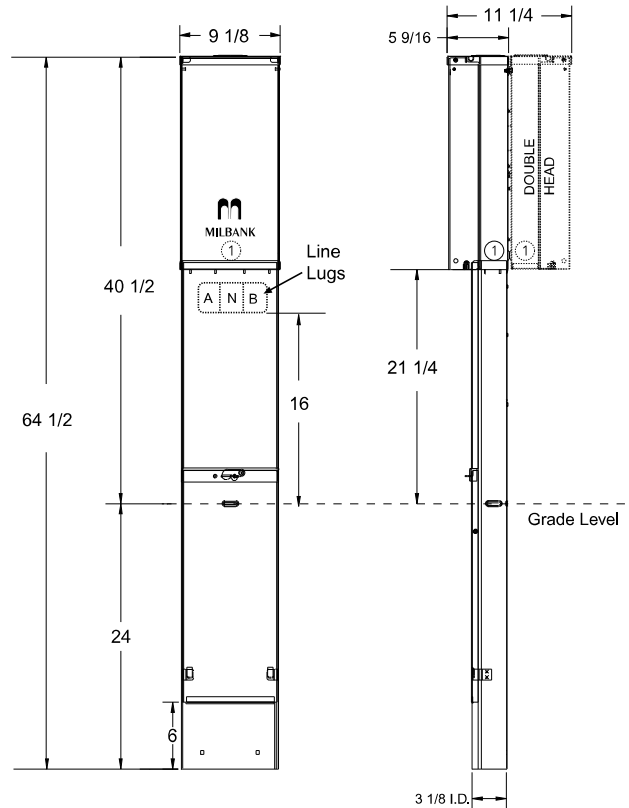


Power Outlet Pedestals

125 Amps | *Unmetered* | 120/240 VAC



U5200-XL-75



Specifications

- UL listed 125 Amps, 120/240 Volt—1Ø power outlet.
- Short circuit current withstand rating 10,000 RMS symmetrical amperes.
- Type 3R welded enclosure for durable outdoor use.
- Enclosure constructed with galvanized 16 gauge steel.
- Direct burial or pad mounted post constructed with 16 gauge galvanized steel. Two removable front covers for ease of installation. Accepts up to (3) 2 1/2" conduits.
- ANSI 61 grey polyester powder coat finish.
- Convenient concentric knock-out configurations.
- Hub opening with closure plate allows for meter retrofit.
- Wire terminations accept copper or aluminum conductors for loop feed wiring.
- Line: (2) #6-350 kcmil per phase, ground: (2) #14-2/0, neutral: (2) #6-350 kcmil
- Six circuit plated copper interior accepts standard plug-in type circuit breakers. Rated up to 125 Amps.
- Three position self-grounded receptacle bridge accepts most standard NEMA receptacles with mounting plates.
- Components factory wired with stranded copper wire.
- Lockable hinge cover and dead front are removable for installation and maintenance. Stay-open hinge cover has safety interlock on dead front. Deadfront must be removed before hinge cover can be removed.
- LED or fluorescent site light kits available. Factory or field installable. See accessories page.
- Unit weight - single: 48 lbs., double: 70 lbs.



Please consult serving utility for their requirements prior to ordering or installing, as specifications and approvals vary by utility, and may require local electrical inspector approval. All installations must be installed by a licensed electrician and must comply with all national and local codes, laws and regulations. Milbank reserves the right to make changes in specifications and features shown without notice or obligation.



CAMPBELL

81 inL Frost Proof, Lead Free Yard Hydrant

Item # **2ZWN6**
UNSPSC # **40141726**

Mfr. Model # **YH-4LF**
Catalog Page # **2912**

Country of Origin USA. Country of Origin is subject to change.

Yard hydrants are outdoor faucets that are tapped into buried water supply pipes to provide year-round access to running water for landscaping, grounds-maintenance, livestock, and fire-protection applications. They allow users to access water outdoors without having to

[View More](#)

☐ Compare this product

[Product Image Feedback](#)

Technical Specs

Item	Frost Proof, Lead Free Yard Hydrant
Bury Depth	4 ft
Overall Length	81 in
Inlet Size	3/4 in FNPT
Outlet Size	3/4 in Hose
Includes	Lockable Handle, Self Draining Bleeder Valve
Casing	1 in Galvanized

Head Material	Cast Iron
Handle Material	Cast Iron
Rod Material	Brass
Plunger Material	Eco Brass
Rod Dia.	7/16 in
Max. Pressure	60 psi