Water Treatment and Pumping Plant — Bldg.#178 Montford Point

A. Pump Room

1. Unit#1 - Service Pump, Single Drive (Electric)
Name: Worthington; Manufacturer: Worthington Corporation, Harrison, New Jersey.
Type: Horizontal Centrifugal; Serial No. 1530331; Pump No. 3L2; HP: 25; GPM: 500; RPM: 1750; T.D.H. 130 feet.
(a) Motor, Electric; Name: Electro Dynamic; Manufacturer: Division of General Dynamic Corporation, Bayonne, New Jersey.
Type: TN; Model No. AJ6295A3; Frame: 364; HP: 25; Cycles: 60; RPM: 1740; Amps: 64/32; Volts: 220/440; Phase: 3; C Rise: 40°; Code: F; % S.F. 115.
(1) Switch, Electric; Name: Westinghouse; (Main for Motor); Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GF; Style: 47A4217G3; Amps: 100; Volts: 600; Type: AB1.
(2) Switch, Electric; (Starter, Stop, and Reset); Name: Westinghouse Life-Line Starter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Class: 11-203-NS3; Style: 174511; Amps: 90 inclosed 100 opened; Volts: 208 - 220; Size: 3AC; Coil frequency: 60.
(b) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 8 inches.
(c) Valve, Check; Chapman Tilting Disc; 6 inches; 6L33; 175 QWG.
(d) Valve, Gate; Effluent; Name: Mueller, Chattanooga, Tenn.; 6 inches.

2. Unit#2 - Service Pump, Single Drive (Electric)
Name: Worthington; Manufacturer: Worthington Corporation, Harrison, New Jersey.
Type: Horizontal Centrifugal; Serial No. 1530339; Pump No. 5L2; HP: 50; GPM: 1000; RPM: 1750; T.H.D. 130 feet;
(a) Motor, Electric; Name: Electro Dynamic; Manufacturer: Division of General Dynamic Corporation, Bayonne, New Jersey.
Type: TN; Model No. AJ5636A10; Frame: 405-S; HP: 50; Cycles: 60; RPM: 1750; Amps: 124/62; Volts: 220/440; Phase: 3; C Rise: 40°; Code: F; Design: B; % S.F. 115.
(1) Switch, Electric(Main for Motor); Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GJ; Style: 47A4217G3; Amps: 225; Volts: 600; Type: AB1.
(2) Switch, Electric (Starter, Stop, and Reset); Name: Westinghouse Life-Line Starter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Class: 11-203-NS4; Style: 46-X-612; Amps: 135; Volts: 208-220; Size: 4AC; Coil frequency: 60.
(b) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 10 inches; 175 QWG; 300 Test.
(c) Valve, Check; Chapman Tilting Disc; 8 inches; 6L33; 175QWG; 300 Test.
(d) Valve, Gate; Effluent; Namr: Mueller, Chattanooga, Tenn.; 8 inches; 175 QWG; 300 Test.

Water Treatment and Pumping Plant — Bldg.#178 Montford Point

A. Pump Room

1. Unit#1 - Service Pump, Single Drive (Electric)
Name: Worthington; Manufacturer: Worthington Corporation, Harrison, New Jersey.
Type: Horizontal Centrifugal; Serial No. 1530331; Pump No. 3L2; HP: 25; GPM: 500; RPM: 1750; T.D.H. 130 feet.
(a) Motor, Electric; Name: Electro Dynamic; Manufacturer: Division of General Dynamic Corporation, Bayonne, New Jersey.
Type: TN; Model No. AJ6295A3; Frame: 364; HP: 25; Cycles: 60; RPM: 1740; Amps: 64/32; Volts: 220/440; Phase: 3; C Rise: 40°; Code: F; % S.F. 115.
(1) Switch, Electric; Name: Westinghouse; (Main for Motor); Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GF; Style: 47A4217G3; Amps: 100; Volts: 600; Type: AB1.
(2) Switch, Electric; (Starter, Stop, and Reset); Name: Westinghouse Life-Line Starter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Class: 11-203-NS3; Style: 174511; Amps: 90 inclosed 100 opened; Volts: 208 - 220; Size: 3AC; Coil frequency: 60.
(b) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 8 inches.
(c) Valve, Check; Chapman Tilting Disc; 6 inches; 6L33; 175 QWG.
(d) Valve, Gate; Effluent; Name: Mueller, Chattanooga, Tenn.; 6 inches.

2. Unit#2 - Service Pump, Single Drive (Electric)
Name: Worthington; Manufacturer: Worthington Corporation, Harrison, New Jersey.
Type: Horizontal Centrifugal; Serial No. 1530339; Pump No. 5L2; HP: 50; GPM: 1000; RPM: 1750; T.H.D. 130 feet;
(a) Motor, Electric; Name: Electro Dynamic; Manufacturer: Division of General Dynamic Corporation, Bayonne, New Jersey.
Type: TN; Model No. AJ5636A10; Frame: 405-S; HP: 50; Cycles: 60; RPM: 1750; Amps: 124/62; Volts: 220/440; Phase: 3; C Rise: 40°; Code: F; Design: B; % S.F. 115.
(1) Switch, Electric(Main for Motor); Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GJ; Style: 47A4217G3; Amps: 225; Volts: 600; Type: AB1.
(2) Switch, Electric (Starter, Stop, and Reset); Name: Westinghouse Life-Line Starter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Class: 11-203-NS4; Style: 46-X-612; Amps: 135; Volts: 208-220; Size: 4AC; Coil frequency: 60.
(b) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 10 inches; 175 QWG; 300 Test.
(c) Valve, Check; Chapman Tilting Disc; 8 inches; 6L33; 175QWG; 300 Test.
(d) Valve, Gate; Effluent; Namr: Mueller, Chattanooga, Tenn.; 8 inches; 175 QWG; 300 Test.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Pump Room Continued

3. Unit#3 - Service pump, Dual Drive (Electric and Gasoline)
Name: Worthington; Manufacturer: Worthington Corporation, Harrison, New Jersey.
Type: Horizontal Centrifugal; Serial No.1532520; Pump No. 5LS2; HP: 50; GPM: 1250; RPM: 1750; T.D.H. 130 feet.
(a) Motor, Electric; Name: Electro Dynamic; Manufacturer: Division of General Dynamic Corporation, Bayonne, New Jersey.
Type: TN; Model No. AJ5636A14; Frame: 405-8; HP: 50; Cycles: 60; RPM: 1750; Amps: 124/62; Volts: 220/440; Phase: 3; C Rise: 40°; Code: F; Design: B; % S.F. 115.
(1) Switch, Electric (Main for Motor); Name: Wertinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GJ; Style: 47A4217G3; Amps: 225; Volts: 600; Type: AB1.
(2) Switch, Electric (Starter, Stop, and Reset); Name: Westinghouse Life-Line Starter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Class: 11-203-NS4; Style: 46-X-612; Amps: 135; Volts: 208-220; Size: 4AC; Coil frequency: 60.
(b) Motor, Gasoline; Name: Continental Red Seal; Manufacturer: Continental Motors Corporation, Muskegon, Michigan.
Model No. MA330; Serial No. 2205; Engine No. 1054; Cylinders: 6.
(c) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 10 inches; 175 QWG; 300 Test.
(d) Valve, Check; Chapman Tilting Disc; 10 inches; 6L33; 175 QWG; 300 Test.
(e) Valve, Gate; Effluent; Name: Mueller, Chattanooga, Tenn.; 10 inches; 175 QWG; 300 Test.

4. Unit#1 - Chemical Pump (Phosphate, 936)
Name: Proportioneer Pump; Manufacturer: Proportioneers Inc., Providence, Rhode Island.
(DB-50)
(a) Motor, Electric; Name: General Electric; Manufacturer: General Electric, Schenectady, New York.
Model No. 5KC45AB1127A; HP: 1/5; Cycles: 60; RPM: 1725; Amps: 2.6; Volts: 115; Phase: 1; C Rise: 40°; Type (?): KC; Frame (?): 434.
(1) Switch, Electric (Limit Switch controled by the Back Pressure Valve); Name: General Electric; Manufacturer: General Electric, Schenectady, New York.
Number: CR9440J; Limit Switch: 1D.

5. Unit#1 - Receiver, Electric (For Clear Water Reservoir Level); Name: Bristol Metameter; Manufacturer: The Bristol's Company, Waterbury, Conn. Model No. 0G534M-16; Serial No. 642109; Scale: 5309; Volts: 120; Cycles: 60; Ohms: 1000; Type: C; Seconds: 15; Water Pressure: 0 to 15 feet.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Pump Room Continued

3. Unit#3 - Service pump, Dual Drive (Electric and Gasoline)
Name: Worthington; Manufacturer: Worthington Corporation, Harrison, New Jersey.
Type:Horizontal Centrifugal; Serial No.1532520; Pump No. 5LS2; HP: 50; GPM: 1250; RPM: 1750; T.D.H. 130 feet.
(a) Motor, Electric; Name: Electro Dynamic; Manufacturer: Division of General Dynamic Corporation, Bayonne, New Jersey.
Type: TN; Model No. AJ5636A14; Frame: 405-8; HP: 50; Cycles: 60; RPM: 1750; Amps: 124/62; Volts: 220/440; Phase: 3; C Rise: 40°; Code: F; Design: B; % S.F. 115.
(1) Switch, Electric (Main for Motor); Name: Wertinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GJ; Style: 47A4217G3; Amps: 225; Volts: 600; Type: AB1.
(2) Switch, Electric (Starter, Stop, and Reset); Name: Westinghouse Life-Line Starter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Class: 11-203-NS4; Style: 46-X-612; Amps: 135; Volts: 208-220; Size: 4AC; Coil frequency: 60.
(b) Motor, Gasoline; Name: Continental Red Seal; Manufacturer: Continental Motors Corporation, Muskegon, Michigan.
Model No. MA330; Serial No. 2205; Engine No. 1054; Cylinders: 6.
(c) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 10 inches; 175 QWG; 300 Test.
(d) Valve, Check; Chapman Tilting Disc; 10 inches; 6L33; 175 QWG; 300 Test.
(e) Valve, Gate; Effluent; Name: Mueller, Chattanooga, Tenn.; 10 inches; 175 QWG; 300 Test.

4. Unit#1 - Chemical Pump (Phosphate, 936)
Name: Proportioneer Pump; Manufacturer: Proportioneers Inc., Providence, Rhode Island.
(DB-50)
(a) Motor, Electric; Name: General Electric; Manufacturer: General Electric, Schenectady, New York.
Model No. 5KC45AB1127A; HP: 1/5; Cycles: 60; RPM: 1725; Amps: 2.6; Volts: 115; Phase: 1; C Rise: 40°; Type (?): KC; Frame (?): 434.
(1) Switch, Electric (Limit Switch controled by the Back Pressure Valve); Name: General Electric; Manufacturer: General Electric, Schenectady, New York.
Number: CR9440J; Limit Switch: 1D.

5. Unit#1 - Receiver, Electric (For Clear Water Reservoir Level); Name: Bristol Metameter; Manufacturer: The Bristol's Company, Waterbury, Conn. Model No. OG534M-16; Serial No. 642109; Scale: 5309; Volts: 120; Cycles: 60; Ohms: 1000; Type: C; Seconds: 15; Water Pressure: 0 to 15 feet.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Pump Room Continued

5. Unit#1 - Heater, Steam; Name: Webster; Manufacturer: Warren Webster and Company, Camden, New Jersey.
   (a) Motor, Electric (For Fan); (Could not get to).

6. Unit#1 - Valve, Gate; It is the valve between the clear water reservoir and the service pumps; Name: Mueller; Chattanooga, Tenn.; 12 inches; 175 W; 300 Test; FM 12 SV.

7. Unit#1 - Valve, Gate; It is the valve between the softeners and the clear water reservoir; Name: Mueller; Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

8. Unit#1 - Valve, Gate; It is the valve to bypass the clear water reservoir; Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

B. Softener Room

9. Unit#1 - Softener, Pressure
   Name: Duplex Automatic Water Softening System; Manufacturer: UW 52 B Pottstown Metal Welding Company, Pottstown, Penn.
   MFRS Serial No. 5368.2; Size: 6 feet diameterand 8 feet 3 inches high; Maxium WP: 75 at 650° F; Shl 3125 HD 375 RD 66; Shl . HD 375 RD .66; Year Built: 1956; Nat'L. Bo No. 2770.
   6.93 cubic feet of 1" - 1½" gravel; 9.24 cubic feet of 5/8" - 1" and ¼" - 5/8" gravel; 13.86 cubic feet of 3/16" - ¼", 1/8" - 3/16", and 1/16" - 1/8" gravel; 6.93 cubic feet of fine torpedo sand; 70 cubic feet of Zeolite. Operating weight 17 tons; Tank operating pressure 75 P.S.I.; Tank test pressure 113 P.S.I.; Exchange capacity 1400 KG; Softener flow rate 180 - 225 G.P.M.
   (a) Motor, Electric; Name: Janette; Manufacturer:

   Model No. SO; Input HP: 1/8; Cycles: 60; Serial No. 568379; Input RPM: 1140; Output RPM: 15.8; Amps: 3.0/1.5; Volts: 115/230; Phase: 1; Rise: 55°; Frame: KS 14; Ratio: 72.
   (b) Counter, Electric; Name: Microflex; Type: HZ50A608; Model No. 1; Amps: 15; Volts: 115; Serial No. 56-6857-138-39
      (1) Impulse Coil, Electric; Volts: 115; Frequency: 50.60.
      (2) Clutch Coil, Electric; Volts: 115; Frequency: 50 60.
   (c) Meter, Water; Name: Worthington-Gamon; 3 inch 1 H Turbine Meter; Number: 5616928.
   (d) Relay, Electric
      Number: 360-38
   (e) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 3 inches; 125 WSP; 200 Test.
   (f) Valve, Check; Effluent; Name: Chapman; 3 inches; 150 WSP; 22A.
   (g) Valve, Gate; Effluent; Name: Jenkins; 3 inches 125 OWP; 200 Test.
   (h) Valve, Gate (Brine); Name: Chapman; 1 ½ inch.
   (i) Valve, Check; Brine; Name: Vertical Check Valve; 1 ½ inch.
   (j) Valve, Check; Brine; Name: HorizontalCheck Valve; 1 ½ inch.

Water Treatment and Pumping Plant   Bldg. #178 Montford Point

Pump Room Continued

5. Unit#1 - Heater, Steam; Name: Wolster; Manufacturer: Warren Webster and Company, Camden, New Jersey.
(a) Motor, Electric (For Fan); (Could not get to).

6. Unit#1 - Valve, Gate; It is the valve between the clear water reservoir and the service pumps; Name: Mueller; Chattanooga, Tenn.; 12 inches; 175 W; 300 Test; FM 12 SV.

7. Unit#1 - Valve, Gate; It is the valve between the softeners and the clear water reservoir; Name: Mueller; Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

8. Unit#1 - Valve, Gate; It is the valve to bypass the clear water reservoir; Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

B. Softener Room

9. Unit#1 - Softener, Pressure
Name: Duplex Automatic Water Softening System; Manufacturer: DM 52 H Pottstown Metal Welding Company, Pottstown, Penn.
Tank Serial No. 5368.2; Size: 6 feet diameter and 8 feet 3 inches high; Maximum WP: 75 at 650° F; Shl 3125 HD 375 ED 66; Shl HD 375 ED .56; Year Built: 1956; Nat'l. Bd No. 2770.
0.75 cubic feet of 1" - 1½" gravel; 9.24 cubic feet of 5/8" - 1" and ¼" - 5/8" gravel; 13.56 cubic feet of 3/16" - ¼", 1/8" - 3/16", and 1/16" - 1/8" gravel; 6.93 cubic feet of fine torpedo sand; 70 cubic feet of Zeolite. Operating weight 17 tons; Tank operating pressure 75 P.S.I.; Tank test pressure 113 P.S.I.; Exchange capacity 1400 KG; Softener flow rate 150 - 225 G.P.M.
(a) Motor, Electric; Name: Janette; Manufacturer:

Model No. 5C; Input HP: 1/8; Cycles: 60; Serial No. 683279; Input RPM: 1140; Output RPM: 15.8; Amps: 3.0/1.5; Volts: 115/230; Phase: 1; Frame: 53; Frame: RS 14; Ratio: 72.
(b) Counter, Electric; Name: Microflex; Type: HS0A6OC6; Model No. 1; Amps: 15; Volts: 115; Serial No. 56-5577-13-39
(1) Impulse Coil, Electric; Volts: 115; Frequency: 50/60.
(2) Clutch Coil, Electric; Volts: 115; Frequency: 50 60.
(c) Meter, Water; Name: Worthington-Gamon; 3 inch L H Turbine Meter; Number: 5616928.
(d) Relay, Electric
Number: 360-38
(e) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 3 inches; 125 SSP; 200 Test.
(f) Valve, Check; Effluent; Name: Chapman; 3 inches; 150 WSP; 72A.
(g) Valve, Gate; Effluent; Name: Jenkins; 3 inches 125 Owp; 200 Test.
(h) Valve, Gate (Brine); Name: Chapman; 1 ¼ inch.
( ) Valve, Check; Brine; Name: Vertical Check Valve; 1 [illegible] inch.
( ) Valve, Check; Brine; Name: Horizontal Check Valve; 1 ¼ inch.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Pump Room Continued

5. Unit#1 - Heater, Steam; Name: Webster; Manufacturer: Warren Webster and Company, Camden, New Jersey.
   (a) Motor, Electric (For Fan); (Could not get to).

6. Unit#1 - Valve, Gate; It is the valve between the clear water reservoir and the service pumps; Name: Mueller; Chattanooga, Tenn.; 12 inches; 175 W; 300 Test; FM 12 SV.

7. Unit#1 - Valve, Gate; It is the valve between the softeners and the clear water reservoir; Name: Mueller; Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

8. Unit#1 - Valve, Gate; It is the valve to bypass the clear water reservoir; Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

B. Softener Room

9. Unit#1 - Softener, Pressure
   Name: Duplex Automatic Water Softening System; Manufacturer: UW 52 B Pottstown Metal Welding Company, Pottstown, Penn.
   MFRS Serial No. 5368.2; Size: 6 feet diameterand 8 feet 3 inches high; Maxium WP: 75 at 650° F; Shl 3125 HD 375 RD 66; Shl HD 375 RD .66; Year Built: 1956; Nat'L. Bo No. 2770.
   6.93 cubic feet of 1" - 1½" gravel; 9.24 cubic feet of 5/8" - 1" and ½" - 5/8" gravel; 13.86 cubic feet of 3/16" - ¼", 1/8" - 3/16", and 1/16" - 1/8" gravel; 6.93 cubic feet of fine torpedo sand; 70 cubic feet of Zeolite. Operating weight 17 tons; Tank operating pressure 75 P.S.I.; Tank test pressure 113 P.S.I.; Exchange capacity 1400 KG; Softener flow rate 180 - 225 G.P.M.
   (a) Motor, Electric; Name: Janette; Manufacturer:

   Model No. SO; Input HP: 1/8; Cycles: 60; Serial No. 568379; Input RPM: 1140; Output RPM: 15.8; Amps: 3.0/1.5; Volts: 115/230; Phase: 1; Rise: 55°; Frame: KS 14; Ratio: 72.
   (b) Counter, Electric; Name: Microflex; Type: HZ50A608; Model No. 1; Amps: 15; Volts: 115; Serial No. 56-6857-138-39
      (1) Impulse Coil, Electric; Volts: 115; Frequency: 50.60.
      (2) Clutch Coil, Electric; Volts: 115; Frequency: 50 60.
   (c) Meter, Water; Name: Worthington-Gamon; 3 inch 1 H Turbine Meter; Number: 5616928.
   (d) Relay, Electric
      Number: 360-38
   (e) Valve, Gate; Influent; Name: Mueller, Chattanooga, Tenn.; 3 inches; 125 WSP; 200 Test.
   (f) Valve, Check; Effluent; Name: Chapman; 3 inches; 150 WSP; 22A.
   (g) Valve, Gate; Effluent; Name: Jenkins; 3 inches 125 OWP; 200 Test.
   (h) Valve, Gate (Brine); Name: Chapman; 1 ½ inch.
   (i) Valve, Check; Brine; Name: Vertical Check Valve; 1 ½ inch.
   (j) Valve, Check; Brine; Name: HorizontalCheck Valve; 1 ½ inch.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Softener Room Continued

10. Unit#2 - Softener, Pressure
Name: Duplex Automatic Water Softening System; Manufacturer: UW 52 B Pottstown Metal Welding Company, Pottstown, Penn.
MFRS Serial No. 5368.1; Size: 6 feet in diameter and 8 feet 3 inches in high; Maximum WP: 75 at 650° F; Shl. 3125 HD 375 RD 66; Shl. HD 375 RD .66; Year Built 1956; Nat'L. Bo No. 2769.
6.93 cubic feet of 1" - 1½" gravel; 9.24 cubic feet of 5/8" - 1" and¼" - 5/8" gravel; 13.86 cubic feet of 3/16" - ¼", 1/8" - 3/16", and 1/16" - 1/8" gravel; 6.93 cubic feet of fine torpedo sand; 70 cubic feet of Zeolite. Operating weight 17 tons; Tank operating pressure 75 P.S.I.; Tank test pressure 113 P.S.I.; Exchange capacity 1400 KG; Softener flow rate 180 - 225 G.P.M.
(a) Motor, Electric; Name: Janette; Manufacturer:

Model No. SO; Serial No. 575743; Input HP: 1/8; Cycles: 60; Input RPM: 1140; Output RPM:15.8; Amps: 3.9/1.95; Volts: 115/230; Phase: 1; Rise: 55; Frame: KS20; Ratio: 72.
(b) Counter, Electric; Name: Microflex; Type: HZ50A608; Model No. 1; Amps: 15; Volts: 115; Serial No. 56-6857-138-10.
(1) Impulse COil, Electric; Volts: 115; Frequency: 50 60.
(2) Clutch Coil, Electric; Volts: 115; Frequency: 50.60.
(c) Meter, Water; Name: Worthington-Gamon; 3 inch 1 H Turbine Meter; Number: 5616927.
(d) Relay, Electric
Number: 360-38
(e) Timer, Electric; Name: Eagle; Manufacturer: Eagle Signal Corporation, Moline, Ill.
Type: HF54S101A603; Serial No. 56-6857-145-27; Frequency: 60; Amps: 10; Volts: 110.
(f) Valve, Gate; Influent; Name: Jinkins, Chattanooga, Tenn.; 3 inches; 125 WSP; 200 Test.
(g) Valve, Check; Effluent; Name: Chapman; 3 inches; 150 WSP; 22A.
(h) Valve, Gate; Effluent; Name: Jenkins; 3 inches; 1250WP; 200 Test.
(i) Valve, Gate; Brine; Name: Chapman; 1½inch.
(j) Valve, Check; Brine; Name: Vertical Check Valve; 1½ inch.
(k) Valve, Check; Brine; Name: Horizontal Check Valve; 1½ inch.

11. Unit#1 - Valve, Gate; Raw Water; Name: Mueller, Chattanooga, Tenn.; 6 inches; 175 W; 200 Test.

12. Unit#1 - Valve, Gate; Raw Water; Name: Mueller, Chattanooga, Tenn.; 6 inches; 175 W; 200 Test.

13. Unit#1 - Valve, Back Pressure;

Model No. 50 RWR; Serial No. 56185.
(a) Coil, Electric

Serial Nol H19917; Catalogue No. WP. No. 82302; Maximum Pressure lbs. Water 150; Volts: 110; Cycles: 60; Watts: 36.

Softener Room Continued

10. Unit#2 - Softener, Pressure
Name: Duplex Automatic Water Softening System; Manufacturer: [illegible] Pottstown Metal Welding Company, Pottstown, Penn.
[illegible] Serial No. [illegible]; Size: 6 feet in diameter and 8 feet 3 inches in high; Maximum [illegible] 75 at 650 [illegible]: Shl. 3125 [illegible] 375 [illegible]; Shl. [illegible] RD .56; Year Built 1956; Nat'l. Bd No. 2769.
6.93 cubic feet of 1" - 1½" gravel; 9.24 cubic feet of 5/8" - 1" and [illegible] - 5/8" gravel; 13.8 cubic feet of 3/16" - [illegible]", 1/8" - 3/16", and 1/16" - 1/8" gravel; 6.93 cubic feet of fine torpedo sand; 70 cubic feet of zeolite. Operating weight 17 tons; Tank operating pressure 75 P.S.I.; Tank test pressure 113 P.S.I.; Exchange capacity 1400 KG; Softener flow rate 100 - 225 G.P.M.
(a) Motor, Electric; Name: Lafotte; Manufacturer:

Model No. 40; Serial No. 575743; Input HP: 1/3; Cycles: 60; Input RPM: 1140; Output RPM: 15.8; Amps: 3.9/1.95; Volts: 115/230; Phase: 1; Disc: 59; Frame: 1520; Ratio: 72.
(b) Counter, Electric; Name: Micro-Flex; Type: HB50A6[illegible]; Model No. 1; Amps: 15; Volts: 115; Serial No. 56-857-138-10.
(1) Impulse Coil, Electric; Volts: 115; Frequency: 50-60.
(2) Clutch Coil, Electric; Volts: 115; Frequency: 50-60.
(c) Meter, Water; Name: Worthington-Gamon; 3 inch 1 [illegible] Turbine Meter; Number: 5016927.
(d) Relay, Electric
Number: 300-36
(e) Timer, Electric; Name: Eagle; Manufacturer: Eagle Signal Corporation, Moline, Ill.
Type: HF51S101A603; Serial No. 56-857-145-27; Frequency: 60; Amps: 10; Volts: 120.
(f) Valve, Gate; Influent; Name: Jenkins, Chattanooga, Tenn.; 3 inches; 125 WSP; 200 Test.
(g) Valve, Check; Effluent; Name: Chapman; 3 inches; 150 WSP; 22[illegible].
(h) Valve, Gate; Effluent; Name: Jenkins; 3 inches; 125WSP; 200 Test.
(i) Valve, Gate; Brine; Name: [illegible]; 1 inch.
(j) Valve, Check; Brine; Name: Vertical Check Valve; 1¼ inch.
(k) Valve, Check; Brine; Name: Horizontal Check Valve; 1½ inch.

11. Unit#2 - Valve, Gate; Raw Water; Name: Mueller, Chattanooga, Tenn.; 6 inches; 175 W; 200 Test.

12. Unit#1 - Valve, Gate; Raw Water; Name: Mueller, Chattanooga, Tenn.; 6 inches; 175 W; 200 Test.

13. Unit#1 - Valve, [illegible] Pressure;

[illegible]; Serial No. [illegible].
(1) Coil, Electric

Serial No. [illegible]; Catalogue No. [illegible] No. 6250[illegible]; Maximum Pressure 105. Water 150; Volts: 110; Cycles: 60; Watts: 36.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Softener Room Continued

10. Unit#2 - Softener, Pressure
Name: Duplex Automatic Water Softening System; Manufacturer: UW 52 B Pottstown Metal Welding Company, Pottstown, Penn.
MFRS Serial No. 5368.1; Size: 6 feet in diameter and 8 feet 3 inches in high; Maximum WP: 75 at 650° F; Shl. 3125 HD 375 RD 66; Shl. HD 375 RD .66; Year Built 1956; Nat'L. Bo No. 2769.
6.93 cubic feet of 1" - 1½" gravel; 9.24 cubic feet of 5/8" - 1" and ¼" - 5/8" gravel; 13.86 cubic feet of 3/16" - ¼", 1/8" - 3/16", and 1/16" - 1/8" gravel; 6.93 cubic feet of fine torpedo sand; 70 cubic feet of Zeolite. Operating weight 17 tons; Tank operating pressure 75 P.S.I.; Tank test pressure 113 P.S.I.; Exchange capacity 1400 KG; Softener flow rate 180 - 225 G.P.M.
(a) Motor, Electric; Name: Janette; Manufacturer:

Model No. SO; Serial No. 575743; Input HP: 1/8; Cycles: 60; Input RPM: 1140; Output RPM:15.8; Amps: 3.9/1.95; Volts: 115/230; Phase: 1; Rise: 55; Frame: KS20; Ratio: 72.
(b) Counter, Electric; Name: Microflex; Type: HZ50A608; Model No. 1; Amps: 15; Volts: 115; Serial No. 56-6857-138-10.
(1) Impulse COil, Electric; Volts: 115; Frequency: 50 60.
(2) Clutch Coil, Electric; Volts: 115; Frequency: 50.60.
(c) Meter, Water; Name: Worthington-Gamon; 3 inch 1 H Turbine Meter; Number: 5616927.
(d) Relay, Electric
Number: 360-38
(e) Timer, Electric; Name: Eagle; Manufacturer: Eagle Signal Corporation, Moline, Ill.
Type: HF54S101A603; Serial No. 56-6857-145-27; Frequency: 60; Amps: 10; Volts: 110.
(f) Valve, Gate; Influent; Name: Jinkins, Chattanooga, Tenn.; 3 inches; 125 WSP; 200 Test.
(g) Valve, Check; Effluent; Name: Chapman; 3 inches; 150 WSP; 22A.
(h) Valve, Gate; Effluent; Name: Jenkins; 3 inches; 1250WP; 200 Test.
(i) Valve, Gate; Brine; Name: Chapman; 1½inch.
(j) Valve, Check; Brine; Name: Vertical Check Valve; 1½ inch.
(k) Valve, Check; Brine; Name: Horizontal Check Valve; 1½ inch.

11. Unit#1 - Valve, Gate; Raw Water; Name: Mueller, Chattanooga, Tenn.; 6 inches; 175 W; 200 Test.

12. Unit#1 - Valve, Gate; Raw Water; Name: Mueller, Chattanooga, Tenn.; 6 inches; 175 W; 200 Test.

13. Unit#1 - Valve, Back Pressure;

Model No. 50 RWR; Serial No. 56185.
(a) Coil, Electric

Serial No. H19917; Catalogue No. WP. No. 82302; Maximum Pressure lbs. Water 150; Volts: 110; Cycles: 60; Watts: 36.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Softener Room Continued

(b) Valve, Hydraulic Pilot; New Style ("O" Ring Packing)

14. Unit#1 - Valve, Solenoid Pilot
Name: Mercoid Magnetic V^Alve
Type: K15BA; Serial No. K6A24; Watts: 28; Cycles: 60; Volts: 115; Solnoid: 300; Manufacturer: F; MFGRS RSI or Port. 1.
On high pressure line that goes between the Back Pressure Valve and the Raw Water line.

15. Switch, Pressure (Used to work Chlorinator)
Name: Pressuretrol; Manufacturer: Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.
Type: L404A4X3;

	A.C.		D.C.	
	115V	230V	115V	230V
Full Load	7.4	5.1	2.4	1.2
Locked Rotor	44.4	30.6	24.0	12.0
Resistance Load	10	5	5	2

16. Valve, Pressure Air (On Raw Water Main to allow air to excape while the Raw Water Main is under pressure.

17. Unit#1 - Valve, Gate (For by passing the Softeners); Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; Test 300.

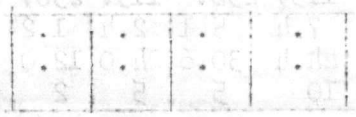
18. Unit#1 - Valve, Gate (For by-passing the Softeners); Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

19. Unit#1 - Proportioner Line (Raw and Softened Water)
(a) Valve, G_ate; Name: Jenkins; 3 inches; 125 WSP; 200 Test.
(b) Valve, Proporting; Raw and Softened Water; Name: Pilot load pressure balanced Regulator; Manufacturer: Fisher Governor Company, Marshalltown, Iowa.
Type: 790; Serial No. 2714916; DVQO fully balanced; Maximum: 33 PSI; Maximum inlet pressure 125.
(c) Valve, Automatic; Fairbanks-Morse; NSVD 3R; 3 inches; 150.

20. Unit#1 - Panel, Electric (For lights, motors, and switches)
Name: Westinghouse Electric; Manufacturer: Underwriters Laboratories, Inc.
Style or Type: NLAB18-4L100; Number: D212474; Assembled in Atlanta Stock Order: CHY74508; Amps: 100; Volts: 120/208; Phase: 3.

21. Unit#1 - Heater, Steam
Name: Trane Unit Heater
Seral No. 361-59-63670; Size: 73 H.
(a) Blower, Electric; Manufacturer: Universal Electric Company,

Serial No. 12V34585; Model No. 18-440; Amps: 1.05; Cycles: 60; Volts: 115; RPM: 1550; HP: 1/30.



Water Treatment and Pumping Plant Bldg.#178 Montford Point

Softener Room Continued

(b) Valve, Hydraulic Pilot; New Style ("O" Ring Packing)

14. Unit#1 - Valve, Solenoid Pilot
Name: Mercoid Magnetic V^Alve
Type: K15BA; Serial No. K6A24; Watts: 28; Cycles: 60; Volts: 115; Solnoid: 300; Manufacturer: F; MFGRS RSI or Port. 1.
On high pressure line that goes between the Back Pressure Valve and the Raw Water line.

15. Switch, Pressure (Used to work Chlorinator)
Name: Pressuretrol; Manufacturer: Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.
Type: L4O4A4X3;

	A.C.		D.C.	
	115V	230V	115V	230V
Full Load	7.4	5.1	2.4	1.2
Locked Rotor	44.4	30.6	24.0	12.0
Resistance Load	10	5	5	2

16. Valve, Pressure Air (On Raw Water Main to allow air to excape while the Raw Water Main is under pressure.

17. Unit#1 - Valve, Gate (For by passing the Softeners); Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; Test 300.

18. Unit#1 - Valve, Gate (For by-passing the Softeners); Name: Mueller, Chattanooga, Tenn.; 8 inches; 175 W; 300 Test.

19. Unit#1 - Proportioner Line (Raw and Softened Water)
(a) Valve, G$_a$te; Name: Jenkins; 3 inches; 125 WSP; 200 Test.
(b) Valve, Proporting; Raw and Softened Water; Name: Pilot load pressure balanced Regulator; Manufacturer: Fisher Governor Company, Marshalltown, Iowa.
Type: 790; Serial No. 2714916; DVQO fully balanced; Maximum: 33 PSI; Maximum inlet pressure 125.
(c) Valve, Automatic; Fairbanks-Morse; NSVD 3R; 3 inches; 150.

20. Unit#1 - Panel, Electric (For lights, motors, and switches)
Name: Westinghouse Electric; Manufacturer: Underwriters Laboratories, Inc.
Style or Type: NLAB18-4L100; Number: D212474; Assembled in Atlanta Stock Order: CHY74508; Amps: 100; Volts: 120/208; Phase: 3.

21. Unit#1 - Heater, Steam
Name: Trane Unit Heater
Seral No. 361-59-63670; Size: 73 H.
(a) Blower, Electric; Manufacturer: Universal Electric Comapny,

Serial No. 12V34585; Model No. 18-440; Amps: 1.05; Cycles: 60; Volts: 115; RPM: 1550; HP: 1/30.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Softener Room Continued

22. Unit#2 - Heater, Steam
Name: Trane Unit Heater
Serial No. 361-57-47861; Size: 71 H
(a) Blower, Electric; Manufacturer: Universal Electric Company,

Serial No. 12U30925; Model No. 18-440; Amps: 1.05; Volts: 115; Cycles: 60; RPM: 1550; HP:

C. Brine

23. Unit#1 - Reservoir, Brine Storage, Number: 1.
Size: 18 feet long, 12 feet 6 inches wide, and 8 feet deep; Capacity, Maximum: 126,000 pounds of rock salt.
(a) Switch, Float (For brine tank #1)
DG4; B1-G5; 156
(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Effluent; 2 inch.

24. Unit#2 - Reservoir, Brine Storage, Number: 2.
Size: 18 feet long, 12 feet 6 inches wide, and 8 feet deep; Capacity, Maximum: 126,000 pounds of rock salt.
(a) Switch, Float (For brine tank #2)

(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Effluent; 2 inch.

25. Unit#1 - Switch, Electric (For control of treated water going into brine reservoir); Name: Atkomatic; Manufacturer: Atkomatic Valve Company, Indianapolis, Ind.
Media: Steam; Size: $\frac{1}{4}$; Maximum PSI: 165; Type: BDGS; Serial No. 138232; Volts: 115; Cycles: 60.
(a) Switch, Electric (Control box for automatic switch)
Name: G; Manufacturer: Underwriters Laboratories, Inc.;
Catalogue No. 633 NP; Amps: 30; Volts: 125/250; Issue: V419.
(b) Valve, Gate; Influent; 3/4 inch;

26. Unit#1 - Tank, Brine (For measuring brine)
Size: 4 feet deep and 3 feet in diameter; Capacity, Maximum: 211.52 gallons.
(a) Switch, Electric (Automatic)

(b) Valve, Gate; Influent; 2 inches
(c) Valve, Gate; Effluent; $1\frac{1}{2}$ inch; Chapman
(d) Valve, Check; ; $1\frac{1}{2}$ inch

Softener Room Continued

22. Unit#2 - Heater, Steam
Name: Trane Unit Heater
Serial No. 361-57-47061; Size: 71 H
(a) Blower, Electric; Manufacturer: Universal Electric Company.

Serial No. 12830925; Model No. 16-440; Amps: 1.05; Volts: 115; Cycles: 60; RPM: 1550; HP:

C. Brine

23. Unit#1 - Reservoir, Brine Storage, Number: 1.
Size: 18 feet long, 12 feet 6 inches wide, and 8 feet deep; Capacity, Maximum: 126,000 pounds of rock salt.
(a) Switch, Float (For brine tank #1)
[illegible]: 21-05: 156
(b) Valve, Gate; Influent: 1 inch.
(c) Valve, Gate; Effluent: 2 inch.

24. Unit#2 - Reservoir, Brine Storage, Number: 2.
Size: 18 feet long, 12 feet 6 inches wide, and 8 feet deep; Capacity, Maximum: 126,000 pounds of rock salt.
(a) Switch, Float (For brine tank #2)

(b) Valve, Gate; Influent: 1 inch.
(c) Valve, Gate; Effluent: 2 inch.

25. Unit#1 - Switch, Electric (For control of treated water going into brine reservoir); Name: Atkomatic; Manufacturer: Atkomatic Valve Company, Indianapolis, Ind.
[illegible]; Size: ; Design No: [illegible]; [illegible]; Serial No. 13[illegible];
Volts: 115; Cycles: 60.
(a) Switch, Electric (Control box for automatic switch)
Name: 0; Manufacturer: Underwriters Laboratories, Inc.;
Catalogue No. 933 C; Amps: 30; Volts: 125/250; Issue: [illegible].
(b) Valve, Gate; Influent: 3/4 inch;

26. Unit#1 - Tank, Brine (For measuring brine)
Size: 6 feet deep and 3 feet in diameter; Capacity, Maximum: 211.52 gallons.
(a) Switch, Electric (Automatic)

(b) Valve, Gate; Influent: 2 inches
(c) Valve, Gate; Effluent; 1½ inch: [illegible]
(d) Valve, Check; ; 1½ inch

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Softener Room Continued

22. Unit#2 - Heater, Steam
Name: Trane Unit Heater
Serial No. 361-57-47861; Size: 71 H
(a) Blower, Electric; Manufacturer: Universal Electric Company,

Serial No. 12U30925; Model No. 18-440; Amps: 1.05; Volts: 115; Cycles: 60; RPM: 1550; HP:

C. Brine

23. Unit#1 - Reservoir, Brine Storage, Number: 1.
Size: 18 feet long, 12 feet 6 inches wide, and 8 feet deep; Capacity, Maximum: 126,000 pounds of rock salt.
(a) Switch, Float (For brine tank #1)
DG4; B1-G5; 156
(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Effluent; 2 inch.

24. Unit#2 - Reservoir, Brine Storage, Number: 2.
Size: 18 feet long, 12 feet 6 inches wide, and 8 feet deep; Capacity, Maximum: 126,000 pounds of rock salt.
(a) Switch, Float (For brine tank #2)

(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Effluent; 2 inch.

25. Unit#1 - Switch, Electric (For control of treated water going into brine reservoir); Name: Atkomatic; Manufacturer: Atkomatic Valve Company, Indianapolis, Ind.
Media: Steam; Size: ¼; Maximum PSI: 165; Type: BDGS; Serial No. 138232; Volts: 115; Cycles: 60.
(a) Switch, Electric (Control box for automatic switch)
Name: G; Manufacturer: Underwriters Laboratories, Inc.;
Catalogue No. 633 NP; Amps: 30; Volts: 125/250; Issue: V419.
(b) Valve, Gate; Influent; 3/4 inch;

26. Unit#1 - Tank, Brine (For measuring brine)
Size: 4 feet deep and 3 feet in diameter; Capacity, Maximum: 211.52 gallons.
(a) Switch, Electric (Automatic)

(b) Valve, Gate; Influent; 2 inches
(c) Valve, Gate; Effluent; 1½ inch; Chapman
(d) Valve, Check; ; 1½ inch

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Brine Continued

27. Unit#2 - Tank, Brine (For measuring brine); Number: 2.
Size: 4 feet deep and 3 feet in diameter; Capacity, Maximum: 211.52 gallons.
(a) Switch, Electric (Automatic)

(b) Valve, Gate; Influent; 2 inches
(c) Valve, Gate; Effluent; 1½ inch; Chapman
(d) Valve, Check; ; 1½ inch

28. Pump, Brine; Number: 1.
Name: Peerless; Manufacturer: Peerless Pump Division, Food Machinery and Chemical Corporation, Los Angeles, California.
Serial No. 189580; Complete Seal No. 2606360; Seal Parts Kit No. 2606360.
(a) Motor, Electric
Name: Master Alternating Current Motor; Manufacturer: Master Electric Company, Dayton, Ohio.
Serial No. HN19915; Type: PA; Frame: G56; Style: 268136; Amps: 3.2/1.6; Cycles: 60; Volts: 208-220/440; Phase: 3; RPM:3450/2850; Code: K; Rise: 40/50°.
(1) Switch, Electric Safety
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. CAU-321; Style No. 1739299; Type: 8; Amps: 30; Votls: 240; HP:5.
(2) Switch, Electric (For Reset, Start, and Stop)
Name: Life-Linestarter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Mech Style: 1532864-A; Class: 11-200N.0; Type: N; Size: 0.
(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Fresh Water; 3/8 inch.

29. Pump, Brine; Number: 2.
Name: Goulds; Manufacturer: Goulds Pump's Inc., Seneca Falls, New York.
Number: 739A087; Size: 1X1½ .6; M G 3199; Capacity: 40; RPM: 1750; Head: 20.
(a) Motor, Electric
Name: Wagner; Manufacturer: Wagner Induction Motor

Serial No. AAM2S; Type: RP; Frame: H 56; Model No. H56-43328-00; Amps: 2-2/1; Volts: 208-220/440; RPM: 1725; Phase: 3; Code: K; HP: ½; Duty: 50; Service Factor: 1.25.
(1) Switch, Electric Safety
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. CAU-321; Style No. 1739299; Type: 8; Amps: 30; Volts: 240; HP: 5.
(2) Switch, Electric (For Reset, Start, and Stop)
Name: Life-Linestarter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Mech Style: 1532864-A; Class: 11-200N.0; Type: N; Size: 0.
(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Fresh Water; 3/8 inch.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Brine Continued

27. Unit#2 - Tank, Brine (For measuring brine); Number: 2.
Size: 4 feet deep and 3 feet in diameter; Capacity, Maximum: 211.52 gallons.
(a) Switch, Electric (Automatic)

(b) Valve, Gate; Influent; 2 inches
(c) Valve, Gate; Effluent; 1½ inch; Chapman
(d) Valve, Check; ; 1½ inch

28. Pump, Brine; Number: 1.
Name: Peerless; Manufacturer: Peerless Pump Division, Food Machinery and Chemical Corporation, Los Angeles, California.
Serial No. 189580; Complete Seal No. 2606360; Seal Parts Kit No. 2606360.
(a) Motor, Electric
Name: Master Alternating Current Motor; Manufacturer: Master Electric Company, Dayton, Ohio.
Serial No. HN19915; Type: PA; Frame: G56; Style: 268136; Amps: 3.2/1.6; Cycles: 60; Volts: 208-220/440; Phase: 3; RPM:3450/2850; Code: K; Rise: 40/50°.
(1) Switch, Electric Safety
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. CAU-321; Style No. 1739299; Type: 8; Amps: 30; Volts: 240; HP:5.
(2) Switch, Electric (For Reset, Start, and Stop)
Name: Life-Linestarter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Mech Style: 1532864-A Class: 11-200N.0 ; Type: N; Size: 0.
(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Fresh Water; 3/8 inch.

29. Pump, Brine; Number: 2.
Name: Goulds; Manufacturer: Goulds Pump's Inc., Seneca Falls, New York.
Number: 739A087; Size: 1X1½ .6; M G 3199; Capacity: 40; RPM: 1750; Head: 20.
(a) Motor, Electric
Name: Wagner; Manufacturer: Wagner Induction Motor

Serial No. AAM2S; Type: RP; Frame: H 56; Model No. H56-43328-00; Amps: 2-2/1; Volts: 208-220/440; RPM: 1725; Phase: 3; Code: K; HP: ½; Duty: 50; Service Factor: 1.25.
(1) Switch, Electric Safety
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. CAU-321; Style No. 1739299; Type: 8; Amps: 30; Volts: 240; HP: 5.
(2) Switch, Electric (For Reset, Start, and Stop)
Name: Life-Linestarter; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Mech Style: 1532864-A; Class: 11-200N.0; Type: N; Size: 0.
(b) Valve, Gate; Influent; 1 inch.
(c) Valve, Gate; Fresh Water; 3/8 inch.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

D. Chlorine

30. Unit#1 - Chlorinator; Number: 1.
Name: Fischer and Porter; Manufacturer: Fischer and Porter Company, Hatboro, Pennsylvania
Type: Monrel visible vacuum; Serial No. 5603A2923J1.

31. Unit#2 - Chlorinator; Number: 2.
Name: Fischer and Porter; Manufacturer: Fischer and Porter Company, Hatboro, Pennsylvania.
Type: Monrel visible vacuum; Serial No. 5603A2923J1.

32. Unit#3 - Pump, Chlorinator Booster
Name: (I think it is) Fairbanks-Morse; (No Nomenclature Plate)

Number: SR4R-C2 Discharge: SR4RB-2

(a) Motor, Electric
Name: Fairbanks and Morse; Manufacturer: Fairbanks, Morse and Company, Fairbanks-Morse Building, Chicago 5, Ill.
Number: F-254785; Spec. No. 2822-22; Frame: RS203; Volts: 208-220/440; HP: 1; Cycles: 60; RPM:1460; Amps: 3.4-3.2/1.6; Phase: 3; Code: K; C. Rise: 40°; Type: QZK; S. E.: 1.25.
(1) Switch, Electric (Main Control for Motor)
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. CAU-321; Style: 1739299; Amps; 30; Volts: 240; HP: 5.
(2) Switch, Electric (Reset).
Name: Cutler-Hammer Motor Control

33. Unit#1 - Scales (For weighting Chlorine)
Name: Fairbanks and Morse; Manufacturer: Fairbanks, Morse and Company, Fairbanks-Morse Building, Chicago 5, Ill.
Serial No. G349743; Capacity: 1000 pounds; Code: 1124.

E. Meter and Panel (Electric) Floor.

34. Unit#1 - Meter, Electric (Rate of Raw Water Flow)
Name: Fisher and Porter; Manufacturer: Fischer and Porter Company, Hatboro, Pennsylvania.
Serial No. 5705A1968J3; FigureNo. 570-UK-1603 Special; Series No. 13; Volts: 120; Cycles: 60; Chart: 0-U-80; Chart X: see curve; Indicator X: 1=GPM; Integrator X: 100 = Gallons; Used with No. 5705A1968J2.
(a) Plate, Orifice
Inlet: 4 Dore 4.550

35. Unit#2 - Receiver, Electric (Service Water Flow Meter)
Name: Fisher and Porter; Manufacturer: Fisher and Porter Company, Hatboro, Pennsylvania.
Serial No. 5705A1968J5; Figure No. 570-UK-1603 Special; Series No. 13; Volts: 120; Cycles: 60; Chart: 0-U-40; Chart X: see curve; Indicator X: 1 = MGD; Integrator X: 1000 = Gallons; Used with No. 5705A1968J4.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

D. Chlorine

30. Unit#1 - Chlorinator; Number: 1.
Name: Fischer and Porter; Manufacturer: Fischer and Porter Company, Hatboro, Pennsylvania
Type: Monrel visible vacuum; Serial No. 5603A2923J1.

31. Unit#2 - Chlorinator; Number: 2.
Name: Fischer and Porter; Manufacturer: Fischer and Porter Company, Hatboro, Pennsylvania.
Type: Monrel visible vacuum; Serial No. 5603A2923J1.

32. Unit#3 - Pump, Chlorinator Booster
Name: (I think it is) Fairbanks-Morse; (No Nomenclature Plate)

Number: SR4R-C2 Discharge: SR4RB-2

(a) Motor, Electric
Name: Fairbanks and Morse; Manufacturer: Fairbanks, Morse and Company, Fairbanks-Morse Building, Chicago 5, Ill.
Number: F-254785; Spec. No. 2822-22; Frame: RS203; Volts: 208-220/440; HP: 1; Cycles: 60; RPM:1460; Amps: 3.4-3.2/1.6; Phase: 3; Code: K; C. Rise: 40°; Type: QZK; S. E.: 1.25.
(1) Switch, Electric (Main Control for Motor)
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. CAU-321; Style: 1739299; Amps; 30; Volts: 240; HP: 5.
(2) Switch, Electric (Reset).
Name: Cutler-Hammer Motor Control

33. Unit#1 - Scales (For weighting Chlorine)
Name: Fairbanks and Morse; Manufacturer: Fairbanks, Morse and Company, Fairbanks-Morse Building, Chicago 5, Ill.
Serial No. G349743; Capacity: 1000 pounds; Code: 1124.

E. Meter and Panel (Electric) Floor.

34. Unit#1 - Meter, Electric (Rate of Raw Water Flow)
Name: Fisher and Porter; Manufacturer: Fischer and Porter Company, Hatboro, Pennsylvania.
Serial No. 5705A1968J3; FigureNo. 570-UK-1603 Special; Series No. 13; Volts: 120; Cycles: 60; Chart: 0-U-80; Chart X: see curve; Indicator X: 1=GPM; Integrator X: 100 = Gallons; Used with No. 5705A1968J2.
(a) Plate, Orifice
Inlet: 4 Dore 4.550

35. Unit#2 - Receiver, Electric (Service Water Flow Meter)
Name: Fisher and Porter; Manufacturer: Fisher and Porter Company, Hatboro, Pennsylvania.
Serial No. 5705A1968J5; Figure No. 570-UK-1603 Special; Series No. 13; Volts: 120; Cycles: 60; Chart: 0-U-40; Chart X: see curve; Indicator X: 1 = MGD; Integrator X: 1000 = Gallons; Used with No. 5705A1968J4.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Meter and Panel (Electric) Floor Continued

(a) Plate, Orifice

36. Unit#3 - Receiver, Electric (Reservoir Water Level Receiver)
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 1M1M1X500GG; Serial No. 642110; Chart: 55001; Volts: 120; Cycles: 60; Loop Resistance: 1000 ohms; Range: 0-15 feet WTR. Press.; Type: c; Impulse Cycle: 15 second.

37. Unit#4 - Receiver, Electric (Elevated Tank Level Receiver)
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 1M1M500-Z7; Serial No. 642107; Chart: 55002; Volts: 120; Cycles: 60; Loop Resistance: 1000 ohms; Range: 0-20 feet (Cal. 75-95 feet WTR. Press.)
Type: C; Impulse Cycle: 15 second.

38. Unit#1 - Panel, Electric (Main Circuit braker for all building)
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. SD-1; Style: 39A5702G6; Type: AB1; Amps: 600 Maximum; Volts: 240 Maximum AC; Volts: 125/250 Maximum DC.

39. Unit#2 - Panel, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GA-E; Style: 47A4217G1; Type: AB1; Amps: 100Maximum; Volts: 240 Maximum AC; Volts: 125/250 Maximum DC.

40. Unit#3 - Switch, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. AF 321; Style: 1606808; Type: A; Amps: 30; Volts: 240 AC; HP: 3.

41. Unit#4 - Switch, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. AF 321; Style: 1606808; Type: A; Amps: 30; Volts: 240 AC; HP: 3.

42. Unit#5 - Control, Electric (For Control Selection for pump Control)
Name: Autocon; Manufacturer:
Number: 37311B; Type: Spec; Volts: 110.

43. Unit#1 - Refrigerator, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Model No. M-7; Style: 965347; Serial No. 6011226; Volts: 115; Cycles: 60; Amps: 3.2; N/A : 1.0 pound F-12; Test Pressure: 200.

44. Unit#1 - Cooler, Water
Name: Sunrco; Manufacturer: Sunroc Corporation, Glen Riddle, Penn.
Model No. NM2B; Serial No. H 384566L; Lowside-Test: 150 pounds; Highsied-Test: 250; F - 12 - 10; Code: AH1; Type: 1 -10; Phase: 1; HP: 1/5; Cycles:

<u>Water Treatment and Pumping Plant</u>   <u>Bldg.#175 Hanford Point</u>

Meter and Panel (Electric) Floor Continued

(a) Plate, Orifice

36. Unit#3 - Receiver, Electric (Reservoir Water Level Receiver)
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 1M1125000; Serial No. 642110; Chart: 55001; Volts: 120; Cycles:
60; Loop Resistance: 1000 ohms; Range: 0-15 feet WTR. Press.; Type: c;
Impulse Cycle: 15 second.

37. Unit#4 - Receiver, Electric (Elevated Tank Level Receiver)
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 1M1500-27; Serial No. 642107; Chart: 55002; Volts: 120; Cycles:
60; Loop Resistance: 1000 ohms; Range: 0-20 feet (Cal. 75-95 feet WTR. Press.)
Type: C; Impulse Cycle: 15 second.

38. Unit#1 - Panel, Electric (Main Circuit Breaker for all building)
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation,
Beaver, Pa.
Catalogue No. SD-1; Style: [illegible]; Type: [illegible]; Amps: [illegible] Maximum; Volts:
240 Maximum AC; Volts: 125/250 Maximum DC.

39. Unit#2 - Panel, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation,
Beaver, Pa.
Catalogue No. CR-E; Style: [illegible]; Type: [illegible]; Amps: 100 Maximum; Volts:
240 Maximum AC; Volts: 125/250 Maximum DC.

40. Unit#3 - Switch, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation,
Beaver, Pa.
Catalogue No. AF 321; Style: 1606608; Type: A; Amps: 30; Volts: 240 AC;
HP: 3.

41. Unit#4 - Switch, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation,
Beaver, Pa.
Catalogue No. AF 321; Style: 1606608; Type: A; Amps: 30; Volts: 240 AC;
HP: 3.

42. Unit#5 - Control, Electric (For Control Selection for Pump Control)
Name: Anderson; Manufacturer:
[illegible]: 272119; [illegible]; Volts: 110.

43. Unit#1 - Refrigerator, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation,
Beaver, Pa.
Model No. [illegible]; Style: 365347; Serial No. 301122; Volts: 115; Cycles: 60;
[illegible]; Refrigerant F-12; Test Pressure: 200.

44. Unit#1 - Cooler, Water
Name: Sunroc; Manufacturer: Sunroc Corporation, Glen Riddle, Penn.
Model No. W-24; Serial No. H 314561; Lowside-Test: 150 pounds; Highside-
Test: 250; F - 12 - 10; Code: A41; Type: 1 -10; Phase: 1; HP: 1/5; Cycles:

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Meter and Panel (Electric) Floor Continued

(a) Plate, Orifice

36. Unit#3 - Receiver, Electric (Reservoir Water Level Receiver)
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 1M1M1X5000G; Serial No. 642110; Chart: 55001; Volts: 120; Cycles: 60; Loop Resistance: 1000 ohms; Range: 0-15 feet WTR. Press.; Type: c; Impulse Cycle: 15 second.

37. Unit#4 - Receiver, Electric (Elevated Tank Level Receiver)
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 1M1M500-Z7; Serial No. 642107; Chart: 55002; Volts: 120; Cycles: 60; Loop Resistance: 1000 ohms; Range: 0-20 feet (Cal. 75-95 feet WTR. Press.) Type: C; Impulse Cycle: 15 second.

38. Unit#1 - Panel, Electric (Main Circuit braker for all building)
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. SD-1; Style: 39A5702G6; Type: AB1; Amps: 600 Maximum; Volts: 240 Maximum AC; Volts: 125/250 Maximum DC.

39. Unit#2 - Panel, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. GA-E; Style: 47A4217G1; Type: AB1; Amps: 100Maximum; Volts: 240 Maximum AC; Volts: 125/250 Maximum DC.

40. Unit#3 - Switch, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. AF 321; Style: 1606808; Type: A; Amps: 30; Volts: 240 AC; HP: 3.

41. Unit#4 - Switch, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Catalogue No. AF 321; Style: 1606808; Type: A; Amps: 30; Volts: 240 AC; HP: 3.

42. Unit#5 - Control, Electric (For Control Selection for pump Control)
Name: Autocon; Manufacturer:
Number: 37311B; Type: Spec; Volts: 110.

43. Unit#1 - Refrigerator, Electric
Name: Westinghouse; Manufacturer: Westinghouse Electric Corporation, Beaver, Pa.
Model No. M-7; Style: 965347; Serial No. 6011226; Volts: 115; Cycles: 60; Amps: 3.2; N/A : 1.0 pound F-12; Test Pressure: 200.

44. Unit#1 - Cooler, Water
Name: Sunrco; Manufacturer: Sunroc Corporation, Glen Riddle, Penn.
Model No. NM2B; Serial No. H 384566L; Lowside-Test: 150 pounds; Highsied-Test: 250; F - 12 - 10; Code: AH1; Type: 1 -10; Phase: 1; HP: 1/5; Cycles:

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Meter and Panel (Electric) Floor Continued

60; Amps: 4.2; Volts: 115.

45. Unit#1 -
Name: Power Pack for Metameter
Type: N/A; Serial Nol: N/A; Volts: 120; Cycles: 60.

46. Unit

F. Reservoir (Clear Water)

46. Unit#1 - Reservoir

Capacity: 400,000 gallons

G. Elevated Tank

47. Unit#1 - Tank, Elevated (Clear Water)
Name:
Contract No. Capacity: 150,000 gallons; Height: 75 feet; Depth: 0 - 20 feet
(a) Transmitter, Electric
Name: Autocon; Manufacturer: Automatic Control Company,St. Paul 4, Minn.
Number: 37911A; Type: TSP2W; Volts: 110; Capacity: 50.
(b) Power Pack
Name: Power Pack for Metameter
Type: N/A; Serial No. N/A; Volts: 120; Cycles: 60.
(c) Meter,
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 0G534M-14-Z7; Serial No. 642106; Scale: 5368; Volts: 120; Cycles: 60; Resistor: 1000 ohms; Meter: 0-20 feet; Cal. 75 -95 feet water pressure; Type: C; Impulse Cycle: 15 second.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

Meter and Panel (Electric) Floor Continued

60; Amps: 4.2; Volts: 115.

45. Unit#1 -
Name: Power Pack for Metameter
Type: N/A; Serial Nol: N/A; Volts: 120; Cycles: 60.

46. Unit

F. Reservoir (Clear Water)

46. Unit#1 - Reservoir

Capacity: 400,000 gallons

G. Elevated Tank

47. Unit#1 - Tank, Elevated (Clear Water)
Name:
Contract No. Capacity: 150,000 gallons; Height: 75 feet; Depth: 0 - 20 feet
(a) Transmitter, Electric
Name: Autocon; Manufacturer: Automatic Control Company, St. Paul 4, Minn.
Number: 37911A; Type: TSP2W; Volts: 110; Capacity: 50.
(b) Power Pack
Name: Power Pack for Metameter
Type: N/A; Serial No. N/A; Volts: 120; Cycles: 60.
(c) Meter,
Name: Bristol's; Manufacturer: The Bristol Company, Waterbury 20, Conn.
Model No. 0053AM-14-Z7; Serial No. 642106; Scale: 5368; Volts: 120; Cycles: 60; Resistor: 1000 ohms; Meter: 0-20 feet; Cal. 75 -95 feet water pressure; Type: C; Impulse Cycle: 15 second.

Water Treatment and Pumping Plant Bldg.#178 Montford Point

H. Wells, Raw Water

48. Unit#1 - Well, Raw Water; Well Number: Z; Bldg.#M-141.
Depth: 100 feet; Deameter: 18 inches; Cased: feet; Yield: 150 GPM at Head; Drilled: ; Air Line: 60 feet (Out of Order).

(a) Pump, Turbine Dual Drive (Electric and Gasoline)
Name: Layne: Manufacturer: Layne and Bowler, Inc., General Officies, Memphis 8, Tennessee.
Type: Vertical Centrifugal; Serial No. ; Oil Lubercated.

(1) Motor, Electric; Name: U. S. Motors; Manufacturer: U. S. Electrical Motors, Los Angeles 54, California.
Type: CFU; Serial No. 218459; Frame: 877; HP: 7½; Cycles: 60; RPM: 1800; Amps: 20/10; Volts: 220/440; Phase: 3; Code:
Plant Account No. 182841.

(aa) Panel, Electric Main
Name: Shutlbrak; Manufacturer: Frank Adam Electric Company, St. Louis, Mo.
Type: A; Amps: 100; Volts: 230 AC; Max. HP: 15 AC; Volts: 125-250 DC; Catalogue No. FALSA 10333 (?); EST: 1891.

(bb) Switch, Electric (Start, Stop, and reset)
Name: General Electric Magnetic Switch; Manufacturer: General Electric, Fort Wayne, Indiana.
Catalogue No. 4381269G103; Cr: 7006-D30B; Control Volts: 220; Control Cycles 60; Maximum Motor Rating: 15 H.P.; Volts: 208-220.

(cc) Switch, Electric (Hand, Off, and Automatic)
Name: Westinghouse Pushbutton Station; Manufacturere Westinghouse Electric Corporation, Beaver, Pa.
Type: H.D.; Style: 1033328; Volts: 600; NP; 25118.B

(dd) Switch, Electric (For Lights)
Name: Square D Company; Manufacturer: Square D Company, Detroit, Michigan.
CatalogueNo. D96351; Series: A1; Amps: 30; Volts: 230 AC.

(2) Motor, Gasoline
Name: Allis-Chamer; Manufacturer: A C Manufacturer Company, Milwaukee, Wis.
Plant Account Number: 182841; Number on side of Motor: AM 2976-73; Number on Throttle: AM 3022-1; Cylinders: 6;

(aa) Magnetta
Name: Fairbanks Morse; Manufacturer: Fairbanks, Morse and Company, Fairbanks-Morse Building, Chicago 5, Ill.
Type: FMJ; 1B3A; A547853.

(3) Clutch, Mechanical; Name: AC; Manufacturer: AC Manufacturer Company, Milwaukee, Wis.
Number: PU 13813 B; AM 3018-3.

(4) Drive, Right Angle; Name: Johnson; Manufacturer: Johnson Gear and Manufacturer Company, Berkeley, California.
Serial No. ; H. ; Ratio: ; B.H.P. ; RPM:

Water Treatment and Pumping Plant Bldg.#178 Montford Point

H. Wells, Raw Water

48. Unit#1 - Well, Raw Water; Well Number: Z; Bldg.#M-141.
Depth: 100 feet; Deameter: 18 inches; Cased: feet; Yield: 150 GPM at Head; Drilled: ; Air Line: 60 feet (Out of Order).

(a) Pump, Turbine Dual Drive (Electric and Gasoline)
Name: Layne: Manufacturer: Layne and Bowler, Inc., General Officies, Memphis 8, Tennessee.
Type: Vertical Centrifugal; Serial No. ; Oil Lubercated.

(1) Motor, Electric; Name: U. S. Motors; Manufacturer: U. S. Electrical Motors, Los Angeles 54, California.
Type: CFU; Serial No. 218459; Frame: 877; HP: 7½; Cycles: 60; RPM: 1800; Amps: 20/10; Volts: 220/440; Phase: 3; Code:
Plant Account No. 182841.

(aa) Panel, Electric Main
Name: Shutlbrak; Manufacturer: Frank Adam Electric Company, St. Louis, Mo.
Type: A; Amps: 100; Volts: 230 AC; Max. HP: 15 AC; Volts: 125-250 DC; Catalogue No. FALSA 10333 (?); EST: 1891.

(bb) Switch, Electric (Start, Stop, and reset)
Name: General Electric Magnetic Switch; Manufacturer: General Electric, Fort Wayne, Indiana.
Catalogue No. 43812690103; Cr: 7006-D30B; Control Volts: 220; Control Cycles 60; Maximum Motor Rating: 15 H.P.; Volts: 208-220.

(cc) Switch, Electric (Hand, Off, and Automatic)
Name: Westinghouse Pushbutton Station; Manufacturere Westinghouse Electric Corporation, Beaver, Pa.
Type: H.D.; Style: 1033328; Volts: 600; NP; 25118.B

(dd) Switch, Electric (For Lights)
Name: Square D Company; Manufacturer: Square D Company, Detroit, Michigan.
CatalogueNo. D96351; Series: A1; Amps: 30; Volts: 230 AC.

(2) Motor, Gasoline
Name: Allis-Chamer; Manufacturer: A C Manufacturer Company, Milwaukee, Wis.
Plant Account Number: 182841; Number on side of Motor: AM 2976-73; Number on Throttle: AM 3022-1; Cylinders: 6;

(aa) Magnetta
Name: Fairbanks Morse; Manufacturer: Fairbanks, Morse and Company, Fairbanks-Morse Building, Chicago 5, Ill.
Type: FMJ; 1B3A; A547853.

(3) Clutch, Mechanical; Name: AC; Manufacturer: AC Manufacturer Company, Milwaukee, Wis.
Number: PU 13813 B; AM 3018-3.

(4) Drive, Right Angle; Name: Johnson; Manufacturer: Johnson Gear and Manufacturer Company, Berkeley, California.
Serial No. ; H. ; Ratio: ; B.H.P. ; RPM:

C. TREATMENT

1. General

a.

b. Methyl Orange Alk. 202, Chlorides34, Hardness 50 ppm, iron .18 p.h. 7.5

2. Processes--Zeolite process and chlorination for hardness and iron removal.

a. none
b. chlorination and zeolite
c. none
d. same as B
e. chlorination
f. none
g. none
h. chlorination
i. none

3. Plant Condition and Capacity

a. 16 yrs.
b. poor
c. fair
d. 400,000 gals.
e. 800,000 GPD with seven wells operating
f. 750,000 GPD
g. The water treatment plant consist of two zeolite softeners which have a rate d capacity of 750,000 gallons per day with a peak demand of 650,000 gals. per day. The softeners were designed for 120,000 gal. run between regenerations. There are two chlorinators rated at 50 lbs. per day each.

h. This water has a considerable amount of iron and hydrogen sulfide and a ph of 7.4. It attacks the piping and softener tanks. The piping has to be replaced approximately once a year, every so often there will come a leak in the softener tank which has to be welded. The softening runs are approximately half the designed capacity. There is an automatic proportioning bypass valve that allows approximately 25% of the to bypass the softeners to maintain a specified hardness in areas where very little water is used. The iron bacteria and hydrogen sulfide kills the chloring, causing it to become turbid, and has and objectionable odor.

To eleminate this problem we need additional treatment, which consists of aeration, detention tank with a small amount of lime treatment to raise the ph and filteration before entering the softeners.

4. Operation

a. one
b. one
c. one WG-10

D, DISTRIBUTION

1. General

   a. one 38 PSI
   b. none

2. Pumping Stations

   a. Montford Point M-178
   b. 16 yrs.
   c. Three Horizontal Centrifugal
   d. Worthington 500 GPM 130 ft. head
      Worthington 1000 GPM 130 ft. head
      Worthington 1250 GPM 130 ft head
   e. 2750 GPM
   f. Continental Red Seal gasoline motor
   g. There is a considerable amount of wear on pumps and check valves.

3. Storage

   a. Elevated Storage

      (1) SM 624 150,000 Gals. Horton Ellipsoidal
      (2) Yes
      (3) good

   b. Ground level storage

      (1) S 179 400,000 gals. cement
      (2) no
      (3) good

4. Distribution piping

   a. 26 yrs
   b. cast iron C or D lead joints
   c. no standing record of dates of leaks.
   d. shifting of earth and tree roots.
   e. none

5. Operation

   a. one WG-10 one

E. System needs an aerator, a small amount of lime treatment ,with detention tank and filteration before the softeners to eliminate hydrogen sulphide gas, iron bacteria, and raise the ph value.

Prices copy

RAW WATER
MONTFORD POINT

WATER TREATMENT PLANTS
CHEMICAL ANALYSIS

DATE July 14 1967

	Z HADNOT POINT	Z-1 MONTFORD POINT	Z-2 CAMP GEIGER	Z-3 TARAWA TERRACE	Z-4 ONSLOW BEACH	Z-5 Z-6 COURT H. BAY	RIFLE RANGE
Phenolthalein alkalinity	0	0	0	0	0	0	0
Methyl Orange Alkalinity	222	190	150	172	178	206	196
Chlorides as CL	20	8	9	18	6	6	10
Hardness as CaCO3	250	206	164	200	186	216	202
Chlorine Residual							
Iron as Fe	.82	.96	.39	.99	.70	.29	1.25
Carbonates as CaCO3							
Bicarbonates as CaCO3							
PH	7.35	7.3	7.4	7.4	7.5	7.5	7.3
Ortho Phosphate							
Meta Phosphate							

CHEMICAL ANALYSIS - WATER Wells - RAW WATER

MCBCL 11330/3 (REV 3-69) M-142 | M-168 | M-197 | M-243 | M-2[illegible] | M-628 | DATE 13 Dec 74

TESTS	HADNOT POINT	MONTFORD POINT	CAMP GEIGER	TARAWA TERRACE	ONSLOW BEACH	COURTHOUSE BAY	RIFLE RANGE
PHENOLTHALEIN ALKALINITY	0	0	0	0	0	0	
METHYL ORANGE ALKALINITY	186	202	230	158	182	206	
CHLORIDES AS CL	8	8	96	10	46	8	
HARDNESS AS $CaCO_3$	186	210	254	166	204	192	
CHLORINE RESIDUAL							
IRON AS Fe							
CARBONATES AS $CaCO_3$	0	0	0	0	0	0	
BICARBONATES AS $CaCO_3$	186	202	230	158	182	206	
PH	7.4	7.4	7.2	7.5	7.3	7.2	
ORTHO PHOSPHATE							
META PHOSPHATE							
	Samples collected 12 Nov 74						

WATER ANALYSIS

by

HUNGERFORD & TERRY, INC.

Manufacturers of Water Treating Plants

CLAYTON, NEW JERSEY 08312

For Water Treatment Plant
Camp Lejeune, N. C.

Date Taken 5/8/79
Received 5/14/79
Analyzed 5/25/79

LAB. NO.	34349	34350		
SOURCE	Well M-629	Well M-630		
CATIONS				
Calcium — ppm as $CaCO_3$				
Magnesium — ppm as $CaCO_3$				
Sodium — ppm as $CaCO_3$				
ppm as $CaCO_3$				
ppm as $CaCO_3$				
TOTAL — ppm as $CaCO_3$				
ANIONS				
Hydroxide Alkalinity — ppm as $CaCO_3$	0	0		
Carbonate Alkalinity — ppm as $CaCO_3$	0	0		
Bicarbonate Alkalinity — ppm as $CaCO_3$	165	200		
Chloride — ppm as $CaCO_3$				
Sulfate — ppm as $CaCO_3$				
Nitrate — ppm as $CaCO_3$				
ppm as $CaCO_3$				
TOTAL — ppm as $CaCO_3$				
Free Carbon Dioxide — ppm as CO_2				
Soluble Silica — ppm as SiO_2				
Iron (Total) — ppm as Fe	3.8	2.0		
Manganese (less than) — ppm as Mn	0.03	0.03		
Chlorine (By OTA Method) — ppm as Cl	neg.	neg.		
Total Hardness — ppm as $CaCO_3$	172	300		
Ammonia — ppm as N				
Spec. Cond. (Micromhos at 25°C)	260	450		
pH (at Lab.)	7.3	7.1		
Turbidity (NTU)	5	4		
Color (APHA units) (less than)	5	5		
Odor (Type and Intensity)	none	none		
Sediment (Appearance)	Iron plated out	none		

Remarks:

By Spe

To convert parts per million to grains per gallon divide by 17.1.
To convert parts per million as calcium carbonate to equivalents per million or millequivalents per liter divide by 50.
To convert to other, refer to chart available through your representative.
To convert specific conductance in micromhos to specific resistance in ohms, divide the micromhos into 1 million.

CHEMICAL ANALYSIS - WATER
MCBCL 11330/3 (REV 8-74)

MONTFORD POINT

Date 2-7-79

Parameter	M-142	M-168	M-197	M-628	M-629	M-630	RIFLE RANGE	HOLCOMB BLVD	NEW RIVER
	HADNOT POINT	MONTFORD POINT	CAMP GEIGER	TARAWA TERRACE	JACKSON PARK	[illegible]			
PH	7.4	7.3	7.3	7.4	7.3	7.4			
PHENOLTHALEIN ALKALINITY	0	0	0	0	0	0			
METHYL ORANGE ALKALINITY	204	230	250	228	178	212			
HARDNESS CARBONATES AS $CaCO_3$	190	220	320	220	180	308			
BICARBONATES AS $CaCO_3$									
CHLORIDES AS Cl	8	14	162	10	12	108			
HARDNESS AS $CaCO_3$									
IRON AS Fe	.83	.95	2.05	.85	4.50	1.16			
MANGANESE TOTAL PHOSPHATE	.03	.03	.04	.03	.06	.03			
CALCIUM ORTHO PHOSPHATE	85	87	125	88	65	115			
MAGNESIUM META PHOSPHATE	1.22	2.31	4.16	1.92	1.68	2.35			
FLUORIDE									
CHLORINE RESIDUAL									

REMARKS:

NOTE: All results reported in parts per million unless otherwise noted except for pH, temperature, and specific conductance. One liter of potable water is assumed to weigh one kilogram.

LABORATORY ANALYSIS BY:

DATE OF ANALYSIS:

Feb. 24, 1967

List of Wells given to Mr. Tew fo preventitive maintenance

1. Well S-------Bldg. RR45 Has been out of operation for 3 months or more
2. Well Z-1----- " M-142 Low delivery
3. Well #1------ " TT-26 Needs overhaul due to excessive wear
4. Well #12----- " 612 Needs overhaul
5. Well #22----- " BA-109 Needs overhaul
6. Well W------- " BB-43 Needs overhaul
7. Well #9------ " 609 Needs overhaul

List furnished to Mr. Tew for abandonment 2-27-1967

1. Well #2 Tarawa Terrace---------TT27 Insufficient water to supply pump
2. Well #4 Tarawa Terrace---------TT29 Sand
3. Well #C Camp Geiger-----------TC300 Insufficient water to supply pump

SHEET #1

VARIOUS WELLS
RAW WATER

~~WATER TREATMENT PLANTS~~
CHEMICAL ANALYSIS

DATE OCT 24 1966

	M-1 ~~HADNOT POINT~~	M-2 ~~MONTFORD POINT~~	636 ~~CAMP GEIGER~~	35 ~~TARAWA TERRACE~~	616 ~~ONSLOW BEACH~~	617 ~~COURT H. DAY~~	633 ~~RIFLE RANGE~~	601	615	620
Phenolthalein alkalinity	0	0	0	0	0	0	0	0	0	0
Methyl Orange Alkalinity	174	166	98	160	140	138	165	204	176	184
Chlorides as CL	10	10	7	10	10	9	10	12	8	8
Hardness as CaCO3	148	156	108	158	163	146	176	224	196	204
Chlorine Residual										
Iron as Fe	.86	.60	.24	.17	.41	.36	.30	.61	.29	.14
Carbonates as CaCO3										
Bicarbonates as CaCO3										
PH	7.5	7.5	7.9	7.9	7.5	7.5	7.5	7.3	8.2	8.1
Ortho Phosphate										
Meta Phosphate										

SHEET #2

VARIOUS. WELLS
RAW WATER

~~WATER TREATMENT PLANTS~~
CHEMICAL ANALYSIS

DATE NOV 8, 1966

	634 ~~HADNOT POINT~~	624 ~~MONTFORD POINT~~	633 ~~CAMP GEIGER~~	610 TARAWA TERRACE	602 ~~ONSLOW BEACH~~	611 COURT H. BAY	612 RIFLE RANGE	613	614
Phenolthalein alkalinity	0	0	0	0	0	0	0	0	0
Methyl Orange Alkalinity	150	160	126	156	200	132	184	144	148
Chlorides as CL	8	8	10	8	12	8	8	8	12
Hardness as CaCO3	160	180	154	184	220	148	200	160	164
Chlorine Residual									
Iron as Fe	.20	.20	.30	.40	.17	.29	.48	.61	.25
Carbonates as CaCO3									
Bicarbonates as CaCO3									
PH	7.5	7.3	8.3	7.3	7.2	7.2	7.3	7.5	7.5
Ortho Phosphate									
Meta Phosphate									

SHEET
5

VARIOUS WELLS
RAW WATER

~~WATER TREATMENT PLANTS~~
CHEMICAL ANALYSIS

DATE NOV 21, 1966

	606 ~~HADNOT POINT~~	609 ~~MONTFORD POINT~~	625 ~~CAMP GEIGER~~	626 ~~TARAWA TERRACE~~	627 ~~ONSLOW BEACH~~	632 ~~COURT H. BAY~~	603 ~~RIFLE~~ RANGE	605	608	619
Phenolthalein alkalinity	0	0	0	0	0	0	0	0	0	0
Methyl Orange Alkalinity	170	128	102	72	120	142	200	198	172	170
Chlorides as CL	8	6	8	4	6	6	16	14	10	10
Hardness as CaCO3	180	140	120	74	132	156	230	236	194	188
Chlorine Residual										
Iron as Fe	0.34	0.11	0.16	0.11	0.14	0.7	0.41	0.34	0.14	0.11
Carbonates as CaCO3										
Bicarbonates as CaCO3										
PH	7.6	7.9	8.2	7.1	8.3	7.5	7.3	7.6	7.6	7.4
Ortho Phosphate										
Meta Phosphate										

SHEET #1

VARIOUS WELLS. RAW WATER

~~WATER TREATMENT PLANTS~~
CHEMICAL ANALYSIS

DATE OCT 24, 1966

	M-1 ~~HADNOT POINT~~	M-2 ~~MONTFORD POINT~~	636 ~~CAMP GEIGER~~	35 ~~TARAWA TERRACE~~	616 ~~ONSLOW BEACH~~	617 ~~COURT H. BAY~~	633 ~~RIFLE RANGE~~	601	615	620
Phenolthalein alkalinity	0	0	0	0	0	0	0	0	0	0
Methyl Orange Alkalinity	174	166	98	160	140	138	165	204	176	184
Chlorides as CL	10	10	7	10	10	9	10	12	8	8
Hardness as CaCO3	148	156	108	158	163	146	176	224	96	204
Chlorine Residual										
Iron as Fe	.86	.60	.24	.17	.41	.36	.30	.61	.29	.14
Carbonates as CaCO3										
Bicarbonates as CaCO3										
PH	7.5	7.5	7.9	7.9	7.5	7.5	7.5	7.3	8.2	8.1
Ortho Phosphate										
Meta Phosphate										

SHEET 2

VARIOUS WELLS
RAW WATER

~~WATER TREATMENT PLANTS~~
CHEMICAL ANALYSIS

DATE NOV. 8 1966

	634 ~~HADNOT~~ POINT	624 ~~MONTFORD~~ POINT	633 ~~CAMP~~ GEIGER	610 TARAWA TERRACE	602 ~~ONSLOW~~ BEACH	611 ~~COURT~~ H. BAY	612 ~~RIFLE~~ RANGE	613	614
Phenolthalein alkalinity	0	0	0	0	0	0	0	0	0
Methyl Orange Alkalinity	150	160	126	156	200	132	184	144	148
Chlorides as CL	8	8	10	8	12	8	8	8	12
Hardness as CaCO3	160	180	154	184	220	148	200	160	164
Chlorine Residual									
Iron as Fe	.20	.20	.30	.40	.17	.29	.48	.61	.25
Carbonates as CaCO3									
Bicarbonates as CaCO3									
PH	7.5	7.3	8.3	7.3	7.2	7.2	7.3	7.5	7.5
Ortho Phosphate									
Meta Phosphate									

SHEET #3

VARIOUS WELLS
RAW WATER

~~WATER TREATMENT PLANTS~~
CHEMICAL ANALYSIS

DATE NOV 21, 1966

	606 ~~HADNOT POINT~~	609 ~~MONTFORD POINT~~	625 CAMP ~~GEIGER~~	626 ~~TARAWA TERRACE~~	627 ~~ONSLOW BEACH~~	632 COURT ~~H. BAY~~	603 ~~RIFLE RANGE~~	605	608	619
Phenolthalein alkalinity	0	0	0	0	0	0	0	0	0	0
Methyl Orange Alkalinity	170	128	102	72	120	142	200	198	172	170
Chlorides as CL	8	6	8	4	6	6	16	14	10	10
Hardness as CaCO3	180	140	120	74	132	156	230	236	194	188
Chlorine Residual										
Iron as Fe	0.34	0.11	0.16	0.11	0.14	0.7	0.41	0.34	0.14	0.11
Carbonates as CaCO3										
Bicarbonates as CaCO3										
PH	7.6	7.9	8.2	7.1	8.3	7.5	7.3	7.6	7.6	7.4
Ortho Phosphate										
Meta Phosphate										

W E L L D A T A

Well Z-3

MONTFORD POINT

SPECIFICATIONS

Pump Base Elev. 21.7
Ground Elev. 19.7
Static Elev. + 7.4
Maximum D. D. -29.0
Total Discharge 300.0
Total Head 170.0

TEST

G.P.M.	PRESSURE	DRAW-DOWN
		Elev.
300	54#	- 24.6 = 171'
275	58#	- 21.8
247	62#	- 20.6
165	70#	- 11.8

Recovers to Elevation + 5.7 in 3 Mi.

This Pump was orginally purchased for Housing Project and was used on Well No. 1, Division Training Area for a period of approximately 18 months.

W E L L D A T A

Well Z-2

MONTFORD POINT

SPECIFICATION

Pump Base Elev. 24.5
Ground Elev. 22.5
Static Elev. +6.2
Maximum Allowed D.D. -37.5
Total Discharge 150
Total Head 160.0

TEST

G.P.M.	PRESSURE	DRAW-DOWN Elev
210	37#	-34.1
175	40#	-31.5
170	45#	-29.2
155	50#	-24.8 = 165.8'

Recovers to Elev. + 1.2 in 3 Mi.

WATER ANALYSIS

by

HUNGERFORD & TERRY, INC.

Manufacturers of Water Treating Plants

CLAYTON, NEW JERSEY 08312

34347 34348
34345 34346

For Water Treatment Plant
Camp Lejeune, N. C.

Date Taken 5/9 5/8/79
Received 5/14/79
Analyzed 5/25/79

LAB. NO.	34345	34346	34347	34348
SOURCE	Well M-142	Well M-168	Well M-197	Well M-628
CATIONS				
Calcium ppm as $CaCO_3$				
Magnesium ppm as $CaCO_3$				
Sodium ppm as $CaCO_3$				
ppm as $CaCO_3$				
ppm as $CaCO_3$				
TOTAL ppm as $CaCO_3$				
ANIONS				
Hydroxide Alkalinity ppm as $CaCO_3$	0	0	0	0
Carbonate Alkalinity ppm as $CaCO_3$	0	0	0	0
Bicarbonate Alkalinity ppm as $CaCO_3$	183	215	230	210
Chloride ppm as $CaCO_3$				
Sulfate ppm as $CaCO_3$				
Nitrate ppm as $CaCO_3$				
ppm as $CaCO_3$				
TOTAL ppm as $CaCO_3$				
Free Carbon Dioxide ppm as CO_2				
Soluble Silica ppm as SiO_2				
Iron (Total) ppm as Fe	0.73	2.9	2.2	1.1
Manganese (less than) ppm as Mn	0.03	0.03	0.03	0.03
Chlorine (By OTA Method) ppm as Cl	neg.	neg.	neg.	neg.
Total Hardness ppm as $CaCO_3$	194	212	294	216
Ammonia ppm as N				
Spec. Cond. (Micromhos at 25°C)	300	330	600	325
pH (at Lab.)	7.2	7.6	7.3	7.1
Turbidity (NTU)	0.25	0.6	0.7	0.08
Color (APHA units) (less than)	5	5	5	5
Odor (Type and Intensity)	stale	none	none	none
Sediment (Appearance)	none	Well sand *	none	none

Remarks: 34346 - * Sediment - and magnetic scale

By Cpe

To convert parts per million to grains per gallon divide by 17.1.
To convert parts per million as calcium carbonate to equivalents per million or millequivalents per liter divide by 50.
To convert to other, refer to chart available through your representative.
To convert specific conductance in micromhos to specific resistance in ohms, divide the micromhos into 1 million.

L-1090–7/77

2 August 1942

Wells: Permanent Water Supply, Hospital Area

By Layne Atlantic Company

Report on Well E-1, this area

Location: Seventy feet North of N.E. corner of Medical Warehouse in line with East side.

Drilling Equipment: Rotary Rig and Rotary Bits

Status: 23" diameter hole reamed and cased with 18" I. D. casing to a depth of 24 ft. Anular space around this was filled with cement grout. A 17" hole was then drilled to a depth of 110 ft.

Log of Formation:

0	to	10'	Tight sand with little clay
10'	to	32'	Sandy clay
32'	to	52'	Very fine sand
52'	to	92'	Fine sand and shells
92'	to	94'	Fine sand, shells and blue clay
94'	to	110'	Fine sand and shells
110'	to		Very hard rock

Remarks: Drilled one well about 2000' from this, near laundry and could not get any water from it. Due to the very fine sand, it was necessary to construct a gravel wall well.

Gravel Wall Construction: An 8" steel pipe with sections of 8" armco iron iron screen was placed in the well to a depth of 102'. The anular space around this was filled with a special 1/4" washed gravel.

Marine Barracks
New River, N. C.
May 16, 1942

Wells: Permanent Water Supply
Mumford Point

By Layne Atlantic Company

Report on Well No. 1, this area

Location: Approximately 300' northwest of Brig, 65' west of center line of Main Access Road and 65' south of existing country road.

Date Drilled: May 1942

Drilling Equipment: Rotary rig and bits

Status: A 23" hole cased with 18" I.D. Steel casing to a depth of 20'. The amular space around this was filled with cement grout. A 17½" hole was drilled to a depth of 106'.

Log of Formation:

0'	to	18'	Fine yellow sand
18'	to	22'	Heavy blue clay
22'	to	27'	Medium coarse sand
27'	to	34'	Blue muck
34'	to	40'	Sandy clay
40'	to	47'	Coquina rock (little water)
47'	to	52'	Very hard rock
52'	to	67'	Hard rock
67'	to	85'	Very hard rock
85'	to	96'	Rock and shells in streaks
96'	to	101'	Rock, hard and soft streaks
101'	to	106'	Blue clay

Gravel Wall Construction: An 8" steel pipe with sections of 8" silician bronze shutter screen was lowered into the 17½" hole to a depth 100'. The amular space around this was filled with a special washed 1/4" gravel.

Log of Screen Setting:

0	to	35'	8" steel pipe
35'	to	40'	8" bronze screen
40'	to	50'	8" steel pipe
50'	to	55'	8" bronze screen
55'	to	65'	8" steel pipe
65'	to	70'	8" bronze screen
70'	to	80'	8" steel pipe
80'	to	85'	8" bronze screen
85'	to	95'	8" steel pipe
95'	to	100'	8" bronze screen

WATER TREATMENT PLANT M-178
Montford Point

A. SOURCE

1. General

a. There are seven deep wells with a safe yield capacity ranging from 72,000 GPD to 180,000 GPD with a tatal safe yield of 800,000 GPD. Four of these wells are approximately 26 years old, one is 19 years old, one 15 years old and one 2 years old. The capacity of all wells have decreased considerable due to sanding and screen corosion.

b. SEE ATTACHED

c. None

2. Ground Water

a.	M-142 Z-1	M-243 Z-2	M244 Z-3	M-627 Z-4	M-628 Z-5
b.	drilled	drilled	drilled	drilled	drilled
c.	69 feet	95 ft.	86 Ft.	100 ft.	67 ft.
d.	+4.0	+1.5	+7.4	+5.0	+7.4
e.	25 ft.	43.7 ft.	36.4 ft.	39.5 ft.	33 ft.
f.	80 GPM	75 GPM	125 GPM	75 GPM	65 GPM
g.	120 GPM	100 GPM	150 GPM	100 GPM	85 GPM

a.	M-168 Z-6	M-197
b.	drilled	drilled
c.	151 ft.	200 ft.
d.	11.4	11.5
e.	25 ft.	40 ft.
f.	50 GPM	130 GPM
g.	90 GPM	150 GPM

3. Surface Water
a. None
b. None

B. SOURCE PUMPING

1. Pump Station Designation
M-142 Z-1
a. 26 yrs.
b. one vertical turbine
c. Layne & Bowler pump 100 GPM 147 ft. head
d. 100 GPM
e. 7½ h.p. 220/440 1800 RPM
f. none
g. Over all condition is considered to be fair. These pumps range in age from two to twenty-six years in age andmare worn considerably. Periodically these pumps have to be pulled and cleaned due to iron deposits.

Marine Barracks
New River, N. C.
July 17, 1942

From: N. H. Kellam, Asst. Chem. Engineer
To: Lieut. E. D. Smith

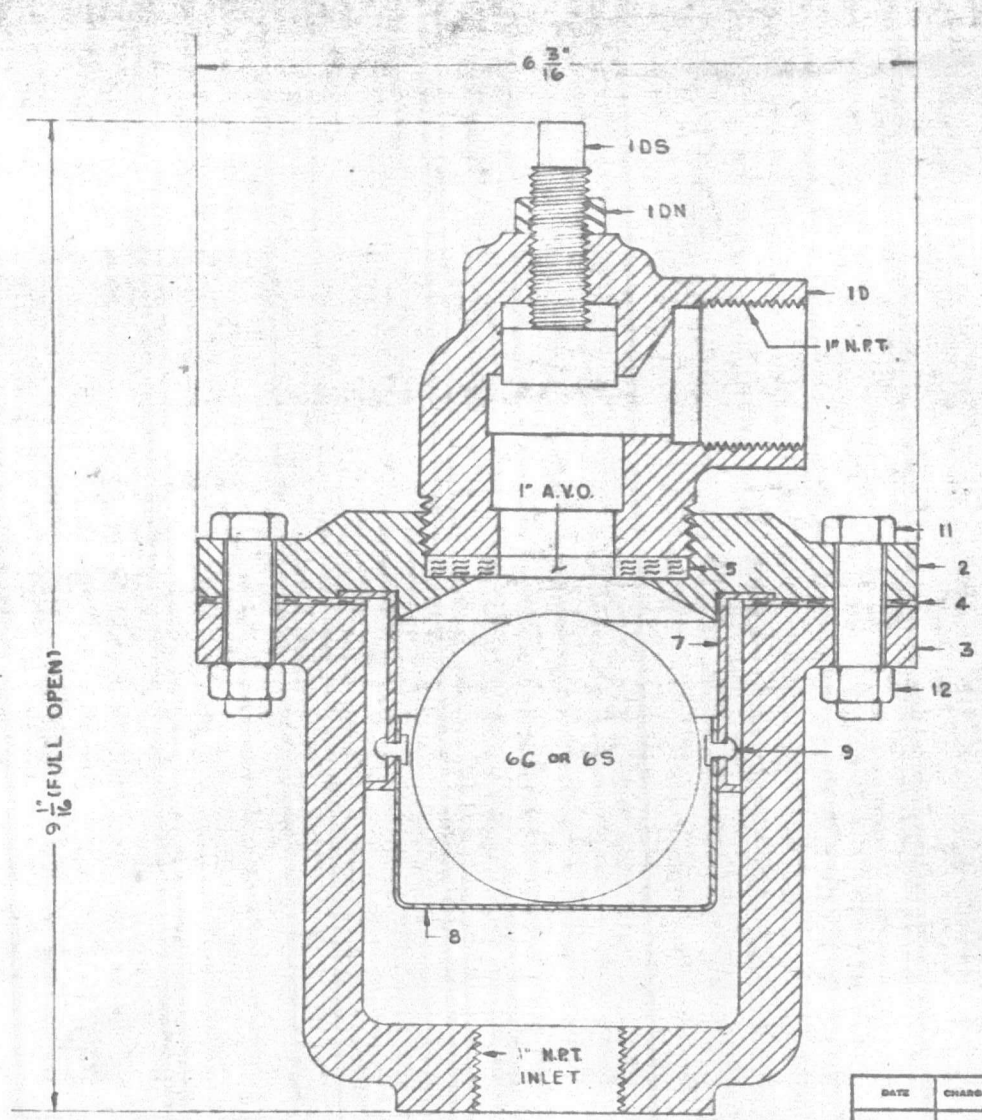
Subject: Wells

Number	Location	Depth	G.P.M.	Draw Down from Static
A	TCA	180'	50	-
B	TCA	66'	84	37' (1)
C	TCA	70'	80	40' (1)
D	TCA	184'	-	-
E	TCA	70'	130	24'
F	TCA	76'	132	29' (1)
G	TCA	75'	75	24'
H	TCA	66'	55	35'
I	TCA	81'	150	41' (1)
J	TCA	100'	265	37.5'
K	TCA	138'	150	34' (1)
L	TCA	136'	155	32'
M	TCA	100'	155	35.6'
N	TCA	Discontinued		
O	Tank Camp	84'	60	33'
R	Paradise Point	100'	290	30'
S	Rifle Range No. 2	130'	130	19'
T	Rifle Range No. 1	452'	160	36.8'
U	Amphibian Base	116'	450	98.9'
V	Balloon Barrage No. 1	62'	350	25'
W	Balloon Barrage No. 2	60'	170	24'
1.	Low Cost Housing	125'	200	14' (1)
2.	Low Cost Housing	145'	335	29.8'
1.	Mockup	40'	100	22' (1)
1.	C.C.C. Camp	75'	108	9' (1)
2.	C.C.C. Camp	90'	150	26.5'
1.	Rumford Point	100'	172	32.7'

(1) These wells do not have screen or gravel.

Report on wells in permanent area will be made later.

N. H. Kellam
Asst. Chem. Engineer



PART NO.	DWG. NO.	ITEM	MATERIAL	QTY. PER UNIT
1D	9-1D	DEEP WELL TOP	CAST IRON	1
1DS	9-1DS	STEM, DR. WELL	STEEL	1
1DN	8-1DN	JAM NUT	STEEL	1
2	2-2	FLANGE	CAST IRON	1
3	2-3	BODY	CAST IRON	1
4	2-4	GASKET	ACCOPAC	1
5	2-5	SEAT	HY-CAR RUBBER	1
* 6C	2-6C	FLOAT	COMPOSITION	1
* 6S	2-6S	FLOAT	STAINLESS STEEL	1
7	2-7	HANGER	BRASS	4
8	2-8	CUP	BRONZE	1
9	1-9	RIVET	COPPER	4
11	2-11	BOLT	STEEL	6
12	2-12	NUT	STEEL	6

* PART NO'S. 6C & 6S ARE INTERCHANGEABLE AND ARE OPTIONAL AT CUSTOMERS REQUEST.

APPROXIMATE WEIGHT: 18 LBS.

DATE	CHARGE NO.	CHANGES

MULTIPLEX MFG. CO. Berwick, Pa.

THIS DRAWING SUPERSEDES DRAWING No.

DRAWN BY	F.R.T.	NAME OF PART	1" CRISPIN DEEP WELL [redacted] AIR VALVE
TRACED BY	F.R.T.	PART USED ON	
APPROVED	R.L.F.	SCALE	FULL SIZE
DATE	10-31-62		

DR. NO. CV-9

TOLERANCE ON FRACTIONAL DIMENSIONS PLUS OR MINUS .015
TOLERANCE ON DECIMAL DIMENSIONS PLUS OR MINUS _____ UNLESS OTHERWISE SPECIFIED

EAST COAST CONSTRUCTION CO., INC.
Contract N62470-75-C-5109
Replace Water Wells (M-244 + M627) Montford Point
Camp Lejeune, N. C.

OT (8-66)

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED:

SUBJECT TO THE REQUIREMENTS OF
CONTRACT N62470-75-B-5109
APPROVAL OF MATERIALS AND/OR EQUIPMENT INDICATES COMPLIANCE WITH SPECIFICATION REQUIREMENTS ONLY — THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.

A. W. WALTON, JR.
RADM, CEC, USN
COMLANTNAVFACENGCOM

Date JAN 14 1976

Henry von Oesen and Associates
Consulting Engineers
611 Princess Street
Wilmington, North Carolina

Checked by _____ Date JAN 14 1976

NHK:dw

Marine Barracks
New River, N. C.
November 2, 1942

PERMANENT WATER SUPPLY MUMFORD POINT

By, Layne Atlantic Co.

Z-1

Report on Well NO. 2 this area

Location: 65' West of Center line of Mumford landing Road, 450' West of present Water Tower.

Date Drilled: Sept. 1942

Drilling Equipment: Retard Rig & Bits

Status: A 17½" hole was drilled to a depth of 65' then this was filled with sand to 516" below surface. 52' of 8" steele pipe was placed in the well and the anular space was filled with cement grout from 52' 8" to Surface. The sand in the bottom of the well was then pumped out to the original depth. There was no caseing or screen used in this well.

Log of Formation:
0 to 8' Sandy clay
8' to 18' Hard yellow clay
18' to 32' Course dark sand
40' to 48' Sandy blue clay
48' to 69' Shell Rock

Remark: From 66' to 69' the rock contained pockets of fine sand. This was sealed off from the well.

Air Line: 57' of 1-1/4" pipe was set in the cement grout to lower a draw-down tube in.

Static: 11' 6" below surface

Pumping: Pumps 95G.P.M. with 45' D.D. from surface
Pumps 120 G.P.M. with 53' D.D. from Surface
Pumps 140 " with 60' D.D. from Surface

Further pumping test should be made after permanent pump has been installed.

N. H. Kellam
Asst. Chem. Eng.

Wells: Permanent Water Supply, Hospital Area

Report on Well-1, this area - Continued

Log of Screen Setting:	0	to 52'	8" pipe
	52'	to 82'	8" iron screen
	82'	to 92'	8" pipe
	92'	to 102'	8" screen

A total of 40' of screen was used.

Air Line: 60' of 1/4" pipe was placed in the well for air line.

Static level: 8'4" below surface

Pumping: Well was pumped for several hours to clear off sand and clay.
Well pumps 100 G.P.M. with a 51' drawdown from static level. This is approximately 1.96 gallons per foot of drawdown.

N. H. Kellam
Asst. Chem. Engineer

8.3
51/6 9.3

The bottom of the screen was filled with a cement plug. The steel pipe was of threaded joints and the screen was welded.

Air Line: 60' of 1/4" pipe was placed and welded.

Static Level: 12' 4" below surface

Pumping: Well pumps 172 GPM with a 32'8" drawdown from static level after 30 hours pumping. This is approximately 5.3 gallons per foot of drawdown. Well recovers to 6'2" below static in 5 minutes.

See separate report for chemical analysis.

Report will be made later of pump instalation.

27.3
12.4
14.9

N. H. Kellam
Asst. Chem. Engineer

montford Point Wells

1 Z-1 Well present capacity 130,000 GPD
with a draw down of 20'
Variation of draw down for past
five years 18' to 24'
Depth of well 69'

2 Z-2 Well present capacity 145000 GPD
with draw down of 26'
variation of draw down for past
five years 24' to 31'
Depth of well 95'

3 Z-5 Well present capacity 140,000 GPD
with a draw down of 25'
Variation of draw down for past
five years 24' to 30'
Depth of well 67'

4 Z-6 Well present capacity 85,000 GPD
with draw down of 24'
Variation of draw down for past
five years 24' to 30'
Depth of well 151'

5 M197 Well present capacity 200,000 GPD
With draw down of 17'
Variation of draw down for the
past four years 14' to 18'
Depth of well 157'

Variation in draw down very likely
is due to slight change in pressure,
and worn pumps

Field (Book)

DEPARTMENT OF THE NAVY
RESIDENT OFFICER IN CHARGE
NAVAL FACILITIES ENGINEERING COMMAND CONTRACTS
CAMP LEJEUNE, NORTH CAROLINA 28542

IN REPLY REFER TO:
43-510:HH: mec
N62470-75-C-5109
18 September 1975

East Coast Construction Company, Inc.
Post Office Box 5004
Jacksonville, North Carolina 28540

Re: Contract N62470-75-C-5109, Replace Water Wells M-627 and M-244, Montford Point, Marine Corps Base, Camp Lejeune, North Carolina

Gentlemen:

We are returning x herewith ___ under separate cover, the following shop drawings or data sheets with action indicated.

No of Dwgs.	Dwg.No.	Description	Action
3	Letter	L. R. GORRELL CO., Certification of Model 500 backdraft damper	APPROVED, subject to contract requirements
3	Sheets,2	ARROW UNITED INDUSTRIES, INC., Backdraft dampers, aluminum, type 500	
3	Brochure	FORD POWER PRODUCTS, Model 172 CID Gasoline Engine	Approved, AS NOTED*, subject to contract requirements
3	Sketch	Installation and Setting on Model 172 CID Gasoline Engine	

*This unit appears satisfactory; however, please provide a letter noting compliance with MIL-P-52029. Additionally, a statement should be provided as to what type of fuel system is used and what gages, etc., are proposed to be furnished with the unit, such as oil pressure, temperature and fuel gage, tachometer, etc.

Sincerely yours,

K. W. MEEKS
LCDR, CEC, USN
Assistant Officer in Charge
of Construction

Copies:
Field (w/1 cy. encl.)
File (w/1 cy. encl.)
Records (w/1 cy. encl.)
Daily

MCBCL 11000/16

L. R. GORRELL COMPANY

MANUFACTURERS REPRESENTATIVE

L. R. GORRELL & E. C. SHEARON

Complete Line in Air Conditioning, Refrigeration and Heating Equipment

L. R. GORRELL
P. O. BOX 5748
PHONE (919) 832-6090
RALEIGH N. C.
27607

L. B. SHOOK
P. O. BOX 9231
PHONE (919) 373-1747
GREENSBORO, N. C.
27408

W. R. SPEER
P. O. BOX 21876
PHONE (803) 772-5824
COLUMBIA, S. C.
29221

F. A. BETTIS
P. O. BOX 4088
PHONE (803) 246-4275
GREENVILLE, S. C.
29608

E. C. SHEARON
P. O. BOX 4806
PHONE (704) 392-6426
CHARLOTTE, N. C.
28204

August 20, 1975

Mr. Ralph Caldwell
Jacksonville Heating Contractors, Inc.
P. O. Box 1030
Jacksonville, North Carolina 28540

Dear Mr. Caldwell:

The damper I submitted for the Waterwell project meets government specification MIL-L-18145A in every way. The Arrow Louver and Damper Corp. model 500 backdraft damper is constructed of an extruded aluminum frame (.080 thick) and formed aluminum blades (.032 thick). The blades are connected by an aluminum rod working with bronze oilite bearings. The blades also have a polyurethane foam on their edges for quiet operation.

If I can be of further help, please do not hesitate to call.

Robert G. Gorrell

RGG:dh

EAST COAST CONSTRUCTION CO. INC.
P. O. BOX 5004
JACKSONVILLE, N. C. 28540

APPROVED:
SUBJECT TO THE REQUIREMENTS OF
CONTRACT N62470-75-C-5109
APPROVAL OF MATERIALS AND/OR EQUIPMENT
INDICATES COMPLIANCE WITH SPECIFICATION
REQUIREMENTS ONLY — THE CONTRACTOR
SHALL BE RESPONSIBLE FOR PROVIDING
PROPER PHYSICAL DIMENSIONS & WEIGHTS,
COORDINATION OF TRADES, ETC., AS REQUIRED.
A. W. WALTON, JR.
RADM, CEC, USN
COMLANTNAVFACENGCOM
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511
Date _____
Checked by _____ Date 9-15-75
Henry von Oesen and Associates
Consulting Engineers
611 Princess Street
Wilmington, North Carolina
OT (8-66)


RECEIVED
17 SEP 1975
MARINE CORPS BASE
CAMP LEJEUNE,
N. C.

LOUVER AND DAMPER SCHEDULE

JOB: REPLACE WATERWELL
MONFORD PT. NORTH CAROLINA

CONTRACTOR: JACKSONVILLE HEATING CONTRACTORS
JACKSONVILLE, NORTH CAROLINA

SUBMITTED BY: L. R. GORRELL COMPANY
RALEIGH, NORTH CAROLINA

Quantity	Model	Size	Remarks
[redacted]			
1 2	500	30 x 30	Back Draft Damper

OT (8-66) ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED:
SUBJECT TO THE REQUIREMENTS OF
CONTRACT N62470-75-C-5109
APPROVAL OF MATERIALS AND/OR EQUIPMENT INDICATES COMPLIANCE WITH SPECIFICATION REQUIREMENTS ONLY — THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.

A. W. WALTON, JR.
RADM, CEC, USN
COMLANTNAVFACENGCOM
Date

GENERAL NOTES:

1. Above models to be manufactured by Arrow United Industries, Inc.
2. ~~Arrow Model 30W2 to be furnished with a flanged frame.~~
3. For further details see attached drawings.

Henry von Oesen and Associates
Consulting Engineers
611 Princess Street
Wilmington, North Carolina
Checked by _____ Date 9-15-75

EAST COAST CONSTRUCTION CO. INC.
P. O. BOX 5004
JACKSONVILLE, N. C. 28540

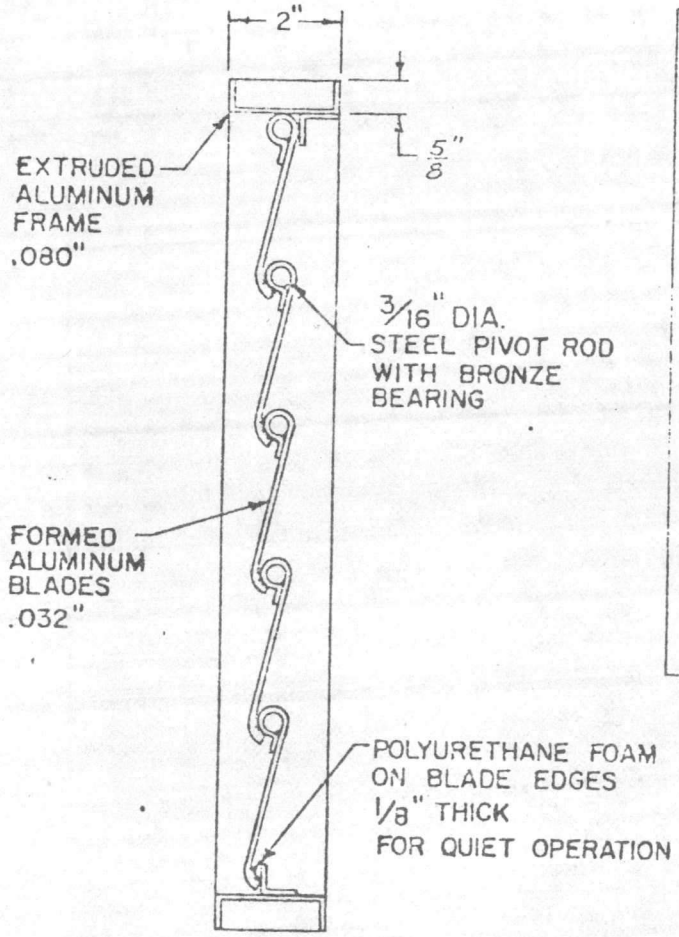



ARROW BACKDRAFT DAMPERS - aluminum

TYPE 500

LIGHT DUTY PRESSURE RELIEF SHUTTERS

FOR VERTICAL AND HORIZONTAL MOUNTINGS



SPECIFICATIONS

Type 500

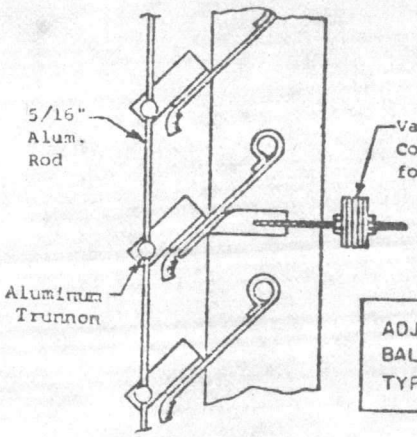
Frame: Standard 5/8 x 2 x 5/8 extruded aluminum channel .080 thick

Blade: .032 aluminum, formed over 3/16 diameter steel rod

Bearings: Bronze oilite

Optional Features: Blade to blade linkage for optimum performance. An adjustable counter-balance can be added for opening at very light pressure.

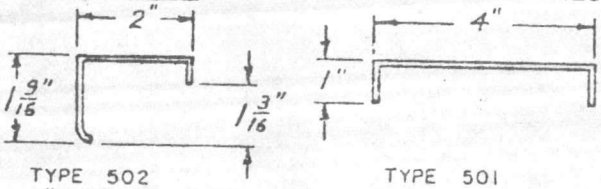
Max. Panel Size: 44" x 72"



ADJUSTABLE COUNTER-BALANCE (ADD "CB" TO TYPE NUMBER)

OPTIONAL (SEE SPECIFICATIONS ABOVE)

OPTIONAL - EXTRUDED ALUM. FRAMES



TYPE 502
2" DEEP FLANGED FRAME .080"

TYPE 501
4" DEEP CHANNEL FRAME .080"

MARK	QUAN	WIDTH OPENING	HEIGHT OPENING	WIDTH LOUVER	HEIGHT LOUVER	MULL	TYPE SCREENS	LOC. SCREENS	
	1	30	30	30	30				

UNION MADE

ARROW UNITED INDUSTRIES, Inc.
WYALUSING, PA 18853 (717) 746-1849
Corporate Sales Office Below

ARROW LOUVER AND DAMPER CORP
707 CONCOURSE VILLAGE W. BRONX, N.Y. 10451
(212) 993-3600

AGENT

ARCH. ENG

CONTR Jacksonville Heating Contractors

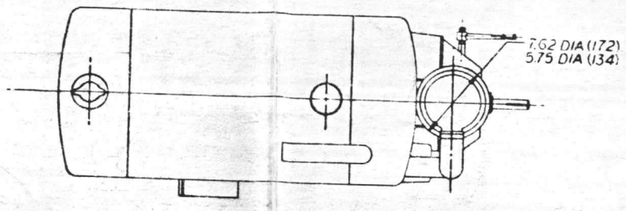
PROJECT Replace Waterwell

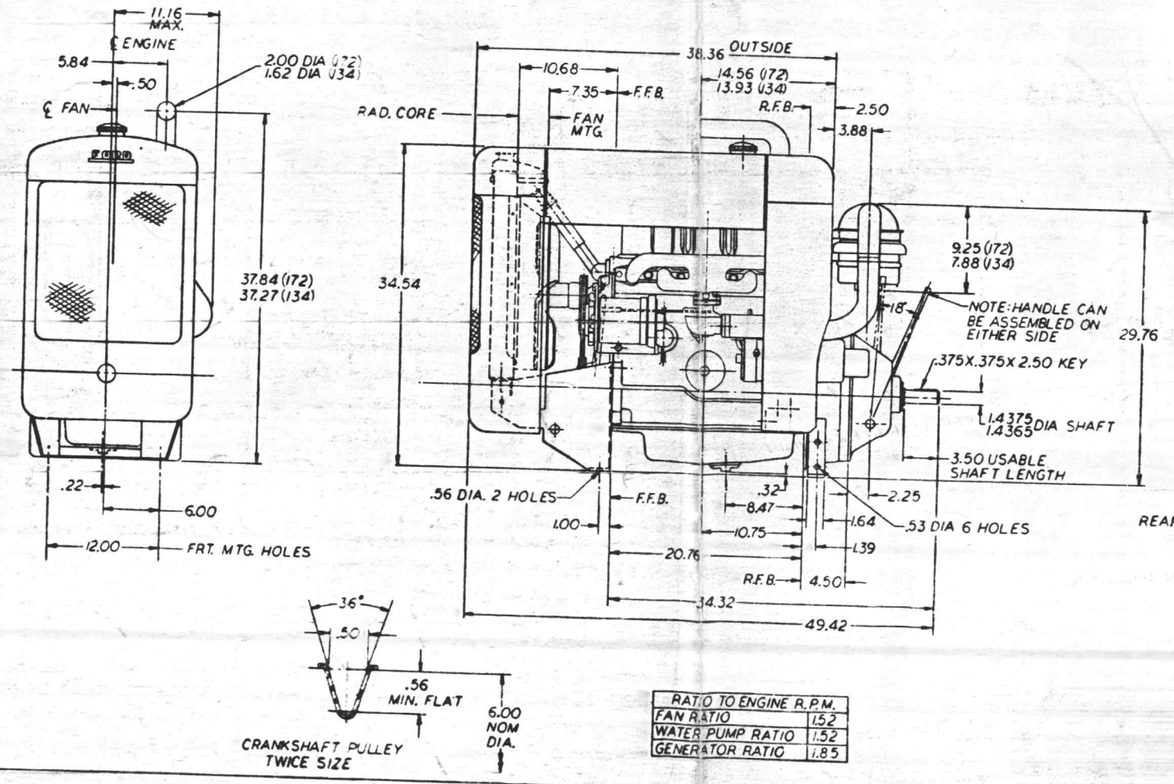
Monford Pt.

JOB NO.

DATE

DWG. NO.





RATIO TO ENGINE R.P.M.	
FAN RATIO	1.52
WATER PUMP RATIO	1.52
GENERATOR RATIO	1.85

LET	DATE	REVISION	BY	CHD

FORD DIVISION OF FORD MOTOR COMPANY
INDUSTRIAL ENGINE DEPARTMENT

DRAWN BY	CHECKED	DATE	APPROVED	SCALE

INSTALLATION 134-172 C.I.D. 4 CYL. GAS POWER UNIT WITH SAE 3HSG & HD QC PTO

6002-GR
MODEL NO.

DRAFT NO. 5K-PD-6986-C

EAST COAST CONSTRUCTION CO. INC.
P. O. BOX 5004
JACKSONVILLE, N. C. 28540

MONTFORD POINT BLDG. M-178

CAPACITY 750,000 GPD

WITH 7 DEEP WELLS

ZEOLITE SOFTENING PLANT

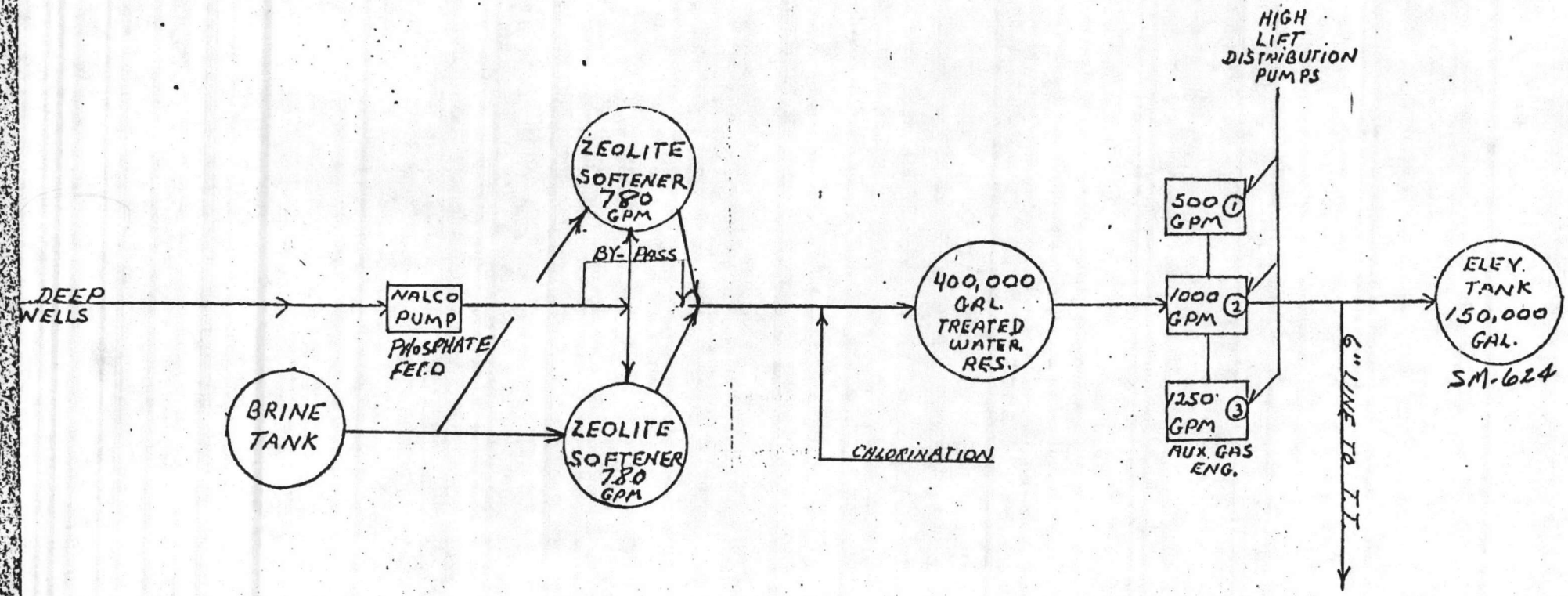


Table III C 3

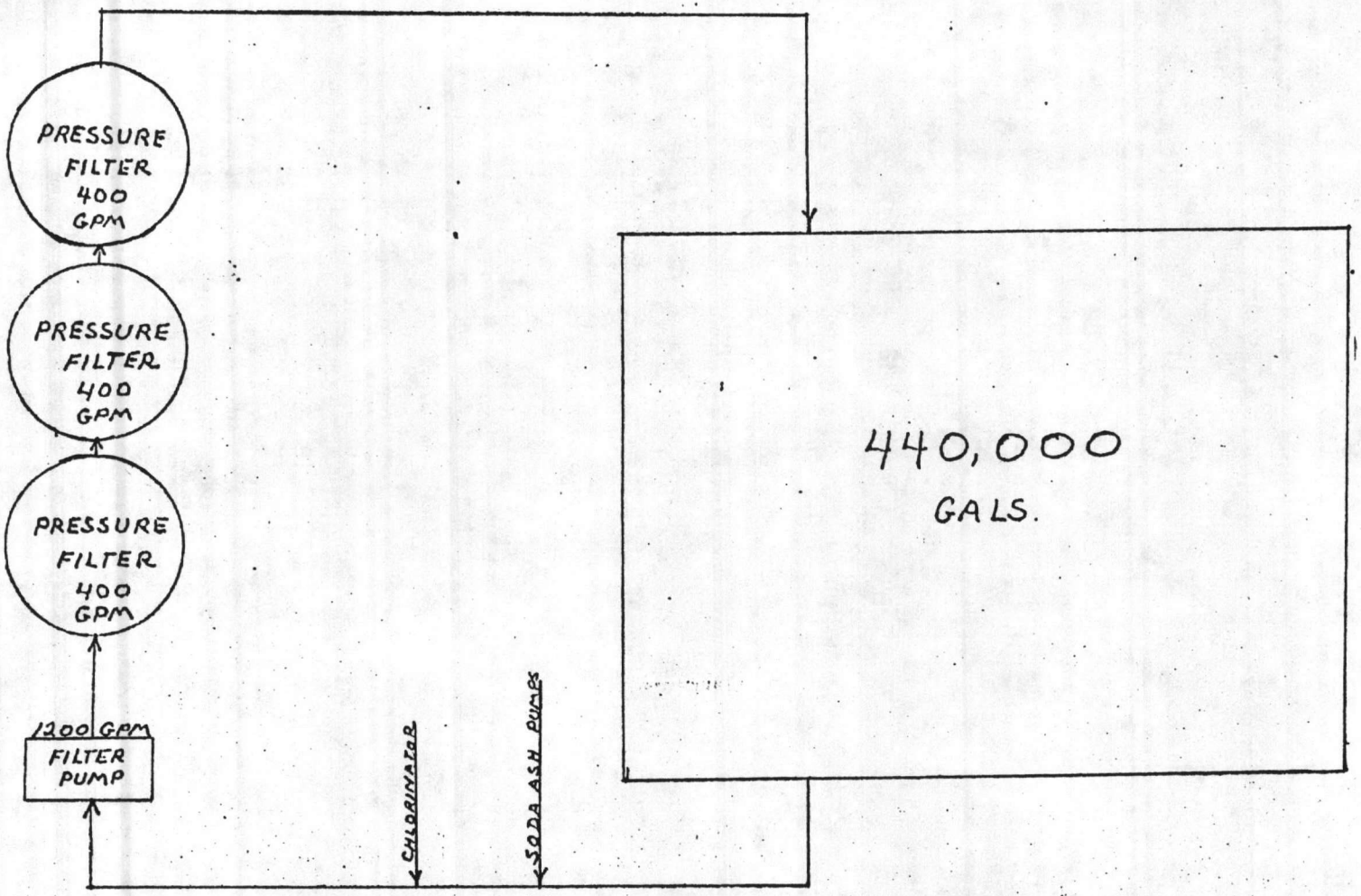
WELL SURVEY SHEET

Sheet No. 6 DATE: 20 June 1984

WELL NO.	WELL TYPE	DRILLED DEPTH ft.	STATIC LEVEL (ft)	CASING SIZE (in.)	STAGES	DRAWDOWN AT RATED CAPACITY (feet	RATED CAPACITY (gpm)	PRESENT CAPACITY (gpm)
M-142	DRILLED	69'	24'	8"	9	21'	100	75
M-197	DRILLED	200'	34'	8"	5	17'	155	100
M-629	DRILLED	70'	27'	8"	5	18'	150	100
M-630	DRILLED	84'	19'	8"	5	25	150	125
M-628	DRILLED	on contract for major repair (replace screens, etc.)						
M-267	DRILLED	100'	45'	8"	?	17'	175	130
New well under construction								

WELL NO.	SPECIFIC CAPACITY (gpm/ft of drawdown)	PUMP HEAD (ft)	MOTOR H. P.	CHLORINATION (AMOUNT)	RESIDUAL CHLORINE (TYPE)	AUXILIARY POWER (TYPE)	DD FORM 710	DD FORM 636
M-142	4.8	147'	7.5					
M-197	9.0	135'	10.0			GASOLINE		
M-629	8.3	140'	7.5			GASOLINE		
M-630	6.0	145	7.5			GASOLINE		
M-628	On contract for major repair							
M-267	10.3	143'	10.0			DIESEL		
New well under construction to replace M-168								

SWIMMING POOL



M-243 Z-2
a. 26 yrs.
b. one vertical turbine
c. Layne Turbine Pump 125 GPM 148 ft. head
d. 150 GPM
e. 10 h.p. 208/416 1740 RPM
f. none
g. See well M-142

M-244 Z-3
a. 26yrs
b. one vertical turbine
c. Layne Turbine Pump 200 GPM 159 ft. head
d. 300 GPM
e. 20 h.p. 220/440 1800 RPM
f. none
g. See well M-142

M-627 Z-4
a. 26 yrs.
b. one vertical turbine
c. Layne Turbine Pump 150 GPM 164 ft. head
d. 150 GPM
e. 7½ h.p. 208/416 1800 RPM
f. Allis-Chalmers gasoline motor
g. See M-142

M-628 Z-5
a. 15 yrs.
b. one vertical turbine
c. Layne Turbine Pump 100 GPM 150 ft head
d. 100 GPM
e. 7½ h.p. 220/440 1800 RPM

M-168 Z-6
a. 19 yrs.
b. one vertical turbine
c. Layne Turbine Pump 100 GPM
d. 100 GPM
e. 5 h.p. 220/440 1800 RPM
f. Allis-Chalmers gasoline motor
g. See M-142

M-197 New well
a. 2 yrss
b. one vertical turbine
c. Peerless 130 GPM
d. 150 GPM
e. 10 h.p. 220/440 1720 RPM
f. Ford gasoline motor

M.P.

WELL NUMBER New well		BY Thomas - BROWN				DATE 1-18-85
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1300
75'	25	30	5	45	105	1310
		40	15	40	164	1320
		50	25	35	236	1330

Set @

REMARKS

Tom K

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE
	Bowl			

NOTICE:
Bids to be opened at 2:00 p.m., e.d.s.t.
JUN 11 1970 at the Office of
Officer in Charge of Construction
Jacksonville, North Carolina Area
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina 28542

N62470-70-B-0478

NAVFAC
SPECIFICATION
NO. 05-70-0478

REPLACE WELL M-141, MONTFORD POINT

at the

Marine Corps Base, Camp Lejeune, North Carolina

Appropriation: 1701106.2721

A priority rating will apply to this contract upon award. The Contractor shall follow the provisions of DMS Reg. 1 and all other applicable regulations and orders of Business and Defense Services Administration in obtaining controlled materials and other products and materials needed to perform this contract.

All questions concerning the plans and specifications occurring prior to bid opening shall be presented to the Director of Design Division, Public Works Department, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina, telephone, Jacksonville, North Carolina, 346-2111, extension 5668, area code 919. Questions requiring interpretation of drawings and specifications must be submitted at least 7 days before bid opening. Interpretations or modifications to specifications made as a result of questions will be made by addendum only, and unless so done, all bidders should base their bids on the plans and specifications as issued.

All questions pertaining to bidding and for prior appointment to inspect the site of the work before bid opening shall be presented to the Officer in Charge of Construction, Jacksonville, North Carolina Area, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina, telephone, Jacksonville, North Carolina, 346-2111, extension 5625, area code 919.

The Government forms and Bureau of Yards and Docks/NAVFAC standard specifications may be obtained or examined at the Public Works Office, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina. Federal and Military specifications and other non-Government materials referred to may be examined at the Public Works Office. Federal and Military specifications may be obtained from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120; requests for copies of the specifications should indicate the contract for which required.

ENCLOSURE (2)

CONTENTS

DIVISION 1. GENERAL REQUIREMENTS

SECTION 1A. General Paragraphs
1B. Additional General Paragraphs
1C. Bids

SECTION 1A. GENERAL PARAGRAPHS

1A.1 General intention. It is the declared and acknowledged intention and meaning to provide and secure replacing of raw water well, M-141, complete and ready for use.

1A.2 General description. The work includes the provision of one new gravel-wall well, complete with prefabricated metal well house, pumping equipment, piping, connections to existing water supply mains, electrical work and other related work. The work further includes the removal of existing well house and foundations, pumping equipment, piping, wiring and other electrical devices and capping existing well.

1A.3 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.

1A.4 Commencement, prosecution and completion of work. The Contractor will be required to commence work under this contract within 10 calendar days after the date of receipt by him of notice to proceed, to prosecute said work diligently, and to complete the entire work ready for use within 120 calendar days after date of receipt of a notice of award or any other communication authorizing the Contractor to proceed. The time stated for completion shall include final cleanup of the premises.

1A.5 Liquidated damages. In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or any extensions thereof, the Contractor shall pay to the Government as liquidated damages pursuant to Clause 5 of Standard Form 23-A the sum of $25 for each day of delay. (See also section entitled "Additional General Paragraphs".)

1A.6 Drawings accompanying specifications. NAVFAC Drawing No. 1243878, "Plan, Sections, and Details", accompanies this specification and is a part thereof. The drawing is the property of the Government and shall not be used for any purpose other than that contemplated by the specification.

1A.7 Factory inspection. (See Clause 10 of Standard Form 23-A and Clause 26 of form NAVFAC 4-4330/5.) 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, if notarized copies of factory reports are furnished that show compliance with the specification requirements. The Government reserves the right to charge to the Contractor any

additional cost of Government inspection and tests when materials and equipment are not ready at the time inspection and tests are requested by the Contractor.

1A.8 Samples. As soon as practicable, and before installation, the Contractor shall submit for approval samples of such materials and equipment as may be required, whether mentioned specifically herein or not.

1A.9 Information required of the Contractor. Specification MIL-D-1000 shall be used as a guide, and its use is encouraged, for all drawings and data submitted by the Contractor. Conformance to the provisions of specification MIL-D-1000 is not mandatory for maps, sketches, presentation drawings, perspectives, renderings, and all other drawings not requiring Naval Facilities Engineering Command drawing numbers. The Contractor shall submit for approval, and in accordance with Clause 67 of NAVFAC 4-4330/5, such drawings, catalog cuts, and/or descriptive data as may be required. Shop drawings shall be submitted and approval obtained before commencing the fabrication of the work. Other data requested shall be submitted and approval obtained prior to installation of the item or associated items. Information shall include, but not be limited to, the following:

1. Prefabricated metal building - manufacturer's data and shop drawings.

2. Well pump - manufacturer's data, showing dimensions, details of construction, H.P. requirements, make and H.P. rating of motor and pump characteristic curve.

3. Auxiliary gasoline engine - manufacturer's data, showing dimensions, details of construction, accessories and characteristic curve.

4. Right angle gear drive - shop drawings and manufacturer's data.

5. Air release valve - manufacturer's data.

6. Power panel - manufacturer's data and electrical characteristics.

7. Battery charger - manufacturer's data.

1A.10 Minimum wage rates and other labor standards. 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 attached

wage determination decision of the Secretary of Labor No. AJ-13,521. Rates for general construction apply to this contract. Other requirements and information are contained in the section entitled "Additional General Paragraphs".

1A.11 North Carolina Sales and Use Tax is required. (See also section entitled "Additional General Paragraphs".)

1A.12 Paragraph 1B.24 of Section 1B does not apply. Full size prints will be furnished to the Contractor without charge.

1A.13 Identification. All catalog cuts, shop drawings, samples and other data submitted for approval by the Contractor shall specifically identify the specification paragraph or contract drawing by number where each item submitted is required to be provided. All submittals shall be clearly marked in ink to indicate the specific item(s) submitted for approval.

1A.14 Disposal of materials and debris. Salvageable material removed from existing work shall be delivered as directed. Distance of haul shall not exceed 7 miles. 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 3 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.

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SECTION 1B. ADDITIONAL GENERAL PARAGRAPHS

1B.1 Form of contract. The contract will be executed on Standard Form 23, January 1961 edition, Construction Contract, and will include Standard Form 19-A, April 1965 edition, Labor Standards Provisions; Standard Form 19-B, December 1965 edition, Representations and Certifications; Standard Form 23-A, June 1964 edition, General Provisions; and Form NAVFAC 4-4330/5, new June 1967, Additional General Provisions.

Clause 3 and Clause 4 of Standard Form 23-A are deleted and the following new clauses substituted in lieu thereof:

"3. CHANGES

"(a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make any change in the work within the general scope of the contract, including but not limited to changes:

"(i) in the specifications (including drawings and designs);

"(ii) in the method or manner of performance of the work;

"(iii) in the Government-furnished facilities, equipment, materials, services, or site, or

"(iv) directing acceleration in the performance of the work.

"(b) Any other written order or an oral order (which terms as used in this paragraph (b) shall include direction, instruction, interpretation, or determination) from the Contracting Officer, which causes any such change, shall be treated as a change order under this clause, provided that the Contractor gives the Contracting Officer written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a change order.

"(c) Except as herein provided, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment hereunder.

"(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any order, an equitable adjustment shall be made and the contract modified in writing accordingly: Provided, however, That except for claims based on defective specifications, no claim for any change under (b) above shall be allowed for any costs incurred more than 20 days before the Contractor gives written notice as therein required: And provided further, That in the

case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with such defective specifications.

"(e) If the Contractor intends to assert a claim for an equitable adjustment under this clause, he must, within 30 days after receipt of a written change order under (a) above or the furnishing of a written notice under (b) above, submit to the Contracting Officer a written statement setting forth the general nature and monetary extent of such claim, unless this period is extended by the Government. The statement of claim hereunder may be included in the notice under (b) above.

"(f) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract.

"4. DIFFERING SITE CONDITIONS

"(a) The Contractor shall promptly, and before such conditions are disturbed, notify the Contracting Officer in writing of: (1) Subsurface of latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract. The Contracting Officer shall promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.

"(b) No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in (a) above; provided, however, the time prescribed therefor may be extended by the Government.

"(c) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract."

Clause 5 of Standard Form 23-A is amended by adding the following sentence at the end of paragraph (d): "As used in this Clause 5(d)(1), the term 'subcontractors or suppliers' means subcontractors or suppliers at any tier." The first sentence of subparagraph (a) of Clause 19 of Standard Form 23-A is amended by deleting the words "and Executive Order 10582, December 17, 1954 (3 CFR Supp.)".

Clause 21 of Standard Form 23-A

(a) Clause 21 of Standard Form 23-A is amended by deleting references to the President's Committee on Equal Employment Opportunity, Executive

Order 10925 of March 6, 1961, as amended, and Section 303 of Executive Order No. 10925 of March 6, 1961, as amended, and substituting therefor the Secretary of Labor, Executive Order No. 11246 of September 23, 1965, and Section 204 of Executive Order 11246 of September 24, 1965, respectively.

(b) Clause 21 of Standard Form 23-A is amended to insert after the reference to "Executive Order 10925" the following: "or the clause contained in Section 201 of Executive Order No. 11114".

(c) The following additional footnote is added to Clause 21 of Standard Form 23-A: "In accordance with regulations of the Secretary of Labor, the rules, regulations, orders, instructions, designations, and other directives issued by the President's Committee on Equal Employment Opportunity and those issued by the heads of various department or agencies under or pursuant to any of the Executive Orders superseded by Executive Order 11246, shall, to the extent that they are not inconsistent with Executive Order 11246, remain in full force and effect unless and until revoked or superseded by appropriate authority. References in such directives to provisions of the superseded orders shall be deemed to be references to the comparable provisions of Executive Order 11246.

Clause 31 of Form NAVFAC 4-4330/5(6-67) is amended by adding the following to paragraph (a) just before the last sentence: "Should the Contractor fail to take appropriate action within a reasonable time, the Government may correct such defects and hold the Contractor responsible for the expenses incurred."

The title of Clause 33 of Form NAVFAC 4-4330/5(6-67) is changed to read "INSURANCE ON GOVERNMENT PROPERTY".

Clause 43 of Form NAVFAC 4-4330/5(6-67) is amended by deleting the word "is" in the second line after "indemnification" and substituting "if" therefor.

Clause 49 of Form NAVFAC 4-4330/5(6-67) is amended by deleting the word "continued" from the first sentence of paragraph (a) and substituting "confined" in lieu thereof.

Clause 56 of Form NAVFAC 4-4330/5(6-67) is amended by deleting the word "of" in the sixth line after "presence" and substituting "or" therefor.

Clause 57 of form NAVFAC 4-4330/5 is deleted and the following new clause substituted in lieu thereof:

"57. SUSPENSION OF WORK

"(a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work for such period

of time as he may determine to be appropriate for the convenience of the Government.

"(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Contracting Officer in the administration of this contract, or by his failure to act within the time specified in this contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent (1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or (2) for which an equitable adjustment is provided for or excluded under any other provision of this contract.

"(c) No claim under this clause shall be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract."

Clause 62 of Form NAVFAC 4-4330/5(6-67) is deleted and the following new clause substituted in lieu thereof:

"62. AUDIT -- PRICE ADJUSTMENTS (NOV. 1967)

(a) This clause shall become operative only with respect to any change or other modification of this contract which involves a price adjustment in excess of $100,000, unless the price adjustment is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation.

(b) For purposes of verifying that certified cost or pricing data submitted in conjunction with such a contract change or other modification were accurate, complete, and current, the Contracting Officer, the Comptroller General of the United States, or any authorized representatives, shall -- until the expiration of three years from the date of final payment under this contract -- have the right to examine those books, records, documents, papers, and other supporting data which involve transactions related to this contract or which will permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.

(c) The Contractor agrees to insert this clause, including this paragraph (c), in all subcontracts hereunder which when entered into exceed $100,000. When so inserted, changes shall be made to designate the higher-tier subcontractor at the level involved as the contracting and certifying party; to add "of the Government prime contract" after "Contracting Officer"; and to add, at the end of (a) above, the words, "provided that the change of other modification to the subcontract results from a change or other modification to the Government prime contract.""

Clause 64 of form NAVFAC 4-4330/5 is deleted and the following new clause is substituted in lieu thereof:

"64. PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA - PRICE ADJUSTMENTS (NOV. 1967)

"(a) This clause shall become operative only with respect to any change or other modification of this contract which involves a price adjustment in excess of $100,000, except where the price is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation. The right to price reduction under this clause shall be limited to such price adjustments.

"(b) If any price, including profit, or fee, negotiated in connection with any price adjustment under this contract was increased by any significant sums because the Contractor or any subcontractor, pursuant to the clause of this contract entitled 'Subcontractor Cost or Pricing Data - Price Adjustments' or any subcontract clause therein required, furnished incomplete or inaccurate cost or pricing data or data not current as of the date of execution of the Contractor's Certificate of Current Cost or Pricing Data, then such price shall be reduced accordingly and the contract shall be modified in writing to reflect such reduction. (Note: Since the contract is subject to reduction under this clause by reason of defective cost or pricing data submitted in connection with certain subcontracts, it is expected that the contractor may wish to include a clause in each such subcontract requiring the subcontractor to appropriately indemnify the contractor. However, the inclusion of such a clause and the terms thereof are matters for negotiation and agreement between the contractor and the subcontractor, provided that they are consistent with ASPR 23-203 relating to Disputes provisions in subcontracts. It is also expected that any subcontractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data required to be submitted by his lower tier subcontractors.)

"(c) Failure to agree on a reduction shall be a dispute concerning a question of fact within the meaning of the "Disputes" clause of this contract.

"(d) The requirement for inclusion of the above clauses in contracts with foreign governments or agencies thereof may be waived in exceptional cases by the Head of a Procuring Activity, stating in writing his reasons for such determination."

The following clause is added as an additional general provision of Form NAVFAC 4-4330/5(6-67) (This clause is not applicable to contracts of less than $2,000 or for work outside the United States, its possessions, and Puerto Rico):

"75. MANDATORY INSURANCE COVERAGE

"(a) Within 15 days after the award of this contract, the successful bidder shall furnish to the OICC a certificate of insurance as evidence of the existence of the following insurance coverage in amounts not less than the amounts specified below:

Type of Insurance	Coverage		
	Per Person	Per Accident	Property
1. Comprehensive General Liability	$100,000	$300,000	$10,000
2. Automobile Liability	$100,000	$300,000	$10,000
3. Workmen's Compensation	As Required By State Law		
4. (Other As Required by State Law)			

The Comprehensive General and Automobile Liability policies shall contain a provision worded as follows: 'The insurance company waives any right of subrogation against the United States of America which may arise by reason of any payment under the policy.' The certificate of all policies shall provide for notice of cancellation to the OICC and the certificates shall indicate that the above provision has been included.

"(b) The Prime Contractor shall also furnish such a similar certificate of insurance as evidence of the existence of such coverage for all subcontractors who will work on the job. This certificate shall be furnished not less than five days before such subcontractor forces enter the Government premises."

1B.2 Performance and payment bonds, executed on Standard Form 25, June 1967 edition, Performance Bonds, and Standard Form 25-A, June 1964 edition, Payment Bond, will be required as stipulated on the reverse side of Standard Form 20, January 1961 edition, Invitation for Bids. The performance bond shall specifically provide coverage for taxes imposed by the United States which are collected, deducted, or withheld from wages paid by the Contractor in carrying out the contract with respect to which such bond is furnished.

1B.3 Damages for delay. The Government will take no action pursuant to Clause 5 of Standard Form 23-A, Liquidated damages, to terminate the right of the Contractor to proceed or to assess liquidated or actual damages where failure of the Contractor to complete the work within the time specified is due solely to the operation of the Defense Materials System and Priorities, provided the Contractor and his subcontractors comply with the provisions of this System and the Contractor's lateness in completion of the work is not otherwise caused by the fault or negligence of the Contractor. Such delays will be excusable within the meaning of Clause 5, and the Contractor will be entitled to a time extension by reason thereof.

1B.4 Specifications and standards. The specifications and standards referenced in this specification (including addenda, amendments, and errata listed) shall govern in all cases where references thereto are made. In case of difference between the referenced specifications or standards and this specification or its accompanying drawings, this specification and its accompanying drawings shall govern to the extent of such difference; otherwise, the referenced specifications and standards shall apply. The requirements for packaging, marking, and preparation for shipment or delivery included in the referenced specifications shall apply only to materials and equipment that are furnished directly to the Government and not to materials and equipment that are to be furnished and installed by the Contractor. Unless specified otherwise in this specification, the requirements included in referenced specifications are modified as follows:

Radio-interference suppression: Not required.
Fungus control: Not required.
Identification or name plate: Manufacturer's standard acceptable.
Technical publications: Manufacturer's standard acceptable.
Production test model: In lieu of tests performed on a production test model, such tests, if required at the manufacturer's plant, shall be performed on the equipment being furnished under this specification.

When a number in parenthese is suffixed to a referenced Yards and Docks/NAVFAC, Federal or Military specification or standard symbol, it denotes the effective amendment or change to the document.

Referenced specifications or standards, other than Yards and Docks/NAVFAC, Federal, and Military, are not available for distribution by the Department of the Navy. Requests therefor should be made to the issuing organization. They may be examined at the office where the bids are being received.

1B.5 Work outside regular hours. If the Contractor desires to carry on work outside the regular hours or on Saturdays, Sundays, or holidays, he shall 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.

1B.6 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.

1B.7 Definitions. Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to the drawings accompanying this specification unless stated otherwise. Where "as directed", "as required", "as permitted", "approved", "acceptance", or words of similar import are used, it shall be understood that the direction, requirements, permission, approval, or acceptance of the Officer in Charge of Construction is intended unless stated otherwise. As used in this specification, "provide" shall be understood to mean "provide complete in place", that is, "furnish and install". Where "Bureau", "Bureau of Yards and Docks", "NAVFAC" or words or phrases of similar import appear in this specification, on the drawings, or in documents referenced by the specification or the drawings, it shall be understood to mean the "Naval Facilities Engineering Command".

1B.8 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.

1B.9 Methods and schedules of procedures. 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.

1B.10 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 noncomplying features by letter accompanying the submitted matter. Partial submittals or submittals of less than the whole of any system made up of interdependent components, will not be considered. Approval of drawings, cuts, and samples by the Officer in Charge shall not be construed as a complete check or 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.

1B.11 Operation of station utilities. The Contractor shall not operate nor disturb the setting of any control devices in the station utilities system, including water, sewer, electrical and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Officer in Charge, giving reasonable advance notice when such operation is required.

1B.12 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.

1B.13 Changed conditions. Wherever changed conditions as defined in Clause 4 of Standard Form 23-A are encountered, and wherever conditions exposed during the course of the work necessitate a change from quantities indicated or specified as either estimated quantities or as a basis for bids, whether or not provision for a change in price for such variation is specified, the Officer in Charge must be notified in writing and written directions to do so must be obtained before quantities stated in the contract documents are exceeded.

1B.14 Protection and repairs. The Contractor shall comply with the fire prevention requirements, 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.

1B.15 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 or specified otherwise. Except where specifically designated as being retained by the Government or to be reinstalled in the new construction, all materials, fixed equipment, and 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.

1B.16 Layout of Work (January 1965). The Contractor shall lay out his work from Government-established base lines and bench marks indicated on the drawings and shall be responsible for all measurements in connection therewith. The Contractor shall furnish, at his own expense, all stakes, templates, platforms, equipment, tools, and materials and labor as may be required in laying out any part of the work from the base lines and bench marks established by the Government. The Contractor will be held responsible for the execution of the work to such lines and grades as may be established or indicated by the Officer in Charge of Construction. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Officer in Charge of Construction until authorized to remove them. If such marks are destroyed, by the Contractor or through his negligence, prior to their authorized removal, they may be replaced by the Officer in Charge of Construction at his discretion. The expense of replacement will be deducted from any amounts due or to become due the Contractor.

1B.17 Payrolls and affidavits. The Prime Contractor, subcontractor, and sub-subcontractors will be required to submit a copy of each weekly payroll together with a Contractor's Weekly Statement of Compliance 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 statements is made a condition precedent to payment for any amounts due under the contract.

1B.17.1 Payroll. The payroll shall be identified by the name of the Contractor, 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 employee's address with the payroll on which the employee's name first appears.

1B.17.2 Contractor's Weekly Statement of Compliance shall be executed on the form furnished for the purpose by the Officer in Charge. Contractors shall list by title or name, all deductions made, omitting from the listing the dollar amount of the deductions.

1B.17.3 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.

1B.18 Subcontractors 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. 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 any emergency. 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.

1B.19 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.

1B.20 Safety requirements. A copy of the Department of the Army, Corps of Engineers, "General Safety Requirements", referenced in Clause 55 of form NAVFAC 4-4330/5, may be examined or obtained on application to the office where the bids are being received. Prior to starting the work, the Contractor shall meet in conference with representatives of the Officer in Charge to discuss and develop mutual understandings relative to administration of the safety program.

1B.21 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 are 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.

1B.22 Responsibility for testing. Where tests are specified to be made by the Government, the Government will make the initial tests at its expense. Should the initial samples fail to meet the requirements of the specifications, all succeeding tests of additional samples shall be made by an approved testing laboratory or agency at the expense of the Contractor.

1B.23 Schedule of prices. Unless otherwise specified in the section entitled "General Paragraphs", upon receipt of a notice of award, the Contractor shall prepare a detailed breakdown of the contract price, giving the quantities of the various kinds of work and the unit and total prices therefor. This breakdown shall be submitted promptly to the Officer in Charge on form NAVDOCKS 83, revised August 1963, Schedule of Prices, in octuplicate. The forms will be furnished by, and shall be executed in a manner satisfactory to, the Officer in Charge of Construction. The submission of this breakdown will not affect the contract terms.

1B.24 Prints furnished to Contractor. Five one-half size prints and one set of full-size reproducibles of each drawing accompanying this specification will be furnished the Contractor without charge. Additional prints and full-size prints required by the Contractor shall be reproduced by him at his own expense.

1B.25 Priorities, allocations, and allotments. The Contractor agrees, in the procurement and use of materials required for the performance of this contract, to comply with the provisions of all applicable rules and regulations of the Business and Defense Services Administration, including Defense Materials System regulations. If the initial contract price hereunder does not exceed $100,000, this project is made a rated order pursuant to DMS Regulation 1 and is assigned DO rating C-2 unless a higher rating is specified in the section entitled "General Paragraphs". The Contractor is hereby made a self-authorizing Contractor as defined in Section 3(g) of that regulation and is required to use the self-authorization provision of Section 9 in obtaining controlled materials, as well as products and materials other than controlled materials needed to fill this rated order.

1B.26 Location of underground utilities. Where existing piping, utilities, and underground obstructions of any type are indicated in locations to be traversed by new piping, ducts, and other work provided hereunder, and are not indicated or specified to be removed, the elevations of the existing utilities and obstructions shall be determined before the new work is laid closer than the nearest manhole or other structure at which an adjustment in grade could be made. For any additional work required by reason of conflict between the new and existing work, an adjustment in contract price will be made in accordance with Clause 4 of Standard Form 23-A.

1B.27 Notice Regarding Buy American Act (October 1966). The Buy American Act (41 USC 10a-10d) generally requires that only domestic construction materials be used in the performance of this contract. Exception from the Buy American Act shall be permitted only in the case of nonavailability of domestic construction materials. A bid or proposal offering nondomestic construction material will not be accepted unless specifically approved by the Office of the Secretary of Defense. When a bidder or offerer proposes to furnish nondomestic construction material, his bid or proposal must set forth an itemization of the quantity, unit price, and intended use of each item of such nondomestic construction material. When offering nondomestic construction material pursuant to this paragraph, bids or proposals may also offer, at stated prices, any available comparable domestic construction material, so as to avoid the possibility that failure of a nondomestic construction material to be acceptable under this paragraph will cause rejection of the entire bid.

1B.28 Availability of utility services. In accordance with Clause 71 of form NAVFAC 4-4330/5, as modified herein, electric and water service will

be made available to the Contractor at the nearest available existing outlets at prevailing Government rates which may be obtained upon application to the Commanding Officer. The Contractor will be required to furnish all labor, equipment and materials to make utilities connections and to furnish and install valves, transformers, and meters for each service. The Contractor shall determine that each source is adequate and suitable for requirements of his equipment before making connection and on completion, shall reinstate all utility sources used to their original condition or a condition satisfactory to the Officer in Charge. No guaranty of any kind is made as to the continuity and level of the supply of such utility services. They will be reduced or suspended as the needs of the Government require and the Government shall not be liable for any damages sustained as a result of such reduction or suspension, nor for any failure of the supply lines to the Contractor's connections. Unless specified otherwise in section entitled "General Paragraphs", final connections to existing utilities shall be made by the Contractor under the direct supervision of Government personnel.

1B.29 Minimum wage rates and other labor standards. 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 subcontractor conformably to the Secretary's decision, subject to the approval of the Contracting Offider. Mechanics and laborers shall be classified in conformance with prevailing practice. In the event of any difference between the Contractor and the Government concerning the proper wage rates to be paid, the classification of employees to conform to prevailing practice, the amount of wages due employees, or any other application or interpretation of the labor standards provisions of this contract, the difference shall be referred to the Contracting Officer (the Commander of the Naval Facilities Engineering Command or his specially authorized representative), and the Contracting Officer shall determine the matter with advice from and reports to the Secretary of Labor as required by Department of Labor regulations. This determination shall not be appealable under the Disputes clause, and the Contractor shall comply promptly with the determination of the Contracting Officer. If the Contracting Officer determines that the Contractor has not satisfied his obligations under the labor standards provisions of the contract, the Contracting Officer will forward a report on the violations to the Department of Labor and the Comptroller General for appropriate action.

1B.29.1 Investigation of labor conditions. The wage determination decision of the Secretary of Labor attached hereto, or included by addendum, 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 workday and workweek, 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 that might affect the 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 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.

1B.29.2 Apprentices employed pursuant to the wage determination decision contained in this contract must be registered in a bona fide appreticeship program registered with a state apprenticeship council recognized by the Federal Committee on Apprenticeship, Department of Labor, or if no such recognized council exists in a state, a program registered with the Bureau of Apprenticeship, Department of Labor. The ratio of apprentices to journeyman mechanics shall not exceed that recognized by the agency of registry as prevailing.

1B.29.3 Posting of wage rates. Where compliance with Clause 1 of Standard Form 19-A requires posting the wage determination decision in an exterior location, it shall, along with other documents required to be similarly posted, be displayed in a weatherproof display case.

1B.30 Equal Employment Opportunity.

(a) Certification of nonsegregated facilities. By the submission of this bid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, offeror, applicant or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, becuase of habit, local custom or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will

obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of Equal Opportunity clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES.

A certification of Nonsegregated Facilities, as required by the May 9, 1967 order on Elimination of Segregated Facilities, by the Secretary of Labor (32 Fed. Reg. 7439, May 19, 1967) must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually). (Mar. 1968) (Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001).

(b) Certification of nonsegregated facilities by subcontractors and federally assisted construction contractors (Mar. 1968). Prior to the award of any subcontract, required to contain the Equal Opportunity clause contained in this contract, the Contractor shall obtain the certification set forth in 2-201(a) (xli). This certification may be required by the Contractor, either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

(c) During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency Contracting Officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invokes as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the provisions of Paragraph (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issues pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

1B.31 North Carolina Sales and Use Tax

(a) As used throughout this clause, the term "materials" means building materials, supplies, fixtures and equipment which become a part of or are annexed to any building or structure erected, altered, or repaired under this contract.

(b) If this is a fixed-price type contract as defined in the Armed Services Procurement Regulation, the contract price includes North Carolina sales and use taxes to be paid with respect to materials, notwithstanding any other provision of this contract. If this is a cost-reimbursement type contract as defined in such regulation, any North Carolina sales and use taxes paid by the Contractor with respect to materials shall constitute an allowable cost under this contract.

(c) At the time specified in paragraph (d) below:

(i) The Contractor shall furnish the Contracting Officer certified statements setting forth the cost of the materials purchased from each vendor and the amount of North Carolina sales and use taxes paid thereon. In the event the Contractor makes several purchases from the same vendor, such certified statement shall indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices and the North Carolina sales and use taxes paid thereon. Such statement shall also include the cost of any tangible personal property withdrawn from the Contractor's warehouse stock and the amount of North Carolina sales or use tax paid thereon by the Contractor. The Contractor shall furnish such additional information as the Commissioner of Revenue of the State of North Carolina may require to substantiate a refund claim for sales or use taxes.

(ii) The Contractor shall obtain and furnish to the Contracting Officer similar certified statements by its subcontractors.

(d) If this contract is completed before the next July 1, the certified statements to be furnished pursuant to paragraph (c) above shall be submitted within 60 days after completion. If this contract is not completed before the next July 1, such certified statements shall be submitted on or before the 31st day of August of each year and shall cover taxes paid during the twelve month period which ended the preceding June 30.

(e) The certified statements to be furnished pursuant to paragraph (c) above shall be in the following form:

I hereby certify that during the period _____ to _____, (name of Contractor or subcontractor) paid North Carolina sales and use taxes aggregating $_____ with respect to building materials, supplies, fixtures and equipment which have become a part of or annexed to a building or structure erected, altered or repaired by (name of Contractor) for the United States of America, and that the vendors from whom the property was purchased, the dates and numbers of the invoices covering the purchases, the total amount of the invoices of each vendor, the North Carolina sales and use taxes paid thereon, and the cost of property withdrawn from warehouse stock and North Carolina sales or use taxes paid thereon are as set forth in the attachments hereto.

1B.32 Quarantine for white-fringed beetles. The entire Camp Lejeune, reservation (including Camp Geiger) and the Marine Corps Air Station (Helicopter), 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 draglines, road-grading machines, ditch diggers, bulldozers, and equipment with tracks 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 necessary to accomplish complete removal. Resulting spoil shall be wasted as directed.

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SECTION 1C. BIDS

1C.1 Instruction to Bidders, Standard Form 22, June 1964 edition, and Invitation for Bids Standard Form 20, January 1961 edition shall be observed in the preparation of bids. Bidders shall affix their names and return addresses in the upper left corner of bid envelopes. Envelopes containing bids must be sealed.

1C.2 Bid guaranty will be required as stipulated on the reverse side of Standard Form 20.

1C.3 Items of Bids. Bids shall be submitted, in duplicate, on Standard Form 21, December 1965 edition, Bid Form, and in accordance with Standard Forms 20 and 22 upon the following item:

Item 1. Price for the entire work, complete in accordance with the drawing and specification.

1C.4 Telegraphic modifications of bids in accordance with Standard Form 22 may be made. Two signed copies of the telegram in a sealed envelope marked "Copies of telegraphic modification of bid for Replace Well M-141, Montford Point, Specification No. 05-70-0478" should be forwarded immediately to the office to which the written bids were submitted.

1C.5 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.

J. W. UPDEGROVE, CAPT, CEC, USN
Officer in Charge of Construction
24 March 1970

DIVISION 2. SITE WORK

SECTION 2A. Demolition
2B. Earthwork

SECTION 2A. DEMOLITION

2A.1 General requirements. The work includes the removal of existing well house, foundations, floor slabs, and all mechanical and electrical equipment and piping remaining in the well house. Piping outside of well house shall be removed as indicated. Underground electric service shall be removed back to the meter mounted on the service pole. The work further includes capping off existing well as indicated.

2A.2 Existing conditions. The existing well house is wood frame construction with concrete foundations and floor slabs, wood door and wood frame roof construction. Size of well house, construction details, equipment layout and piping are approximately the same as indicated for new construction. Well pump and gasoline engine have been removed and disposed of. Other mechanical equipment and some piping are in various stages of dismantlement.

2A.3 Materials which have been removed shall not be permitted to accumulate and shall be promptly removed from the site. All salvageable materials, including mechanical and electrical equipment, piping and valves, shall remain the property of the Government. All debris and other removed materials shall be removed from the site and disposed of as specified in SECTION 1A, General Paragraphs.

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SECTION 2B. EARTHWORK

2B.1 Scope. The work includes the excavation, filling, backfilling, and grading indicated and necessary for the proper completion of the project.

2B.2 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

(a) Bureau of Yards and Docks/NAVFAC Specifications.

42Yc Drainage, sanitary, electrical, and water service appurtenances.

(b) Non-Government Specifications and Standards.

American Association of State Highway Officials (AASHO).

T99-61 Moisture-density relations of soils, 5.5 lb. rammer and a 12-inch drop.

North Carolina Seed Improvement Association.

Requirements for certification. (current edition)

2B.3 General requirements. 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 or shown, or both, the provisions of the contract 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, firmly cemented unstratified masses or conglomerate deposits possessing the characteristics of solid rock not ordinarily removed without systematic drilling and blasting, and any boulder, masonry, or concrete except pavement, exceeding 1/2 cubic yard in volume.

2B.4 Topsoil. Material from the excavations and grading which, in the opinion of the Officer in Charge, is suitable for topsoil shall be

deposited in piles separate from other excavated material. Topsoil shall be free of stones, wood matter, cuttings, excessive quantities of vegetation, and debris of every kind. Piles of topsoil shall be located so that the material can be used readily for finished surface grading. Topsoil shall be protected and maintained until needed, and shall be spread uniformly over the ground in the areas where the natural soil conditions have been disturbed under the operations of this contract.

2B.5 Excavations shall be carried to the depths, contours and dimensions indicated or necessary. Excavations shall be kept free from water while construction therein is in progress.

2B.5.1 Excavations for structures and trenches. Excavations carried below the depths indicated, without specific directions, shall be refilled to the proper grade with suitable material and compacted thoroughly, except that in excavations for footings, the concrete shall be extended to the bottom of the excavations; all additional work of this nature shall be at the Contractor's expense. Trenches for pipe lines shall be excavated along straight lines and, unless indicated otherwise, shall provide a minimum of 6 inches between the outside of the pipe bell and the sides of the trench or bracing. Standard pipe trench excavation and bedding shall be in accordance with specification 42Y. Mechanical excavation, other than in rock, shall be held at least 2 inches above final invert grade. The remainder of the excavation shall be shaped manually and graded to provide uniform bearing on compacted soil, immediately before the pipe is laid.

2B.5.2 Excavations under new concrete slab. The entire area of the original ground under new concrete slab shall be excavated to remove all vegetable matter, topsoil, sod, muck, rubbish, and other unsuitable material to a minimum depth of 6 inches. In the event that it is required to remove unsuitable material to a greater depth than specified, an adjustment in the contract price will be made in accordance with the contract.

2B.5.3 Shoring and sheeting. Excavations shall be shored and sheeted with members of sizes and arrangement sufficient to prevent injury to persons, damage to structures, injurious caving, or erosion. Shoring, sheeting, and bracing shall be removed as the excavations are backfilled; care shall be exercised to prevent injurious caving during the removal of the shoring and sheeting.

2B.6 Borrow required shall be taken only from approved locations. Borrow pits shall be so excavated that drainage is provided and shall not be left in an unsightly or unsanitary condition. Maximum haul for borrow shall not exceed three miles.

2B.7 Filling and backfilling. All fill and backfill shall be free from roots, wood or other scrap material, and other vegetable matter and

refuse. Fill and backfill shall be placed in layers not more than 6 inches thick, except as specified otherwise herein, and each layer shall be compacted thoroughly and evenly. Backfill about structures shall be placed, as far as practicable, as the work of construction progresses. Backfilling of trenches shall progress as rapidly as the construction and testing of the work permits. In backfilling pipe trenches, approved fill shall be compacted in 6-inch layers to a depth of one foot over the top of the pipe; the remainder of the trench shall be backfilled in well-compacted one-foot layers.

2B.8 Compaction. The subgrade of soils in cut shall have a density of 95 percent of the maximum density to a depth of 12 inches below the subgrade surface. If the density of the existing material is less than 95 percent, it shall be compacted to a depth of 12 inches to the minimum 95 percent density. Fill and backfill under concrete floor slabs shall be compacted to not less than 100 percent of the maximum density for cohesionless materials and 95 percent of the maximum density for other materials; under grassed areas to 85 percent; and other backfill adjacent to structures to 90 percent. The moisture content of the specified densities shall be within 2 percent more or less than the optimum.

2B.9 Grading. The Contractor shall perform all grading in the areas so indicated or specified. Fill shall be brought to finished grades indicated within a tolerance of one-tenth of a foot and shall be graded to drain away from structures. Existing grades which are to remain and which are disturbed by the Contractor's operations shall be graded to provide surfaces suitable for the proper use of mowing machines.

2B.10 Disposition of surplus material. Surplus material not required for filling, backfilling, or grading and other spoil material shall be wasted by deposition at the site of the work, as directed. Wasted material shall be spread and leveled as directed.

2B.11 Quality assurance provisions. All soil tests will be performed by the Government. Maximum density at optimum moisture content will be determined by AASHO method T99, Method D with the following modifications: (1) all material passing a 2-inch sieve and retained on a 3/4-inch sieve shall be removed and replaced with an equal portion of material between the no. 4 and 3/4-inch sieves, and (2) a separate batch of material shall be used for each compaction test specimen. No material shall be reused for compaction tests.

2B.12 Vegetation. The work includes seedbed preparation, liming, fertilizing and seeding of all areas where natural soil conditions have been disturbed by this contract.

2B.12.1 Materials.

(a) Lime shall be dolomitic agricultural ground limestone containing 10 percent Magnesium Oxide.

(b) Fertilizer shall be standard commercial product of 10-10-10 analysis.

(c) Seed shall be Bermuda (hulled) and shall be certified seed or equivalent based on North Carolina Seed Improvement Association requirements for certification.

2B.12.2 Seedbed preparation. The areas to be vegetated shall be prepared by thoroughly loosening the soil to a depth of 4 inches. After loosening the soil, all surface irregularities where surface water could collect and pond shall be smoothed out. A firm and compact seedbed is required, and after smoothing, it shall be lightly compacted with a land roller.

2B.12.3 Liming. Limestone shall be uniformly applied at the rate of 40 pounds per 1,000 square feet to all areas to be vegetated. Limestone may be applied to the area prior to the preparation of the seedbed, but in all cases, it shall be applied before seeding and thoroughly incorporated into the entire depth of prepared seedbed.

2B.12.4 Fertilizing. Fertilizer shall be uniformly applied at the rate of 20 pounds per 1,000 square feet. The fertilizer shall be incorporated into the upper three or four inches of prepared seedbed.

2B.12.5 Seeding. Seed shall be sown by hand or an approved seeder and distributed uniformly at the rate of two pounds per 1,000 square feet. The seed shall be planted no deeper than 1/4 inch. After seeding, the seeded areas shall be compacted with a land roller. All seeding and compacting shall be done when weather conditions are favorable and not when seedbed is wet.

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DIVISION 3. CONCRETE

SECTION 3A. CONCRETE CONSTRUCTION

3A.1 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

(a) Bureau of Yards and Docks/NAVFAC Specifications.

13Yh Concrete construction; including addendum no. 1.

(b) Federal and Military Specifications.

HH-F-341e Fillers, expansion-joint; bituminous and nonbituminous (preformed; for concrete).

3A.2 General requirements. Concrete construction, including reinforcing, shall be in accordance with specification 13Y, except as modified herein. Concrete for footings, walls, steps, and slabs on grade shall be Class D-1. Cement for exposed concrete surfaces of the building where appearance is a consideration shall be from the same source. Horizontal wall steel not otherwise indicated shall return lap 18 inches at corners.

3A.3 Expansion joints and cleavage joints between vertical and concrete surfaces and slabs shall be 1/2-inch wide, unless otherwise indicated, expansion joint material shall extend the full thickness of the concrete. Joints shall be filled with preformed joint filler conforming to specification HH-F-341.

3A.4 Surface finishes.

3A.4.1 All exposed surfaces cast against forms shall be given a special grout finish.

3A.4.2 All exterior concrete pads on grade shall be given a wood-float finish.

3A.4.3 All interior floor surfaces shall be given a troweled finish.

3A.5 Setting miscellaneous material. All dowels, bolts, anchors, pipes, hangers, insets, sleeves, and all other material in connection with the concrete work shall be placed and secured in position, when practicable, before the concrete is placed.

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DIVISION 4. METALS, STRUCTURAL AND MISCELLANEOUS

SECTION 4A. MISCELLANEOUS METAL WORK

4A.1 General requirements. Miscellaneous metal shall consist of standard shapes of commercial quality. Cast iron shall be soft, tough, gray iron; castings shall have sharp corners and edges, and shall be clean, smooth and true to pattern. Welding shall be done in a manner that will prevent permanent buckling and all welds exposed in the finished work shall be ground smooth.

4A.2 Workmanship and finish. Workmanship and finish shall be equal to the best practice of modern shops for the respective work. Exposed surfaces shall have smooth finish and sharp, well defined lines and arrises. Sections shall be well formed to shape and size with sharp lines and angles; curved work shall be sprung evenly to curves. All necessary rabbets, lugs, and brackets shall be provided so that the work can be assembled in a neat and substantial manner. Holes for bolts and screws shall be provided. Fastenings shall be concealed where practicable. Thickness of metal and detail of assembly and supports shall provide ample strength and stiffness.

4A.3 Shop painting. All surfaces of steel and iron work, except zinc-coated work and work with bituminous or other priming, shall be shop painted in accordance with the fabricator's standard practice.

4A.4 Anchors and fastenings. Ties anchors and other miscellaneous fastenings shown, specified or necessary for the securing of the work in place shall be furnished and installed.

4A.5 Prefabricated metal building is specified in DIVISION 5 in the section entitled "Prefabricated Metal Building".

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DIVISION 5. SPECIAL CONSTRUCTION

SECTION 5A. PREFABRICATED METAL BUILDING

5A.1 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

(a) Bureau of Yards and Docks/NAVFAC Specifications.

32Ye	Metal doors.

(b) Federal and Military Specifications.

DD-G-451c (INT.2)	Glass, plate, sheet, figures (float, flat, for glazing, corrugated).
FF-H-00106b	Hardware, builders'; locks and door trim.
FF-H-00111b	Hardware, builders'; shelf and miscellaneous.
FF-H-116c(5)	Hinges, hardware, builders'.
QQ-S-775d	Steel sheets, carbon, zinc-coated.
TT-G-410E	Glazing compound, sash (metal) for back bedding and face glazing (not for channel or stop glazing).
TT-P-645	Primer, paint, zinc-chromate, alkyd type
MIL-S-4174B	Steel sheet and strip, flat, aluminum coated, low carbon.
MIL-P-15328C	Primer (wash), pretreatment blue (formula No. 117-B for metals).
MIL-C-18969B	Calking compounds, metal seam and wood seam.

(c) Non-Government Specifications and Standards.

American Institute of Steel Construction (AISC)

Manual of Steel Construction (6th Edition).

American Iron and Steel Institute (AISI)

Light gage cold-formed steel design manual - 1962.

Architectural Aluminum Manufacturers' Association (AAMA)

Aluminum window specification - 1969.

Metal Building Manufacturers' Association (MBMA)

Recommended design practices manual - 1963.

Steel Window Institute (SWI)

Recommended standards for steel windows - 1967.

5A.2 Special requirements. The dimensions shown on the drawing depict minimum requirements for width and length of building. Building with slightly larger dimensions will be acceptable. Additional footings, floor slab or other details of construction required shall be provided by the Contractor at no expense to the Government. The Contractor shall submit a revised floor plan showing the proposed changes and receive approval prior to starting construction of foundations for well house or equipment.

5A.3 General requirements. Prefabricated metal building shall be the product of a manufacturer who is regularly engaged in the manufacture of prefabricated metal buildings. The building shall have clear spans. The building shall be one of the following types:

Type I	Truss (or beam) type
Type II	Rigid frame type
Type III	Self-framing type

5A.3.1 Assembly and disassembly. The size of the prefabricated components and the necessary field connections required for erection shall be such as will permit easy assembly and disassembly by means of the building manufacturer's standard fasteners and construction tools. The maximum size of any shop-assembled component of the building shall be such as will permit transportation from factory to site by commercial carrier. Components of the metal building shall be fabricated in such manner that once assembled, they may be disassembled, packaged, and reassembled with a minimum amount of labor and maximum salvageability. Each and every piece and part of the assembly shall be clearly and legibly marked to correspond with previously prepared erection drawings, diagrams, and/or instruction manuals.

5A.3.2 Storage and protection. Prefabricated components, sheets, panels, and other manufactured items shall be delivered, stored, handled, and erected in such a manner that they will not be damaged or deformed. Materials stored on the site before erection shall be stacked on platforms or pallets and covered with tarpaulins or other suitable weathertight covering. All metal sheets or panels shall be stored so that water which might have accumulated during transit or storage will drain off; the sheets or panels shall not be stored in contact with materials that might cause staining. Upon arrival on the job site, the sheets or panels shall be inspected; if found wet, the moisture shall be removed and the sheets or panels shall be re-stacked and protected until used.

5A.3.3 Design requirements. Unless specified otherwise herein, the design of all prefabricated metal buildings shall be in accordance

with the Metal Building Manufacturers Association's "Recommended Design Practices Manual". If required, the Contractor shall submit for approval the engineering design calculations and stress diagrams of all structural or load-bearing components.

(a) Normal design loads. The vertical live loads, in addition to the applicable dead loads, shall be applied on the horizontal projection of the roof structure. The wind load on the building shall be proportioned and applied as horizontal and uplift velocity pressures. The maximum deflection in roofing or roof panels shall not exceed 1/180th of the span, and the maximum deflection in siding or wall panels shall not exceed 1/90th of the span.

(b) Auxiliary loads. Superimposed dynamic and/or static loads shall be applied in addition to the normal design loads and shall be considered in combinations with normal design loads.

5A.4 Materials and components.

5A.4.1 Steel framework shall be in accordance with the Steel Construction Manual of the American Institute of Steel Construction. Steel framing less than 3/16-inch thick shall be in accordance with the American Iron and Steel Institute's Light Gage Steel Design Specification. Prefabricated sections of the framework shall be designed to assure easy packing, shipping, erection, dismantling, repacking, and re-erection, and shall be assembled in a manner which will assure the maximum strength and rigidity. Approved structural members, or structural assemblies, having cross-sectional areas and/or connections that differ from the section and connections indicated may be used, if the proposed framework adequately meets design requirements.

5A.4.2 Siding and roofing (sheets or panels) shall be either steel or aluminum conforming to the following requirements. As far as practical, one type of siding and one type of roofing shall be used throughout the project.

(a) Steel sheets or panels shall be either zinc-coated or aluminum-coated. Zinc-coating for steel shall conform to the requirements of specification QQ-S-775, class d. Aluminum-coated steel shall conform to the applicable requirements of specification MIL-S-4174, type II. The siding or panels shall be either (1) the standard corrugated type, (2) the deep corrugated type, or (3) the panel type. The standard corrugated type shall have corrugations not less than 1/2-inch deep spaced not to exceed 2-1/2 inches on centers. The deep corrugated type shall have corrugations, V-beams, ribs, channels, or other similar configurations not less than 1-inch deep spaced not to exceed 12 inches on centers or not less than 3/4-inch deep spaced not to exceed 6 inches on centers. The panel type shall have either (1) interlocking ribs not less than 3-inches deep

spaced not greater than 16 inches apart, or (2) configurations not less than 1-1/2 inches deep spaced not greater than 12 inches apart.

(b) Aluminum sheets or panels shall be manufactured from alloy 3003 alclad or 3004 alclad and shall be tempered as required to suit the respective forming operations. The minimum thickness shall be 0.032 inch (20 B&S gage). The sheets or panels shall be either (1) the standard corrugated type, (2) the deep corrugated type, or (3) the panel type. The standard corrugated type shall have corrugations not less than 7/8-inch deep spaced not to exceed 2-1/2 inches on centers. The deep corrugated type shall have corrugations, ribs, V-beams, channels, or other similar configurations not less than one inch deep spaced not to exceed 12 inches on centers or not less than 3/4-inch deep spaced not to exceed 6 inches on centers. The panel type shall have either (1) interlocking ribs not less than 3 inches deep, spaced not greater than 16 inches apart, or (2) configurations not less than 1-1/2 inches deep, spaced not greater than 12 inches apart.

5A.4.3 Fasteners for securing sheets and panels. Fasteners for attachment to structural supports and fasteners for attachment to adjoining sheets or panels shall be as approved, and in accordance with the manufacturer's recommendation. Unless specified otherwise herein, the fasteners shall be either self-tapping screws, bolts and nuts, self-locking rivets, self-locking bolts, end-welded studs, bolted or riveted studs, or step rivets held by aluminum straps. Other types of fasteners of the building manufacturer's standard type may be used if prior approval is obtained. The fastening system shall be designed to withstand the design loads specified hereinbefore. Fasteners shall be stainless steel, cadmium-plated steel, or aluminum. All fasteners, with the exception of those having integral Hex washer heads and those having aluminum drive caps, shall have composite metal and polymerized chlorphene washers. Fasteners having integral Hex washer heads and fasteners having aluminum drive caps shall have polymerized chlorphene washers. Side laps of roofing sheets or panels having configurations 3/4-inch deep, or less shall be fastened at a maximum spacing of 12 inches on centers.

5A.4.4 Sheet metal accessories. As far as practical, zinc-coated steel accessories shall be provided with zinc-coated siding or roofing, and aluminum accessories shall be provided with aluminum alloy siding and roofing. Zinc-coating for all sheet steel accessories shall conform to specification QQ-S-775, class d. All aluminum accessories shall be of the alloy and temper necessary to suit forming requirements. Ridge caps, eave and edge strips, fascia strips miscellaneous flashings, and miscellaneous sheet metal accessories, unless specified otherwise, shall be formed from the same material and gage as the roof covering. Wall plates, base angles or base channels, and other miscellaneous framing

members may be standard structural steel shapes, or they may be formed from steel not lighter than 16 gage.

5A.4.5 Miscellaneous accessories.

(a) Closure strips shall be formed of approved compressed rubber, synthetic rubber, bituminous impregnated materials, or metal of the same respective type as the roofing and siding, and as standard with the manufacturer. Molded closure strips shall be free of open voids and shall not absorb or retain water. Closure strips shall be formed to match the corrugations or configurations of the roofing or siding being used and shall be provided where indicated and where necessary to provide weathertight construction.

(b) Joint sealing material. All side and end laps shall be sealed with Type I, Class B ribbon form sealant equal to or exceeding the performance characteristics of specification MIL-C-18969. Minimum sizes of ribbons shall be 3/32-inch by 1/2-inch for rectangular areas and 1/4-inch diameter for circular areas. All joints at doors, windows, accessories, and flashings shall be sealed in a manner similar to the sealing of sheets and panels. Bituminous type sealing materials shall not be used with painted sheets and panels.

5A.4.6 Metal door and frame. Metal door and frame shall conform to the applicable requirements of specification 32Y except as specified otherwise herein. Door shall have a minimum width of 3 feet and shall be 6'-8" or 7'-0" high in accordance with the building manufacturer's standard. Door shall be hinge-type and shall swing outward. Door shall be located on end of building approximately as indicated.

(a) Frames for hinged door. Hollow pressed steel frames shall be the full welded type or the knock-down field-assembled type. The frames shall be of a type standard with the metal building manufacturer and shall be constructed to be coupled or interlocked with the adjoining wall covering material in an approved manner. The edges of the wall covering material at the sides of the frames shall be reinforced as necessary to form a connection of strength and rigidity which adequately meets design requirements. Lintels above door frames shall be contoured to serve as combination framing and flashing. Doors and frames may be shipped as a part of a prefabricated wall section, or may be packaged for fabrication at the site. Approved structural steel frames may be provided in lieu of pressed steel frames if such construction is standard with the metal building manufacturer.

(b) Hollow metal hinged door shall be type III (Industrial) design for exterior use.

(c) Hardware for hinged door. All hardware shall, as far as practicable, be of one manufacturer's make. Hardware for application on metal shall be made to standard templates. Materials shall be in accordance with the applicable Federal specifications, except that approved aluminum alloy or corrosion-resistant steel hardware may be provided in lieu of the materials specified in the Federal specifications.

(1) Hinges and butts. The sizes and number of hinges shall conform to the minimum requirements given in specification FF-H-116. Loose pin hinges for exterior doors shall be so constructed that the pins cannot be removed when the doors are closed. Type of hinges and butts shall be as specified hereinafter in the paragraph entitled "Hardware sets".

(2) Locksets, latchsets, and deadlocks shall conform to the application requirements of specification FF-H-106, except as specified otherwise herein. Series 161 may be provided as an optional equivalent of series 86, and series 160 may be provided as an optional equivalent of series 85. Types and trim for locks and latches shall be as specified hereinafter in the paragraph entitled "Hardware sets".

(3) Miscellaneous hardware shall conform to the applicable requirements of specification FF-H-111, except as specified otherwise herein. Types and sizes of miscellaneous hardware used on doors, such as bolts, holders, and stops, shall be as specified hereinafter in the paragraph entitled "Hardware sets".

(4) Metal thresholds for hinged doors shall be extruded bronze or aluminum. Thresholds shall extend the full width of the openings and shall be fastened securely to the floor with screws set in expansion shields. Corrosion-resistant or cadmium-plated screws shall be used for fastening aluminum thresholds in place; bronze screws shall be used for fastening bronze thresholds in place. Thresholds, not indicated or specified otherwise, shall be double beveled with fluted tops, and shall be not less than 3 inches wide.

(5) Finishes. All hardware shall have US 10 finish, unless specified otherwise herein.

(6) Keys and keying. Two keys shall be provided for each lock. (Master keying shall be as directed.)

(7) Application of hardware. All hardware shall be installed in a neat, workmanlike manner in accordance with the hardware manufacturer's instructions. Fasteners shall be of the proper size, quantity, and finish. After application, hardware shall be protected from paint, stains, blemishes, and damage until acceptance of the

work. All hardware shall be properly adjusted and checked out to see that the butts, locks, latches, bolts, holders, and closers operate easily. After hardware is checked, keys shall be tagged, identified, and given to the Officer in Charge. Any errors in cutting or fittings or any damage to adjoining work shall be repaired, as directed.

(8) Hardware sets shall be provided as follows.

Butts	1½ pair	type T2107-US10 4-1/2" x 4-1/2"
Lockset	1 each	type 86-B-4
Threshold	1 each	cast bronze with weatherstrip interlock.

5A.4.7 Metal windows shall be complete, including frames, sash, flashings, hardware, operating devices, fastening devices, clips, and all other appurtenances necessary for a complete installation and for proper operation. At the option of the Contractor, the windows shall be either steel or aluminum. Windows shall be approximately 3'-8 7/8" by 2'-9" and one shall be provided in each side of the building, located approximately in the center. Ventilators shall be screened.

(a) Steel windows shall be the standard commercial projected type, conforming to the applicable requirements of the steel window specifications of the Steel Window Institute, except as specified otherwise herein. Steel windows shall be given a phosphoric acid treatment and a factory-applied prime coat of an approved rust-inhibitive primer, of a type standard with the window manufacturer.

(b) Aluminum windows shall be the standard commercial projected type, conforming to the applicable requirements of the aluminum window specifications of the Architectural Aluminum Manufacturers' Association, except as specified otherwise herein. The minimum metal thickness for principal members of solid section windows shall be 1/8-inch.

(c) Window lintels, heads, jambs, and sills shall be a type standard with the metal building manufacturer, and shall be constructed to be connected, or interlocked, with the adjoining wall covering material in an approved manner. The edges of the wall covering shall be reinforced as necessary to form jambs of strength and rigidity which adequately meet design criteria. Lintels, heads, and sills shall be formed from the same type of sheet metal as the wall covering, except that extruded aluminum may be used with aluminum windows. Structural steel frames and/or lintels may be provided in lieu of sheet metal or extruded aluminum frames and/or lintels, if such construction is standard with the metal building manufacturer. Sheet metal and extruded aluminum lintels, heads, and sills shall be contoured to serve as combination framing and flashing.

(d) Operation of windows. Ventilators within reach of the floor shall be operated by means of handles or push bars. Hardware for all windows shall be of plain pattern, and of malleable iron or steel of the manufacturer's standard type. Operators for screened windows shall work through, or under the screens, and shall be of a type that will permit the opening, closing, and locking of the ventilators without disturbing the screens.

5A.4.8 Roof hatch. A roof hatch not less than 3 feet square shall be provided. The hatch shall be centered over the center of the well and shall be provided with a curb, flashing and all else required for weathertight construction. Adequate fastening devices shall be provided on two sides of the hatch to secure it in place.

5A.4.9 Shop painting. All ferrous metal work, except factory finished work, zinc-coated work, aluminum-coated work, and work specified to be painted hereinbefore, shall be (1) cleaned of all dirt, rust, scale, loose particles, grease, oil, and other deleterious substances, (2) given a coat of pretreatment primer conforming to specification MIL-P-15328 applied to a dry film thickness of 0.3 to 0.5 mil or chemically treated with a phosphoric type cleaner, and (3) then be given one coat of an approved rust-inhibiting primer paint of the type standard with the metal building manufacturer.

5A.4.10 Factory finishing. Exterior and interior exposed surfaces of metal roofing, metal siding, and metal accessories shall be provided with a factory applied baked on enamel finish. The finish shall consist of cleaning, pretreatment with a chemical conversion coating and one coat of baked on synthetic enamel applied to a dry film thickness of not less than 1 mil; color shall be as selected from the manufacturer's standard color chart.

5A.4.11 Dissimilar materials. Where aluminum surfaces come in contact with ferrous metal or other incompatible metals, the aluminum surfaces shall be kept from direct contact by one of the following methods:

(a) Painting the incompatible metal with a coating of heavy-bodied bituminous paint;

(b) Painting the incompatible metal with a prime coat of zinc-chromate primer conforming to specification TT-P-645, followed by one or two coats of aluminum metal-and-masonry paint, or other suitable protective coating, excluding those containing lead pigmentation;

(c) An approved nonabsorptive gasket;

(d) An approved calking placed between the aluminum and the incompatible metal.

If drainage from incompatible metal passes over aluminum, the incompatible metal shall be painted by method (a) or method (b). Aluminum surfaces in contact with concrete or masonry materials shall be painted by method (a). Green or wet wood, or wood treated with incompatible wood preservatives, shall be painted by method (a) or shall be given two coats of aluminum paint.

5A.4.12 Glazing. Glass shall conform to specification DD-G-451. Elastic glazing compound, type I, conforming to specification TT-G-410, shall be used for glazing sash.

(a) Clear sheet glass, Type II, Class 1, quality q6, single strength shall be used for glazing windows.

(b) Setting. All glass shall be bedded and back puttied, using the elastic glazing compound or putty specified, and shall be set without springing or forcing. Glass in sash shall be set with glazing clips, and compound or putty.

(c) Cleaning. Following the completion of the building, all glass shall be washed clean.

5A.5 Erection. Concrete foundations and floor slabs shall be level and true, and shall be inspected and approved before the structural steel work is started. Anchor bolts shall be installed while the concrete work is in progress; templates or other gaging devices shall be used to assure accurate spacing of the anchor bolts. Defects or errors in the fabrication of building components shall be corrected by the Contractor in an approved manner. Defects or errors in fabrication of components, which cannot be corrected in an approved manner, shall be replaced by nondefective members at no additional cost to the Government. Columns, rigid frames, and walls of self-framing building shall be plumbed in both directions, guyed and stayed, and all framing elements shall be accurately spaced to assure the proper fitting of prefabricated wall and roof coverings.

5A.5.1 Rigid frames, column bases, and sill members shall be set accurately, using a non-shrinking grouting mortar to obtain uniform bearing on the concrete and to maintain a level base line elevation. Anchors and anchor bolts for securing rigid frames, columns, or sill members to foundations shall be steel, unpainted, set accurately to templates, and of proper size to adequately resist all applicable design

loads at the base. Grouting mortar shall be a mixture of one part of blended portland cement, to two parts of well-graded fine aggregate, and enough water to provide a maximum water cement ratio of 0.50. The blended portland cement shall be a mixture of cement with 1/4 ounce of aluminum powder to each sack of cement. Surfaces to receive the mortar shall be cleaned and moistened thoroughly immediately before placement of mortar. Exposed surfaces of mortar shall be water cured with wet burlap for 7 days.

5A.5.2 Wall construction. All sheets or panels shall be applied with the corrugations, V-beams, ribs, channels, or other configurations in a vertical position. Sheets or panels shall be supplied in full wall heights from base to eave with no horizontal joints except at the junctions of door frames, window frames, and similar locations. All side and end laps shall be sealed with the joint sealing material specified hereinbefore. All walls shall be flashed and/or sealed at the base, at the top, around windows, doors, and all other similar openings. The placement of closure strips, flashing and sealing material shall be accomplished in an approved manner that will assure complete weathertightness. Flashing will not be required where approved "self-flashing" sheets or panels are used. Minimum end laps for all types of sheets or panels shall be 2-1/2 inches. Minimum side laps for all types of sheets or panels shall be one corrugation or one configuration.

5A.5.3 Roof construction. All roofing sheets or panels shall be applied with the corrugations, ribs, channels, or other configurations parallel to the slope of the roof. The roofing sheets or panels shall be supplied in full lengths from ridge or ridge panel to eaves, top to eaves on shed roofs with no transverse joints except at the junction of curbs, and similar openings. All side laps shall be laid away from the prevailing wind, and all side and end laps shall be sealed with the joint sealing material specified hereinbefore. The roof shall be flashed and sealed at the ridge, at eaves and rakes, at projections through the roof, and elsewhere as necessary. The placement of closure strips, flashing, and sealing material shall be accomplished in an approved manner that will assure complete weathertightness. The use of various types of roof covering in relation to roof slopes shall be as follows:

Roof Slope	Minimum End Laps			Remarks
	Standard	Deep	Panel	
1:12	-	10	8	Deep corrugated or panel type only

(Slopes less than 1:12 shall not be used)

Minimum side laps for roof covering shall be as follows:

Roof Covering	Minimum Side Laps
Deep corrugated type	One full corrugation or configuration
Panel type	One full configuration or interlocking rib

5A.6 Quality assurance provisions.

5A.6.1 Samples. One sample of each proposed type of siding material, and roofing material shall be submitted and approved.

5A.6.2 Shop drawings, erection diagrams, and instruction manuals including anchor bolts plan, details of structural framework, structural connections, roofing, siding, fastening system, doors, windows, other openings, flashing, sealing of joints, and other details of diagrams as necessary to augment erection instructions shall be supplied. Shop drawings shall be submitted and approved before prefabricated components are delivered to the site.

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DIVISION 6. MECHANICAL

SECTION 6A. Well Construction
6B. Well Pumping Equipment
6C. Piping

SECTION 6A. WELL CONSTRUCTION

6A.1 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

Federal and Military Specifications.

SS-C-192g(1) Cement, portland
WW-P-441c(2) Pipe; wrought iron (welded, black or zinc-coated).

6A.2 General requirements. The work includes the provision of an exploratory test well and a permanent gravel wall well at the site indicated and as hereinafter specified.

6A.3 Capacity and depth of wells. It is intended that the permanent well produce from 225 to 275 gallons of potable water continuously. Bids shall be based on test well having an average depth of 200 feet and the permanent well having a depth of 100 feet in accordance with the following construction details:

(a) Total depth of well - 100 feet

(b) Total length of 18-inch outer casing - 45 feet

(c) Total length of 8-inch intercasing - 75 feet

(d) Total length of 8-inch screen, eight sections totaling - 25 feet.

In case the actual conditions differ substantially from those stated and/or shown, the provisions respecting an adjustment for changed conditions shall apply, subject to the requirement of notification thereunder being given.

6A.4 Test well.

6A.4.1 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.

6A.4.2. The Contractor shall keep an accurate log and record of all materials drilled through and the depths at which changes in formation occur.

6A.4.3 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.

6A.4.4 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.

6A.4.5 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.

6A.4.6 Test well not incorporated in the finished construction shall be sealed in an approved manner to prevent contamination of the underlying ground water.

6A.4.7 Recommendation. After analyzing the information from the test well, the Contractor shall make recommendations for a permanent well at the site. The recommendations shall include the appropriate depth, details of construction, length and location of screens, and an estimation of the quantity of water that can be obtained from each water-bearing stratum and from the completed well.

6A.5 Permanent gravel wall well .

6A.5.1 A pit casing shall be installed by drilling a 24-inch diameter hole to the specified depth for the site and placing an 18-inch nominal diameter outer casing of the type hereinafter specified.

6A.5.2 Grouting. 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 wall 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.

6A.5.3 Gravel packing. The hole drilled below the pit casing shall be drilled to the depth indicated for well, and shall be 17 inches in diameter. Each indicated water-bearing formation to be developed shall be under-reamed to at least 22 inches in diameter and held open for placing of gravel after the screens and the inner casing have been set. All drilling shall be accomplished with proper drilling clay of the bentonite type having a weight not to exceed 9 pounds per gallon at 15 centipoise viscosity. The Ph value of the drilling mud shall be maintained at 7.6 or more at all times. The drilling clay shall be of a type readily thinned with commercial mud thinners for easy removal from the walls of the well and the introduced gravel. Screens of approved lengths shall be provided at the approved location. After introduction of the gravel is completed, the drilling clay shall be thinned and the well pumped free of all sand, mud, drillings, and other foreign matter.

6A.6 Tests. Upon completion of the permanent well, the Contractor shall provide a temporary pump for measuring the flow and drawdown. The temporary pump shall have a capacity of not less than 1,000 gallons per minute. After determining the static water level in the well, the pumping shall begin at a rate of approximately 75 gallons per minute and the drawdown checked at 15-minute intervals until it stabilizes, after which pumping shall be continued at that rate for 2 hours and the water level checked at 30-minute intervals. The pumping rate shall then be increased in uniform increments not exceeding 40 gallons per minute and the described procedure repeated at each increment of increased rate until the capacity of the well at the specified drawdown is determined. After the safe maximum yield of the well has been determined, a continuous 24-hour pumping test shall be conducted at that rate and the drawdown checked at hourly intervals. A complete written log of the tests showing static water level, pumping rate, and drawdown at the specified intervals shall be furnished to the Officer in Charge. At the end of the 24-hour test, water samples shall be taken and tested by an approved testing laboratory for complete chemical and bacteriological analysis. Additional samples shall be furnished in suitable containers to the Officer in Charge.

6A.7 Materials.

6A.7.1 Casings. The outer pit casing, 18-inch nominal diameter, shall be standard weight steel pipe. All other casings shall be genuine

wrought-iron pipe, conforming to specification WW-P-441, Class A. Joints shall be either threaded and coupled; with heavy recessed-type couplings in which the ends of the pipe shall butt, or they may be field welded.

6A.7.2 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 corrosion resistant (stainless) steel type 304, with shutter-type 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 materials, or by welding.

6A.7.3 All gravel used for the gravel envelope around screens shall be round, hard, water-worn, gravel of proper gradation that 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 mat or elongated pieces as well as of dirt, vegetable matter, or other foreign material. The gravel shall be thoroughly sterilized with hypochlorite before being placed.

6A.7.4 Cement grout for sealing the space between the casing and the drilled hole, shall be composed of portland cement, type I, conforming to specification SS-C-192, and water. The mixed grout shall weigh not less than 14 pounds per gallon.

6A.8 Air lines. The well shall be provided with an air line as indicated. The pipe shall be 1/2-inch diameter wrought iron. Couplings, if used, shall be tack welded to the pipe.

6A.9 Sterilizing. The well shall be sterilized by adding chlorine or hypochlorine solution to the water used for placing the gravel. Sufficient chlorine or solution to give the water a chlorine content of 50 P.P.M. shall be fed into the water continuously during the gravel placing operation.

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SECTION 6B. WELL PUMPING EQUIPMENT

6B.1 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

(a) Federal and Military Specifications.

WW-P-441c(2) Pipe; wrought iron (welded, black or zinc-coated).

(b) Non-Government Specifications and Standards.

National Electrical Manufacturers' Association (NEMA).

Book of Standards (current edition).

6B.2 General requirements. The work includes the provision of a turbine-type deep well pump, complete with vertical, hollow shaft, electric motor drive, gasoline engine and right angle gear drive, and all appurtenances as indicated and specified herein. The installation shall be complete and ready to operate.

6B.3 Pump shall be the vertical turbine type, oil lubricated and provided with a non-reverse ratchet to prevent reverse rotation. Pump shall have an efficiency of not less than 70 percent.

6B.3.1 Pumping conditions. Speed of pump shall not exceed 1800 rpm. Bids shall be based on the pump operating under the following conditions:

Well No.	Capacity (gpm)	T.D.H. (feet)	Depth of setting (to top of bowl) (feet)
M-141	250	125	50

In case the actual conditions differ substantially from those stated and/or shown, the provisions respecting an adjustment for changed conditions shall apply, subject to the requirement of notification thereunder being given.

6B.3.2 Pump head. Pump head 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.

6B.3.3 Pump column. The column shall be genuine wrought iron conforming to specification WW-P-441, 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.

6B.3.4 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 percent 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.

6B.3.5 Bearings. The pumping unit shall have sufficient guide bearings 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.

6B.3.6 Bowls. The pump bowls shall be made of close grained cast iron, free from blow-holes and all other defects which would impair their strength or durability for the service, and shall be lined with vitreous porcelain enamel. Bowls shall have smooth, curved vanes to efficiently direct the flow of water and to prevent air locking. The bowls shall be of suitable thickness and strength to withstand the shutoff pressure of the unit. Bowls shall 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.

6B.3.7 Impellers shall be of the enclosed type, of heavy construction, and lined with vitreous porcelain enamel. Each impeller shall be accurately fitted and perfectly balanced both dynamically and hydraulically. Impeller shaft shall be of high grade stainless steel, carefully ground and polished and furnished with lathe cut threads. No keyways shall be cut into the shaft. Impellers shall have non-overloading characteristics and shall have head characteristics as steep as possible 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 easily be removed, and that they will not work loose for any reason.

6B.3.8 Suction pipe and strainer. A suction pipe of suitable diameter and 10 feet long shall be provided for the 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.

6B.4 Motor. Motor shall be a hollow shaft, vertical, full enclosed electrical motor and 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, but shall be not less than 15 horsepower. The speed of the motor shall not exceed 1800 rpm. The motor shall conform to NEMA standards.

6B.5 Magnetic motor starter shall be of the full voltage across-the-line type conforming to the latest NEMA standards. Starter shall be of the quick-make and quick-break type having a low voltage and thermal overload release and hand reset device. Starter shall have hand-off-automatic switch and shall be provided with the pumping equipment, but shall be wired in accordance with the electrical section of this specification.

6B.6 Right angle drive. A combination electric motor and right angle gear drive shall be provided for dual drive arrangement. The drive shall have one to one gear ratio to transmit the power from the engine to the pump at normal operating speed and shall be of the vertical, hollow shaft, spiral bevel gear type equipped with anti-friction bearings and a base flange matching the pump head flange. It shall be conservatively rated to transmit the maximum power requirements of the pump and be equipped with a heavy duty ball thrust bearing capable of carrying the hydraulic thrust of the pump and the weight of the rotating element. An oil reservoir of ample capacity shall supply adequate lubrication to the gears and bearings. A suitable motor stand shall be furnished which provides ample room for a sliding clutch for alternating the prime mover. A sliding clutch shall be mounted on the head shaft so the gears do not operate when the pump is driven by the electric motor. A non-reverse ratchet shall be incorporated in the clutch to prevent backspin in the event of reverse rotation.

6B.7 Auxiliary gasoline engine shall be provided and shall be multi-cylinder, water-cooled, heavy duty gasoline power plant with maximum horsepower at least 30 percent in excess of the maximum brake horsepower required to operate the pump continuously at its rated speed, over the entire head capacity range of the pump. The engine shall be arranged for motor cranking and shall be equipped with a high tension ignition system, battery and required appurtenances, shall include

an adjustable governor, carburetor, tachometer, oil pressure gauge, cylinder temperature gauge, gasoline pump and filter, gravity fuel tank, air cleaner, oil filter, generator, starting crank, radiator, exhaust pipe and muffler, and clutch take-off assembly.

6B.7.1 Battery charger, electric type, shall be mounted on wall of pump house where directed and shall be the rectifier type for operation with 120 volt, 60 cycle current. Charger shall be protected by an automatic circuit breaker and shall have capacity to charge two 6-volt batteries or one 12-volt battery at eight to five amps. One direct current ammeter shall be included and shall be flush-mounted on the front of the enclosure. All metal parts shall be corrosion-resistant or shall be suitably protected against corrosion.

6B.7.2 Exhaust pipe from the engine shall be carried through the wall of the pump room in an asbestos-cement sleeve and a suitable muffler shall be mounted on the end of the exhaust pipe. The muffler shall be properly supported in an approved manner.

6B.7.3 A metal instruction plate shall be mounted on the engine unit giving the manufacturer's recommendations for lubricating oil and other pertinent information.

6B.7.4 Safety guards. The interconnecting shafting between the gasoline engine and the combination drive and all other rotating units shall be provided with approved safety guards for protection of operating personnel.

6B.8 Performance test. The unit shall be tested by the Contractor after being put in operation to determine conformance with this specification. Equipment failing to perform as specified shall be replaced by the Contractor at no additional cost to the Government.

6B.9 Warranty. All the equipment to be furnished under this section of the specification shall be guaranteed for a period of one year from the date of acceptance thereof, either for beneficial use or for final acceptance, whichever is earlier, against defective material, design and workmanship.

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SECTION 6C. PIPING

6C.1 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

(a) Bureau of Yards and Docks/NAVFAC Specifications.

42Yc	Drainage, sanitary, electrical and water service appurtenances.

(b) Federal and Military Specifications.

FF-B-575b	Bolts, hexagon and square.
HH-G-76b	Gasket, asbestos metallic cloth.
WW-P-406c	Pipe, steel,(seamless and welded)(for ordinary use)
WW-P-421c	Pipe, cast gray and ductile iron, pressure, (for water and other liquids).
WW-P-521f	Pipe-fittings, flange fittings and flanges, steel and malleable iron, (threaded and butt-welding), 150-pound.
WW-V-51d	Valve, bronze, angle, check, and globe, 125, 150, and 200 pound, screwed, or flanged for solder (for land use).
WW-V-54c	Valve, gate, bronze (125, 150 and 200 pound, screwed, flanged, soldered, for land use).
MIL-V-18436B	Valves, check.

(c) Non-Government Specifications and Standards.

American Nat'l. Standards Institute, Inc. (ANSI).

A21.10-1964	Cast iron fittings, 2 inch through 48 inch, for water and other liquids.

American Water Works Association (AWWA).

C110-64	Cast iron fittings, 2 inch through 48 inch, for water and other liquids.
C500-61	Gate valves for ordinary water works service.
C601-54	A standard procedure for disinfecting water mains.

6C.2 General requirements. Piping shall be any of the types and materials as specified herein and shall be of new and unused materials.

All piping shall be placed to follow the general arrangement shown and shall be entirely out of the way of lighting fixtures, doors, windows and other openings. The interior of all pipe and fittings shall be thoroughly cleaned of debris and foreign matter prior to installation and shall be kept clean throughout the installation operation. When work is not in progress, open ends of pipe and fittings shall be secured with plugs, or other approved methods, in such a manner as to prevent trench water or other foreign matter from entering the pipe.

6C.3 Piping 4 inches and larger shall be cast iron pipe, class 150, outside coated, cement lined, conforming to specification WW-P-421, type I, II or III, or at the option of the Contractor, slip-on jointed pipe may be provided. Slip-on jointed pipe shall conform to specification WW-P-421 for class 150, outside coated,cement lined pipe, except for dimentional modifications to bell-and-spigot end to suit gaskets. Exposed piping and where indicated shall be flanged piping and shall be class 150 cast iron pipe as specified above, with ANSI class 125 flanges.

6C.4 Piping 3 inches and smaller shall be zinc-coated steel pipe conforming to specification WW-P-406.

6C.5 Fittings and specials.

6C.5.1 Fittings and specials for bell-and-spigot cast iron pipe shall be class D, in accordance with AWWA specification C110 with lead joints.

6C.5.2 Fittings for mechanical jointed pipe and flanged jointed pipe shall be short-body fittings in accordance with American National Standards Institute, Inc. specification A21.10 and flange fittings provided with American National Standards Institute, Inc. class 125 flanges.

6C.5.3 Fittings for use with pipe 3 inches and smaller shall be zinc-coated malleable iron conforming to specification WW-P-521.

6C.6 Placing and laying.

6C.6.1 Cast iron pipe.

(a) Pipe laid underground shall be inspected in the sling, tapped with a light hammer to detect cracks, before lowering into the trench. 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 bell-and-spigot, 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) All flanged pipe shall be accurately cut and shall be worked into place without springing or forcing.

6C.6.2 Zinc-coated steel piping shall be accurately cut, shall be worked into place without forcing or springing, and shall be free of burrs or fins.

6C.6.3 All water pipe laid underground shall be installed at an average depth of 3 feet to the top of pipe unless otherwise indicated and not less than 2 feet of cover shall be provided.

6C.7 Pipe supports. All piping shall be supported in a manner to adequately carry the weight of the lines and maintain proper alignment. Exposed piping in the well house shall be adequately supported from floor as required. Pipe laid underground shall have the bottom third (1/3) of the barrel supported on firm soil. All 1/16 and sharper cast iron bends, including connections to existing mains and services, shall be securely blocked in the direction of flow. Pipe laid underground shall be blocked in accordance with specification 42Y. Plugs shall be secured similarly except that concrete bracing shall be poured in a manner that affords easy removal of the concrete without disturbing the piping.

6C.8 Joints.

6C.8.1 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 2-1/4 inches measured from the face of the bell. After caulking, the lead shall be practically flush with the face of the bell.

6C.8.2 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.

6C.8.3 Mechanical joints. The jointing shall be in accordance with the recommendations of the manufacturer of the joint. Bolts, nuts and exposed threads shall be coated with asphalt varnish after installation.

6C.8.4 Flanged joints. The joints shall be firmly bolted with machine bolts. Bolts shall be regular hexagon bolts conforming to specification FF-B-575, type II. Gaskets shall be made of asbestos metallic cloth conforming to specification HH-G-76, and shall be full-faced.

6C.8.5 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.

6C.9 Valves.

6C.9.1 Gate valves for use with pipe 4 inches and larger shall be the double-disc type with non-rising stems and shall conform to American Water Works Association standard AWWA C500. Stems shall have nuts similar to those on valves of the existing system except exposed flanged valve in well house shall have standard size wheel. Gate valves shall be of one make and shall open by a counter-clockwise rotation of the valve stem.

6C.9.2 Gate valves for use with pipe 3 inches and smaller shall be bronze wedge disc in accordance with specification WW-V-54, type I,

class A.

6C.9.3 Check valves for use with pipe 4 inches and larger shall be cast iron body, bronze mounted, tilting disc, class 150, non-slamming type and shall conform to the applicable requirements of specification MIL-V-18436, type II, style A.

6C.9.4 Check valves for use with pipe 3 inches and smaller shall be bronze and shall conform to specification WW-V-51, class A.

6C.9.5 Air release valves. Where indicated, an approved pressure air valve shall be provided to automatically permit air to escape 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 construction of the valve shall be such that valve seats may easily be replaced.

6C.10 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 head 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.

6C.11 Connection to existing main shall be made by means of tapping sleeve and valve where indicated. The valve shall meet the requirements of AWWA standard C500, except that ends and seat rings may be oversized to permit use of full size cutter. Joints in tapping sleeves shall be poured with lead and caulked.

6C.12 Tests. Before being covered, the completed pressure 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.

6C.13 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. The chlorine solution shall remain in the system at least 24 hours. After final flushing, the quality of the water shall be approved by the Officer in Charge before acceptance.

6C.14 Warranty. All the equipment to be furnished under this section of the specification shall be guaranteed for a period of one year from the date of acceptance thereof, either for beneficial use or for final acceptance, whichever is earlier, against defective material, design and workmanship.

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DIVISION 7. ELECTRICAL

SECTION 7A. ELECTRICAL WORK

7A.1 Applicable publications. The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

(a) Bureau of Yards and Docks/NAVFAC Specifications.

9Yi Electrical apparatus, distributing systems, and wiring; including addendum no. 1.

42Yc Drainage, sanitary, electrical and water service appurtenances.

(b) Federal and Military Specifications.

J-C-30(2) Cable and wire, electrical (power, fixed installations).

7A.2 General requirements.

7A.2.1 The work includes the provision of an underground service to well house, lighting and power circuits in conduit, wiring of motor starter, lighting fixture complete with lamp, wall switch, receptacle and other miscellaneous items as required to provide complete and operating power and lighting circuits.

7A.2.2 Materials and methods of installation shall be in accordance with specification 9Y, except as indicated or specified otherwise.

7A.3 Electrical characteristics. Electrical service to well house shall be 120/208y volts, three phase, four wire, 60 cycle, grounded neutral.

7A.4 Drawings diagrammatic. The electrical drawings are primarily diagrammatic in nature, intended to indicate the purpose and connections of the conduit and/or circuits rather than the exact locations of the runs which may be modified by the Contractor to meet conditions at the time of work.

7A.5 Method of wiring. All wiring shall be in rigid conduit concealed in concrete construction or underground or exposed on plywood panelboard.

7A.6 Backboard at load center. Wall mounted switches and starter shall be mounted on a backboard consisting of angle iron uprights embedded

in the concrete slab and surfaced with 3/4-inch grade AD exterior type Douglas fir plywood as indicated. Previous to mounting equipment, the backboard shall be given two coats of asphaltum varnish.

7A.7 Wires and cables shall conform to the following where applicable, and meet the requirements of specification J-C-30. All wires shall be color coded. Color coding shall be integral with the sheath.

7A.7.1 No conductor smaller than No. 12 AWG shall be used for any purpose other than controls which shall be not smaller than No. 14 AWG.

7A.7.2 All wire in conduit installed in dry locations shall be type RHW or THW.

7A.7.3 All wire in conduit installed wholly or in part in damp locations, in or under the floor slab or underground, shall be type RHW with a neoprene jacket or type THWN.

7A.7.4 Underground service conductors shall be size indicated and shall be type RHW-USE with a neoprene jacket.

7A.8 Conduit. Conduit shall be of the rigid type, except where flexible type is indicated, 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 one-inch size and above. Conduit installed underground or in fill under concrete slabs shall be encased in concrete in accordance with specification 42Y.

7A.9 Outlet boxes. Flush outlet boxes, wherever used to terminate conduit at equipment or lighting fixture location, shall be 4-inch square hot dipped zinc-coated boxes with a cover in each case suitable for the respective purpose. Pendant fixture boxes shall have aligning covers. Surface mounted outlet boxes shall have threaded hubs.

7A.10 Pull and junction boxes. The Contractor shall provide and install all necessary or required pull or junction boxes. Such boxes shall be constructed of code gauge of steel standard for the respective dimensions and equipped with a turned-in flange to which the cover shall be mounted by screws into threaded holes. All parts shall be zinc-coated.

7A.11 Local wall switches. Wall switches shall be single pole or three-way toggle type "T" rated, 20 ampere, 125 volt, in composition base. Covers shall have chrome finish.

7A.12 Convenience receptacles. Convenience receptacle outlets shall be single or duplex, as indicated, 15 ampere, 125 volts, grounding type,

parallel slot, double-sided contacts with four terminal screws in composition base. Receptacles shall be grounded as specified in specification 9Y. Covers shall have chrome finish.

7A.13 Magnetic motor starter and motor. Magnetic starter and motor will be furnished with the equipment as specified in section entitled "Well Pumping Equipment", but shall, unless integral with the equipment, be installed and wired by the Contractor. If the approved equipment differs from that indicated or specified, the Contractor shall provide the correct wiring and control for same.

7A.14 Disconnect switch shall be of the size and type indicated. Type of enclosure shall be as indicated.

7A.15 Incandescent fixture shall be vaportight and of the highest quality of the type shown. Fixture varying in minor design will be acceptable, if drawings are submitted and approved.

7A.16 Grounding. Service neutral wire shall be grounded to the underground pressure water pipe at exit from the building.

7A.16.1 The continuity of grounding shall be assured by use of conduit lock nuts inside and outside of metallic enclosures, the removal of insulating coatings at points of contact, and bonding across any insulated joints. Grounding connections through continual metal raceways or conductor armor back to service ground will be considered effective.

7A.16.2 All exposed metallic non-current carrying-materials of electrical equipment forming a part of the interior electrical system shall be effectively grounded, including conduit, metal enclosures of switching equipment, panelboard and motor frames.

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DEPARTMENT, AGENCY, OR BUREAU
Dept. of the Navy, Naval Facilities Engineering Command

LOCATION OF PROJECT (CITY OR OTHER DESCRIPTION)
Camp Lejeune and New River

STATE: North Carolina — COUNTY: Onslow

DESCRIPTION OF WORK:
General building construction, heavy and highway.

DECISION NO.
AJ-13,521

DATE OF DECISION
1-27-70

EXPIRES
5-26-70

SUPERSEDES DECISION NO.

67 - NC - 1 - S

BUILDING CONSTRUCTION	BASIC HOURLY RATES	FRINGE BENEFITS PAYMENTS H & W	PENSIONS	VACATION	APP. TR
Asbestos workers	$5.05	.15			
Boilermakers	5.35	.20	.35		.01
Boilermakers helpers	5.10	.20	.35		.01
Bricklayers	4.45				
Carpenters	2.98				
Cement masons	3.00				
Electricians	3.00				
Elevator constructors	4.49	.125	.155	1%+a+b	.005
Elevator constructors' helpers	3.14	.125	.155	1%+a+b	.005
Elevator constructors' helpers (prob.)	2.245				
Glaziers	2.25				
Ironworkers, structural, ornamental & Reinforcing	2.75				
LABORERS:					
Air tool operator (jackhammer, vibrator), common laborer	1.75				
Mason tender	2.15	.10			
Pipelayers (concrete & clay)	1.75				
Lathers	4.25		.10		.01
Marble setters, tile setters & terrazzo workers	3.00				
Marble setters' helpers, tile & terrazzo helpers	1.75				
PAINTERS:					
Brush	2.78				
Plasterers	3.925				.01
Plumbers	4.55	.15			.01
Roofers	1.80				
Sheet metal workers	2.65				
Soft floor layers	2.75				
Sprinkler fitters	4.425	.11	.10		.02
Steamfitters	4.55	.15			.01
Truck drivers	1.75				
POWER EQUIPMENT OPERATORS:					
Backhoes & shovels	2.25				
Bulldozers	2.25				
Cableway, derricks, boom hoists & Draglines	2.125				
Cranes	3.75				
Dredging and other floating equipment	2.25				
Front end loaders & motor graders	2.00				

67 - NC - 1 - S

BUILDING CONSTRUCTION (continued)	BASIC HOURLY RATES	FRINGE BENEFITS PAYMENTS H & W	PENSIONS	VACATION	APP.TR
Hoist, double drum	1.875				
Mechanics and Piledrivers	2.00				
Pavers, trenching machines & truck cranes	2.125				
Rollers, earth	1.75				
Scrapers, wheel type	2.00				
Tractors with attachments	2.50				
Tractors without attachments	1.875				

WELDERS - receive rate prescribed for craft performing operation to which welding is incidental.

Paid Holidays (where applicable):

A-New Years' Day; B-Memorial Day; C-Independence Day; D-Labor Day; E-Thanksgiving Day; F-Christmas Day.

FOOTNOTES:

a - Employer contributes 4% of basic hourly rate for 5 years or more of service or 2% basic hourly rate for 6 months to 5 years of service as vacation pay credit.

b - Holidays: A through F.

67-N.C.-2-3-C

HEAVY CONSTRUCTION

	PER HOUR		PER HOUR
BRICKMASONS	$3.00	POWER EQUIPMENT OPERATORS:	
BRICKMASON, MANHOLE	1.625	AIR COMPRESSORS	$1.60
CARPENTERS	1.70	BACKHOE	2.00
CEMENT FINISHERS	1.875	BULLDOZERS	2.375
FORM SETTERS	2.00	CRANES, DERRICKS, DRGLS.	2.75
IRON WORKERS, REINF.	1.75	CONCRETE PAVER OPERATOR	2.00
LABORERS:		FRONT END LOADER	1.75
Laborers, unskilled	1.60	GRADALL	1.875
Air Tool Operators	1.60	MECHANIC	1.60
Mason Tenders	1.60	MOTOR GRADERS	1.75
Mortar Mixers	1.60	PUMPS	1.60
Pipelayers, Conc. & Clay	1.60	ROLLERS	1.60
Asphalt Rakers	1.60	SCRAPERS	2.50
Mechanic	2.00	SHOVELS	2.125
PAINTERS, BRUSH	1.75	TRACTORS, WHEEL TYPE FARM	1.60
RAKERS (ASPHALT)	1.60		
TRUCK DRIVERS	1.60		

Welders - Rate for craft

HIGHWAY CONSTRUCTION	BASIC HOURLY RATES
Mason	$ 3.75
Carpenter	2.88
Carpenter-Helper	2.00
Concrete Finisher	2.50
Concrete Rubber	1.76
Fireman	2.25
Formsetter-Roadway	2.50
Ironworker-I-Beam	2.00
Ironworker-Reinforcing	1.81
Ironworker-Structural	3.00
Laborer	1.60
Painter-Bridge	3.50
Piledriver-Leadman	2.25
Pipelayer-Drainage	2.03
Powderman	2.50
Raker-Asphalt	2.00
Sprinkler-Water	2.00
Luteman	2.00
Truck Driver	1.60
Truck Driver-Concrete	2.25
Truck Driver-Euclid	2.00
Truck Driver-Tandem	1.75
Greaseman	2.31
Weigher-Scale	1.80
Concrete Finisher-Pavement	2.50
Fine Grade Man	2.50
Lowboy Trailer	2.50
Service Truck	1.75
Asphalt Laydown Man	1.75
Builder-Curb & Gutter	2.10
Rotary Driller	2.75
POWER EQUIPMENT OPERATORS:	
Air Trac Drill	3.00
Air Trac Drill Helper	1.65
Driller	2.08
Driller-Helper	1.97
Earth Boring Machine	2.00
Form Grader Operator	2.25
Asphalt Plant	2.75
Tractor-Wheel w/attachment	2.25
Bin Operator	2.50
Bulldozer	2.75

HIGHWAY CONSTRUCTION	BASIC HOURLY RATES
POWER EQUIPMENT OPERATORS (Cont'd)	
Crusher Operator	1.80
Chain Saw Operator	2.00
Concrete Saw	2.75
Concrete Plant-Operator	3.25
Concrete Spreader	3.00
Cranes-Draglines-Backhoes	3.00
Distributor-Driver	2.16
Distributor-Operator	2.00
Finishing Machine-Asphalt	2.50
Finishing Machine-Concrete	2.75
Gradall	2.75
Dryer-Asphalt	1.85
Loader-Front End	2.50
Machine-Concrete Curing	2.25
Machine-Concrete Joint	2.25
Mechanic	2.75
Mechanic-Helper	2.13
Mixer-Asphalt	1.90
Motor Grader	3.00
Oiler	2.03
Pilot Vehicle	1.75
Post Driver	2.00
Subgrade Machine	2.63
Roller-Asphalt	2.19
Roller-Earth	1.92
Roller-Rubber Tired	1.75
Roller-Sheepfoot	2.00
Scraper	2.75
Screed-Asphalt	2.45
Shovel	3.00
Stone Spreader-Tractor Mtd.	2.44
Sweeper	1.75
Tractor-Pusher	2.50
Tractor-Without Attachment	2.10
Stone Spreader	2.25
Truck Crane	3.00
Tugboat	2.75
Roller Virbratory	1.75
Wagon Drill	2.10
Welder	3.00
Tractor-wheel-type farm	1.75

U. S. DEPARTMENT OF LABOR
OFFICE OF THE SECRETARY
WASHINGTON

AJ-13,521

DECISION OF THE SECRETARY

This case is before the Department of Labor pursuant to a request for a wage predetermination as required by law applicable to the work described.

A study has been made of wage conditions in the locality and based on information available to the Department of Labor the wage rates and fringe payments listed are hereby determined by the Secretary of Labor as prevailing for the described classes of labor in accordance with applicable law.

This wage determination decision and any modifications thereof during the period prior to the stated expiration date shall be made a part of every contract for performance of the described work as provided by applicable law and regulations of the Secretary of Labor, and the wage rates and fringe payments contained in this decision, including modifications, shall be the minimums to be paid under any such contract by contractors and subcontractors on the work.

The contracting officer shall require that any class of laborers and mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary for determination.

Before using apprentices on the job the contractor shall present to the contracting officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U.S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U.S. Bureau of Apprenticeship and Training.

The contractor shall submit to the contracting officer written evidence of the established apprentice-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

Fringe payments include medical and hospital care, compensation for injuries or illness resulting from occupational activity, unemployment benefits, life insurance, disability and sickness insurance, accident insurance (all designated as health and welfare), pensions, vacation and holiday pay, apprenticeship or other similar programs and other bona fide fringe benefits.

By direction of the Secretary of Labor,

/s/ E. Irving Manger

E. Irving Manger, Associate Administrator
Division of Wage Determination
Wage and Labor Standards Administration

NOTICE:
Bids to be opened at 2:00 P.M., EST, 6 November 1956, at the Public Works Office, Marine Corps Base, Camp Lejeune, North Carolina

NAVDOCKS SPECIFICATION NO. 3885/56

REPAIRS TO WELL PUMPS, MONTFORD POINT, RIFLE RANGE, COURTHOUSE BAY AND ONSLOW BEACH (SECOND INCREMENT)

at the

Marine Corps Base, Camp Lejeune, N. C.

CONTRACT NBy-3885

Appropriation: 1771106.11 MCT&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.

SECTION 1. GENERAL CLAUSES.

1-01. General intention. - It is the declared and acknowledged intention and meaning to provide and secure repairs to well pumps at Montford Point, Rifle Range, Courthouse Bay and Onslow Beach, complete and ready for use.

1-02. General requirements. - Five deep well turbine pumps at Montford Point, three deep well turbine pumps at Rifle Range, two deep well turbine pumps at Courthouse Bay and two deep well turbine pumps at Onslow Beach are to be repaired. The work includes the removal of existing pumping units, cleaning and testing of wells and the renewal of all pump parts below the pump bases together with water level testing devices.

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 Authur 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, Latvia, 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 120 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.

Y&D Drawing No.	Title
647001	Index and Location Plan
647002	Site Plans and Well Construction 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

WW-P-441h Dec. 1953 - Pipe, wrought iron (welded black or zinc-coated) including Amendment No. 1

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 trademarked 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 of 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: Manufacturers' specifications and illustrations of deep well pump parts showing pump characteristic curves, maximum horsepower required, size of suction pipe, size of line shaft, type of bearings, spacing of bearings on line shafts, number of pump impellers, size of columns, type of column connection and spacing of guides between oil tube and column.

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-962, 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 reclassification 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, 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, available labor supply and prospective changes or adjustments of wage rates in the area concerned which might affect operations under the contract. Under no circumstances shall any 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, or the payment of higher wage compensation than set forth therein 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.

(b) Government right to change. - The Government reserves the right to change the wage determination decision attached to the specification or addendum, either before or after the award of this contract, in accordance with the latest wage determination decision applicable at the time of award of this contract under the regulations of the Secretary of Labor. Such change shall be made without liability upon the Government for any increase in the contract price or other additional payment or recovery.

(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. 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.

1-17. Storm protection - Should warnings be issued of winds of gale force or greater, 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 work.

1-18. 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.

1-19. 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.

1-20. 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.

1-21. 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.

1-22. 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.

1-23. 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.

1-24. 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.

1-25. Payrolls and affidavits. - The prime contractor, sub-contractors, 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.

1-26. 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.

1-27. 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.

1-28. Lines and grades required for execution of the work shall be established by the contractor.

1-29. 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.

1-30. 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.

1-31. 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 two 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. All salvageable material, including pump parts not used in the new work, shall be delivered as directed by the officer in charge; haul not to exceed ten miles.

SECTION 2. PUMP REPAIRS

2-01. General requirements. - The work includes the removal of existing pumping units, cleaning and testing of wells; the provision of water level testing device, the provision of pump bowls, impellers, pump columns, suction pipes, strainers, shafts, bearings, oil tubes, automatic lubricators, and all other parts required below existing pump base to provide complete repairs to the existing pumping units. The pumps to be repaired are located in the following wells:

(a) Montford Point

Bldg. No.	Well No.
M-142	Z-1
M-243	Z-2
M-244	Z-3
M-627	Z-4
M-226	Z-5

(b) Rifle Range

Bldg. No.	Well No.
RR-45	"S"
RR-47	S-1
RR-227	T-1

(c) Courthouse Bay

Bldg. No.	Well No.
BB-43	"W"
BB-44	"V"

(d) Onslow Beach

Bldg. No.	Well No.
BA-109	22
BA-110	23

2-02. Existing conditions. - The pumps to be repaired are located in well houses which are approximately 12 feet square of wood frame or brick wall construction with a 3 feet by 5 feet hatch in the roof centered over the pumping unit.

(a) Drawings. - The drawings indicate construction details of the wells when drilled and present the best available record of their construction.

(b) The existing pumping units are as follows:

(1) Montford Point

Well No.	Manufacturer	Serial No.	Column Size	Shaft	Depth of Setting	Motor H. P.
Z-1	Layne & Bowler	12449	6"	1-3/16"	55'	7-1/2
Z-2	Layne & Bowler	12839	6"	1-3/16"	60'	10
Z-3	Layne & Bowler	11302	6"	1-3/16"	50'	20
Z-4	Layne & Bowler	13138	6"	1-3/16"	50'	7-1/2
Z-5	Layne & Bowler	12840	6"	1-3/16"	55'	7-1/2

(2) Rifle Range

Well No.	Manufacturer	Serial No.	Column Size	Shaft	Depth of Setting	Motor H. P.
"S"	Layne & Bowler	12116	6"	1-3/16"	90'	15
S-1	Layne & Bowler	13140	6"	1-3/16"	65'	20
T-1	Layne & Bowler	13139	6"	1-3/16"	50'	10

(3) Courthouse Bay

Well No.	Manufacturer	Serial No.	Column Size	Shaft	Depth of Setting	Motor H. P.
"V"	Layne & Bowler	12117	6"	1-3/16"	45'	10
"V"	Peerless	J7478	5"	1-3/16"	35'	15

(4) Onslow Beach

Well No.	Manufacturer	Serial No.	Column Size	Shaft	Depth of Setting	Motor H. P.
22	Layne & Bowler	13373	6"	1-3/16"	40'	10
23	Layne & Bowler	13374	6"	1-3/16"	40'	10

(c) Well Z-4 at Montford Point, Wells "S" and T-1 at the Rifle Range, Well "V" at Courthouse Bay and Well 22 at Onslow Beach are equipped with electric motors, right angle gear drives and auxiliary gasoline engines. The other wells are equipped with electric motors only.

2-03. Maintenance of service. - Cleaning and testing of wells and pump repairs shall be made at approved times and in such manner as to prevent all unnecessary interruptions to service. Not more than one well on any one water supply system shall be taken out of service at any one time unless approved by the officer in charge.

2-04. Cleaning wells. - After removal of existong pumping equipment, the wells shall be agitated and pumped off by means of an air lift until all accumulation of sand or gravel has been removed from the casing. During the cleaning operations the well shall be surged and agitated adjacent to each screen and the pumping continued until all traces of sand and turbidity have disappeared.

2-05. Testing. - After cleaning operations, a temporary gasoline driven turbine-type test pump with a capacity of at least 400 gpm shall be installed in the well, approved equipment provided for measuring rate of flow and water level in the well and the well tested to determine its safe maximum yield. After measuring the static water level in the well, the test shall begin at a rate of one-half the original capacity of the well as indicated on the drawings and the rate increased by one-tenth the original capacity at intervals. The pumping rate shall remain constant during each interval and shall be continued until the draw-down stabilizes. The draw-down shall be determined at end of each interval. The test shall continue until the maximum rate of flow at a stabilized draw-down is determined. The well shall be pumped at this rate of flow for one additional hour to confirm that the safe maximum yield of the well has been reached. The pump shall then be cut off and the draw-down measured at sufficient intervals to plot a recovery curve for the well.

(a) Water levels and rate of pumping shall be determined and recorded for all tests and the contractor shall submit a characteristic curve, in triplicate, for the well showing the draw-down level in feet for various rates of flow in gpm. Similar curves, in triplicate, showing the recovery of the well shall be provided.

2-06. Pumping conditions. -

(a) Bids shall be based on repairing the existing pumps to operate under the conditions as hereinafter specified at a speed of 1,800 rpm without overloading the existing electric motors. Final pumping conditions shall be determined by the contractor and approved by the officer in charge after testing the existing gravel wall wells. In case final pumping condition differs substantially from that specified and/or shown, an adjustment in the contract price and/or the time for completion of the work will be made in that same manner as provided by Clause 4, U. S. Standard Form No. 23A. The contractor, after determining the final pumping conditions, shall reinstall the existing pumping equipment and place the well in operation until the required pump parts can be obtained.

(b) Bids shall be based on the repaired pumps operating at an efficiency of not less than 70 per cent under the following conditions:

(1) Montford Point

Well No.	Discharge gpm	Total discharge head above impellers feet	Depth of setting feet
Z-1	100	141	55
Z-2	150	163	60
Z-3	300	170	50
Z-4	150	140	50
Z-5	130	142	55

(2) Rifle Range

Well No.	Discharge gpm	Total discharge head above impellers feet	Depth of setting feet
"S"	150	205	90
S-1	250	190	65
T-1	150	200	50

(3) Courthouse Bay

Well No.	Discharge gpm	Total discharge head above impellers feet	Depth of setting feet
"W"	150	170	45
"V"	200	160	35

(4) Onslow Beach

Well No.	Discharge gpm	Total discharge head above impellers feet	Depth of setting feet
22	200	130	40
23	150	163	40

2-07. New pump parts. - New pump parts shall be in accordance with the following:

(a) Pump head. - The contractor at his option may replace the existing pump heads provided new heads are adapted to fit existing motor bases or right angle gear drive bases, and pipe connections. If new pump heads are furnished they shall be constructed from close grained cast iron and shall be of the heavy duty type, designed for hollow shaft drive.

(b) Column. - The column shall be genuine wrought iron conforming to Specification No. WW-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.

(c) Line shaft. - The line shafting shall be high-grade ground and polished steel and of the same diameter as that of existing pumps. 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 shafts. All threads shall be lathe cut.

(d) 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 or continuous operation shall be provided to feed oil to the bearings. Lubricator shall have sight glass and feed adjustment.

(e) 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.

(f) 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 both dynamically and hydraulically. Impeller shafts 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.

(g) 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.

2-08. Water-level testing device. - A 1/4 inch wrought iron pipe 60 feet long shall be provided in each well for measuring the water level in the well. The pipe shall be extended on the outside of the pump casing to the pump foundation. Pipe shall be fitted with an air valve, for connection to air pump, and with a 4 inch dial, brass case, altitude gauge, with a range of 0 to 100 feet. The entire installation shall be air tight.

SECTION 3. BIDS.

3-01. 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 Repairs to Well Pumps, Montford Point, Rifle Range, Courthouse Bay and Onslow Beach (Second Increment), Marine Corps Base, Camp Lejeune, N. C., Specification No. 3885/56

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

3-02. Bid guarantee will be required as stipulated on the reverse side of U. S. Standard Form 20.

3-03. 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 drawings and specifications.

Item 2. Price for the entire work, complete in accordance with the drawings and specifications based on the omission of all work in connection with the repairs to the deep well turbine pump in Well No. 22 at Onslow Beach.

Item 3. Price for the entire work, complete in accordance with the drawing and specifications based on the omission of all work in connection with the repairs to the deep well turbine pumps in Wells No. 22 and 23 at Onslow Beach.

3-04. 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 Repairs to Well Pumps, Montford Point, Rifle Range, Courthouse Bay, and Onslow Beach (Second Increment), Marine Corps Base, Camp Lejeune, N. C., Specification No. 3885/56" should be forwarded immediately to the office to which the written bids were submitted.

3-05. 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. 2 October 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-962, 20 JULY 1956
CAMP LEJEUNE, ONSLOW COUNTY, NORTH CAROLINA

	Per Hour
	$
Air Tool Operators (jackhammerman vibrator	.935
Asbestos workers	2.75
Asbestos workers improvers:	
1st year	1.25
2nd year	1.64
3rd year	1.85
4th year	2.07
Asphalt rakers	1.00
Boilermakers-blacksmith	2.975
Boilermakers helpers	2.725
Bricklayers	2.50
Carpenters	1.65
Cement masons	1.625
Electricians	2.40
Elevator constructors	2.20
Elevator constructors helpers	1.54
Glaziers	1.50
Iron workers, structural	2.50
Iron workers, ornamental	2.50
Iron workers, reinforcing	2.25
Laborers	.90
Lathers	1.75
Marble setters	1.75
Marble setters helpers	.85
Power Equipment Operators:	
Backhoes	2.125
Cranes	2.125
Cableways	2.125
Derricks	2.125
Beam hoist	2.125
Draglines	2.125
Dredge 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 attachments	2.125
Tractors without attachments	1.875
Trench machines	2.125

	Per Hour
	$
Mason tenders	$ 1.00
Mortar mixers	1.00
Painters, brush	1.65
Painters, structural steel	2.00
Piledriverman	1.65
Pipe layers (concrete and clay)	.90
Plasterers	2.00
Plasterers tenders	.935
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
Terrazzo workers helpers	.85
Tile setters	2.00
Tile setters helpers	.85
Truck drivers	.85
Welders - receive rate prescribed for craft performing operation to which welding is incidental	
Power Equipment Operators: (Cont'd.)	
Welding machines	2.125
Tournapull	2.125
Air compressors	1.75
Bulldozers	1.875
Fireman	1.55
Hoist, double drum	1.875
Hoist, one drum	1.625
Finishing machine	1.875
Mixers (Larger than 10-S)	1.75
Mixers (Smaller than 10-S)	1.625
Motor graders	2.00
Pump over 2" discharge	1.75
Pump under 2" discharge	1.625
Rollers, earth	1.87
Rollers, asphalt	2.00
Apprentice engineers and oilers	1.55

APPRENTICESHIP SCHEDULE
PERIOD AND RATE*

Craft	Interval	1st	2nd	3rd	4th	5th	6th	7th	8th
Iron workers	6 mos.	.50	.60						
Iron workers	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.	37-1/2	.40	.45	.50	.55	.60	67-1/2	.75
Sprinkler Fitters**	6 mos.	.54	.58	.62	.66	.70	.74	.78	.82
Sheet Metal Workers	6 mos.	.40	.45	.50	.55	.60	.65	.70	.80

Craft	9th	10th
Sprinkler Fitters**	.86	.90

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

H.P. Well 641