Highway 17
file

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH, N. C.

PROPOSAL

OF

_____
Name of Bidder

_____
Address of Bidder

DATE OF OPENING BIDS 10:00 A.M., 19____

PROJECT No. 8.13652 F-614(6) R/W MILES (Relocation of Wells and Power Lines)

COUNTY Onslow

ROUTE NUMBER US 17

DESCRIPTION Drilling Four Gravel Packed Wells and Relocating Existing Power Lines Along US 17 in Camp Lejeune.

BID BOND OR CERTIFIED CHECK _____

ENTIRE PROJECT: _____

ROADWAY: _____

STRUCTURES: _____

MOVING BUILDINGS: _____

ROADWAY & MOVING BUILDINGS: _____

RELOCATION OF WELLS & POWER LINES $6,000.00

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RELOCATION OF WELLS & POWER LINES $6,000.00

PROPOSAL FOR THE CONSTRUCTION OF PROJECT NO. 8.13652 .....

IN Onslow .....COUNTY, NORTH CAROLINA

Date ....., 19.....

State Highway Commission,

Raleigh, North Carolina

Sirs.—The undersigned bidder has carefully examined the location of the proposed work and the proposed form of contract to be known as Project No. 8.1302 .....; has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal form, the form of contract, and the form of contract bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bind himself on award to him by the State Highway Commission under this proposal to execute within ten days, in accordance with such award, a contract with necessary surety bond, of which contract this proposal and such plans and specifications shall be a part, to provide all necessary machinery, tools, labor, and other means of construction, and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said project within the time limit specified below.

Number of working days to complete entire project .....

Number of working days to complete roadway .....

Number of working days to complete bridges and culverts .....

Number of working days to complete moving buildings .....

Number of working days to complete roadway and moving buildings .....

Number of working days to complete roadway and structures .....

Number of working days to complete relocation of wells & Power lines. 100

7-1-57

CHANCE IN NAMES OF COMMISSION AND ITS OFFICIALS:

WHEREAS, the name of the State Highway and Public Works Commission has been changed by the 1957 Legislature to "State Highway Commission"; AND WHEREAS, a new official position has been created as chief executive officer of said Commission, designated as "Director of Highways"; AND WHEREAS, the title of "State Highway Engineer" has been changed to "Chief Engineer",

Wherever the name "State Highway and Public Works Commission" appears in the Plans, Specifications, Proposals and Contracts, the name shall be understood to mean "State Highway Commission";

Wherever the title, "Chairman" appears in such documents the title shall be understood to mean "Director of Highways"; and

Wherever the title, "State Highway Engineer" appears in such documents, the title shall be understood to mean "Chief Engineer".

8.13652 SPECIAL PROVISIONS 4-16-59

Relocation of Wells & Power Lines

LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE CONTRACT ON TIME:

The attention of the contractor is called to the enclosed "Revision of Sections 5 and 8 of the Specifications".

Liquidated damages on this project will be One hundred dollars($100.00) per calendar day.

RELOCATION OF WELLS AND POWER LINES:

The relocation of wells and power lines shall comply with the specifications, "Relocation of Wells and Power Lines", included herein, with the plans as shown by P.W. Drawings Numbers 5885 through 5894 and with the applicable sections of the N. C. State Highway Commission, "Standard Specifications for Roads and Structures", dated October 1, 1952.

This project shall consist of a complete installation and the contractor shall make a careful examination of the site in order to determine the exact extent of the work.

DRAWINGS:

The drawings required in section 1.4 and 1.6 of the General Provisions herein, shall be submitted to:

Mr. C. E. Brown
Division Engineer
State Highway Commission
Wilmington, N. C.

FIRES:

Approval for setting fires to burn refuse shall be obtained from the Resident Engineer.

DRAWINGS FOR

RELOCATION OF WELLS AND POWER LINES U. S. HIGHWAY 17

P. W. DRAWING NO.	5885
	5886
	5887
	5888
	5889
	5890
	5891
	5892
	5893
	5894

RELOCATION OF WELLS & POWER LINES

U.S. HIGHWAY 17

SECTION 1. GENERAL PROVISIONS

1.1 General requirements. - The work includes the drilling of four gravel-wall wells, the relocation of four existing well houses on new concrete foundations, the removal and installation of pumping equipment together with associated piping, electrical wiring and control equipment and the construction of a new raw water collection system and new electrical distribution system. The work also includes the removal of existing well house foundations, sealing existing wells and the salvage of existing raw water collection system, existing electrical distribution system and all appurtenances not incorporated in the new relocated system.

1.3 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.

BUREAU OF YARDS AND DOCKS

9Yg Sept 1956 Electrical apparatus, distributing systems, and wiring.

FEDERAL

FF-B-575 May 1955 Bolts, hexagon & square

HH-G-76b May 1955 Gaskets, asbestos metallic cloth

QQ-L-00156a June 1934 Lead, calking including Amendment No. 1

SS-C-192b July 1956 Cements, portland

SS-P-351a Oct. 1953 Pipe, asbestos-cement

WW-P-406a July 1957 Pipe; steel and ferrous alloy (for) ordinary uses (iron pipe size)

WW-P-421a Mar 1955 Pipe, cast-iron, bell-and-spigot, water

WW-P-441b Mar 1952 Pipe; wrought iron (welded black or zinc coated) including Amendment No. 1

MILITARY

MIL-V-18436 - Jan. 1955 Valves, check

NON-GOVERNMENT STANDARDS

NOTE: Non-Government standards are not available for distribution by

the Department of the Navy; application therefor should be made to the issuing organization. They may be examined at the office where the bids are being received.

AMERICAN SOCIETY TESTING MATERIALS
Designation A153-53

AMERICAN INSTITUTE ELECTRICAL ENGINEERS
Current Standards for Transformers

AMERICAN STANDARDS ASSOCIATION
Specification B16.1

AMERICAN WATER WORKS ASSOCIATION
Specifications C 100, C500-52T, C601-54

AMERICAN WOOD PRESERVERS ASSOCIATION

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
Current Standards for Transformers

NORTH CAROLINA FERTILIZER, LIME AND SEED LAW

NORTH CAROLINA BOARD OF AGRICULTURE, RULES & REGULATIONS

N.C. STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES

The Bureau of Yards and Docks Specifications, the standard specifications and other material referred to above may be examined at the Public Works Office, Navy Department, Building No. 1005, Marine Corps Base, Camp Lejeune, North Carolina or the standard government specifications may be obtained from the Superintendent of Documents, Washington 25, D.C.,at their established price.

1.4 Drawings required of the contractor.- Before commencing the installation of any of this work, the contractor shall submit for approval such drawings as may be required including those showing:

1.4.1 Manufacturer's specifications and illustriations for new deep well pump to be provided for Well "H", showing pump characteristic curves, maximum horsepower required, pump dimensions, and make and horsepower rating of electric motor.

1.4.2 Manufacturer's specifications and illustrations for pressure air valve.

1.4.3 Electrical characteristics of transformers, fuse cutouts, lightning arresters, motor starters, lighting fixture and main fuse service entrance switch.

1.5 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.

1.6 Methods and schedules of procedure.- In order to accomplish the work in a manner that will cause the least allowable interruptions to the water supply system for Camp Geiger and to the electrical service to the Camp Geiger Trailer Park, the following procedure shall be strictly adherred to:

1.6.1 The new construction as listed below shall be accomplished prior to the interruptions of either the raw water supply system or electrical distribution system.

(a) The new raw water wells, Well "H", "I", "K" and "L" shall be drilled and tested at their new location.

(b) The new concrete foundations for the relocated well houses shall be constructed at the new well sites.

(c) The new raw water collection system, including the valves on the laterals to the wells, shall be constructed, tested and connected into the existing raw water collection system as indicated.

(d) The new electrical distribution system shall be constructed connected into its source of supply and the electrical service to the Camp Geiger Trailer Park changed over from the existing primary system to the new primary system.

1.6.2 At the completion of the above work, the well pumping equipment, well house and electrical service shall be removed and reinstalled at the new sites in such a manner that not more than one raw water well shall be out of service at any one time.

1.6.3 As the well houses are relocated, the existing concrete foundations shall be removed and the wells sealed as indicated.

1.6.4 After the relocation work has been completed, tested and approved, the existing raw water system and electrical distribution system shall be removed and all materials salvaged as hereinafter specified.

1.7 Lines and grades required for execution of the work shall be established by the engineer.

1.8 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 engineer. 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.

1.9 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:

1.9.1 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.

(a) 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.

(b) Nursery stock, plants and sod.

(c) 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.

1.10 Cleaning up. - Upon completion of the work, the contractor shall remove all debris from the site, and the premises shall be left free from all litter and refuse; exterior grounds shall be left in a raked, clean condition.

1.11 Salvagable materials. - Salvagable materials and equipment shall be delivered to the State Highway Commission District Shop at Jacksonville, North Carolina.

SECTION 2. EARTHWORK

2.1 Topsoil. Material from the excavation suitable for topsoil shall be deposited in piles separate from other excavated materials. Piles of topsoil shall be so located that the material can be readily used for the finished surface grading in the areas designated for seeding and the topsoil shall be protected and maintained until needed. Topsoil shall be spread to a uniform thickness of four inches over the ground, 10 feet each side and rear and 25 feet in front of all new buildings and where the natural soil conditions have been disturbed due to the operation of this contract in the following areas:

(a) in existing lawn or grassed areas.

(b) slopes and shoulders of roads.

Where used for finished grading, topsoil shall be spread uniformly over the designated areas.

2.2 Clearing and grubbing.

2.2.1 General. Brush, woods and other symbols indicating vegetation are not all inclusvie and are shown in approximate locations only. Clearing shall be performed within the limits as follows:

(a) area bounded by 10 feet on each side of all buildings

(b) 10 feet each side of underground utility lines

(c) power lines, 15 feet each side of the center line, including all projecting limbs or branches within these limits and all dead limbs, dead trees and leaning timber outside the clearing line which may endanger or constitute an incipient hazard to the new line in falling.

2.2.2 Clearing shall include the cutting, removal and satisfactory disposal of all trees, brush and undergrowth, including those described on the power line. All vegetable growth shall be cut off flush with the ground. 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 stock piled on the site where directed.

2.2.3 Grubbing shall be performed within the area designated for clearing and within the limits as follows:

(a) area bounded by 10 feet on each side of all buildings

(b) 5 feet each side of underground utility lines.

Grubbing shall consist of the excavation, removal and satisfactory disposal of all stumps, roots, logs and other objectionable material within the area as defined.

2.3 Burning. All shrubs, brush, stumps, matted roots, refuse and other objectionable material shall be burned within the cleared area, except that when permitted, large stumps and other material that will not burn may be otherwise disposed of. Material that will not burn will be considered debris and disposed of as specified elsewhere. All fires for burning refuse shall be at locations where directed and shall be tended in a manner to eliminate all hazards to buildings, structures, trees and other property. Approval shall be obtained prior to the setting of all fires. Disposal by burning shall be under the constant attendance until members have burned out or have been extinguished.

2.4 Excavation.

2.4.1 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.

2.4.2 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.

2.4.3 Trench backfill.

(a) 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.

(b) 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.

(c) 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.

(d) 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.

2.5 Shoring and pumping. Excavations shall be shored and braced by timbers 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.

2.6 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.

2.7 Seeding and grassing. Areas specified to receive topsoil shall be seeded and a stand of grass produced. 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.

2.7.1 Seeding operations shall be completed during the following periods.

Bermuda: From 1 April to 15 July

Italian Rye: From 1 September to 31 March

(a) 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 fertilizer or organic base bearing analysis of a recognized authority. Formula for the fertilizer shall contain 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.

(b)The seed shall be delivered to the job in the original containers showing the guaranteed seed:

100% Bermuda (hulled)

100% Italian Rye

No seed in the mixture shall show a purity of less than 90% or germination quality 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, not less than 18 inches in diameter, weighing not more than two hundred ten pounds per foot of width and watered with a fine spray.

(c) No lime, fertilizer or seed shall be applied when the wind is strong or when the soil is extremely wet or otherwise unworkable. 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.

2.7.2 Grassed area. A grassed area shall be considered established when it presents a green appearance from eye level fifty feet away and the specified grass is vigorous and growing well in each square foot of seeded area. It is not required that the seeded area be thick and heavy as an old established lawn.

SECTION 3. GENERAL CONSTRUCTION

3.1 General requirements. - The work includes the construction of well house foundations, floor slab and pump foundations, as indicated and as hereinafter specified, and the moving of the existing wood frame well houses from their present foundations to the new foundations.

3.2 The drawings indicate the construction of the existing well houses and foundations. The new foundations shall be constructed similar to the existing foundations and adjustments made where required to fit the particular well house for which it is to serve.

3.3 The contractor shall take all necessary precautions to protect the existing construction during the moving operations and shall make all necessary repairs required to leave the well house in as good a condition as when the work was started.

3.4 After the well houses have been moved, the contractor shall remove existing concrete floor slabs, pump and building foundations and seal off the existing well as indicated on the drawings.

3.5 Concrete shall be Class B (2500 psi) in accordance with the applicable parts of Section 207 of N.C. State Highway Commission "Standard Specifications for Roads and Structures". The earth under foundations and slab on grade shall be wetted before placing concrete. Ready-mixed concrete may be used. Forms shall be of wood, plywood, steel or other approved material. Wood forms for exposed surfaces shall be tongue and groove or ship lap boards. For unexposed surfaces, undressed square edge lumber may be used. Concrete interior floors shall be given a float finish and lightly troweled. Suitable chamfers shall be provided at edges of pump foundations. Miscellaneous fastenings shall be placed and secured in position when concrete is poured.

SECTION 4. WELL CONSTRUCTION

4.1 General requirements.- The work includes the provision of four test wells and four 8-inch permanent gravel-wall wells as indicated and as hereinafter specified.

4.2 Depth and capacity of well.- It is the intent of these specifications to drill four exploratory test wells and four permanent gravel wall wells, the latter to produce from 150 to 200 gallons per minute of potable water continuously. Bids shall be based on each test well having an average depth of 225 feet, and each permanent well having a depth of 175 feet in accordance with the typical well section shown and the following construction details:

(a) Total depth of well	175 feet
(b) Total length of 18" outer casing	40 feet
(c) Total length of 8" inner casing	105 feet
(d) Total length of 8" screen	30 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 by change order.

4.3 Test well.

4.3.1 The contractor shall drill a test well at the sites 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.

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

4.3.3 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.

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

4.3.5 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 phenophthalein alkalinity, total alkalinity, chlorides, carbon dioxide, carbonates, bicarbonates, turbidity, odor and pH.

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

4.4 Permanent gravel wall well. -

4.4.1 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.

4.4.2 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.

4.4.3 A 17½ 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 Engineer. Water bearing strata that will be adjacent to screen setting shall be hydraulically underreamed. 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 Engineer that the methods and equipment for placing the gravel, which he proposes to use, will achieve this result, and the Engineer shall approve such methods and equipment before gravel placing is begun.

4.4.4 Water level testing device.- A ¼ 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 a 4 inch polished brass case altitude gauge graduated from 0 to 70 feet. The entire installation shall be air tight.

4.4.5 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.

4.5 Materials.

4.5.1 The 18-inch outer casing shall be standard weight, black steel pipe conforming to Specification No. WW-P-406a, 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.

4.5.2 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 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 welding.

4.5.3 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.

4.5.4 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-192b, and water. The mixed grout shall weigh not less than 14 pounds per gallon.

4.5.5 Sterilizing. - The well shall be sterilized by adding chlorine or hypo-chlorite 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.

4.6 Testing. -

4.6.1 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 50 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 75 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.

4.6.2 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.

4.6.3 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.

4.6.4 When the test has been satisfactorily completed, the contractor shall secure samples of water in suitable containers and 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 Engineer.

SECTION 5. DEEP WELL PUMPS

5.1 General requirements.- The work includes the removal of pumping equipment from existing wells and the provision of pumping equipment in the new wells. The installation shall be as herein specified and shall be complete and ready to operate. The following work is included at each well site:

5.1.1 Well "H".- The pumping unit, including motor and starter, in existing well shall be removed and salvaged. A new pump, including motor and starter, shall be furnished and installed in the new well.

5.1.2 Well "I" and "Well "K".- The pumping units shall be removed from existing wells and the pump bowls, columns and shafts below the pump bases shall be salvaged. The motors and pump bases together with the new pump bowls, columns and shafts, furnished by the U.S. Marine Corps shall be installed in the new wells.

5.1.3 Well "L". - The pumping unit in the existing well shall be removed and re-installed in the new well.

5.2 Removal of existing pumping equipment. - The existing pumps are deep well turbine type, oil lubricated and are as follows:

Well No.	Capacity	Manufacturer	Column	Shaft	Depth of Setting	Motor H.P.
"H"	50 gpm	Peerless	4"	1-3/16"	50'	2
"I"	150 gpm	Peerless	5"	1-3/16"	55'	5
"K"	150 gpm	Peerless	5"	1-3/16"	50'	5
"L"	200 gpm	Johnson	5"	1-3/16"	60'	5

Pumps shall be removed using proper equipment and taking care not be damage component parts. As the pump is removed, each section of columns and shaft shall be disassembled as the work progresses exercising due care to protect threads and to preserve all bearings and guides. Bowl assembly shall be removed intact. Pumps and component parts shall be thoroughly cleaned prior to reuse in the new wells.

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.

5.4.7 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 by-passing 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.

5.4.8 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.

5.4.9 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. WATER PIPING

6.1 General requirements. - The work includes the furnishing and installation of a new raw water collection system prior to removal and salvage of the existing collection system. Piping, valves and fittings shall be new and unused materials, except that piping in Well House "I", Well House "K" and Well House "L" may be removed and reinstalled at the new sites. The 4-inch piping in Well House "H" shall be salvaged and new 6-inch piping, valves and fittings provided for new Well "H".

6.2 Piping and fittings. -

6.2.1 Pipe 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" thick cement lining. Asbestos cement pipe and couplings shall be Class 150 and conform to Specification No. SS-P-351a.

6.2.2 Fittings for underground cast-iron pipe and for asbestos cement pipe shall be Class D, conforming to AWWA Specification C-100. Fittings for flanged cast-iron pipe shall be short-body fittings conforming to ASA Specification B16.1. Flanged fittings shall have ASA Class 125 flanges.

6.3 Placing and laying. - 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 or 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 pipes and fittings shall be securely closed so that no trench water or other foreign substances will enter the pipes or fittings. All 1/16 and sharper 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 6 square feet of bearing area against a vertical trench face.

6.3.1 Cast iron pipe laid underground shall be inspected in the sling before lowering into the trench 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.

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

6.3.3 All flanged pipe shall be worked into place without springing or forcing.

6.3.4 All water pipe laid underground shall be installed to line and grade indicated.

6.4 Joints. -

6.4.1 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 2¼ 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-001$6a.

6.4.2 Asbestos cement pipe shall be jointed in accordance with the recommendations of the manufacturer, subject to the approval of the Engineer. Connections to cast iron fittings shall be as specified for cast iron pipe.

6.4.3 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. New bolts and gaskets shall be provided for all existing flanged pipe, fittings and valves used in the new work.

6.5 Valves. -

6.5.1 Gate valves 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.

6.5.2 Check valves shall be cast iron body, bronzed mounted, tilting disc, Class 150 and shall conform to Specification No. MIL-V-18436, Type II, Style A.

6.5.3 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.

6.6 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.

6.7 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.

6.8 Manholes.- Manholes for air release valve shall be constructed as detailed on drawings. Brick shall be hard burned new, whole brick of uniform standard commercial size with straight and parallel edges and square corners. Mortar used for brick masonry shall be composed of one part Portland cement and 10 percent hydrated lime, based on the volume of cement, and two parts sand. Manhole frame and cover shall weight not less than 328 pounds. The cover shall be solid and shall have the words "WATER VALVE" cast therein.

6.9 Tests. - Before being covered, the completed piping shall be subjected to a hydrostatic pressure test of 150 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.

6.10 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 C601-54. 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 Engineer before acceptance.

SECTION 7. INTERIOR ELECTRICAL

7.1 General Requirements. -

7.1.1 The work shall include provision of complete and operating interior electrical wiring systems in conduit for serving current to lighting, power and control.

7.1.2 The work shall include new service entrances including junction box, new conduit and new conductors; the reconnecting of existing motors, motor starters, disconnect switches, toggle switches, and lighting circuits to be relocated to the well houses at new Wells "I", "K" and "L".

7.1.3 The work further includes providing a new service entrance, all wires, conduit outlet and junction boxes, receptacle, lighting fixtures complete with lamps, wiring of motor starter, control devices, service entrance switch for a complete and operating electrical system for well house at new well "H".

7.1.4 All electrical work to be done as specified herein, as shown, and unless otherwise specified or shown in accordance with Bureau Yards and Docks, Specification No. 9Yg and other specifications listed therein.

7.2 Electric service to the well house shall be 120/208 volt, wye, 4-wire, 3-phase.

7.3 Conductors for interior wiring shall be 600 volts, Type RH in dry locations, Type RHL in wet locations. Minimum size shall be No. 12 AWG.

7.4 Service switch. - The service switch shall be a Type A, 100 ampere, 4 pole, solid neutral type, quick make and quick break fused safety switch, approved for service entrance duty, in a NEMA Type I enclosure having an exterior operating handle interlocked to prevent access to the interior when switch is closed.

7.5 Magnetic motor controllers. - Magnetic motor controllers shall be of the quick make and quick break type having overload and low voltage release and with hand reset overload trip mechanisms. Controllers shall conform to the latest applicable NEMA standards for the type and class as specifically applied. All magnetic controllers will be furnished with the equipment under the mechanical section but shall, unless integral with the equipment, be installed and wired by the electrical contractor. The controller shall be in a NEMA type 1 enclosure, arranged for surface mounting.

7.6 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.

7.7 Convenience receptacles. - Convenience receptacle outlets shall be duplex, 15 ampere, 125 volts, "T" rated, 20 ampere, 125 volt, in composition base, polarized, 3 wire grounding type.

7.8 Lighting fixtures shall conform to Fixture No. 11, Plate No.2 of Bureau of Yards and Docks Specification No. 9Yg.

7.9 Grounding System shall be as follows:

7.9.1 Electrical system ground. - All conduit, motor frames, metal casings, solid neutral, etc., shall be permanently and effectively grounded. Resistance to ground shall not exceed 3 ohms.

SECTION 8. EXTERIOR ELECTRICAL

8.1 General Requirements. -

8.1.1 The work shall include the providing of all electrical apparatus, equipment, accessories, and other materials indicated, specified and/or necessary to provide new overhead and underground services including new rigid galvanized conduit, new poles, anchors and down guys, crossarms, galvanized pole line hardware, lightning

arresters, fuse cutouts, transformers, copper conductors for primary and secondary circuits, ground systems and new pole numbers. Underground service shall be encased in concrete.

8.1.2 The work further includes the removal of the existing electrical distribution line consisting of poles, primary and secondary conductors, down guys, crossarms, pole line hardware, the removal and rehanging of transformers, the removal and installing of lightning arresters, fuse cutouts, meters, and the Provision of new poles. Materials and equipment not used in the new work shall be salvaged and disposed of as herein specified.

8.1.3 All electrical work shall be done as specified herein, as shown on the drawings and unless otherwise specified or shown in accordance with Bureau of Yards and Docks Specification No. 9Yg and other standard specifications listed therein.

8.2 Existing conditions. -

8.2.1 The existing primary source of electrical energy for the work is 7200/12,470 V. wye. 4-wire, 3-phase overhead distribution line along and adjacent to U. S. Highway No. 17.

8.2.2 The existing secondary source of electrical energy is 120/208 V, 4W, 3 phase located on the same poles as the primary circuit.

8.3 Electric service. -

8.3.1 Primary service shall be 7200/12,470 volts, wye, 3-phase, 4-wire, 60 cycle, solid neutral grounded.

8.3.2 Secondary service shall be 120/208 volts wye, 3-phase, 4-wire, (common with primary neutral) 60 cycle, grounded neutral.

8.4 Wires and cables shall conform to the following where applicable.

8.4.1 No conductor smaller than #12 AWG shall be used.

8.4.2 All wire in conduit installed in dry locations shall be type RH.

8.4.3 All wire in conduit installed wholly or in part in damp locations, outside, in or under the floor slab or underground shall be type RHL.

8.4.4 The number, size and type of conductors shall be as shown on the drawings.

8.5 New transformers shall be pole mounted as shown and shall be of the outdoor, oil-filled type designed for single phase 7200/240/120 volts with four 2½% taps below normal rated voltage, 60 cycles and arranged for three phase wye primary, wye secondary, in a group of three to deliver 120/208 volts, three phase, four wire secondary current. The transformers shall conform to the current standards of the NEMA, ASA and AIEE for transformers of this size and voltage.

8.6 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.

8.7 Fused cutouts. - 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.

8.8 Transformer ground. - The primary and secondary wye connections of the bank shall be grounded at the transformer pole. The transformer case and all equipment shall be grounded to the same common grounding system. Resistance to ground shall not exceed 10 ohms.

8.9 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 3 sections of ten foot lengths of not less than 5/8 inches O.D. copper-encased sectional steel road driven to a depth of at least thirty-one feet.

8.10 Ground resistance. - The ground resistance at each ground location, previous to any connections, shall be not greater than 10 ohms. If additional material and/or labor is required to obtain the above resistance, payment will be made by change order.

8.11 Ground wires.- All ground wires shall be 4 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 Suspension insulators. - There shall be two 7½" diameter suspension insulators for each primary wire at every dead end. The overall flash-over value of the two insulators in series shall not be less than 125 KV dry and 60 KV wet. The positive flash-over value shall be not less than 210 KV and the negative impulse flash-over value shall be not less than 210 KV. Insulators shall be of the wet process type.

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

8.14 Spool insulators shall be of the wet process type. The over-all flash-over value of the insulators shall be not less than 26 KV dry and 13 KV wet.

Radio influence voltage shall have approximately the following values:

Type of Insulator	Test KV RMS to Ground	Maximum Micro Volts at 1000 KC
Suspension insulators (2 in series)	10	50
Pin type insulators (ea)	15	100
Spool insulators (ea)	10 (approx.)	50 (approx.)

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

8.15.1 Secondary wire rack shall be of solid construction hot dipped zinc-coated of not less than #9 gauge steel, having points on 8-inch centers, welded or strongly riveted to the channel and attached to the pole with two 5/8th through bolts. The rack shall be complete with wet processed porcelain insulators.

8.16 Guys. - Strand shall have a minimum breaking strength of 10,000 pounds and shall be 7-wire, specification strand type. Each guy shall be made up with 3-bolt heavy duty clamps and thimble eyes. Guard shall be half round metal, bolted to guy, eight feet in length and installed on all guys in this contract.

8.17 Strain insulators. - Shall be installed on each guy and shall have a dry flash-over of 30 KV, a wet flash-over of not less than 16 KV, minimum strength of 10,000 pounds and made by the wet process method.

8.18 Anchors may be either of the expanding type not less than 135 square inches with holding power of 10,000 pounds in sand and equipped with 3/4 inches by eight foot rods having thimble eye or five feet by eight inches diameter logs, creosoted after cutting and framing, complete with 3/4 inches by nine feet thimble eye rod, nut and washer. Anchor or log shall be installed five feet below grade.

8.19 Poles and crossarms.- Poles shall be American Standard Association, Class 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 (Const.).

8.20 Double arming. - All dead ends shall be double armed, with two cross arms provided, one on either side of the pole; double arming bolts shall be installed.

8.21 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.

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

8.23 Pole line hardware. Pole line hardware shall be zinc-coated

by the hot dip process in accordance with the American Society of Testing Materials standards specification for "zinc-coating (hot dip) on Iron and Steel Hardware" ASTM Designation A153-53.

8.24 Pole numbering. Provide on each of the new poles a pole number designation, on the side of the pole facing the road, with the code letters arranged horizontally and the numerals arranged vertically not less than one inch and not over two inches below. The height of mounting shall be seven feet above the adjacent road grade to the bottom of the lowest numeral.

8.24.1 Letters and numerals shall be two inches high embossed from polished aluminum and of Arabic Type. Each numeral shall have a minimum of two nail holes and letters shall have a sufficient number of additional nail holes to insure firm support to the pole of all portions of the letter. Both the letters and numerals shall duplicate those on existing poles.

8.24.2 For this purpose transfer the pole designations on the existing pole #ND5 to the new replacing pole and provide new numbers for the remainder of the new poles.

8.25 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 engineer seventy-two hours previous to the proposed outage and a written directive obtained and followed stipulating the time and duration permitted.

2-3-59

SPECIAL PROVISION

FINAL PAYMENT

Should final payment on this project not be made within ninety (90) calendar days after the project is completed and accepted by the Commission interest at the rate of five per cent (5%) per annum will be paid the contractor on the final payment for the period beginning ninety (90) calendar days after the project is completed and accepted and extending to the date final payment is made; provided, the contractor has not requested that final payment be delayed, and provided further, that there has been no delay in making the final payment caused by the Contractor's failure to furnish the following documents or instruments on the project:

1. Statement of contractor as to any claim which he may have against the Commission arising from work on the project.

2. Affidavit of the contractor that all obligations and debts arising out of the construction have been satisfied.

3. Statement of consent of surety on the contract bond for payment of money due to the contractor.

4. Freight bills, if any, as provided in Section 9.9 of the Standard Specifications (Oct. 1, 1952)

5. Completed B. P. R. 47 as to the project;

provided, interest shall not accrue at the end of aforesaid 90 days period unless the aforesaid documents and instruments have been submitted within 45 days from the completion and acceptance of the project, however, if the contractor submits aforesaid documents and instruments after said 45-day period then interest shall begin to accrue 45 days after receipt by the Commission of said documents.

The Commission reserves the right to reduce the retained percentage held upon completion of the project and receipt of consent of surety for payment.

February 6, 1958

REVISION OF SECTIONS 5 AND 8 OF SPECIFICATIONS

DIVISION I GENERAL PROVISIONS

The provisions of Division I, General Provisions, of the North Carolina State Highway Commission Standard Specifications for Roads and Structures, dated October 1, 1952, are amended and augmented by the following:

Section 5 CONTROL OF WORK

5.1 AUTHORITY OF THE ENGINEER

The second paragraph of this section is rescinded and replaced by the following:

Pre-construction conferences shall be held between the Division Engineer, the Resident Engineer and the Contractors or their representatives to determine points at which the contractor may begin work and the sequence of operations. The points at which the contractor may begin work and the sequence of operations or prosecution of the work should be mutually agreed upon by the Engineer and the contractor unless otherwise stipulated in special provisions; however, should the contractor and the Engineer fail to agree on the sequence of operations or the prosecution of the work, then the decision of the Engineer shall be final.

Section 8 PROSECUTION AND PROGRESS

8.6 DETERMINATION AND EXTENSION OF CONTRACT TIME FOR COMPLETION OF WORK

The next to the last paragraph is rescinded and replaced by the following:

From the date of expiration of the working days shown in the contract to the date of actual completion of same, the Contractor, shall be charged the sum as stipulated in the contract ranging from $100 to $400 per day for each calendar day that the contract remains incompleted after working days have elapsed, not as a penalty but as liquidated damages in lieu of engineering costs.

Section 8.7 FAILURE TO COMPLETE WORK ON TIME

The first two sentences are deleted and replaced by the following:

Time is an essential element of the contract and as delay in the prosecution of the work will inconvenience the public, obstruct traffic, and interfere with business, it is important that the work be pressed vigorously to completion. Moreover, the cost to the Commission of the administration of the contract including engineering, inspection, and supervision, will be increased as the construction period is lengthened. Should the contractor fail to complete the work in the time as stipulated in the contract or within such extra time as may have been allowed for delays by formal extensions, a deduction of the amount stipulated in the contract will be made for each and every calendar day that such contract remains incompleted after the time above designated for the completion. The said amount is hereby agreed upon as liquidated damages for the loss to the Commission and will be deducted from any money due the contractor under this contract, and the contractor and his sureties shall be liable for any liquidated damages in excess of the amount due the contractor.

The last two sentences remain unchanged.

10-15-57

NOTE TO CONTRACTORS:

SPECIAL ATTENTION IS CALLED TO SECTION VII OF THE REQUIRED PROVISIONS FOR FEDERAL AID CONTRACTS.

9-16-57

SUPPLEMENTARY REQUIRED PROVISIONS FOR FEDERAL AID CONTRACTS:

Paragraph I, "Application", of the Required Provisions for Federal Aid Contracts shall be amended and supplemented by the addition of the two following paragraphs:

> The contractor shall insert in each of his subcontracts all of the stipulations contained in these Required Provisions and such other stipulations as may be required.
>
> A breach of any of the stipulations contained in these Required Provisions may be grounds for termination of the contract.

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

Required Provisions

For

Federal Aid Contracts

I. Application.
II. Nondiscrimination of Employees.
III. Payment of Predetermined Minimum Wages.
IV. Affidavits and Payrolls.
V. Employment Classification Reports.
VI. Record of Materials and Supplies.
VII. Subletting or Assigning the Contract.

January 1, 1955

Required Provisions—Federal Aid-Contracts

I. Application

These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work or by subcontract.

II. Nondiscrimination of Employees

In the performance of this contract, the contractor shall not discriminate against any worker because of race, creed, color, or national orgin.

III. Payment of Predetermined Minimum Wages

These contract provisions are supplemented elsewhere in the contract by special provisions which set forth certain predetermined minimum wage rates. The contractor shall pay not less than those rates.

IV. Affidavits and Payrolls

The regulations of the Secretary of Labor, under the "Anti-Kickback" Act, as amended, 18 U.S.C. 874, U.S.C. 276c, are hereby made a part of the contract.

In accordance with the above act, as amended, and regulations, each week the contractor and subcontractor shall each furnish to the resident engineer a sworn affidavit, with respect to the wages paid during the preceding weekly pay-roll period, in the form prescribed by the regulations as follows:

State of _____

County of _____

I,_____ (name of party signing affidavit)

_____ (title), being duly sworn, do depose and say: That I pay or supervise the payment of the persons employed by

_____ (contractor or subcontractor) on the

_____ (building or work); that during the payroll

period commencing on the _____day of _____, 195____ and ending the _____day of _____, 195____, all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of

said _____ (contractor or subcontractor) from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full weekly wages earned by any person, other than permissible deductions, as defined in the Regulations under the "Anti-Kickback" Act, as amended, 40 U.S.C. 276c and described below:

(Paragraph describing deductions, if any.)

_____
(Signature and title)

Sworn to before me this_____day of _____, 195_____

The filing of weekly affidavits with the resident engineer on a project shall be considered compliance with regulations for filing such documents.

The contractor and subcontractor shall report, upon the completion of the contract, a summary statement of all employment, indicating for the completed project the total hours worked and the total amount earned. This report shall be submitted to the resident engineer together with the data required in Section VI hereof relative to materials and supplies.

The submission by the contractor of payrolls, or copies thereof, is not required. However, in accordance with the "Anti-Kickback" regulations referred to above, each contractor or subcontractor shall preserve his weekly payroll record for a period of three years from the date of completion of this contract. The payroll record shall set out accurately and completely the name, occupation and hourly wage rate of each employee, hours worked by him during the payroll period, the full weekly wages earned by him, any deductions made from such weekly wages, and the actual weekly wages paid to him. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative.

The time book of the contractor and subcontractor shall be open to the inspection of the engineers at any time.

The wages of labor shall be paid in legal tender of the United States, except that this condition will be considered satisfied if payment is made by negotiable checks, on a solvent bank, which may be cashed readily by the employee in the local community for the full amount, without discount or collection charges of any kind. Where checks are used for payment, the

contractor shall make all necessary arrangements for them to be cashed and shall give information regarding such arrangements.

No fee of any kind shall be asked or accepted by the contractor or by any of his agents from any person as a condition of employment on the project.

No labor shall be charged for any tools used in preforming their respective duties except for reasonably avoidable loss or damage thereto.

Every employee on the work covered by this contract shall be permitted to lodge, board and trade where and with whom he elects and neither the contractor nor his agents, nor his employee shall directly or indirectly require as a condition of employment that an employee shall lodge, board or trade at a particular place or with a particular person.

No charge shall be made for any transportation furnished by the contractor or his agents to any person employed on the work.

No individual shall be employed as a laborer on this contract except on a wage basis, but this shall not be construed to prohibit the rental of teams, trucks or other equipment from individuals. No such rental agreement, or any charge for feed, gasoline, supplies, or repairs on account of such agreement, shall cause any deduction from wages accuring to any employee except as authorized by the regulations hereinbefore cited.

V. Employment Classification Reports

The contractor and each subcontractor shall furnish, for the weekly payroll periods nearest to January 15, April 15, and October 15, a summary statement with respect to employment, broken down into the four classifications enumerated below. Such summary statement shall indicate for the payroll period covered the total number of employees, the total hours worked and the total amount earned for each of the four classifications,

statement data shall be submitted on Form PR-110 (formerly PR-200), which will be furnished for this purpose upon request, or on any other form which provides for reporting identical information.

(1) Executive or Administrative:

Employees in this category shall be classified in accordance with the definitions for Executive and Administrative employees as adopted by the Secretary of Labor under the Fair Labor Standards Act, as amended, and in effect at the time of invitation for bids.

(2) Skilled:

Skilled labor shall include the operator of complex, heavy power equipment and skilled craftsmen of the journeyman grade.

(3) Intermediate grade:

Intermediate grade labor shall include

(a) Operators of power equipment except:
Complex, heavy power equipment
Trucks of 1½ tons or less (manufacturer's rated capacity)
Tractors of less than 20 horsepower (manufacturer's rated capacity)

Passenger cars

(b) Persons performing any other labor which requires considerable training and experience

(4) Unskilled:

Unskilled labor shall include

(a) Operators of trucks of 1½ tons or less (manufacturer's rated capacity), operators of tractors of less than 20 horsepower (manufacturer's rated capacity), and operators of passenger cars.

(b) Helpers to journeyman craftsmen and all other labor which requires no special skill or experience or the exercise of discreation and independent judgement.

VI. Record of Materials and Supplies

The contractor shall maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed below and in the units shown. Upon completion of the contract, this record, together with the final labor summary required in Section IV hereof shall be submitted to the resident engineer for the project on Form PR-47 in accordance with instructions thereon, which will be furnished for this purpose upon request, or upon any other form which provides for reporting identical information. The quantities for the listed items shall be reported separately for roadway and for structures over 20 feet long as measured along the center line of the roadway.

1. *Cement*: All cement used, whether standard, natural, high-early-strength, or other special types, shall be reported in barrels.

2. *Aggregates* (Commercial): This item shall include only those aggregates (sand, gravel and crushed stone or rock) that the contractor purchases from commercial producers and shall be reported either in tons or cubic yards, Aggregates produced by the contractor shall be reported under Item 15.

3. *Bituminous Materials*: All bituminous materials purchased by the contractor shall be reported in gallons. This item shall include all liquid asphaltic materials such as S.C., M.C., R.C., and emulsions and all asphaltic cement and tars. All petroleum fuels, lubricating oils and grease shall be reported under Item 9, Petroleum Products.

4. *Lumber*: This item shall include plywood, pressed wood, other form lumber : all lumber used for falsework, bridge timbers, floor planks, guard rail, fences; and any other lumber product, except timber piling and shall be reported in thousand board feet.

5. *Timber Piling*: This item shall be reported in linear feet.

6. *Corrugated Metal Culvert*: This item shall include factory riveted corrugated pipe, structrual plate pipe, pipe-arches and arches. Quantities for these structures shall be reported in linear feet for each size used.

7. *Reinforcing Steel*: This item shall be reported in pounds, and shall include all steel used as reinforcing in pavments and/or structural concrete.

8. *Structural Steel*: This item shall be reported in pounds, and shall include fabricated bridge steel, steel H-piling, and sheet piling.

9. *Petroleum Products*: This item shall be reported in gallons, and shall include supplies such as gasoline, lubricating oil, grease, diesel fuel or fuel oil used in the operation of equipment or on incidental work connected with the construction of the project.

10. *Explosives*: This item shall be reported in pounds and shall include all explosives used in the construction of the project. Caps and fuses shall not be included in this item.

11. *Ready-mixed Concrete*: This item shall include all concrete used on the job that is purchased in a prepared condition ready for placement as it reaches the job and shall be reported in cubic yards.

12. *Premixed Bituminous Paving Materials*: This item shall include all bituminous paving mixtures,including rock asphalt, used on the job that are purchased in a prepared condition ready for placement as they reach the job and shall be reported in tons.

13. *Concrete Culvert and Drain Pipe*: This item shall include both plain and reinforced pipe used on the job and shall be reported in linear feet for each size used.

14. *Clay Pipe and Drain Tiles* This item shall include all clay pipe and tile used on the job and shall be reported in linear feet for each size used.

15. *Aggregates Produced (other than Commercial)*: This item shall include only the quantity of aggregates (sand, gravel, and crushed stone or rock) that is produced by the contractor. The quantity shall be reported either in tons or cubic yards.

16. *Miscellaneous Steel*: This shall include an estimated total weight of steel products not covered by Items 6, 7, or 8, such as steel guard-rail, fences, cast iron pipe, tubular piling, joint devices, nails, etc. The quantity shall be reported in pounds.

Where subcontractors are involved the general contractor shall submit either a single report covering work both by himself and all his subcontractors, or he may submit seperate reports for himself and for each of his subcontractors.

VII. Subletting or Assigning the Contract

The contractor shall perform with his own orginization work amounting to not less than 50 percent of the remainder obtained by subtracting from the total original contract value the sum of any items designated in the contract as "Specialty Items."

Any items that have been selected as "Specialty Items" for the contract are listed as such in the Special Provisions found elsewhere in the contract.

No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer or his authorized representative. Requests for permission to sublet, assign or otherwise dispose of any portion of the contract shall be in writing and accompanied by a showing that the orginization which will perform the work is particularly experienced and equipped for such work. The contractor shall give assurance that the minimun wage for labor as stated in his proposal shall apply to labor performed on all work sublet, assigned or otherwise disposed of in any way. Consent to sublet, assign or otherwise dispose of any portion of the contract shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract.

SPECIAL PROVISIONS 2-10-56

MINIMUM WAGES:

In so far as the State Highway and Public Works Commission is concerned, the following minimum wages shall prevail, subject to the interpretation of the Fair Labor Standards Act.

The minimum wage paid to all skilled labor employed on this contract shall be 85 cents per hour.

The minimum wage paid to all intermediate labor employed on this contract shall be 75 cents per hour.

The minimum wage paid to all unskilled labor employed on this contract shall be 65 cents per hour.

FAIR LABOR STANDARDS ACT:

The attention of the Contractor is called to the fact that the Fair Labor Standards Act has been amended and, effective March 1, 1956, specifies a minimum wage rate of not less than one dollar ($1.00) an hour.

The determination of the extent of the application of this act to this project is the responsibility of the contractor and the State Highway and Public Works Commission disclaims any responsibility in its application.

July 1, 1955

SWORN STATEMENT RELATIVE TO COLLUSION, ETC., REQUIRED BEFORE CONTRACT IS AWARDED:

"Section 17 (b) of the Federal-Aid Highway Act of 1954 requires as a condition precedent to approval by the Commissioner of Public Roads of the contract for this work that the contractor file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract. This sworn statement shall be in form of an affidavit executed and sworn to by the successful bidder before such persons as are authorized by the laws of the State to administer oaths. The original of such sworn statement shall be filed with the State Highway Department prior to the award of the contract."

Enclosed is a copy of affidavit form referred to above. It must be properly prepared, executed and sworn to by an official authorized to administer oaths. It should be included in your proposal when the latter is submitted as a bid. The contract for this project cannot and will not be awarded until this affidavit has been received by the Commission.

9-10-57

SAFETY AND ACCIDENT PREVENTION

The contractor will be required to comply with all applicable Federal, State and local laws governing safety, health and sanitation, and shall provide all safeguards, safety devices and protective equipment and take any other needed actions, on his own responsibility or as the contracting officer may determine, reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

9-4-56

SPECIAL PROVISIONS

Rental Rates for Equipment Used in Performing Extra Work

The attention of contractors is called to the fact that in the event it is necessary to perform extra work in connection with the construction of this project, the rental rates to be allowed for equipment used in performing such work shall, except as otherwise specified below, be in accordance with the schedule published by the Associated Equipment Distributors. The cost of fuel, lubricants, and cutting edges shall be added to the above rates.

When extra work is performed with equipment already on the project, the rental rates to be allowed shall be at the hourly rates of 1/160 (20 days @ 8 hours) of the applicable monthly rental rates shown in the above mentioned schedule. The cost of operators, fuel, lubricants and cutting edges shall be added to the above rates.

ITEM NUMBER	SECTION NO.	APPROXIMATE QUANTITIES	ITEM WITH UNIT PRICE WRITTEN IN WORDS	UNIT BID PRICE DOLLARS	UNIT BID PRICE CENTS	AMOUNT BID DOLLARS	AMOUNT BID CENTS
358		Lump Sum	Drilling Four Gravel Packed Wells & Relocating Existing Power Lines at _____ Dollars and _____ Cents Lump Sum				

NOTE—BIDDERS MUST CARRY OUT THE EXTENSIONS

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The State Highway Commission may increase, or decrease, the amount of any item or portion of work as may be deemed necessary or expedient.

An increase, or decrease, in quantity for any item will not be regarded as sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided for in the contract.

Accompanying this proposal is a surety bond with warrant of attorney to confess judgment, or other satisfactory surety, or certified check drawn on a responsible banking institution, payable to the order of The State Highway Commission, for _____ _____ Dollars (_____), which deposit is to be forfeited as liquidated damages in case this proposal is accepted and the undersigned shall fail to execute a contract with necessary bond for the performance of said contract with the State Highway Commission, under the condition of this proposal, within 10 days after contract is mailed for execution, as provided in paragraph 3.6, page 16, under sec. 3 "Execution and Approval of Contract" of the standard specification; otherwise said deposit is to be returned to the undersigned.

SIGNATURE OF CONTRACTOR

If an individual:

Signature of Contractor _____ (Seal)

Address of Contractor _____ (Seal)

_____

If a Corporation:

Signature of Contractor _____ (Seal)

By _____ (Seal)
President

Address of Contractor _____

_____

Attest: _____
Secretary

Corporation Seal

Names of Officers

President _____

Vice President _____

Secretary _____

Treasurer _____

If a Co-partnership

Names and Addresses of Members

_____

_____

_____

_____

_____

By _____ (Seal)
Title

Address of Contractor _____

_____