103
30
11

HP-632 [redacted] 1-21-83 10-25-84

Static	13	12	13
Pumping Level	46	53	40
Drawdown	33		26
air line	63		63
PSI	20		19
GPM	185		201

used altitude gage

HP 632

8-26-85

AL - 63'

Static 13

P/L - 46

D/D - 33

PSI - 15

GPM - 205

632

8-26-85

AL	SL	PL	D/D	PSI	GPM	TIME START
63	13	22	9	50	104	920 932
		24	11	47	111	944
		26	13	45	122	957
		28	15	42	128	1007
		31	18	39	140	1013
		31	18	37	146	1023
		33	20	34	151	1033
		36	23	31	162	1049
		38	25	27	170	1100
		40	27	24	183	1111
		43	30	20	192	1120
		46	33	15	205	1130

Well 632 by Thomas/Serdinas 2-13-89

Air line	Static Level	Pumping Level	Drain Down	Discharge Pressure	GPM	Time
63	12'	17	5	50	115	20
		20	8	45	128	30
		22	10	40	140	40
		24	12	35	154	50
		27	15	30	170	60
		29	17	25	185	10
		33	21	20	203	20
		36	24	15	219	30
		38	26	10	235	40
		41	29	6	239	

Dead Head over 60 PSI

WELL NUMBER	632	BY THOMAS / BROWN			DATE 10-25-84	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1050
63'	13	18	5	53	104	1100
		20	7	49	108	1110
		22	9	46	115	1120
		24	11	43	125	1130
		26	13	40	133	1143
		28	15	37	146	1157
		31	18	34	154	1210
		32	19	31	162	1224
		33	20	28	170	1235
		36	23	25	180	1245
		38	25	22	190	1255
REMARKS test set at →		40	26	19	201	1305

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	632	BY THOMAS / RAYNOR			DATE 11-21-83	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1316
63	13	26	13	45	111	1327
		29	16	42	122	1340
		31	18	39	128	1351
		35	22	35	143	1401
		37	24	31	154	1417
		41	28	27	164	1432
		43	30	24	170	1442
		46	33	20	185	1455

REMARKS used altitude gage

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

632

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN GPM	TIME
	63				start	Time	0935
7-30-82	63	23	34	11'	46	104	0945
			36	13'	43	111	0955
			39	16'	40	119	1005
			41	18'	37	125	1015
			43	20'	34	133	1025
			46	23'	31	146	1035
			48	25'	28	157	1045
			50	27'	25	159	1055

REMARKS: used direct reading gage
left set at 28 PSI D/D 25' P/L 48' GPM 159

DATE 7-25-09

PWSID 04-67-041

WELL # HP 632

WELL NAME HADNOT POINT HP20

BLDG. HP 632

CODE 6.

AVAILABILITY P.

LOCATION SNEADS FERRY Road.

LATITUDE 34.62133

LONGITUDE 77.2935

WELL DIAMETER 8"

WELL DEPTH 200'

SCREEN INTERVAL ---

YIELD 349

STATIC LEVEL 13'

PUMPING LEVEL 43'

PUMP TYPE VERTICAL TURBINE

MOTOR HP 15

INTAKE DEPTH 60'

DESIGN CAPACITY 240

ACTUAL GPM 250

SIZE OF CONCRETE SLAB 10 X 12

HEIGHT OF CASING 10"

North Carolina Department of Environment, Health, and Natural Resources
Division of Environmental Health, Public Water Supply Section

SOURCE INFORMATION
GROUND WATER

Date Form Completed (M M D D Y Y): 01/25/95

PWSID: 0460701

Owner Assigned Source Code: 632

Well Name (If purchase, name of system): HADNOT POINT 632

Code: G (G=Ground, W=Purchase/G, Y=G w/direct influence, Z=W w/direct influence)

If Purchase, seller ID#:

Source Begin Date (M M Y Y):

Source exempt—SWTR? ☐ Y ☐ N

Direct Influence Date (M M D D Y Y):

Availability: P (P=Permanent, E=Emergency, S=Seasonal, I=Interim, O=Other)

Location of well within the system (If purchase, location of master meter): SNEADS FERRY ROAD

Latitude (N) (Deg. Min. Sec.): 34 37 11

Longitude (W) (Deg. Min. Sec.): 077 17 36

How Determined: O (G=GPS, M=Map, S=Surveyed)

GPS Data: Q# or DOP #

No. of Sats. Locked on:

(If purchase, use seller's primary source lat/long)

Vulnerable (VOCs)? ☐ Y ☐ N

Assessment Date (M M D D Y Y):

ENTRY POINT INFORMATION

Use Code: C (C=Ground/Permanent, D=Ground/non-permanent)

Availability: P (P=Year-round, S=Seasonal, E=Emergency, I=Interim, O=Other)

Owner Assigned Entry Point Code: 100

Entry Point Name: ~~HP632~~ MCB HADNOT PT WTP

Location:

Well Site: Owned or controlled? Y (Y,N) Control Area (100' radius)? N (Y,N) If no, explain:

Sources of pollution/distance: Road @ 80'

Surface water within 200'? ☐ N ☐ Y If yes, actual distance ☐☐☐ feet If yes, bact. samples collected? ___ (Y,N)

Adequate slope? Y (Y,N) Flooding? N (Y,N) Maintenance: OK

Well House: Free of stored materials? Y (Y,N) Properly drained? Y (Y,N) Locked? Y (Y,N)

Condition of house: OK Type of freeze protection: NONE

Well: Diameter: 8" Type: SCREEN(S) Yield (gpm): ~~240~~ 250 Properly sealed? Y (Y,N

Properly vented? Y (Y,N) Casing depth: ~~63~~ ft. (If unknown, put 'UNK') Well depth: ~~UNK~~ I 200 Meter available? N (Y,N

Concrete slab adequate? Y (Y,N) If no, explain: Size: 10x12

Size of blow-off: 3" (V) Sample tap: Before treatment? Y (Y,N) After treatment? ___ (Y,N

Pumps: Capacity: GPM: ~~250~~ 240 HP: 15 Pump intake depth: 60 Auxiliary Power? N (Y,N

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 10" /

Storage at well site: Elev: Hydro: Ground:

If hydroautomatic, air volume control? ___ (Y,N) Safety valves? ___ (Y,N) Coded? ___ (Y,N)

High service pumps: 1. ___ gpm ___ hp 2. ___ gpm ___ hp 3. ___ gpm ___ hp Auxiliary Power? ___ (Y,N

Is the water treated at this well? ☐ N ☐ Y If yes, complete back of form.

If other wells are treated here, which ones? If treated elsewhere, where? HP-20 PLANT

If purchase, retreat? ☐ Y ☐ N If yes, complete back of form.

① No meter ② Repair Vent ③ Oil Lube bearings @ pump

* - DOWN FOR PARTS -

WELL NUMBER 632		BY Stevenson @ KWA			DATE 5-13-96	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
60	25	28	3	80	108	20
		31	6	50	287	30
		37	12	30	340	
		39	14	20	500+	
		43	18	15	500+	
		THOMAS	PETERSON		5-6-97	D.H. 86
63	16	19	3	80	128	
		26	10	71	197	
		31	15	60	257	
		36	20	50	283	
		39	23	40	310	
		40	24	32	323	
		43	27	26	349+	
→	96" @	20 PSI				

REMARKS D/H - 86 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

63 − 20 = 43

43 − 24 = 39

63 − 27 = 36

31 − 16 = 15

63 − 32 = 31

63 − 50 = 13

63 − 37 = 26

COVER SHEET

FAX

To: Mr. Mack Frazelle
Fax #: 910-451-3350
Subject: Well # 632
Date: September 27, 1995
Pages: Three, including this cover sheet.

COMMENTS:

Hello !!!!!!!!!!!!!!

Following find quotation for the above application. Hard copy to follow by mail. If any questions, please call me.

Thanks !!!!!!!!!!!!!!! "Pete"

From the desk of...

N. F. 'Pete" Lowe
Industrial Sales
Pump & Lighting Company
205-B Hyde Park
Cary, North Carolina 27513

919-460-0051
Fax: 919-460-0051

Pump & Lighting

315 9TH STREET, S.E. • P.O. BOX 2504 • HICKORY, NC 28601 • PHONE: (704) 324-9705 • FAX: (704) 324-4365

September 27, 1995

Mr. Mack Frazelle
PSC Box 20004
Base Maintenance Div. Bin *1)
Camp LeJeune, North Carolina
28542

Dear Mack:

Subject: **Well 632**

We are pleased to offer the following "American Made" equipment for your evaluation on the above application.

Design Conditions: 250 GPM @ 160' TDH

One (1) ea. Fairbanks Morse Figure 7000, Model 8M, Six Stage, Vertical Turbine Bowl Assembly. Product Lubricated, with Impellers Trimmed to Above Conditions.

One (1) ea. 6" X 10' Suction Pipe

Two (2) ea. 6" X 5' Top-Bottom Column Pipe

Five (5) ea. 6" X 10' Intermediate Column Pipe

Two (2) ea. 1" X 6" X 5' Top-Bottom Line Shaft

Five (5) ea. 1" X 6" x 10' Intermediate Line Shaft

One (1) ea. 16 ½ X 6 Type "CT" Discharge Head

One (1) ea. 1" Packing Box 175 PSI

One (1) ea. 24 X 24 Cast Iron Foundation Plate

One (1) ea. Vertical Hollow Shaft Motor. 15 H.P., 208 Volt, 3 Phase, 1770 RPM, 1" BX, WP-1 Enclosure, Non-Reverse Clutch.

Your Cost $6,360.00

Price includes freight to your location and start up service. Price does not include any taxes, anchor bolts, gauges, or other accessories not listed above. Terms are net 30 days. If any questions, or I may be of further service to you, please call me.

Best regards,

N.F. "Pete" Lowe
Industrial Sales

NFL

cc: Ed White
Cindy Benfield
File

Pump & Lighting

315 9TH STREET, S.E. • P.O. BOX 2504 • HICKORY, NC 28601 • PHONE: (704) 324-9705 • FAX: (704) 324-4365

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N. F. 'Pete" Lowe
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NFL

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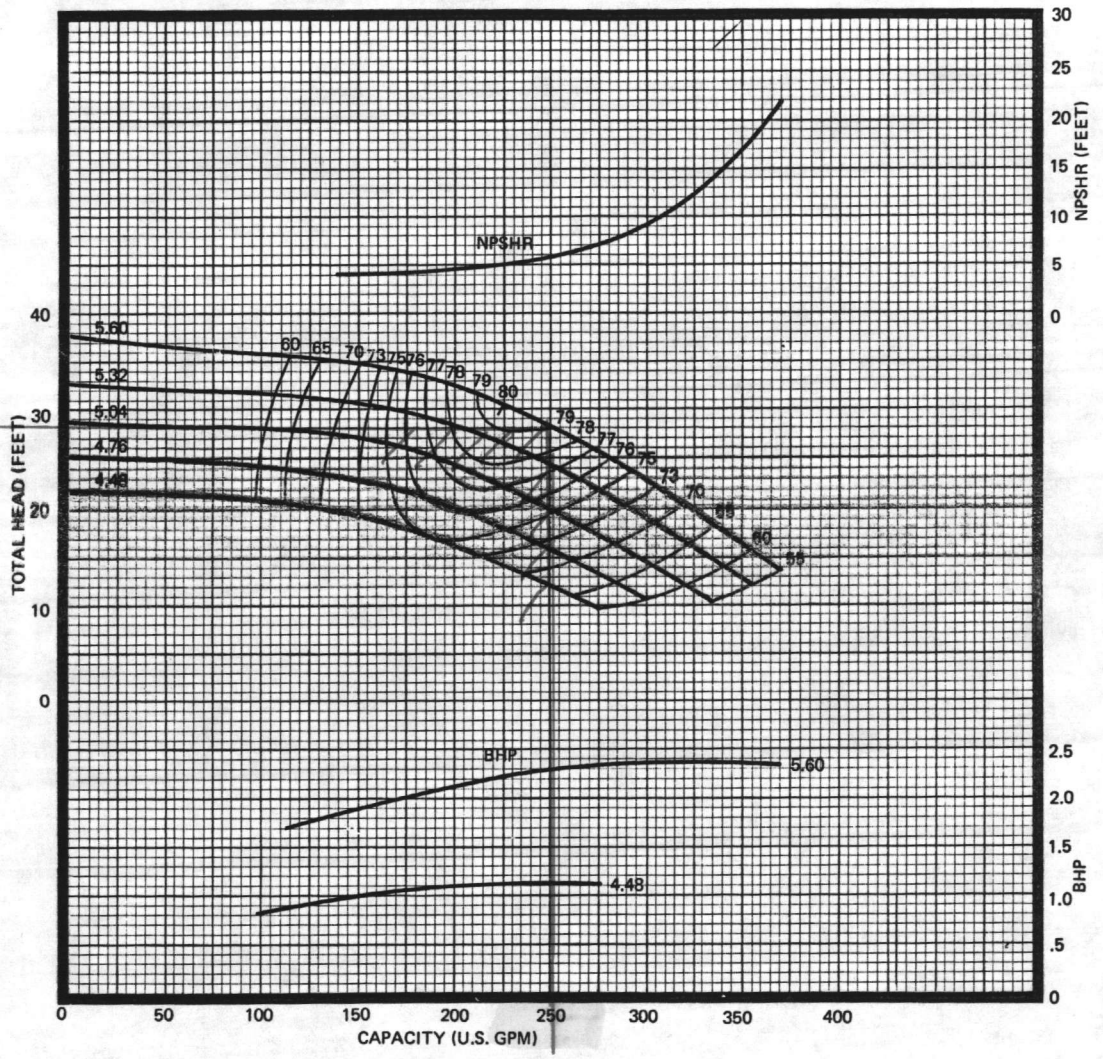
File



8M
7000

1770
RPM

ENCLOSED
IMPELLER
T7CA92

EFFICIENCY CORRECTIONS(1)

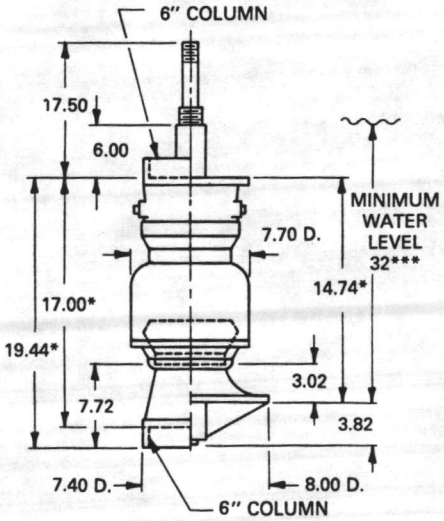
NUMBER OF STAGES	EFFICIENCY CHANGE
1	-7.0 POINTS
2	-3.0 POINTS
3	-1.0 POINTS
4	NO CHANGE
5	NO CHANGE
6 OR MORE	NO CHANGE

BOWL MATERIAL	EFFICIENCY CHANGE
CAST IRON	-2.0 POINTS
ENAMELED C.I.	NO CHANGE

IMPELLER MATERIAL	EFFICIENCY CHANGE
CAST IRON	-1.0 POINTS
BRONZE	NO CHANGE
ENAMELED C.I.	NO CHANGE

(1) Refer to "Application and Reference Data" for head correction.

DIMENSIONS (Inches)



*Add 6.58 for each additional stage.

TECHNICAL DATA

DATA	VALUE
MAXIMUM OPERATING SPEED	3600 RPM
MAXIMUM NUMBER OF STAGES	32**
PUMP SHAFT DIAMETER	1 3/16 IN.
IMPELLER EYE AREA	6.93 SQ. IN.
MAXIMUM SPHERE SIZE	.56 IN.
K_t (THRUST FACTOR)	2.32 LBS./FT.
K_s (ROTOR WT. PER STAGE)	5.25 LBS.
BOWL WT. (FIRST STAGE)	82 LBS.
BOWL WT. (EACH ADD'L. STAGE)	31 LBS.
ALLOWABLE SHAFT STRETCH	.37 IN.**
WK^2 (FIRST STAGE)	.17 LBS.-FT.^{2}
WK^2 (EACH ADD'L. STAGE)	.16 LBS.-FT.^{2}
BOWL RING CLEARANCE	.014/.018 IN.

** These are nominal values. Refer to "Application and Reference Data" for information further limiting or extending these values.

*** This value is the minimum submergence required to prevent vortexing only. This value may need to be increased to provide adequate NPSHA.

WELL # 632

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
3/28/77	63		37		35		185
			38		33		192
			39		31		201
			40		(29)		205
			42		27		214
			43		25		222
			47		20		246
			50		16		
			51		14		
			54		10		
REMARKS:	1-11-79	used ALT. Gage					
1-11-79			26'		30		170
			23'		25		187
			20'		20		201
			28'		35		146
2-13-80	65'		53'		20 SOT		205
			57'		15		221
			50'		25		187
EPTH OF ELL:							
AIRLINE LEVATION:	+	-					
ATE NSTALLED:							

WELL NUMBER 632 BY Brown & Stevenson DATE 10-7-93

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
63	11	16	5	57	105	1030
		18	7	50	128	
		21	10	40	154	
		25	14	30	185	
		31	20	20	224	
		32	21	15	240	← Pump set

REMARKS

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 632 | Thomas-Brown | DATE 4-3-90

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
43	12	18	6	55	108	05
		21	9	45	130	15
		25	13	35	159	25
		30	18	25	195	35
		31	19	20	205	45
		33	21	15	224	55
		38	26	10	242	65
		39	27	5	256	75

REMARKS

dead head @ 70 PSI

set @ 15 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL # 632

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
9,10,81	63'	23'	39'	16'	38 LB	128	GPMS
			42'	19'	35 LB	137	
			45'	22'	32 LB	143	
			47'	24'	29 LB	154	

REMARKS: set at 29 LB pressure
23' static
47' pumping level
24' draw down
154 GPMs.
63' air line

DEPTH OF WELL:
TERLINE ELEVATION:
PUMP INSTALLED:

FORM A-4
JUNE '66)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF WATER DATA COORDINATION

APPROVED.
Budget Bureau No. 42-R1485
Approval Expires June 30, 1968

INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
MC	Q	° ' " N: 34 37 14	° ' " W: 77 17 36	

6. AGENCY STATION NO.	7. STATION NAME
632	HP20-632

8. DRAINAGE BASIN CODE No.	Letter	9. STATE CODE	10. COUNTY CODE	11. COUNTY NAME
06	N	32	133	ONSLOW

12. PERIOD OF RECORD
Began: 1957
Discontinued:
Y ☐ Continuous Interruption Exceeds 1 Year

13.

14.

15. SITE
- ☐ 101 Stream
- ☐ 102 Canal
- ☐ 103 Lake
- ☐ 104 Reservoir
- ☐ 105 Estuary
- ☐ 106 Spring
- ☑ 107 Well
- ☐ 110 Other

16. FREQUENCY OF MEASUREMENT
- ☐ 201 Continuous Recorder
- ☐ 202 Telemetered
- ☐ 203 Daily
- ☐ 204 Weekly
- ☐ 205 Monthly
- ☐ 206 Quarterly
- ☐ 207 Seasonal
- ☐ 208 Annual
- ☐ 209 Other Periodic
- ☑ 210 Occasional

17. TYPES OF DATA AVAILABLE

Physical
- ☐ 311 Temperature
- ☐ 312 Specific Conductance
- ☐ 313 Turbidity
- ☐ 314 Color
- ☐ 315 Odor
- ☐ 316 Radioactivity
- ☐ 317 pH (field)
- ☑ 318 pH (lab)
- ☐ 319 Eh
- ☐ 320 Other

Chemical
- ☐ 331 Dissolved solids
- ☑ 332 Chlorides Only
- ☐ 333 Nutrients (Nitrogen and phosphorus compounds)
- ☐ 334 Common ions
- ☑ 335 Hardness
- ☐ 336 Radiochemical
- ☐ 337 Dissolved oxygen
- ☐ 338 Other Gases
- ☐ 339 Other

Organic
- ☐ 351 Pesticides (insecticides, herbicides, etc.)
- ☐ 352 Synthetic detergents
- ☐ 353 Other

Biologic
- ☐ 361 Coliforms
- ☐ 362 Other Micro-organisms
- ☐ 363 BOD
- ☐ 364 Other

Sediment
- ☐ 371 Concentration
- ☐ 372 Particle size
- ☐ 373 Other

18. SUPPLEMENTARY DATA FOR SITE
- ☐ 421 Surface Water Station
- ☐ 422 Ground Water Station
- ☐ 423 Water Stage or Level
- ☑ 424 Water discharge
- ☐ 425 Time of Travel
- ☐ 426 Drainage Area

19. STORAGE OF DATA
- ☐ 501 Periodic Report
- ☐ 502 Areal Report
- ☑ 503 Not Published
- ☐ 504 Data on Punchcard
- ☐ 505 Data on Magnetic Tape
- ☐ 506 Other

20. OFFICE AT WHICH DATA AVAILABLE

Office: BASE MAINTENANCE DEPARTMENT, UTILITIES DIVISION

Street No.: MARINE CORPS BASE

City, State, Zip: CAMP LEJEUNE, N. C. 28542

City Code: 0735

21. OFFICE COMPLETING FORM

BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME

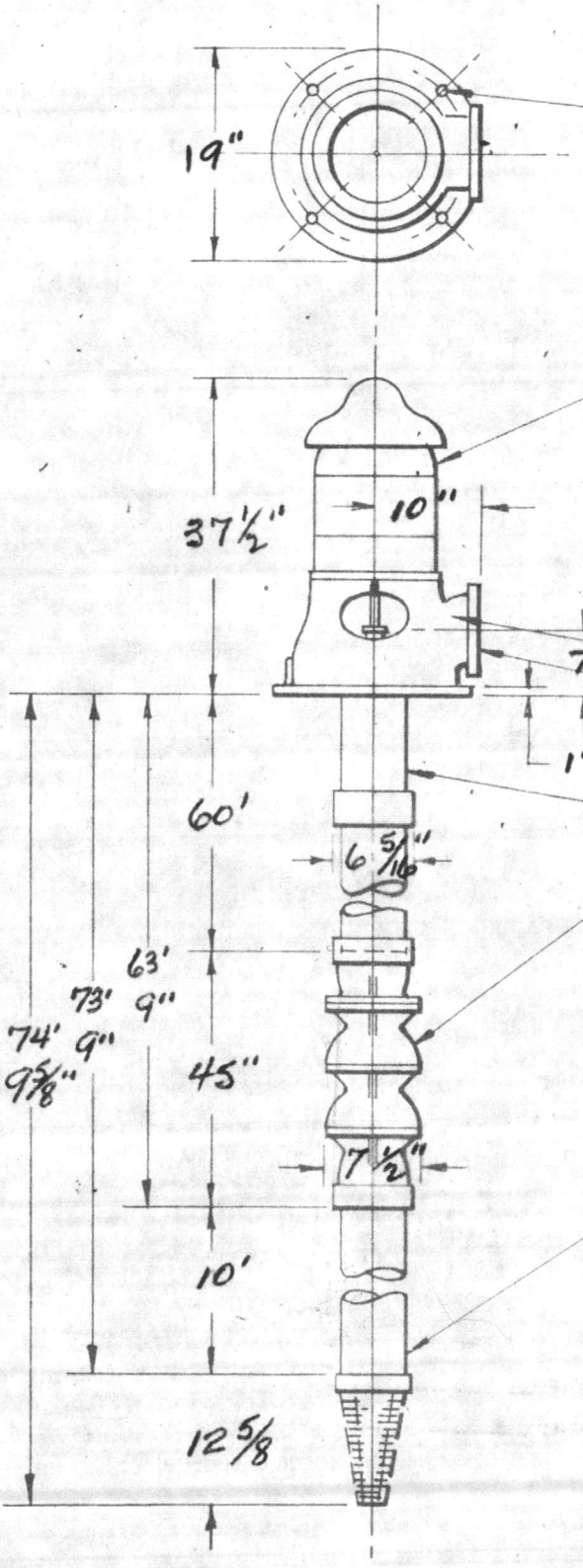
F. E. TEW, JR.

23. DATE
Month: SEPT.
Year 19: 66

09

JOHNSTON VERTICAL TURBINE PUMP

#32 - 3
AIR LINE - 60'



4 - 5/8" DIA. HOLES

US Electric
VERTICAL HOLLOW SHAFT MOTOR

15 HP 3 PHASE 60 CYCLE
208 VOLT 1760 RPM
Drip-proof ENCLOSURE

12X6 TYPE "A" DISCHARGE HEAD
6" X 125# FLANGE

5"x 2"x 13/16" GWI COLUMN ASSEMBLY

6 STAGE 8 BC BOWL ASSEMBLY

CONDITIONS:
250 USGPM
155 FT. TOTAL HEAD
LIQUID Water
SPEC. GRAV 1.0 @ 60 F PUMPING TEMP.

5" SUCTION PIPE 5" CONE STRAINER

CUSTOMER
SPEC PO# 7525
DEALER Heater Well Co.
PO#
JOHNSTON SERIAL #
JOHNSTON QUOTATION #

NOTE: DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

JOHNSTON PUMP COMPANY
PASADENA, CALIFORNIA

H-1253-A

PUBLIC WORKS DEPARTMENT
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NO. 7520 SPEC. NO. 7520/66

TITLE New River Water Well

DATE: 1 Mch 1957

BY DIRECTION OF OFFICER
IN CHARGE OF CONSTRUCTION

HYDRAULIC PERFORMANCE IS CONTINGENT ON WELL BEING FINISHING PUMP WITH CLEAR, FRESH NON-AERATED OR NON-GASEOUS WATER FREE FROM DETRITUS WITH NO SUCTION LIFT AND TEMPERATURE NOT TO EXCEED 85 DEGREES FAHRENHEIT

NOTE: ALL COLUMN LOSSES ARE INCLUDED

CUSTOMER: _____

P.O.#

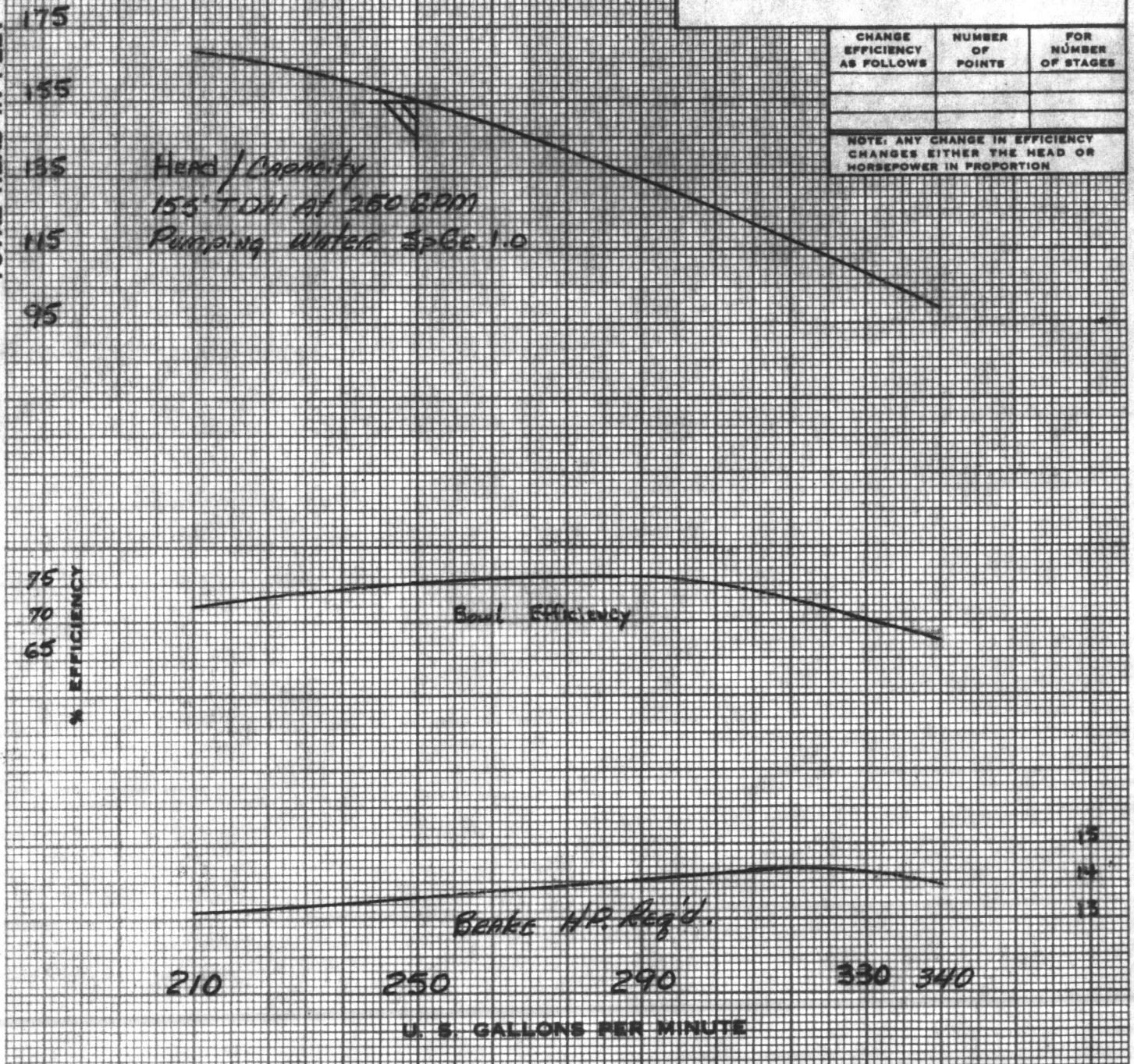
DEALER: HEATER WELL CO.

P.O.#

JOHNSTON SERIAL: _____

CHANGE EFFICIENCY AS FOLLOWS	NUMBER OF POINTS	FOR NUMBER OF STAGES

NOTE: ANY CHANGE IN EFFICIENCY CHANGES EITHER THE HEAD OR HORSEPOWER IN PROPORTION



IMPELLER Bez.

6 3/16" DIA.

DATE: 1-18-57 BY: J.O.M.

JOHNSTON PUMP CO.

JOHNSTON

VERTICAL PUMPS

PASADENA · CALIFORNIA · USA

PERFORMANCE 6 STAGE

8 BC DEEP WELL TURBINE PUMP

1800 R. P. M.

CURVE SHEET No.

PUBLIC WORKS DEPARTMENT
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

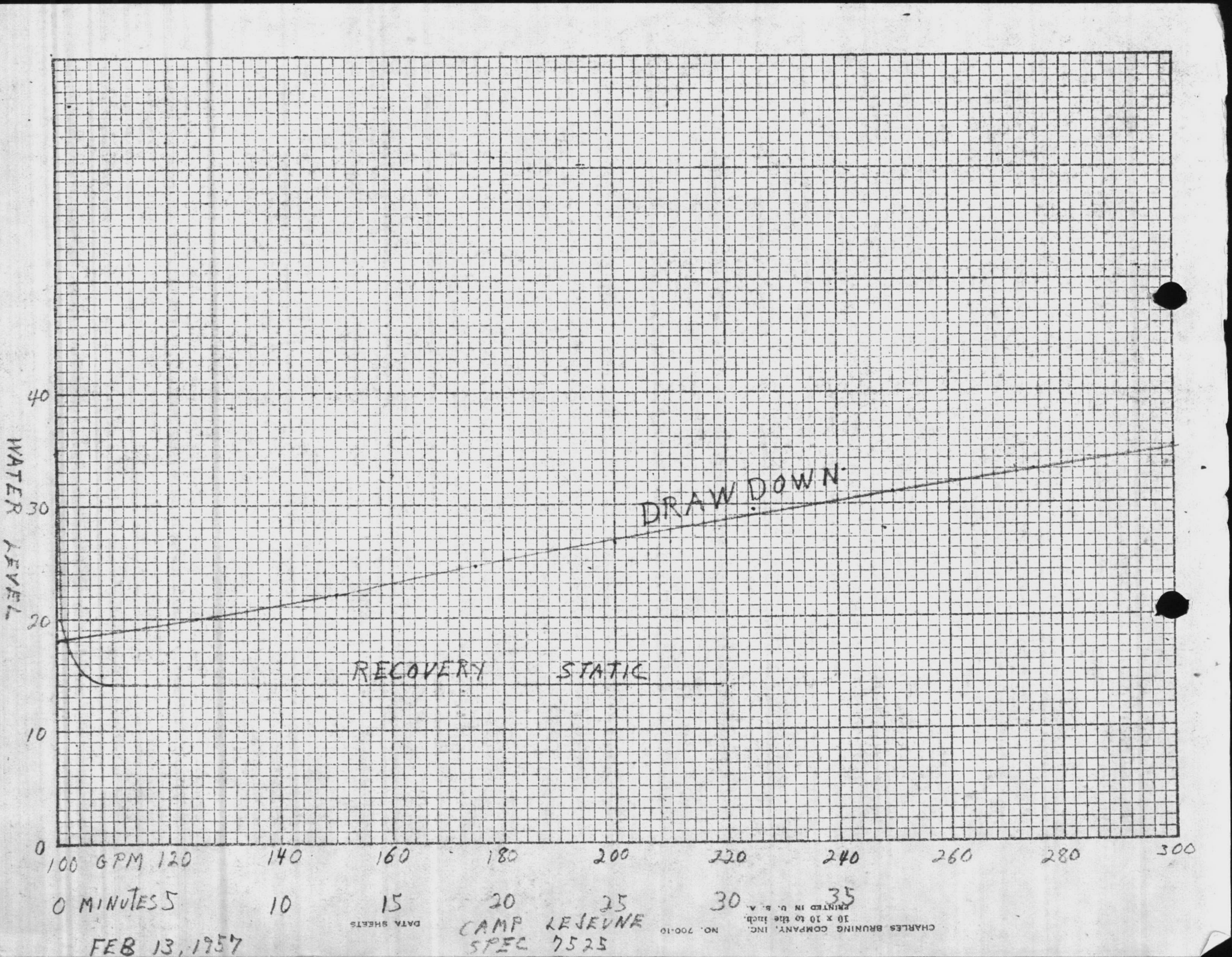
SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NOy 7525 SPEC. NO 7525/56

TITLE New Rural Water Well

DATE: 1 Mch 1957

BY DIRECTION OF OFFICER
IN CHARGE OF CONSTRUCTION



PUBLIC WORKS DEPARTMENT
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NOy 2525 SPEC. NO 7525/56

TITLE New Pump House Water Well

DATE: 1 March 1957

BY DIRECTION OF OFFICER
IN CHARGE OF CONSTRUCTION

PHYSICAL AND CHEMICAL ANALYSIS OF WATER [redacted]

SAMPLE NO.

FROM: *(Station or unit)* Well 32

DATE 8-1-57

TO: *(Name and location of laboratory)*

SAMPLE FROM *(Location of sampling point)*

COLLECTED BY	DATE	HOUR	SOURCE *(Designate ground, surface, raw, treated)*
Chadwick	8-1-57		Raw

REASON FOR EXAMINATION

EXAMINATION REQUESTED BY

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.

I. FIELD ANALYSIS

1. pH	TEMPERATURE °F	TEMPERATURE °C

ITEM	PPM
2. CARBON DIOXIDE (CO_2)	
3. DISSOLVED OXYGEN (O_2)	
4. HYDROGEN SULFIDE (H_2S)	
5. CHLORINE DEMAND (Cl_2)	

FIELD ANALYSIS BY

DATE OF ANALYSIS

II. SPECIAL LABORATORY ANALYSES

Check (X) individual items to be included in the Special Analyses. Request determination only of those substances suspected of being present in significant amounts.

(X)	ITEM	PPM
	1. As	
	2. Se	
	3. Pb	
	4. B	
	5. Cu	
	6. Zn	
	7. Cr *(Hexavalent)*	
	8. PO	
	9. Cd	
	10. CN	
	11. Phenolic Compounds *(PPB)*	
	12. Others *(Specify)*	
	13.	
	14.	
	15.	
	16.	

III. ROUTINE LABORATORY ANALYSIS

(CHECK ONE)

	REQUESTED		NOT REQUESTED

ITEM	PPM
1. COLOR	
2. TURBIDITY	
3. ALKALINITY ($CaCO_3$)	
P: 0	MO: 131
4. TOTAL HARDNESS ($CaCO_3$)	134
5. NON-CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*	
6. CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*	
7. TOTAL DISSOLVED SOLIDS	
8. SPECIFIC CONDUCTANCE *(Micromhos)*	
9. CALCIUM (Ca)	
10. MAGNESIUM (Mg)	
11. SODIUM (Na) AND POTASSIUM (K)	
12. HYDROXIDE ~~(OH)*~~ $CaCO_3$	0
13. BICARBONATE ~~(HCO_3)*~~ $CaCO_3$	131
14. CARBONATE ~~(CO_3)*~~ $CaCO_3$	0
15. SULFATE (SO_4)	
16. CHLORIDE (Cl)	10
17. NITRATE (NO_3)	
18. IRON (Fe) TOTAL	0.2
19. MAGANESE (Mn)	
20. SILICA (SiO_2)	
21. FLUORIDE (F)	

*State whether determined or computed from P and MO alkalinity.

REMARKS *(Such as unusual appearance, taste, odor, etc.)*

LABORATORY ANALYSIS BY Justice

DATE OF ANALYSIS 8-1-57

DD FORM 1 APR 53 710 REPLACES WD AGO FORM 8-125, 1 APR 45, WHICH MAY BE USED.

GPO 912375

Well #32 Beach Road.

~~Drilled~~ Put in operation. 5-27-57

Static. 50 ft by gage.

DD. 37 ft " " (DD in ft. 13.)

Air line ft. ?. 60 ft.

~~P~~ - 11-2-61

Well delivered 349 G.P.M. - DIS-PRESS-28 LB.

DD. Gage - 14 ft.

13
10
23
37
60

DATE	G. P. M.	STATIC	AIRLINE
11/16/66	235	50'	63.5'
8/5/69	207	50'	63'
9-4 69	207	STATIC +28 PUMPING LEVEL -9	14 13 12 DD. FT. 37.0

as of March 1/67 32 well has Johnston pump

February 18, 1957

WELL # #" 32 SNEADS FERRY ROAD

(Contract NBy 7525)

36 hour test (all readings from ground level) 60' air line

Feb. 14,1957

time	G.PM.	P.L.	D.D.
	300		
10:00	300	29'	19'
11	300	29	19
12	300	29	19
1	300	29	19
2	300	29	19
3	300	29	19
4	300	29	19
5	300	29	19
6	300	29	19
7	300	29	19
8	300	29	19
9	300	29	19
10	300	29	19
11	300	29	19
12	300	29	19
1	300	29	19
2	300	29	19
3	300	29	19
4	300	29	19
5	300	29	19
6	300	29	19
7	300	29	19
8	300	29	19
9	300	29	19
10	300	29	19
11	300	29	19
12	300	29	19
1	300	29	19
2	300	29	19
3	300	29	19
4	300	29	19
5	300	29	19
6	300	29	19
7	300	29	19
8	300	29	19
9	300	29	19
10	300	29	19
			19
			19

static level 10'

recovery after 36 hour test

time	water level
10seconds	20'
20 "	20
30 "	20
40 "	20
50 "	20
6 0 "	19
2 minutes	18
4 "	17.5
8 "	17
16 "	17
32 "	17
60 "	15

WATER ANALYSIS ON COM P LETED WELL

p. alk.	0.0	ppm.
total alk.	146.0	"
chlorides	15.0	"
carbon dioxide	8.0	"
carbonates	0.0	"
bicarbonates	146.0	"
turbidity	0.0	"
odor	0.0	"
iron	0.1	"
hardness	132.0	"
p.h.	7.5	"

Westinghouse

ELECTRIC SUPPLY COMPANY

319 W. MARTIN STREET
RALEIGH, N. C.

February 8, 1957

64703-3

A. J. Jenkins & Son, Inc.
Warsaw, North Carolina

References: New Well Hadnot Point - Camp Lejeune - Contract NBy-7525

Gentlemen:

In reference to the Polyphase Meter and Socket, which we propose to furnish on the subject job, we would like to point out that the CS-3 Meter as shown in our descriptive bulletin 42-100 is a 3-element 50 ampere self-contained Meter for use on 3 phase, 4 wire WYE system as called for in specifications.

We are incorrect in showing the ST-3 Socket for this Meter and it should be a type ST-8 as shown in our descriptive bulletin 42-800.

This ST-8 Socket is rated at 100 amperes and is quite sufficient for the 50 ampere meter.

In view of this explanation and correction of the socket we believe that we can expect approval on same.

Very truly yours,

WESTINGHOUSE ELECTRIC SUPPLY COMPANY

A. C. Bangs

A. C. Bangs
SALES ENGINEER, ASS

ACB:mm

Westinghouse

ELECTRIC SUPPLY COMPANY

319 W. MARTIN STREET
RALEIGH, N. C.

- Contract NBy-7525

YOU CAN BE SURE ... IF IT'S Westinghouse

Raleigh, North Carolina

January 21, 1957

A. J. Jenkins and Son, Inc.
Warsaw, North Carolina

Gentlemen:

Below is a list of standard parts and the material of which they are made which are being furnished by Johnston Pump Company for the Camp Lejeune, North Carolina contract #7525.

Description	Material	Standard
Bowls	Cast Iron (Vit.*)	ASTM - A-48, Cl. 30
Impellers	Bronze	ASTM - B-62-52
Collet, Impeller Lock	Mild Steel	AISI - C-1018/Eq.
Shaft	Stainless Steel	AISI - No. 416
Coupling, Shaft	Mild Steel	AISI - C-1018/Eq.
Bearings, Bowl **	High Lead Bronze	ASTM - B-144-52, 3B
Bearings, Bowl	Buna N	
Discharge Case	Cast Iron (Vit.*)	ASTM - A-48, Cl. 30
Bearing, Discharge Case	High Lead Bronze	ASTM - B-144-52, 3B
Bearing, Discharge Case Screw	Bronze	ASTM - B-62-52
Suction Case (Bell)	Cast Iron (Vit.*)	ASTM - A-48-Cl. 30
Bearing, Suction Case	High Lead Bronze	ASTM - B-144-52, 3B
Tubing Adapter	Cast Iron	ASTM - A-48, Cl. 40
Bearing, Tubing Adapter Screw	Bronze	ASTM - B-62-52
Seal Ring, Impeller	Aluminum Bronze	ASTM - B-148-52, 9C
Thrust Ring	Stainless Steel	AISI - No. 416
Thrust Ring Plate	Cast Iron	ASTM - A-48, Cl. 30
Impeller Key	Mild Steel	Key Stock
Cap Screws	Mild Steel	AISI - C-1018/Eq.
Bolting	Mild Steel	AISI - C-1018/Eq.
Suction Pipe	Steel	ASTM - A-53, Grade B
Strainer	Galvanized Steel	

PUBLIC WORKS DEPARTMENT
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NOy 2525 SPEC. NO 3026/56

TITLE New Raw Water Well

DATE: 1 Mch 1957 [signature]

BY DIRECTION OF OFFICER
IN CHARGE OF CONSTRUCTION

January 21, 1957

*Vitriform enameled lining on interior vanes and surfaces of bowls, suction case and discharge case up to and including 16" bowl assemblies, and on 18" bowls only. Above 18" no vitriform enamel is used. All cast iron closed impellers are vitriform enameled. Semi-open impellers are not coated.

**Dual bronze and rubber bearings on 7" through 16" bowl assemblies - all other bowls bronze only.

COLUMN ASSEMBLY

Oil and Water Lubricated Construction

Description	Material	Standard
Column (std. threaded)	CWI	WWP-441b
Shaft	Steel	AISI - C-1018/Sq.
Shaft Coupling	Steel	AISI - C-1018/Sq.

Oil Lubricated Only

Bearing, Lineshaft Enclosing Tube	Bronze	ASTM - B-62-52
Shaft	Steel	ASTM - A-53, Grade B
Stabilizer, Enclosing Tube	Rubber-Reinforced	

Very truly yours,

R. D. Ferguson, Warehouse Manager
JOHNSTON PUMP COMPANY

RDF:mdd

PUBLIC WORKS DEPARTMENT
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NOy 75525 SPEC. NO 75526/56

TITLE New Raw Water Well

DATE: 1 Mch 1957 W. [illegible]

BY DIRECTION OF OFFICER
IN CHARGE OF CONSTRUCTION

H.P. Well 632

WELL DRAWING & MATERIALS LIST

HARTSFIELD WATER COMPANY, INC.
P. O. DRAWER 3109 - PH. 523-2154
KINSTON, NORTH CAROLINA 28501

CUSTOMER: U.S. Marine Corp Base WELL No. 639

ADDRESS: Camp Lejeune, N.C.

WELL LOCATION: Sneads Ferry Road

Gauge Connection = 19.8

Ground Elev = 17.0

Static Level = 4.30

Static Level in Existing Well = 13.00

GROUND LEVEL

24" HOLE SIZE

20" PIT CASING

O.D. Elev

CASING SIZE 20"

NEAT CEMENT

8" CASING SIZE

Wrought Iron MATERIAL

SCREEN SIZE

THICKNESS

BAGS OF CLAY

TONS OF GRAVEL

BAGS OF CEMENT

OTHER MATERIAL USED

1/2" wrought iron Pipe

20" HOLE SIZE

SCREEN SIZE 8"

Bottom of Aquifer = -68.0

8"

CASING SIZE

MATERIAL

THICKNESS

SHOW GRAVEL LEVEL

SHOW SCREEN SETTINGS

SHOW GUIDE LOCATIONS

SCREEN SIZE 8"

STAINLESS STEEL MATERIAL

STD. THICKNESS

DOERR MANUFACTURER

Capacity Test Showed 150 gpm at Pumping Level of -23.0

Maximum Drawdown Level = -30.0

Length of 1/2" Air Line = 82.9'

NEAT CEMENT

20" STEEL

8" W.I.P.

55'

62'

70'

85'

93'

120

132

136'

148'

155'

163'

168'

176'

182'

8

15'

8

27'

12

4'

12

7'

8

5'

8

6'

OFFICE OF THE
OFFICER IN CHARGE OF CONSTRUCTION
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS
CONTRACT NBy 69-0792 SPEC. NO. ____
DATE: 15 Dec 69

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

New 639

8-26-85 662

Static - 10

A:2 Line - 81

P/L - 73

D/D - 63

psi - 45

Gpm - 168

SET AT 60 LB

5-14-86

639 (OLD)

8-26-85

A/L	SL	PL	D/D	PSI	GPM	START Time
63	4	56	52	49	105	1330
						1345

WELL NUMBER	639	BY THOMAS / BROWN / MILLER			DATE 10-19-84	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1030
63'	4	48	44	54	104	1040
	-	56	52	49	115	1050

REMARKS Regs set at 49 PSI 115 GPM

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

639

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN GPM	TOTAL CAP.
7-30-82					start	Time	1350
	88'	20'	72	52	48	100	1405
			78	58	45	104	1425

REMARKS: used direct reading gage
set at 45 PSI 58' D/D 78' P/L 104 GPM

WELL # 639

9/10/81

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
	88'	23'	61	38'	59.	3"	
			65	42"	56	3"	
			71'	48	53	4"	
			75	52	50	100	
			77	54	47	104	

REMARKS: set at 50 LB pressure
23' static
75' Pumping level
52' draw down
100 GPM's
88' air line

DEPTH OF WELL:
TRLINE ERVATION:
ATE INSTALLED:

WELL #639

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
1-10-79	879 ?		20'		50		100
			Lose Suction		40		
			27'		55		60 est
3/15/79			26'		50		100
2-13-80	88'		75'		50 set		80
			79'		45		108
			65'		55		60

REMARKS:

EPTH OF
ELL:
IRLINE
LEVATION: + -
ATE
NSTALLED:

FORM A-4
(MAY '70)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF WATER DATA COORDINATION

INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

APPROVED.
Budget Bureau No. 42-R1485
Approval Expires June 30, 1976

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
MC	Q	34° 38' 07" N	77° 18' 00" W	

6. AGENCY STATION NO.	7. STATION NAME
HP-639	HP-20-639

8. DRAINAGE BASIN CODE No.	Letter	9. STATE CODE	10. COUNTY CODE	11. COUNTY NAME
06	N	32	133	Onslow

12. PERIOD OF RECORD
Began: 1969
Discontinued:
Y ☐ Continuous Interruption Exceeds 1 Year

13.

14.

15. SITE

☐ 101 Stream ☐ 104 Reservoir ☒ 107 Well
☐ 102 Canal ☐ 105 Estuarine zone ☐ 108 Drain
☐ 103 Lake ☐ 106 Spring ☐ 109 Other

16. TYPES OF DATA AVAILABLE AND FREQUENCY OF MEASUREMENT (Enter appropriate number (1-8) beside each parameter to indicate frequency of measurement. For parameters telemetered, enter "T".)

1 Continuous 3 Daily 5 Monthly 7 Annual
2 Seasonal 4 Weekly 6 Quarterly 8 Other Periodic

Physical
311 ___ Temperature
312 ___ Specific conductance
313 ___ Turbidity
314 ___ Color
315 ___ Odor
316 ___ pH (field)
317 8 pH (lab)
318 ___ Eh
319 ___ Suspended solids
320 ___ Other

Chemical
331 ___ Dissolved solids
332 8 Chloride
333 ___ Nutrients (nitrogen)
334 ___ Nutrients (phosphorus)
335 ___ Common ions
336 8 Hardness
337 ___ Radiochemical
338 ___ Dissolved oxygen
339 ___ Other gases
340 ___ Minor elements
341 ___ Pesticides (insecticides, herbicides, etc.)
342 ___ Detergents - MBS
343 ___ Biochemical oxygen demand
344 ___ Carbon (total, dissolved, etc.)

Biologic
361 ___ Coliforms
362 ___ Other micro-organisms (Benthic organism, phytoplankton, etc.)
363 ___ Other

Sediment
371 ___ Concentration (suspended)
372 ___ Particle size (suspended)
373 ___ Particle size (bed load material)
374 ___ Other

17. SUPPLEMENTARY DATA AVAILABLE FOR STATION

☐ 421 Surface water station ☐ 423 Water stage or level ☐ 425 Time of travel
☐ 422 Ground water station ☒ 424 Water discharge ☐ 426 Drainage area

18. STORAGE OF DATA

☐ 501 Published ☐ 503 Data on punchcard ☐ 505 Other
☒ 502 Not published ☐ 504 Data on magnetic tape, disc, data cell, etc.

19. INQUIRIES ABOUT DATA SHOULD BE SENT TO:

Office: Base Maintenance Department, Utilities Division
Street No.: Marine Corps Base
City, State, Zip: Camp Lejeune, North Carolina 28542
City Code: 0735

20. DATA ARE AVAILABLE TO PUBLIC ON REQUEST ☒ Yes ☐ No

21. OFFICE COMPLETING FORM
BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME
BOB WILSON

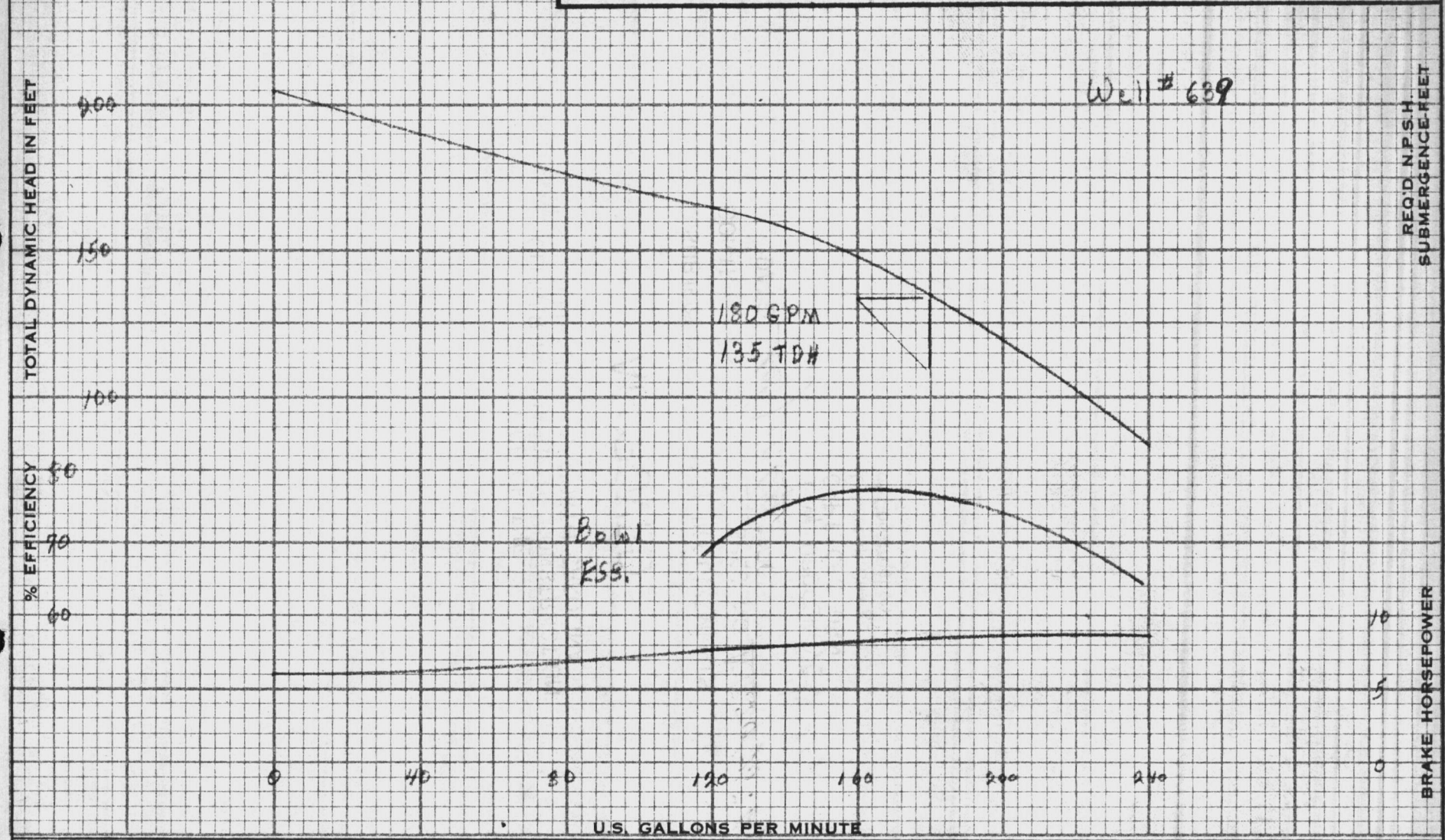
23. DATE
Month: 12
Year: 19 76

NOTE: All COLUMN LOSSES ARE INCLUDED

JOHNSTON: REF. NO. 688-B-106N GB-1703

DEALER: Hartsfield Water Co REF. NO.

CUSTOMER: Camp Lejeune, N.C. REF. NO. N-62470-69-C-0792



THE CAPACITY, HEAD AND EFFICIENCY GUARANTEE IS FOR THE DESIGNATED POINT ONLY: IT IS BASED ON SHOP TESTS, WHEN HANDLING CLEAR, FRESH WATER AT A TEMPERATURE OF NOT OVER 85° F. AND UNDER SUCTION CONDITIONS AS SPECIFIED IN THE CONTRACT.

IMPELLER CI-Vit. DIA. ES

BOWLS Cast Iron-Vit.

LIQUID Water

SP. GR. 1.0

DATE 6-30-69 BY TJD

JOHNSTON PUMP CO.

VERTICAL PUMPS

GLENDORA • CALIFORNIA • U. S. A.

Turbine PERFORMANCE

8 STAGE 7CC PUMP

1760 R.P.M.

JP-319-3M

OFFICE OF THE
OFFICER IN CHARGE OF CONSTRUCTION
CAMP LEJEUNE, NORTH CAROLINA

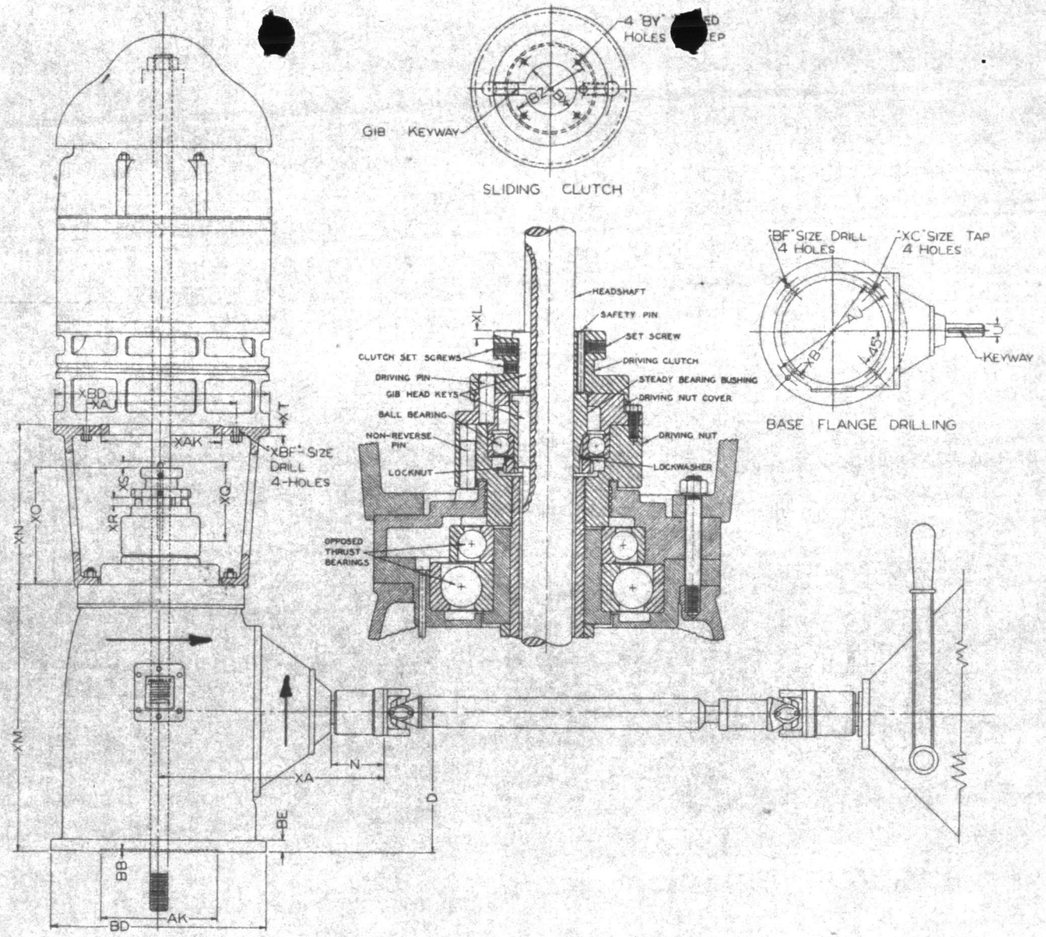
APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NBy_____ SPEC. NO. N62470-69-C-0795

DATE: 10 Jul 69

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



AMARILLO RIGHT ANGLE PUMP DRIVE

DIMENSION PRINT OF COMBINATION DRIVE
MANUAL OPERATION—SLIDING CLUTCH

Drive No. JRL-20 Ratio 1:1

Flexible Drive Shaft No. _____ Length _____

Drive Flange Bored 1¼ Keyway 5/16 x 5/32

Engine Flange Bored _____ Keyway _____

Customer Johnston Pump Co.

Customer's Order No. 21959 9B1702-04

Date 8-18-69 Drive Serial No. _____

AMARILLO GEAR COMPANY
AMARILLO, TEXAS

By: W. Robbins

Camp LeJeune Well Nos. 638, 639, 640

MODEL	D	N	HORIZONTAL SHAFT U NOMINAL	HORIZONTAL SHAFT U ACTUAL	HORIZONTAL SHAFT U KEYWAY	AJ	AK*	BB	BD	BE	BF	XA	XB	XC	XL	XM	XN	XO	XQ	XR	XS	XT	XAJ	XAK	XBD	XBF
→ JRL-20	6¾	2⅝	1¼	1.249	5/16 X 5/32	9⅛	8.250	3/16	10	5/8	7/16	10⅞			9/32	12¼	12½	5½	5¼	½	1½	7/16	9⅛	8¼	10	T/16
OL	8½	4¼	1½	1.499	3/8 X 3/16	14¾	13.500	¼	16½	¾	11/16	15⅝			9/32	15 7/16	16	6½	7	⅝	2	⅝				
1BL	11½	4¼	1½	1.499	3/8 X 3/16	14¾	13.500	¼	16½	⅞	11/16	16¾			9/32	20⅜	18	7 13/16	7¾	¾	2¼	¾				
2BL	11½	4¼	1⅞	1.874	3/8 X 3/16	14¾	13.500	¼	16½	⅞	11/16	16¾			9/32	19¾	18	8⅜	7¾	¾	2¼	¾				
2BL-90	11½	4¼	1⅞	1.874	3/8 X 3/16	14¾	13.500	¼	16½	⅞	11/16	16¾			9/32	19¾	18	8⅜	7¾	¾	2¼	¾				
3BC	13¾	5¼	2 7/16	2.436	5/8 X 5/16	18¼	13.500	¼	20	1⅛	11/16	20¾	14¾	5/8-11-NC	9/32	25	20	9⅜	10	⅞	2¾	⅞				
4BC	13¾	5¼	2 7/16	2.436	5/8 X 5/16	18¼	13.500	¼	20	1⅛	11/16	20¾	14¾	5/8-11-NC	9/32	25	20	9⅜	10	⅞	2¾	⅞				
4BC-200	13¾	5¼	2 7/16	2.436	5/8 X 5/16	18¼	13.500	¼	20	1⅛	11/16	20¾	14¾	5/8-11-NC	9/32	26¼	20	9⅜	10	⅞	2¾	⅞				
6BL	16	6	2 15/16	2.936	¾ X ⅜	23	13.500	¼	24½	1⅛	13/16		14¾	5/8-11-NC	9/32	30¾	27	12½	11½	1⅛	3½	1				
6BL-350	16	6	2 15/16	2.936	¾ X ⅜	23	13.500	¼	24½	1⅛	13/16		14¾	5/8-11-NC	9/32	30½	27	12⅜	11½	1⅛	3½	1				
6BL-425	16	6				23	13.500	¼	24½	1⅛	13/16		14¾	5/8-11-NC	9/32		27	12⅜	11½	1⅛	3½	1				
6BC-500	18	6	3¾	3.749	7/8 X 7/16	23	13.500	¼	24½	1⅛	13/16	26¾	14¾	5/8-11-NC	9/32											
7BL	21	8	4	3.998	1 X ½	28¾	22.000	¼	30½	1¼	13/16	36⅞	26	¾-10-NC	7/16	42	30	16¼	15	1 3/16	4	1¼				

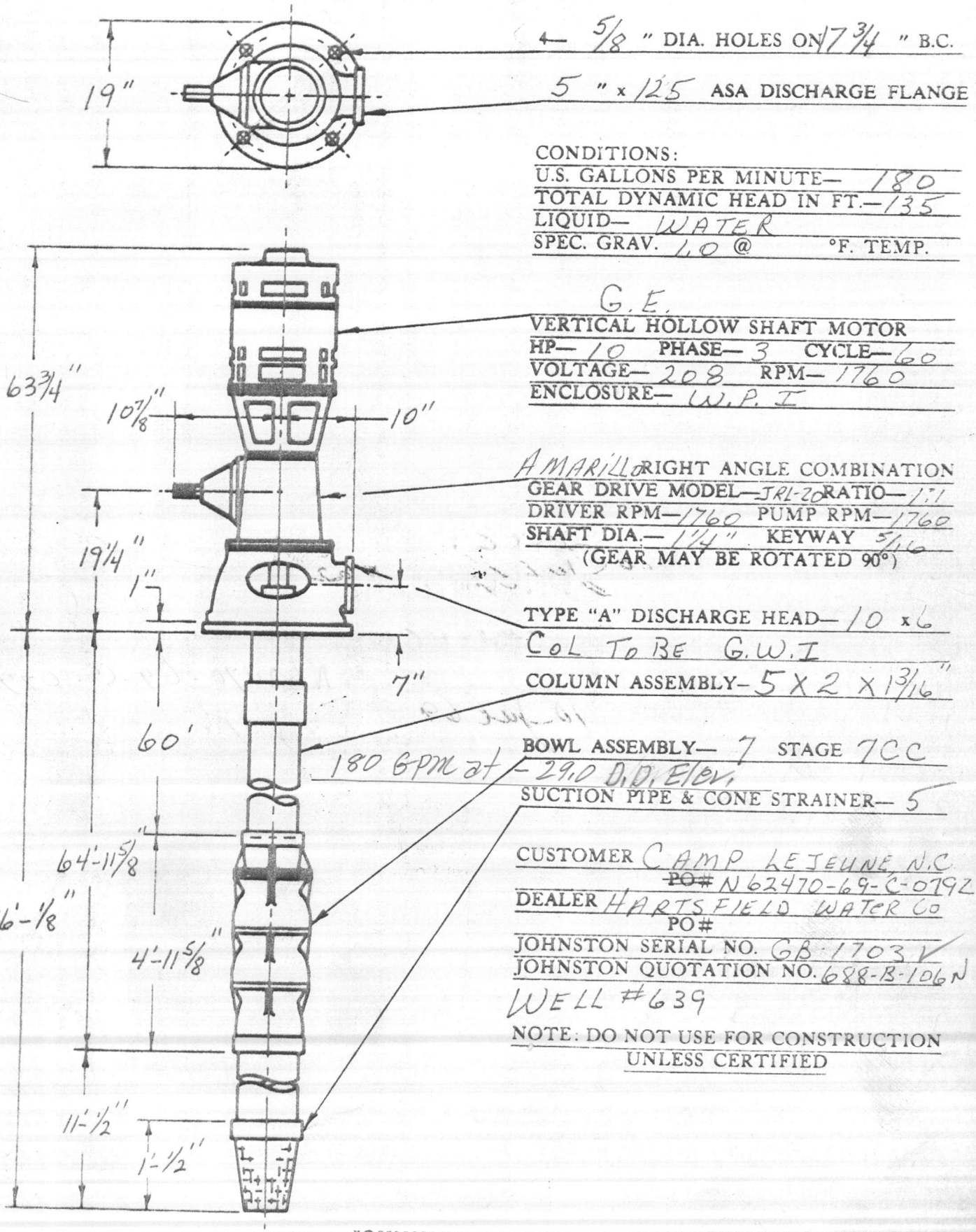
*Tolerance on AK dimension + .003 inch, — .000 inch for 8.250 dimension and + .005 inch, — .000 inch for 13.500 and 22.000 inch Dimension.
† Tolerances on BX dimension: up to and including 1½ inch diameter, + 0.001, — 0.000 inch; larger than 1½ inch diameter, + 0.0015, — 0.000 inch.

FORM 125-D REV. 7-65

COUPLING DIMENSIONS

BX BORE NOMINAL	BX BORE ACTUAL†	GIB KEYWAY	BY	BZ
¾	.751	3/16 X 3/32	10-32	1⅜
⅞	.876	¼ X ⅛	10-32	1⅜
→ 1	1.001	¼ X ⅛	10-32	1⅜
1 3/16	1.188	¼ X ⅛	¼-20	1¾
1¼	1.251	¼ X ⅛	¼-20	1¾
1 7/16	1.438	⅜ X 3/16	¼-20	2⅛
1½	1.501	⅜ X 3/16	¼-20	2⅛
1 11/16	1.688	⅜ X 3/16	¼-20	2½
1¾	1.751	⅜ X 3/16	¼-20	2½
1 15/16	1.938	½ X ¼	¼-20	2½
2 3/16	2.188	½ X ¼	⅜-16	3¼
2 7/16	2.438	⅝ X 5/16	⅜-16	3¼
2 11/16	2.688	⅝ X 5/16	⅜-16	3¾

JOHNSTON VERTICAL TURBINE PUMP well no. 639



4 — 5/8 " DIA. HOLES ON 17 3/4 " B.C.

5 " x 125 ASA DISCHARGE FLANGE

CONDITIONS:
U.S. GALLONS PER MINUTE— 180
TOTAL DYNAMIC HEAD IN FT.— 135
LIQUID— WATER
SPEC. GRAV. 1.0 @ °F. TEMP.

G.E.
VERTICAL HOLLOW SHAFT MOTOR
HP— 10 PHASE— 3 CYCLE— 60
VOLTAGE— 208 RPM— 1760
ENCLOSURE— W.P. I

AMARILLO RIGHT ANGLE COMBINATION
GEAR DRIVE MODEL— JRL-20 RATIO— 1:1
DRIVER RPM— 1760 PUMP RPM— 1760
SHAFT DIA.— 1 1/4" KEYWAY 5/16
(GEAR MAY BE ROTATED 90°)

TYPE "A" DISCHARGE HEAD— 10 x 6

COL TO BE G.W.I

COLUMN ASSEMBLY— 5 X 2 X 13/16"

BOWL ASSEMBLY— 7 STAGE 7CC

180 GPM at -29.0 D.D. Elev.

SUCTION PIPE & CONE STRAINER— 5

CUSTOMER CAMP LEJEUNE N.C.
~~PO#~~ N62470-69-C-0792
DEALER HARTSFIELD WATER CO
PO#
JOHNSTON SERIAL NO. GB 1703 V
JOHNSTON QUOTATION NO. 688-B-106N

WELL #639

NOTE: DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

JOHNSTON PUMP CO.
GLENDORA, CALIFORNIA

H-1868-A

OFFICE OF THE
OFFICER IN CHARGE OF CONSTRUCTION
CAMP LEJEUNE, NORTH CAROLINA

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT NBy_____ SPEC. NO. N62470-69-C-0792

DATE: 10 Jul 69

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

H.P. Well 639