

Operation

NOTICE:

Bids to be opened at 2:00 P.M., EST,
18 December 1956, at the Public Works
Office, Marine Corps Base,
Camp Lejeune, North Carolina

NAVDOCKS
SPECIFICATION
NO. 7525/56

NEW RAW WATER WELL HADNOT POINT WATER SYSTEM

at the

Marine Corps Base, Camp Lejeune, N. C.

CONTRACT NBY-7525

Appropriation: 1771106.11 MGT&F 1957

A priority rating, in consonance with the rating system in effect at the time of award of this contract, will be issued by the Bureau of Yards and Docks.

CONTENTS

SECTION

SECTION

1. General Clauses

6. Piping

2. Earthwork

7. Interior Electrical

3. General Construction

8. Exterior Electrical

4. Well Construction

9. Bids

5. Well Pumping Equipment

SECTION 1. GENERAL CLAUSES.

1-01. General intention. - It is the declared and acknowledged intention and meaning to provide and secure a new raw water well and connecting raw water main complete and ready for use.

1-02. General description. - The work includes the construction of one well complete with a well house, deep well pump, piping and electrical work together with connecting raw water main, clearing, grubbing, grading, and exterior electrical work.

1-03. Location. - The work shall be located at the Marine Corps Base, Camp Lejeune, North Carolina, approximately as shown. The exact location will be indicated by the Officer in Charge.

1-04. Form of contract. - The contract will be executed on U. S. Standard Form No. 23 revised March 1953, and will include U. S. Standard Form No. 23A March 1953, General Provisions, and NavDocks Form 113, revised January 1956, Additional General Provisions, with the following modifications:

(a) The phrase "including connection charges" is inserted after the word 'utilities' in the fifth sentence of Clause 43, Government Utilities of Form No. NavDocks 113.

(b) At the end of Clause 17 of Form No. 23A, add the following thereto:

"No materials, supplies or manufactured products originating from sources within Soviet-controlled countries or areas shall be used, furnished or installed under this contract. The prohibited areas presently include: Albania; Bulgaria; China, including Manchuria (and excluding Taiwan (Formosa)) (includes Inner Mongolia; The Provinces of Tsinghai and Sikang; Sinkiang, Tibet; The Former Kwantung Leased Territory, The Present Port Arthur Naval Base Area and Lisoning Providence), Communist-controlled area of Viet Nam and Communist-controlled area of Laos, Czechoslovakia, East Germany (Soviet Zone of Germany and the Soviet Sector of Berlin), Estonia, Hungary, Letvia, Lithuania, North Korea, Outer Mongolia, Poland and Danzig, Rumania, Union of Soviet Socialist Republics."

1-05. Performance and payment bonds. executed on U. S. Standard Form Nos. 25 and 25A, respectively, will be required as stipulated in U. S. Standard Form No. 20, revised March 1953, Invitation for Bids.

1-06. Time for completion. - The entire work shall be completed within 150 calendar days after date of receipt of a notice of award or any other communication authorizing the contractor to proceed.

1-07. Damages for delay in accordance with Clause 5 of U. S. Standard Form No. 23A shall be at the rate of \$25.00 per calendar day. The Government will take no action pursuant to Clause 5, Liquidated Damages, to terminate the right of the contractor to proceed or to assess liquidated or actual damages where the failure of the contractor to complete the work within the time specified elsewhere in this contract is due solely to the operation of the priorities and allocations system and is not otherwise caused by the fault or negligence of the contractor. It is understood and agreed that such delays will be considered an act caused by the Government, and as such will be excusable within the meaning of Clause 5, and the contractor will be entitled to a time extension by reason thereof.

1-08. Drawings accompanying specification. - The following drawings accompany this specification and are a part thereof. Drawings are the property of the Government and shall not be used for any purpose other than that contemplated by the specification.

<u>Y&D Drawing No.</u>	<u>Title</u>
647003	Index and Location Plan
647004	Site and Utility Plan, Connecting Water Main and Details
647005	Well House, Piping, Electrical and Details

1-09. Standard specifications. - The standard specifications given in the following list or mentioned elsewhere herein (including the addenda, amendments, and errata listed) shall govern in all cases where references to standard specifications are made. In case of difference between these standard specifications and this specification or its accompanying drawings, this specification or its accompanying drawings shall govern. Especial care shall be exercised to refer in request for quotations, in orders, and in subcontracts to the standard specifications and to all modifications thereof. The requirements for packaging, packing, marking, and preparation for shipment or delivery included in the standard specifications shall apply only to materials and equipment which are furnished directly to the Government and not to materials and equipment which are to be installed by the contractor.

BUREAU OF YARDS AND DOCKS

7Yg	Jan	1934	Roofing, siding, and sheet metal work; damp proofing and membrane water proofing; including Addendum No. 2
9Yf	Oct	1946	Electrical apparatus, distributing systems and wiring; including Addendum No. 1.
10Yc	Jan	1938	Metal windows

SPECIFICATION NO. 7525/56

13Ye	Nov.	1955	Concrete construction, including Addendum No. 1
28Yc	Oct.	1944	Carpentry and joinery
32Ya	June	1935	Metal doors
42Ya	May	1947	Manholes and frames and covers

FEDERAL

DD-G-451a	June	1951	Glass, flat and corrugated, for glazing, mirrors, and other uses; including Amendment No. 1
FF-B-575	May	1955	Bolts, hexagon and square
FF-H-106a	Dec.	1952	Hardware, builders'; locks and door-trim, including Amendment No. 1
FF-H-116b	Oct.	1947	Hardware, builders'; hinges (nontemplate), including Amendment No. 2
HH-G-76b	May	1955	Gaskets, asbestos metallic cloth
QQ-L-156	Nov.	1946	Lead, caulking; including Amendment No. 1
QQ-S-775	Mar.	1955	Steel, sheet, zinc-coated, including Amendment No. 1
SS-B-656	June	1932	Brick, building (common), clay
SS-C-192a	Apr.	1954	Cements; portland, including Amendment No. 1
TT-P-781a	July	1943	Putty and elastic-compound for metal-sash glazing, including Amendment No. 1
WW-P-406	June	1945	Pipe; steel and ferrous alloy (for) ordinary uses (iron pipe size), including Amendment No. 1
WW-P-421a	Mar.	1955	Pipe; cast iron, bell-and-spigot, water
WW-P-441b	Dec.	1953	Pipe, wrought iron, (welded, black or zinc-coated) including Amendment No. 1
WW-P-521c	June	1956	Pipe-fittings; malleable iron (wrought iron and steel) (screwed) 150-pound
WW-V-54	June	1954	Valves, bronze, gate; 125-and 150-pound, screwed and flanged (for land use), including Amendment No. 2
SS-P-351a	Oct	1953	Pipe, asbestos-cement.

MILITARY

MIL-V-18436 Jan. 1955 Valves, check

NON-GOVERNMENT

Note. - Non-Government standards are not available for distribution by the Department of the Navy; application therefor should be made to the issuing organization.

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS
Standard Method M-41-49, T 147-49, T 99-49

AMERICAN STANDARDS ASSOCIATION
Specification A21.10

AMERICAN WATER WORKS ASSOCIATION
Standard Specifications: C-100, C 500-52T, C 601-48

1-10. General specification for inspection of materials (issued by the Navy Department) with such appendices thereto as may be applicable, of the issues in effect on the date of the invitation for bids, shall govern for the factory inspection of materials and equipment required under the contract including materials and equipment specified in detail herein or covered by standard specifications. (See also Clause 9 of U. S. Standard Form No. 23A). Factory inspection of material and equipment for which tests at the place of manufacture are required may be waived at the option of the Government, provided notarized copies of factory test reports are furnished which show compliance with the specification requirements. Factory inspection will not be required for lumber provided it is grade-marked and trade-marked by the association under whose rules it is graded, or provided it is accompanied by certificates of inspection issued by the association under whose rules it is graded or by another inspection agency which is satisfactory to the Officer in Charge.

1-11. Optional requirements. - Where a choice of materials and/or methods is permitted herein, the contractor will be given the right to exercise the option unless stated specifically otherwise.

1-12. Definitions. - Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference to the drawings accompanying this specification is made unless otherwise stated. Where "as directed", "as required", "as permitted", "approved", "acceptance", or other words of similar import are used, it shall be understood that the direction, requirement, permission, approval or acceptance of the Officer in Charge is intended unless stated otherwise. As used herein, "provide" shall be understood to mean "provide complete in place", that is "furnish and install".

1-13. Drawings required of the contractor. - Before commencing the installation of any of this work, the contractor shall submit for approval and in accordance with Clause 29 (F) of NavDocks Form No. 113 such drawings as may be required, including those showing:

(a) Manufacturer's descriptive and technical data for watt-hour meter.

(b) Manufacturer's specifications and illustrations for deep well pump showing pump characteristic curves, maximum horsepower required, pump dimensions, make and horsepower rating of electric motor and make and description of starter.

(c) Manufacturer's specifications and illustrations for water meter and pressure air valve.

1-14. Rates of wages at the site. - (See Clause 20 of U. S. Standard Form No. 23A). The contractor shall pay mechanics and laborers employed or working directly upon the site of the work, wage rates not less than those contained in the wage determination decision of the Secretary of Labor No. R-5216, which is attached hereto. Any class of laborers and mechanics not listed in the Secretary's decision, which will be employed on the contract, shall be classified or reclassified by the contractor or sub-contractor conformable to the Secretary's decision subject to the approval of the contracting officer; the classification shall be submitted on Form NavDocks 1882 to the Officer in Charge for approval, prior to their employment in any work under the contract. In the event the interested parties cannot agree on the proper classification or re-classification of a particular class of laborers and mechanics to be used, the question shall be submitted through the contracting officer to the Secretary of Labor for final determination. Where differing rates are listed for the same trades according to the type of construction on which employed, their application shall be conformable to prevailing area practice, subject to the approval of the Officer in Charge.

(a) Required by Davis-Bacon Act. - The wage determination decision of the Secretary of Labor attached hereto is made a part of this contract solely for the purpose of setting forth the minimum hourly wage rates required to be paid by the Davis-Bacon Act and is not to be considered as a guaranty, warranty, or representation as to the wage determination decision, the wage rates therein, the prevailing wages, or the availability of labor at the wage rates indicated. Bidders are advised to make their own investigations and to rely solely upon their own information as to local labor conditions, such as wage rates necessary to attract labor, the length of the work day and work week, overtime compensation, health and welfare contributions and available labor supply, and as to prospective changes or adjustments of wage rates or employment conditions in the area concerned which might affect operations under the contract. Neither a mistake in attaching the wage determination decision of the Secretary of Labor or in the determination or statement of the wage rates set forth therein, nor the payment of higher wage rates than those set forth therein shall entitle the bidder to the cancellation of his bid or contract, to an increase in the contract price, or to other additional payment or recovery, except when the contracting officer modifies the specified wage rates and when the requirements of subparagraph (b) below are satisfied.

(b) Modification of Minimum Wage Rates. - The Contracting Officer reserves the right to require the contractor to pay the minimum wages set forth in the wage determination which is applicable to this contract and in effect at the time of award (irrespective of the wage rates set forth in the specification) and, if necessary, to modify the contract accordingly. The Government shall not be liable to the contractor to increase the contract price or to make any other additional

payment as a result of any such modification made by the Contracting Officer in the specified wage rates, except that an equitable contract price adjustment shall be made (1) when the contractor clearly demonstrates that his investigation of the wage rates at the site did not, and that a reasonable investigation could not, disclose that wage rates higher than those previously specified would have to be paid, and (2) when the contractor clearly demonstrates that he actually and reasonably based his bid or proposal upon wage rates lower than those required to be paid by such modification.

(c). Apprentices employed pursuant to this determination of wage rates must be registered in a bona fide apprenticeship program registered with a State apprenticeship council recognized by the Federal Committee on Apprenticeship, U. S. Department of Labor; or if no such recognized council exists in a State, it shall mean a program registered with the Bureau of Apprenticeship, U. S. Department of Labor.

1-15. Work outside regular hours. - If the contractor desires to carry on work outside the regular hours or on Saturdays, Sundays, or holidays, he may submit application to the Officer in Charge, but shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, he shall light the different parts of the work in an approved manner.

1-16. Government work and materials. - The Government will furnish three 5KVA 12,470/240/120 volt transformers for installation under this contract.

1-17. Security requirements. - No employee or representative of the contractor will be admitted to the site of the work unless he furnishes satisfactory proof that he is a citizen of the United States or if an alien, his residence within the United States is legal.

1-18. Storm protection. - Should warnings of winds of gale force or stronger be issued, the contractor shall take every practicable precaution to minimize danger to persons, to the work, and to adjacent property. These precautions shall include closing all openings; removing all loose materials, tools, and/or equipment from exposed locations; and removing or securing scaffolding and other temporary work.

1-19. Approval of samples, cuts, and drawings. - Matter submitted for approval shall be accompanied by complete information concerning the material, articles, and/or design proposed for use in sufficient detail to show compliance with the specification; and shall be approved before incorporation into the work. Approval thereof will not be construed as relieving the contractor of compliance with the specification, even if such approval is made in writing, unless the attention of the Officer in Charge is called to the non-complying features by letter accompanying the submitted matter. Partial submittals, or submittals of less than the whole of any system made up of inter-dependent components, will not be considered. Approval of drawings, cuts, and

samples by the Officer in Charge shall not be construed as a complete check nor approval of the detailed dimensions, weights, gauges, and similar details of the proposed articles. The conformance of such details with the contract requirements, together with the necessary coordination of dimensions and details between the various elements of the work and between the various subcontractors and suppliers, shall be solely the responsibility of the contractor; approval of submitted matter notwithstanding.

1-20. Methods and schedules of procedure. - The work shall be executed in a manner and at such times that will cause the least practicable disturbance to the occupants of the buildings and the normal activities of the station. Before starting any work, the sequence of operations and the methods of conducting the work shall have been approved.

1-21. Operation of station utilities. - The contractor shall not operate nor disturb the setting of any valve in the station water system. The Government will operate the valves as required for normal conduct of work. The contractor shall notify the Officer in Charge, giving reasonable advance notice, when such operation is required.

1-22. Examination of premises. - Before submitting proposals, bidders are expected to visit and inspect the site of the work and satisfy themselves as to the physical conditions at the site; the general and local conditions, including availability of labor, the nature and extent of the work, the character and effect of existing adjoining and/or adjacent work; and other factors that can affect the cost of the performance of the contract to the extent that such information is reasonably obtainable.

1-23. Protection and repairs. - The contractor shall comply with the Fire Prevention Requirements, as published by the Officer in Charge of Construction, security rules and regulations of the activity, and shall provide approved means necessary for the protection of all Government and private property, including contents of buildings affected directly or indirectly by his operations. All damage to Government or private property, resulting directly or indirectly from the contractor's actions, shall be made good by him without expense to the Government.

1-24. Existing work damaged or otherwise affected by the contractor's operations shall be restored to a condition as good as existed before the work was commenced, except where indicated or specified otherwise. Where new construction adjoins, connects to, or abuts the existing work, the junction shall be made in a substantial workmanlike and weathertight manner as the case requires. All new work shall match, as nearly as practicable, the existing adjoining and/or adjacent similar work unless indicated otherwise. Except where specifically designated as being retained by the Government or to be re-installed in the new construction, all materials, fixed equipment, and/or debris resulting from demolition and removal operations shall be removed by the contractor from the limits of the Government reservation at such times during the progress of the work as directed.

1-25. Accident reports. - The contractor and his subcontractors shall maintain an accurate record of, and shall report to the Officer in Charge, exposure data and all accidents resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, and equipment incident to work performed under the contract. The report shall be in accordance with the pamphlet entitled "Instructions to Contractor for Preparation of Accident Reports, NavDocks P-275" and shall be submitted on the standard form prescribed therein; the pamphlet and the required forms will be furnished by the Officer in Charge.

1-26. Payrolls and affidavits. - The prime contractor, subcontractors, and sub-subcontractors will be required to submit a copy of each weekly payroll together with a Notarized Contractor's Weekly Payroll Affidavit covering the payroll to the Officer in Charge of Construction within seven days after the regular payment date of the payroll period. The receipt of these payrolls and affidavits is made a condition precedent to payment for any amounts due under the contract.

(a) The payroll shall be identified by the name of the contractor, NBy Contract Number and the location of the site of the work. Payrolls shall state accurately and completely for each employee, his name, classification, social security number, rate of pay, daily and weekly hours worked, wages earned, all deductions from such wages and the actual weekly wages paid. Contractors are required to submit employees addresses with the payroll on which the employee's name first appears.

(b) Contractor's Weekly Payroll Affidavit (NavDocks Form 118) (1-55) which must be used shall be reproduced by the contractor for his use. This form combines the required payroll affidavit and certification of payrolls. In order to provide uniformity with regard to information, contractors are advised to list by title, or name, all deductions made, omitting from the listing, the dollar amount of the deductions.

(c) A sworn affidavit accomplished by the contractor, stating that he and his subcontractors have complied with the Labor Standards provisions of the contract, must accompany each request for reimbursement. Affidavit form will be furnished by the Officer in Charge of Construction.

1-27. Schedule of prices. - Upon award of the contract, the contractor shall promptly prepare Y&D Form 83, "Schedule of Prices"; in octuplicate and submit to the Officer in Charge of Construction. Submission of these prices shall not affect the contract terms. These forms will be furnished by the Officer in Charge of Construction.

1-28. Sub-contractors and personnel. - Promptly after the award of the contract, the contractor shall submit to the Officer in Charge of Construction in triplicate, a list of his subcontractors and the work each is to perform.

(a) On this form shall appear the names of the key personnel of the contractor and subcontractors, together with their home addresses and telephone numbers, for use in event of an emergency.

(b) From time to time as changes occur and additional information becomes available, the contractor shall amplify, correct and change the information contained in previous lists.

1-29. Lines and grades required for execution of the work shall be established by the contractor.

1-30. As-built drawings. - On completion of the work, one print of each of the drawings accompanying this specification shall be neatly and clearly marked in red to show all variations between the construction actually provided and that indicated or specified in the contract documents, and delivered to the Officer in Charge. Where a choice of materials and/or methods is permitted herein; and where variations in the scope or character of the work from the entire work indicated or specified is permitted either by award on bidding items specified for that purpose or by subsequent change to the contract; the as-built drawings shall define the construction actually provided. The representation of such variations shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as may be necessary for legibility and clear portrayal of the as-built construction; the marked prints shall be subject to approval before acceptance.

1-31. Quarantine. - The entire Camp Lejeune reservation, including Camp Lejeune, Camp Geiger, and Marine Corps Air Facility, Peterfield Point (New River) have been quarantined by the United States and North Carolina Departments of Agriculture for the White Fringed Beetle. Compliance with the quarantine regulations established by these authorities as set forth in the U. S. D. A. Quarantine No. 72 and North Carolina State Quarantine No. 7 is required for operations hereunder. Pertinent requirements of the quarantines include the following:

(a) Certification is required for the following articles and they shall not be moved from the reservation unless accompanied by a valid inspection certificate issued by an authorized White Fringed Beetle Inspector.

1. Soil, sand, or gravel moved independently or attached to other articles, such as heavy equipment including drag lines, road grading machines, ditch diggers, bulldozers, and equipment with track or cleats.

2. Nursery stock, plants and sod.

3. Scrap metal.

Authorization for movement of equipment shall be obtained from the Officer in Charge, and requests for inspection shall be made sufficiently in advance of the date of movement, to permit arrangements for the services of authorized inspectors. The equipment shall be prepared and assembled so that it may be readily inspected. Articles and materials requiring certification for movement shall be removed from the equipment by washing with water and such other means as are necessary to accomplish complete removal. Resulting spoil shall be wasted as directed.

1-32. Cleaning up. - Upon completion of the work, the contractor shall remove all debris from the site. All debris shall be hauled to a Government dump, a distance not exceeding 2 miles from the site of the work, and placed where directed and the premises shall be left free from all litter and refuse; exterior grounds shall be left in a raked, clean condition.

SECTION 2. EARTHWORK

2-01. Elevations and obstructions. - Bids shall be based on the following:

- (a) That the surface elevations are as indicated;
- (b) That no pipes or other artificial obstructions, except those indicated, will be encountered; and
- (c) That hard material will not be encountered.

In case the actual conditions differ substantially from those stated and/or shown, the provisions of Clause 4 of U. S. Standard Form No. 23A respecting an adjustment for changed conditions shall apply, subject to the requirement of notification thereunder being given. Hard material shall be defined as solid ledge rock, boulders more than one-half cubic yard in volume, or any cemented material requiring blasting for removal.

2-02. Topsoil. - Material from the excavation suitable for topsoil shall be deposited in piles separate from other excavated material. Piles of topsoil shall be so located that the material can be used readily for the finished surface grading in the areas designated for planting, and the topsoil shall be protected and maintained until needed. Topsoil shall be spread to a uniform thickness of four inches over the ground in the areas where the natural soil condition has been disturbed as a result of the operations of this contract. If sufficient topsoil cannot be secured from the project area site, it shall be secured from borrow pits less than five (5) miles distant. Where used for finished grading of the surfaces to be planted to grass, topsoil shall be spread uniformly over the designated areas.

2-03. Clearing and grubbing. -

(a) Clearing shall be performed within the entire project area which is defined as being in the area bounded by a distance of 10 feet from building line on all sides and 5 feet each side of underground utility lines. Clearing shall consist of the cutting, removal, and satisfactory disposal of all trees, downed timber, brush, projecting roots, stumps, lapwood, rubbish, and all other objectionable material within the project area.

(b) Grubbing shall be performed within all areas previously designated for clearing and shall consist of the excavation, removal and satisfactory disposal of all stumps, roots, logs and other objectionable material from within the area as defined.

(c) Disposal of cleared and grubbed material. -

1. All trees from which saw logs, pulpwood, posts, poles or ties can be produced shall be considered merchantable timber. All merchantable timber shall be trimmed of limbs and tops and shall be sawed into merchantable lengths and stockpiled adjacent to the site in areas designated by the Officer in Charge.

2. All shrubs, brush, stumps, matted roots, refuse and other objectionable material shall be burned within the cleared area, except that when permitted by the Officer in Charge, large stumps and other material that will not burn may be otherwise disposed of. Materials that will not burn will be considered debris and disposed of as outlined elsewhere in these specifications. All fires for burning refuse shall be at locations specified by the Officer in Charge and shall be tended in a manner to eliminate all hazards to buildings, structures, trees, and other property. The Officer in Charge shall be notified before fires are set. Disposal by burning shall be under constant attendance until the embers have burned out or have been extinguished.

2-04. Excavation. -

(a) General. - All materials shall be excavated to dimensions and levels indicated on the drawings or in these specifications. Where roots, stumps, or other materials have been removed or excavations carried below grade, the spaces shall be filled with clean, thoroughly compacted earth except that when excavations for structures are carried below grade the spaces shall be filled with concrete of the same class as that of the structure.

(b) Trenching. - Pipe trenches shall be excavated true to line and grade and of sufficient width to afford six inches clearance between trench wall and extreme outside dimension of the pipe. In the excavation of pipe trenches, beds of clean, well tamped earth shall be provided, so placed as to insure that the full length of the pipe barrel is supported by a firm but slightly yielding bed.

(c) Trench backfill. -

1. As soon as practicable after the pipe has been installed and tested, backfilling of the space between pipe and sides of the trench shall be packed full by hand shovel with selected sand and thoroughly compacted with hand tamper as fast as placed up to a level one foot above top of pipe. The fill shall be placed uniformly on both sides of the pipe and neither horizontal nor vertical alignment of the pipe shall be disturbed.

2. The remainder of the trench shall be filled with clean earth free from vegetation or other objectionable material, and compacted as directed, either by puddling, rolling or mechanical tamping dependent upon the method best suited to the materials, sufficiently to prevent subsequent settlement.

3. Puddling. - If backfill material is compacted by puddling, it shall be done by depositing the material in water. Where dams or dikes are constructed in trench to hold back water used for puddling, they shall be compacted by mechanical tamping as described below.

4. Rolling. - If backfill material is compacted by rolling, a satisfactory roller or a tractor with caterpillar tread shall be used after the trench has been filled, care being exercised to compact thoroughly the material close to the bank as well as that in all other portions of the trench.

5. Mechanical tamping. - Where impractical to compact by other methods, and under all roadways, service drives, and other travelled areas, the backfill material shall be compacted by mechanical tamping. Clean, refuse-free material shall be placed in six inch layers and each layer thoroughly tamped with an approved mechanical tamper. If required, material shall be wet by sprinkling before rolling or tamping.

6. Whatever method is used, care shall be taken that lumps shall not become nested and that all voids between lumps shall be completely filled with fine material. No large masses of backfilling material shall be dropped into the excavation, as from a grab bucket, in such a manner as to disturb pipe or structure.

(e) Drainage during construction. - During excavation operations, the work shall be kept shaped and drained at all times. Drains and ditches to insure proper drainage shall be installed as required.

2-05. Shoring and Pumping. - Excavations shall be shored and braced by numbers of suitable sizes and arrangement where necessary to prevent danger to persons or structure, injurious caving or erosion. Shoring, bracing, and sheeting shall be removed, as the excavations are back-filled, in a manner such as to prevent injurious caving. Excavations shall be kept free from water while construction therein is in progress.

2-06. Embankment. - Where shown, embankments are to be formed to the lines, grades and elevations indicated.

(a) All depressions or holes below the ground surface, whether caused by grubbing or otherwise, shall be backfilled with suitable material and compacted to the ground surface before construction of embankment will be permitted to start.

(b) Preparation of subgrade. - Immediately prior to the placing of fill materials, the entire area upon which embankment is to be placed shall be scarified and harrowed to a depth of 6 inches. Scarifying shall be done approximately parallel to the axis of the fill. All roots, stones, or other objectionable material that would cause interference with compaction of the fill shall be removed and disposed of, as directed. A thin layer of fill material (approximately 3 inches thick) shall be spread over the scarified foundation and compacted to the required density.

(c) Material. - Embankments shall be formed of approved material spread in horizontal layers for the widths approved by the Officer in Charge of Construction. The material shall be placed in successive layers not to exceed 12 inches of loose thickness and shall be compacted to a density of 90 percent as determined by compaction test specified hereinafter.

(d) Slopes. - All slopes shall be trimmed neatly to the lines shown on the drawings, and all work shall be left in a finished, neat, and acceptable condition.

(e) Maintenance of embankment. - The contractor, shall be responsible for the stability of all embankments and shall replace all sections which have been damaged or misplaced due to the carelessness or neglect on the part of the contractor or due to natural causes other than those attributable to the unavoidable movement of the natural ground upon which the embankment is made until completion of the work.

2-07. Filling, backfilling, and grading. -

(a) Immediately prior to the placing of fill material, the entire area of original ground under concrete slabs which are to be placed on fill shall be scarified and harrowed to a depth of 6 inches. All roots, stones, or other objectionable material that would interfere with compaction of the fill shall be removed and disposed of as directed. A layer approximately 3 inches thick of fill material shall be spread over the scarified foundation and compacted to the required density.

(b) Material for fill and backfill shall be free from vegetable matter and refuse, and the moisture content shall be such that proper compaction will be obtained. Fill and backfill under concrete slabs shall be placed in successive layers not more than 6 inches thick and compacted.

(c) All backfill about the structures shall be placed, as far as practicable, as the work of construction progresses, except that backfilling against foundation walls shall be done only when directed.

(d) Finished site grading in all cases shall conform to the grades shown on the drawings. Local variations above or below the grades shown on the drawings will be acceptable provided the variations represent unavoidable waves in the surface and not sharply defined hollows or high spots. All grades shall be sloped to drain surface water away from structures. Abrupt changes in slopes shall be rounded. All work shall be left in a finished, neat and acceptable condition for subsequent operation.

2-08. Compaction tests.

(a) Wherever in the specifications percentages of density are called for, the percentages actually obtained shall be measured by in-place density tests made in accordance with A.A.S.H.O. Standard Method T 147-49.

(b) The in-place densities actually obtained shall equal or exceed the percentages of laboratory maximum densities at optimum moisture content, as determined in accordance with A.A.S.H.O. Standard Method T 99-49.

(c) Samples of all materials for testing, both before and after placement and compaction, will be taken at frequent intervals and if the degree of compaction obtained is not as specified, additional compaction will be required.

2-09. Borrow. - If borrow is required, it shall be taken only from approved locations. Borrow pits shall be so excavated that drainage is provided and shall not be left in unsightly or unsanitary condition. Maximum soil borrow haul shall not exceed two miles.

2-10. Disposal of surplus material. - Surplus material not required or unsuitable for fill, backfill, or grading shall be wasted as directed; waste haul shall not exceed two miles.

2-11. Seeding. - Areas specified to receive topsoil shall be seeded. The quality of all fertilizer, lime and seed and all operations in connection with the furnishing of this material shall comply with the requirements of the North Carolina Fertilizer, Lime and Seed Law; and with the rules and regulations adopted by the North Carolina Board of Agriculture in accordance with the provisions of said law.

(a) Seeding operations shall not be done if the completion of the work should occur after November 15 and before March 1, in this event the seeding shall be done by Government forces during the next planting season and adjustment in the contract price will be made in accordance with Clause 4 of Standard Form 23A.

1. Lime and fertilizer shall be uniformly spread over the area and thoroughly disced, harrowed or raked into the top one and one-half inches of surface, and watered. The lime will be applied at the rate of 20 pounds per 1,000 square feet and fertilizer at the rate of 12 pounds per 1,000 square feet at least three days before seeding. The lime shall be an approved hydrated agricultural lime. The fertilizer shall be a ready-mixed fertilized or organic base bearing analysis of a recognized authority. Formula for the fertilizer shall be 6% nitrogen, 8% phosphoric acid, and 6% potash. Both lime and fertilizer shall be delivered on the job in the manufacturer's container, plainly marked and unopened.

2. The seed shall be delivered to the job in original containers showing the guaranteed seed mixture, which shall contain the following percentages by weight.

80% Bermuda Grass
20% Red Top (Herd Grass)

No seed in the mixture shall show a purity of less than 90% or germination equality of less than 85%. The seed shall be uniformly sown, at the rate of seven pounds per 1,000 square feet of area, by hand or approved seeding equipment. The surface of the seed bed shall be lightly raked or otherwise worked to cover the seed with a layer of soil not more than one-fourth inch in depth, after which it shall be rolled with an approved lawn roller, weighing not more than two hundred ten pounds per foot of width, and watered with a fine spray.

3. No lime, fertilizer or seed shall be applied when the wind is strong or when the soil is extremely wet or otherwise workable. No rolling shall be done if precipitation after seeding should make the operation detrimental to the seed bed. The contractor shall notify the Officer in Charge and receive his approval before performing any planting operation. All seeded areas shall be maintained by watering, mowing, and weeding for a period of thirty days after rolling has been completed.

SECTION 3. GENERAL CONSTRUCTION.

3-01. Concrete. - Concrete shall conform to the requirements of Specification No. 13Ye, Class D-1. The earth under foundations and slab on grade shall be wetted before placing concrete. Ready-mixed concrete may be used. Forms shall conform to paragraph 4-02 of Specification No. 13Ye. Concrete interior floor shall be given a dusted-on finish in accordance with paragraph 9-04 of Specification 13Ye. Suitable chamfers shall be provided at edges of machinery foundations. Miscellaneous fastenings shall be placed and secured in position when concrete is poured.

3-02. Masonry.

(a) **Brick** shall be hard, select common. Variations from the nominal dimensions, $2\frac{1}{4}$ inches by $3\frac{3}{4}$ inches by 8 inches, shall not exceed the tolerances given in Specification No. SS-B656. Brick shall meet the absorption and strength requirements as given in Specification No. SS-B-656, for Grade H. All brick shall have true faces and straight, sharp edges and shall be so handled that exposed edges and faces shall be free from chips, spalls and cracks.

(b) **Concrete masonry units** shall be of approved texture, load bearing type laid in masonry cement mortar composed of one part masonry cement and three parts sand by volume. The masonry units shall be laid in an approved manner with cells vertical and with full mortar joints on face shells. Joints shall be one half inch thick, slightly concave and on completion the masonry shall be cleaned as directed.

(c) **Precast stone and lintels.** - Precast concrete for window sills and coping shall be Class G-0.75 concrete in accordance with Specification No. 13Ya. Reinforcement shall be two No. 3 rods. The sills and coping shall have a smooth finish and shall be set level and true to line with the faces kept free from mortar. Lintels shall be cast from material similar to that used in the masonry units, reinforced as shown.

3-03. Miscellaneous steel and work shall be well formed as to shape and size, free from mill scale, flake, rust, and pitting. Steel shall be stock material of commercial quality. All steel and iron work shall receive a shop coat of red lead paint.

3-04. Roofing and sheet metal. - The work shall conform to the requirements of Specification No. 7Yg and the roof shall be Type 4 TWS: sheet metal to be zinc-coated sheet steel in accordance with paragraph 1-23 of Specification No. 7Yg and shall be Type A, Class 5. Specification No. QQ-S-775 with the gravel stop fastened to wood sheathing by means of metal clips. The roof hatch shall be metal covered with soldered flat seams as detailed.

3-05. Metal windows and door. - Metal windows shall conform to the applicable requirements of Specification No. 10Yc, shall be commercial projected type made of steel, given an approved rust-preventative treatment and equipped with all necessary hardware. The metal door shall be pressed steel conforming to the requirements of paragraph No. 3-02 of Specification No. 32Ya; 1-3/4 inches in thickness with stiles and rails 4-1/2 inches wide and sheet steel for forming stiles and rails and sheets for panels not less than .0598 inches in thickness. Door frame shall be pressed steel not less than .0598 inches in thickness provided with anchors for building into the masonry. Door and frame shall be given a shop coat of red lead paint.

3-06. Glazing. - Glass shall be clear sheet glass, Type II, B quality, double strength in accordance with Specification No. DD-G-451a. Elastic glazing compound Type I, conforming to Specification No. TT-P-781a shall be used for glazing metal sash.

3-07. Carpentry. - Wood framing material shall be No. 2 dimension Southern pine or No. 2 Douglas fir. Carpentry work shall conform to the applicable requirements of Specification No. 28Yc; the material to have a content of not more than 19 per cent. Millwork material shall be No. 1 tidewater red cypress or No. 2 Douglas fir or No. 2 Northern white pine with a moisture content of not more than 15 per cent. All hardware items shall be carefully fitted and securely attached.

3-08. Caulking. - Caulking shall be installed at all exterior joints between windows and masonry and at the head and jamb of exterior contacts between the door and the masonry and shall be an approved type of caulking compound installed under pressure in order to make watertight contact between frames and masonry walls.

3-09. Hardware for door shall be as follows:

1 cylinder lock, type 86 J-4, U. S. 10 finish in accordance with Specification No. FF-H-106a.

1-1/2 pair of butts, type B2080 1/2P in accordance with Specification No. FF-H-116b.

3-10. Field painting. - Paint materials shall be applied to dry and thoroughly clean surfaces and shall be of approved types and brands. Any abraded surfaces on shop painting of exterior metal including sheet metal, door and windows shall be touched up. Afterwards the metal shall be given two coats of ready-mixed lead and oil paint. The first coat to consist of paint mixed with one pint of turpentine to the gallon and the final coat to consist of the paint without admixture. Exterior wood shall be primed with an approved

type of ready-mixed white lead and oil paint; the priming coat to consist of paint with one pint of linseed oil to the gallon and the two following coats to be of the same type of paint as specified above on exterior metal. Interior metal shall be painted with the same treatment as specified above for exterior metal. Electrical switches and fuse boxes shall be painted to conform to Government Safety Code Requirements. No painting is required on interior masonry walls nor on structural lumber exposed on the underside of the roof.

SECTION 4. WELL CONSTRUCTION.

4-01. General requirements. - The work includes the provision of one test well and one 8-inch permanent gravel-wall well as indicated and as hereinafter specified.

4-02. Depth and capacity of well. - It is the intent of these specifications to drill one exploratory test well and one permanent gravel wall well, the latter to produce from 200 to 300 gallons per minute of potable water continuously. Bids shall be based on the test well having an average depth of 200 feet, and the permanent wells having a depth of 200 feet in accordance with the typical well section shown and the following construction details:

(a)	Total depth of well	200 feet
(b)	Total length of 18" outer casing	40 feet
(c)	Total length of 8" inner casing	150 feet
(d)	Total length of 8" screen, eight sections totalling	40 feet

In case the actual conditions differ substantially from this, an adjustment in the contract price and/or the time for completion of the work will be made in the same manner as provided by Clause 4 of U. S. Standard Form 23A.

4-03. Test well. -

(a) The contractor shall drill a test well at the site before construction of the permanent well is started. The test well shall be of sufficient size to obtain the necessary information required for the construction of the permanent well. The location, size of well and method of drilling must be approved before work is started.

(b) The contractor shall keep an accurate log and record of all materials drilled through and the depths at which changes in formation occur.

(c) Samples of the type of material found in each stratum shall be taken by the contractor and preserved in approved containers furnished by the contractor. Samples shall be appropriately labeled to show depth below ground surface and thickness of the stratum from which the sample was obtained.

(d) All water bearing strata must be described in detail as to whether material is loose or compact, it's color, and if gravel, whether it is water-worn or angular. The presence of clay must be noted.

(e) The contractor shall collect and have analyzed samples of water from all water bearing strata encountered so as to accurately show the quality of water from each stratum. These preliminary tests shall show in P.P.M. the phenolphthalein alkalinity, total alkalinity, chlorides, carbon dioxide, carbonates, bicarbonates, turbidity, odor and pH.

(f) Test wells not incorporated in the finished construction shall be sealed in an approved manner to prevent contamination of the underlying ground water.

4-04. Permanent gravel wall well. -

(a) A pit casing shall be installed by drilling a 24 inch diameter hole to the first hard clay or rock stratum and placing an 18 inch diameter outer casing of the type hereinafter specified.

(b) The area between the outer well casing and the native formation shall be thoroughly washed out and filled with Portland cement grout, by pumping with approved equipment. The grout shall be pumped under pressure through a temporary down feed pipe in the well so arranged that the grout will be forced into the bottom of the annular space between the casing and the hole. Grout shall be pumped continuously, in one operation, until the annular space and all voids and fissures are completely filled, as evidenced by the grout overflowing on the surface. The grout shall be allowed 48 hours to set up before drilling operations are resumed.

(c) A 17-1/2 inch hole shall be drilled below the bottom of the pit casing and concentrically with it for a distance which shall be determined by the Officer in Charge. An 8 inch screen line composed of casing and screen as hereinafter specified shall be installed and completely enveloped by gravel. The location and length of screens installed shall be as directed. The gravel shall be pumped into place under pressure, through a temporary pipe line, extending to the bottom of the screen. The pipe line shall be raised as the gravel fills the hole, so that the lower end of the pipe shall always be 2 feet to 6 feet below the gravel level. It is intended that the gravel shall completely fill the space provided for it, without voids which would allow the infiltration of sand. The contractor must satisfy the Officer in Charge that the methods and equipment for placing the gravel, which he proposes to use, will achieve this result, and the Officer in Charge shall approve such methods and equipment before gravel placing is begun.

(d) Water level testing device. - A 1/4 inch wrought iron pipe shall be provided for measuring the water level in the well. The pipe shall be tapped or brazed into the top section of the screen and extended on the outside of the well casing to the pump foundation. Pipe shall be fitted with an air valve, for connection to air pump and with an altitude gauge. The entire installation shall be air tight. Altitude gauge and pipe shall be in accordance with piping section.

(e) When the well has been completed, the contractor shall install a temporary pump, and pump the well until it is free of all sand, mud, drillings, or other foreign matter.

4-05. Materials.

(a) The 18-inch outer casing shall be standard weight, black steel pipe conforming to Specification No. WW-P-406, Type I, Class A. The 8 inch inner casing shall be genuine wrought iron pipe conforming to Specification No. WW-P-441b, Class A. Joints shall be either threaded and coupled, with heavy recessed type coupling in which the ends of pipe shall butt, or they may be field-welded.

(b) Well screen shall have an inside diameter of not less than 8 inches and be of not less than 6 gauge material, and shall be of silicon manganese bronze or stainless steel, with openings of proper size and design to hold back and support the gravel used in the gravel envelope around the screens. Joints shall be made with heavy butt-type couplings of the same material or by brazing.

(c) All gravel used for the gravel envelope around screens shall be round, hard, water-worn gravel. The gravel shall be of such size as will allow free flow of water in the well and positively prevent the infiltration of sand. It shall be of siliceous material, reasonably smooth and round, and shall be free of flat or elongated pieces as well as of dirt, vegetable matter, or other foreign matter. The gravel shall be thoroughly sterilized with hypochlorite before being placed.

(d) Cement grout for sealing the space between the casing and the drilled hole, shall be composed of Portland cement, Type I, conforming to specification No. SS-C-192a, and water. The mixed grout shall weigh not less than 14 pounds per gallon.

4-06. Sterilizing. - The well shall be sterilized by adding chlorine or hypochlorite solution to the water used for placing the gravel. Sufficient chlorine or solution to give the water a chlorine content of 50 PPM shall be fed into the water continuously during the gravel placing operation.

4-07. Testing. -

(a) Upon completion of the permanent wells, the contractor shall furnish and install a temporary turbine test-pump having a capacity of at least 400 g.p.m. with approved equipment for measuring the rate of flow and the water level in the well. After measuring the static water level in the well, test shall begin at a rate of 100 g.p.m. and the draw-down determined at 15 minute intervals until the level becomes stabilized. Pumping shall then be continued at the same rate for one hour and the water level determined at 15 minute intervals. The rate of pumping shall then be increased to 125 g.p.m. and the procedure above repeated, followed by similar tests at rates increased in increments of 25 g.p.m. until the capacity of the well is determined.

(b) After the above test has been completed and the safe maximum yield of the well determined by the contractor and approved, a continuous 36 hour test shall be run and the draw-down recorded at hourly intervals to confirm that the safe maximum yield as determined above can be produced continuously.

(c) Water levels and rates of pumping shall be determined and recorded for all tests and the contractor shall submit after testing has been completed, a characteristic curve in triplicate for each well showing the draw-down level in feet for various rates of pumping in g.p.m.

(d) When the test has been satisfactorily completed, the contractor shall secure samples of water in suitable containers, and of sufficient quantity, to have bacterial and chemical analyses made by a recognized testing laboratory, except that the bacterial analyses may be made by the State Board of Health if desired. The results of the analyses shall be furnished to the Officer in Charge.

SECTION 5. DEEP WELL PUMP.

5-01. General requirements. - The work includes the provision of a turbine-type deep well pump with vertical, hollow shaft, electric motor drive, complete with all appurtenances, as shown and as herein-after specified.

5-02. Pumping conditions. -

(a) The deep well pump shall be designed to deliver 250 g.p.m. against a head of 114 feet above the pump discharge. The final pump setting shall be 20 feet below the water level in the well when the pump is discharging at well capacity. Pump speed shall not exceed 1,800 r.p.m. Final pumping conditions shall be determined by the contractor and approved by the Officer in Charge after testing of the permanent gravel-wall well.

(b) Bids shall be based on the pump producing 250 g.p.m. at a speed of 1,800 r.p.m. against a total discharge head above impellers of 155 feet and a depth of setting below foundation of 60 feet. If final pumping conditions differ substantially from that stated, an adjustment in the contract price and/or the time for completion will be made in accordance with Clause 4 of U. S. Standard Form 23A.

5-03. Pump head. - Pump heads shall be constructed from close-grained cast iron and shall be heavy duty type designed for hollow shaft drive. Pump shall have flanged above ground discharge.

5-04. Pump column. - The column shall be genuine wrought iron conforming to Specification No. MW-P-441b, and shall be in sections not to exceed 10 feet in length and of proper diameter to eliminate undue friction when pumping at pump capacity.

5-05. Line shaft. - The line shafting shall be high-grade ground and polished steel and not less than 1-3/16 inches in diameter. The shaft shall be furnished in interchangeable sections not over 10 feet in length and fastened with threaded steel couplings having a strength of not less than 100 per cent of the strength of shaft after being assembled. The ends shall be machine finished and undercut for proper butting of the shaft. All threads shall be lathe cut.

5-06. Bearings. - The pumping unit shall have sufficient guide bearing to maintain the alignment of the pump and shafting and to prevent vibration. The inner column couplings shall be bronze and shall act as bearings for the line shaft which shall be turned and polished. Oil lubricated bearings shall be provided with oil grooves to effect passage of oil down through the entire length of oil tube and shafting. An automatic lubricator with capacity sufficient for one week of continuous operation shall be provided to feed oil to the bearings. Lubricator shall have sight glass and feed adjustment.

5-07. Bowls. - The pump bowls shall be made of close grained cast iron, free from blow holes, sand holes and other defects which would impair their strength or durability for the service; accurately machined and fitted to close dimensions. Bowls shall have smooth, curved vanes to direct the flow of water efficiently and to prevent air locking. The bowls shall be of suitable thickness and strength to withstand the shut-off pressure of the unit. Bowls should be fastened together in such a manner that accurate alignment is assured and maintained. Guide passages for water shall be so designed and finished as to reduce friction to a minimum.

5-08. Impellers. - Impellers shall be enclosed type, cast bronze, and of heavy construction. Each impeller shall be carefully machined, finished all over, accurately fitted and perfectly balanced dynamically. Impeller shaft shall be high grade chrome-nickel steel carefully ground and polished and furnished with lathe-cut threads. No keyways shall be cut into the shaft. A long skirt shall be provided to eliminate bypassing under any adjustment of the impeller. Impellers shall have non-overloading characteristics and shall have head characteristics so that an increase or decrease in the operating head above the design point will not cause an excessive decrease or increase in pump capacity. Impellers shall be attached and locked to pump shaft in such a manner that they may be easily removed, and so that they will not work loose for any reason.

5-09. Suction pipe and strainer. - A suction pipe of suitable diameter and 10 feet long shall be provided for each pump. A galvanized strainer having a net inlet opening area of at least five times the area of the suction pipe shall be provided at the lower end of the suction pipe.

5-10. Motor. - The hollow shaft, vertical, fully enclosed electric motor shall be squirrel-cage induction type for operation on 208 volt, 3 phase, 60 cycle service and shall have ample capacity to operate the pump properly through its entire head capacity range without exceeding its rated capacity. The speed of the motor shall not exceed 1,800 r.p.m. The motor shall conform to N.E.M.A. standards. Starting equipment shall be as specified in the electrical section.

SECTION 6. PIPING

6-01. General requirements.- Piping shall be of new and unused material. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate the bells and joints. Any pipe that has the grade of joint disturbed after laying shall be taken up and relaid. The interior of the pipe shall be thoroughly cleaned of all foreign matter before being laid in the trench, and shall be kept clean during laying operations by means of plugs or other approved methods. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water or other foreign substance will enter the pipes or fittings. All 1/16 and sharper cast iron bends shall be securely blocked in the direction of flow with poured in place concrete bearing solidly against the pipe and affording a minimum of 3 square feet of bearing area against a vertical trench face for 4 inch pipe and 6 square feet for larger pipe.

6-02. Piping and fittings.-

(a) All pipe 4 inches and larger shall be cast iron or asbestos cement as indicated. Cast iron pipe shall be Class 150 conforming to Specification No. WW-P-421a. Well house piping shall be cast iron, Class 150 pipe provided with ASA, Class 125 flanges. Cast iron pipe other than flanged pipe shall have 1/16 inch cement lining. Asbestos cement pipe and couplings shall be Class 150 and conform to Specification No. SS-P-351a.

(b) Pipe 3 inches and smaller shall be standard weight, with threads and couplings, zinc-coated wrought iron pipe conforming to Specification No. WW-P-441b.

(c) Fittings and specials for use with pipe 4 inches and larger shall be flanged, bell and spigot or mechanical jointed, as required.

(1) Fittings.- Cast iron bell and spigot and asbestos-cement pipe shall be Class "D" in accordance with AWWA Specification C-100.

(2) Fittings for mechanical jointed pipe and flanged jointed pipe shall be short-body fittings in accordance with ASA Specification A21.10. Flanged fittings shall have ASA Class 125 flanges.

(d) Fittings for use with pipe 3 inches and smaller shall be zinc-coated, malleable iron, conforming to Specification No. WW-P-521c.

6-03. Placing and laying.

(a) Cast iron pipe laid underground shall be inspected in the sling before lowering into the trench, and tapped with a light hammer to detect cracks. Defective, damaged, or unsound pipe will be rejected. Deflections from a straight line or grade, as required by vertical or horizontal curves or offsets shall not exceed $6/D$ inches per lineal foot of pipe, where D is the nominal diameter of the pipe in inches, between the center lines extended, of any two connecting pipes. If the alignment requires deflection in excess of that limitation, the contractor shall provide special bends or a sufficient number of shorter lengths of pipe to conform to the limitation specified. Except where necessary in making connections with other lines, pipe shall be laid with the bells facing in the direction of laying. Except at closures not less than two lengths of pipe shall be in position ahead of each joint, with packing installed and earth fill tamped alongside the pipe, before the joint is poured. Where cutting of pipe is necessary, it shall be done with approved mechanical cutters in a manner that will not damage the pipe. Where coatings are damaged, they shall be touched up with material similar to that used for the original coating.

(b) Asbestos cement pipe, couplings and fittings shall be handled and installed in accordance with the recommendations of the pipe manufacturer.

(c) All flanged pipe shall be worked into place without springing or forcing.

(d) Zinc-coated wrought iron piping shall be accurately cut, shall be worked into place without forcing or springing and shall be free of burrs or fins. Each valved connection shall be provided with a union.

(e) All water pipe laid underground shall be installed to line and grade indicated.

6-04. Joints.

(a) Bell and spigot joints.— Before jointing, all lumps, blisters, and excess coating material shall be removed from the bell and spigot ends of the pipe. All oil or grease shall be removed. The outside of the spigot and inside of the bell shall be wire brushed and wiped clean and dry. Spigots shall be adjusted in the bells so as to give uniform space all around and if any pipe does not allow sufficient space for proper caulking, it shall be replaced with one of proper dimensions. Adjacent lengths of pipe shall be adjusted with reference

to each; blocking or wedging between hub and spigot will not be permitted. Molded or tubular rubber, asbestos, or especially prepared paper rings treated to prevent deterioration or support of bacteria shall be used as gaskets. The gasket shall be driven or caulked tightly into the annular spaces between the pipes, and shall be of proper size to seal the joint tightly and leave sufficient space for lead as specified. Where rubber rings are used as gaskets, a braided or twisted hemp or jute ring shall be caulked into the joint after the rubber ring is placed to prevent contact of the molten lead with the rubber. Gaskets shall not project into the bore of the finished joint. When the joints are approved for pouring, the joints shall be cleaned and the remaining space filled at one pouring with lead which shall be caulked in a manner that will assure tight joints without overstraining the bells. The depth of lead shall be not less than 2-1/4 inches measured from the face of the bell. After caulking, the lead shall be practically flush with the face of the bells. The lead shall conform to Specification No. QQ-L-156.

(b) Roll on joints shall be made with the standard materials furnished with the pipe, and in accordance with the recommendations of the manufacturer, subject to approval of the officer in charge.

(c) Asbestos cement pipe shall be jointed in accordance with the recommendations of the manufacturer, subject to the approval of the officer in charge. Connections to cast iron fittings shall be as specified for cast iron pipe.

(d) Mechanical joints.-- The joints shall be in accordance with the recommendations of the manufacturer of the joint except as specified otherwise. Installation shall conform to the procedure recommended in Specification No. WW-P-421a. Bolts, nuts, and exposed threads shall be coated with asphalt varnish after installation.

(e) Flanged joints.-- The joints shall be firmly bolted with machine bolts. Bolts shall be regular hexagon bolts conforming to Specification No. FF-B-575, Type II. Gaskets shall be made of asbestos metallic cloth conforming to Specification No. HH-G-76b and shall be full faced.

(f) Screwed joints shall have the threads cut full and not more than three threads on the pipe shall remain exposed. Pipe lubricant shall be applied to the male threads only.

6-05. Valves.--

(a) Gate valves for use with pipe 4 inches and larger shall be of the double disc type with non-rising stems in accordance

with American Water Works Association Standard AWWA C500-52T. Stems shall have nuts similar to those on valves of the existing system; valve stems shall be right hand thread. Gate valves shall be of one make and shall open by a counter-clockwise rotation of the valve stem.

(b) Gate valves for use with pipe 3 inches and smaller shall be bronze, wedge disc, in accordance with Specification No. MW-V-54, Type I, Class A.

(c) Check valves for use with pipe 4 inches and larger shall be cast iron body, bronzed mounted, tilting disc, Class 150 and shall conform to Specification No. MIL-V-18436, Type II, Style A.

6-06. Altitude gauge.- An altitude gauge shall be installed where indicated and shall have a 4-inch polished brass case with a white dial. The gauge shall be graduated in increments of one foot and shall have a measuring range of 0 to 70 feet for use with the water level device and a range of 0 to 150 feet for use on the discharge side of the pump.

6-07. Pressure air valve.- An approved pressure air valve shall be installed where shown on the plans to permit air to escape automatically while the pipe line is in service and under pressure. The valve shall be iron body, bronze mounted, and designed for 125 pounds working pressure. The float shall be made of hard rubber with phosphor bronze levers. The seat shall be hard rubber and plunger of hard quality soft rubber. The valve shall be constructed so that valve seats may be easily replaced.

6-08. Roadway boxes.- Each valve on underground piping shall be provided with an adjustable cast iron roadway box of a size suitable for the valve on which it is used. The heads shall be round and shall have the word "water" cast upon it. The least diameter of the shafts of the boxes shall be 5.25 inches. Boxes shall be given a heavy coat of bituminous paint.

6-09. Setting valves and valve boxes.- Valves and valve boxes shall be set plumb, and centered, with valve boxes placed directly over the valves. Earthfill shall be carefully tamped around the valve box to a distance of 4 feet on all sides of the box or to the undisturbed trench face if less than 4 feet. Valves shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and the valve shall be inspected in opened and closed positions to see that all parts are in working condition.

6-10. Manholes.- Manholes for air relief valve shall be constructed as detailed on the drawings. Materials and workmanship shall be in accordance with Specification No. 42Ya. Manhole frame and cover shall be Pattern No. 4 as indicated on Plate No. 12. The words "WATER-VALVE" shall be cast in the cover.

6-11. Tests.- Before being covered, the completed piping shall be subjected to a hydrostatic pressure test of 200 pounds per square inch maintained for two hours. All pipe, joints, valves, and fittings in the test section shall be examined. Defective material disclosed as a result of the test shall be replaced and the test repeated; any joint showing visible leakage shall be made watertight.

6-12. Sterilization.- Before being placed in service, the new piping shall be flushed and sterilized by chlorination in accordance with the American Water Works Association Standard AWWA C601-48. The chlorine solution shall remain in the system at least twenty-four hours. After final flushing, the quality of the water shall be approved by the officer in charge before acceptance.

SECTION 7. INTERIOR ELECTRICAL

7-01. General requirements. - The work includes the provision of a complete and operating interior electrical system, including fused switches, magnetic motor starter, four-circuit plug fuse box (2 circuits in use 2 spares) dual coded relay, conduit, outlet boxes, switches, receptacle, wire, lighting fixtures complete with lamps and all appurtenances incidental to a workmanlike, dependable and durable installation. All electrical work shall be done as specified herein, as shown on the electrical drawings and, unless otherwise specified or shown, in accordance with standard specification No. 9Yf and other standard specifications listed therein.

7-02. Description of system. - The interior electrical work shall start at the termination of the service entrance conduit and include all interior electrical work:

7-03. Electrical characteristics. - The electrical service to the building shall be 120/208 volts, 3 phase, 4 wire solid grounded neutral, 60 cycles, as specified under "Exterior Electrical".

7-04. Existing well control system. - The existing well control system operates on a dual frequency carrier current principle (2340 and 3218 cycles), using the electrical distribution system for signal transmission. Dual coded relays located in the well houses initiate both an "on" function and an "off" function to the pumps as these signals are received over the power line. This system was manufactured by International Business Machine.

7-05. Service switch. - The service switch shall be a Type A 200 ampere, 3 pole, 4 wire, solid neutral type, quick make and quick break fused safety switch, in a NEMA type 1 enclosure having an exterior operating handle interlocked to prevent access to the interior when switch is closed. An equivalent air circuit breaker calibrated to protect the service entrance cable will be acceptable.

7-06. Fused safety switches. - All fused safety switches shall be Type "A" quick make and quick break type having ampere ratings as specified or shown in NEMA type 1 enclosure, equipped with exterior operating handle interlocked to prevent access to interior when switch is closed. Equivalent air circuit breakers calibrated to protect the associated feeders will be acceptable.

7-07. Magnetic motor starter. - The magnetic motor starter shall be Style "A", quick make and quick break, having overload and low voltage release. The contacts shall be of the sliding, self-wiping double break type arranged for interchangeable heaters. Starter shall be equipped with a "Manual, Off, Automatic" selector switch, correctly wired to the starter, remote control button, and dual coded relays.

7-08. Dual coded relays. - The contractor shall install IBM Type 4073 dual coded relay arranged to operate this new well in Group D-8 (3218 cycles) of the existing well control system.

7-09. Wire and cable. - All wire and cable used for the electrical shall conform to the following where applicable:

- (a) No wire smaller than No. 12 AWG shall be used for any purpose.
- (b) All wire in conduit, installed wholly or in part in damp locations, in areas below ground level or in floor slab shall be type RHL.
- (c) All wire in conduit installed in dry locations shall be type RH-RW.
- (d) The number and size of conductors shall be as shown.

7-10. Conduit shall be zinc-coated on inner and outer surface and shall be cut only with a hack saw and reamed to size. No bends greater than 90 degrees shall be used and manufactured bends shall be used on 1 inch size and larger. The electrical drawings are primarily diagrammatic in nature, intended to indicate the purpose and connections of the conduit and circuits rather than the exact locations of the runs which may be modified by the contractor to meet construction conditions at the time of work.

7-11. Standard wall switches shall be 20 ampere, single pole, and 3 way switch "T" rating in composition bases as shown.

7-12. Convenience receptacles. - Convenience receptacle outlets shall be duplex, 15 ampere, 125 volts, "T" slot, double sided contacts with 4 terminal screws, in composition base. All receptacles shall be three pole polarized, equipped with three pole cord caps, one pole of receptacle and cord cap arranged for grounding appliance enclosure independent of power conductors.

7-13. Outlet and junction boxes shall be hot-dipped zinc-coated threaded hub types standard for the purpose used and complete with box covers.

7-14. Supports. - All auxiliary structure and fittings necessary or required shall be provided for supporting electrical devices to the structure.

7-15. Lighting fixture. - Lighting fixture shall be as shown on drawing, shall be lamped, and shall be of the highest quality for the applicable designs and wattage shown.

SECTION 8. EXTERIOR ELECTRICAL

8-01. General requirements.-

(a) The work includes the provision of a new pole grounding system, underground service feeder, lightning arresters, former service pole and all appurtenances together with the installation of three 5 K.V.A. 12,470/240/120 volt transformers, to be furnished by the Government, for a complete and operating underground service to the new well house.

(b) All electrical work shall be done as specified herein, as shown, and unless otherwise specified or shown in accordance with Specification 9Yf and other standard specifications listed therein.

8-02. Description of work.- The exterior work shall start at the transformer connections to the existing primary line and terminate within the well house at the location of the service switch in readiness for the installation of same as specified under the interior electrical section.

8-03. Watt-hour meter shall be of the self-contained, 120 volt, 50 ampere, 3 phase, 3 current element, 2 voltage element, balanced voltage socket type for use on four-wire 120/208 volt secondary conforming to the applicable requirements of Specification No. MIL-M-18420.

8-04. Meter socket shall be of the outdoor, weather-proof, box type possessing a large porcelain block assembly. It shall be of rigid construction zinc-coated. The jaw contacts shall be high capacity silver-plated copper contacts.

8-05. Wires and cables shall conform to the following requirements under the applicable conditions:

(a) Line wires shall be medium hard drawn bare copper having 98 per cent conductivity sized as indicated on drawings.

(b) Underground feeders shall consist of non-metallic sheathed cable of the direct burial type having stranded coated copper conductors and 600-volt type RHW ozone resisting insulation conforming to ASTM Specification No. D 1352 and I.P.C.E.A. Appendix O, enclosed in a tough rubber outer jacket conforming to ASTM Specification No. D 752 and I.P.C.A. Appendix K, Grade 1.

8-06. Lightning arresters.- Shall be of the 9,000 volt type for cross arm mounting. They shall be designed for outdoor service and of the encased valve type. Ground wires shall be protected by wood moulding extending at least 8 feet above ground. Arrester grounds shall be a separate grounding system.

8-07. Fused cut-outs. - There shall be a 15,000 volt fused cutout in each primary wire connected to the transformer stations. The ampere ratings shall be in accordance with standards set up for good practice and adequate protection for the several conditions involved. The cutouts shall be of the open trip-out type for cross arm mounting. They shall be point pressure type equipped with solderless connector terminals, swivel type mounting brackets, positive tripping mechanism and lifting hooks for easy installation and removal of cartridge. The thermal element of the fuse link shall be held under tension in the center of the cartridge tube surrounded by a dead air space to prevent carbonization of the cartridge. Flash-over values shall be in accordance with NEMA specifications.

8-08. Transformer ground. - The primary and secondary wye connections of the bank shall be grounded at the transformer pole. The transformer case and all pole hardware and equipment shall be grounded to the same common grounding system.

8-09. Ground rods. - Each ground rod required under this section of the specification for lightning arresters, transformer secondary, or for any other purpose, shall consist of two sections of ten foot lengths of not less than 5/8 inches O.D. copper-encased sectional steel rod driven to a depth of at least twenty-one feet.

8-10. Ground resistance. - The ground resistance at each rod, previous to any connections, shall be not greater than 25 ohms. If additional material and/or labor is required to obtain the above resistance, payment will be made therefor, as described under Clause 4, U. S. Standard Form 23A.

8-11. Ground wires. - All ground wires shall be #6 AWG, bare solid copper and shall be protected by wood moulding to a height of not less than eight feet above ground. Attachment to ground rods shall be made by means of heavy duty solderless bronze clamps.

8-12. Poles and cross-arms. - Poles shall be American Standards Association, Class 3, as indicated on distribution drawing, yellow pine poles, creosoted to twelve pounds retention by the empty cell process according to the specifications of the American Wood Preservers Association. Cross arms shall be close-grained Douglas Fir (Coast).

8-13. Pole hardware and accessories shall be hot dipped zinc-coated.

8-14. Pin type insulators. - Shall be of the wet process type, having flash-over values not less than 85KV dry and 55 KV wet.

8-15. Radio influence voltage shall have approximately the following values:

<u>Type of Insulator</u>	<u>Test KV RMs to Ground</u>	<u>Maximum Micro Volt at 1000 KC</u>
Pin type insulators (ea)	15	100

8-16. Conduit. - Conduit shall be of the rigid type and shall be zinc-coated for both inner and outer surfaces. Standard lengths shall be threaded previous to treatment. All conduit shall be cut with a hacksaw and reamed to size. No bends shall be made of greater than 90 degrees and manufactured elbows shall be used on 1-inch size and above.

8-17. Cross arm braces shall be 1/4 inch by 1-1/4 inch by 32 inches (flat steel bars, galvanized after punching), punched for a 1/2 inch screw at the pole end and a 3/8-inch bolt at the arm end, bolted to the front of arm after it has been carefully aligned. They shall be secured to pole with 4-1/2 inches drive screws. Buck arms shall be installed if required for good construction as in standard practice.

8-18. Insulator pins. - Steel pole top and cross arm pins shall have a 1-inch lead thread and a minimum strength of 1,500 pounds based on a 10 degree deflection.

8-19. Bolts and nuts shall conform to NELA specification No. E-209-22. Bolts shall be of sufficient length to accommodate the necessary nuts, washers, etc., without projecting more than 1 inch at the free end except that they shall not project more than 1/4 inch into the eye when an eye nut is installed.

8-20. Non-interruption of service. - By careful planning of his work, the contractor shall minimize interruptions to the normal operation of the existing distribution system. If an outage becomes unavoidable, notification shall be made in writing to the officer in charge seventy-two (72) hours previous to the proposed outage and a written directive obtained and followed stipulating the time and duration permitted.

SECTION 9. BIDS

9-01. Instruction to bidders.- U. S. Standard Form No. 22 revised March 1953, and Invitation for Bids, U. S. Standard Form No. 20 shall be observed in the preparation of bids. Envelopes containing bids must be sealed, marked, and addressed as follows:

Bid for New Raw Water Well
Hadnot Point Water System,
Specification No. 7525/56

Public Works Officer
Building No. 1005
Marine Corps Base
Camp Lejeune, N. C.

9-02. Bid guarantee will be required as stipulated on the reverse side of U. S. Standard Form No. 20.

9-03. Items of bids.- Bids shall be submitted, in triplicate, on U. S. Standard Form No. 21 revised March 1953, Bid Form, and in accordance with U. S. Standard Form Nos. 20 and 22, upon the following items:

Item 1. Price for the entire work, complete in accordance with the drawings and specifications.

9-04. Telegraphic modifications of bids in accordance with U. S. Standard Form No. 22 may be made. Two signed copies of the telegram in a sealed envelope marked "Copies of telegraphic modification of bids for New Raw Water Well Hadnot Point Water System, Specification No. 7525/56" should be forwarded immediately to the office to which the written bids were submitted.

9-05. Reference to addenda.- Each bidder shall refer in his bid to all addenda to this specification; failure to do so may constitute an informality in the bid.

NOTICE

The Government forms, Bureau of Yards and Docks standard specifications mentioned and other information necessary may be obtained from the District Public Works Officer, Headquarters, Fifth Naval District, U. S. Naval Base, Norfolk 11, Virginia, or Public Works Officer, Navy Department, Building No. 1005, Marine Corps Base, Camp Lejeune, N. C. The remainder of the standard specifications and other material referred to may be examined at the District Public Works Office or at the Public Works Office, or the standard Government specifications may be obtained from the Superintendent of Documents, Washington 25, D. C. at their established prices.

Camp Lejeune, N. C.

20 November 1956

R. E. HARRIS
CAPT (CEC) USN
Officer in Charge of Construction

FOR:

ROBERT H. MEADE
RADM (CEC) USN
Chief of Bureau of Yards and Docks
Department of the Navy

LIST OF WAGE RATES
 DECISION R-5216 9 OCTOBER 1956
 CAMP LEJEUNE, ONSLOW COUNTY, NORTH CAROLINA

Per Hour

Per Hour

Air tool operators	\$	
(jackhammerman vibrator)	1.00	
Asbestos workers	2.75	
" " improvers		
1st year	1.25	
2nd "	1.64	
3rd "	1.85	
4th "	2.07	
Asphalt rakers	1.00	
Boilermakers-Blacksmith	2.975	
" helpers	2.725	
Bricklayers	2.50	
Carpenters	1.65	
Cement masons	1.625	
Electricians	2.40	
Elevator constructors	2.20	
" " helpers	1.54	
Glaziers	1.50	
Ironworkers, structural	2.50	
" ornamental	2.50	
" reinforcing	2.25	
Laborers	1.00	
Lathers	1.75	
Marble setters	1.75	
" " helpers	1.00	

Mason tenders	\$1.00
Mortar mixers	1.00
Painters, brush	1.65
Painters, structural steel	2.00
Filedrivermen	1.65
Pipe layers (concrete & clay)	1.00
Plasterers	2.00
" tenders	1.00
Plumbers	2.50
Roofers	1.50
Sheet metal workers	1.75
Soft floor layers	1.65
Steam fitters	2.50
Stone masons	2.50
Sprinkler fitters	2.95
Terrazzo workers	2.00
" " helpers	1.00
Tile setters	2.00
" " helpers	1.00
Truck drivers	1.00
Welders - receive rate prescribed for craft performing operation to which welding is incidental.	

Power equipment operators:

Backhoes	\$2.125
Cranes	2.125
Cableways	2.125
Derricks	2.125
Boom hoist	2.125
Draglines	2.125
Dredges or other floating equipment	2.25
Pile drivers	2.25
Pavers	2.125
Heavy duty mechanics	2.125
Scrapers, wheel type	2.125
Shovels	2.125
Truck Cranes	2.125
Tractors with attach- ments	2.125
Tractors without attachments	1.875
Trench machines	2.125

Power equipment operators: (cont)

Welding machines	\$2.125
Tournapull	2.125
Air compressors	1.75
Bulldozers	1.875
Fireman	1.55
Hoist, double drum	1.875
" one drum	1.625
Finishing machine	1.875
Mixers (larger than 10-S)	1.75
" (smaller than 10-S)	1.625
Motor graders	2.00
Pumps over 2" discharge	1.75
Pumps under 2" discharge	1.625
Rollers, earth	1.87
" asphalt	2.00
Apprentice engineers and oilers	1.55

Apprentice Schedule

Craft	Interval	*Period and Rate										
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
Ironworkers	6 mos.	50	60									
"	year		66-2/3									
Carpenters	year	\$1.05	1.15	1.25	1.40							
Electricians	6 mos.	45	50	55	60	65	70	75	80			
Plumbers and steam fitters	6 mos.	37½	40	45	50	55	60	67½	75			
Sprinkler fitters	6 mos.	54	58	62	66	70	74	78	82	86	90	
Sheet metal workers	6 mos.	40	45	50	55	60	65	70	80			

*The apprentice rate is by percentage of the journeymen's rate unless otherwise indicated.

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