

Phone: 919-775-2463
Fax: 919-708-7232

THE SOURCE FOR PUMP SOLUTIONS

**Charles Underwood,
Inc.**

Fax

To: Mr. Danny Hill

From: N. F. "Pete" Lowe

Fax 1-910-451-7195

Date: February 23, 2001

Phone:

Pages Six

q Well # 628

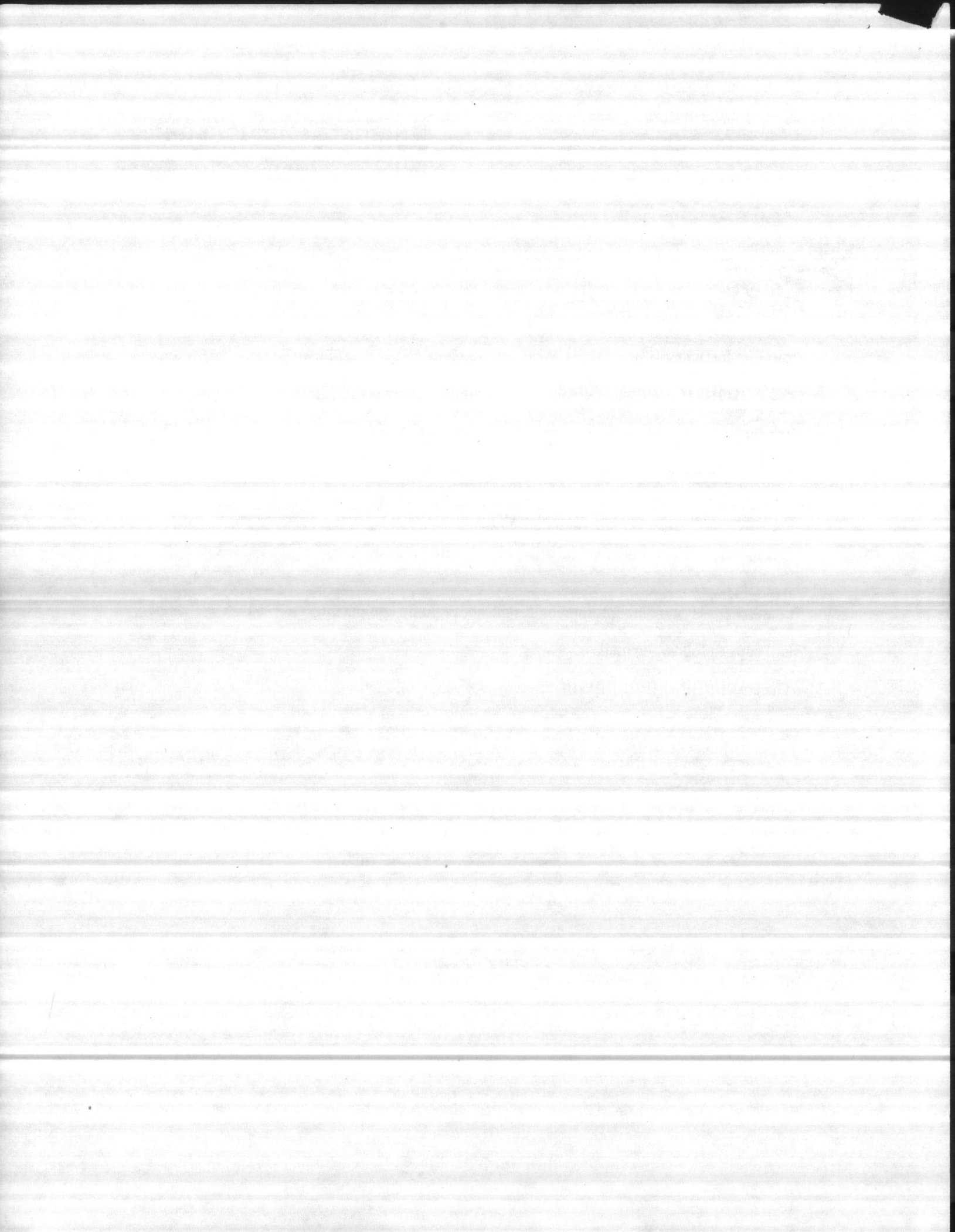
CC:

Urgent For Review Please Comment ~~X~~ Please Reply Please Recycle

•Comments Following information for the above pump equipment.

Hard copy to follow via mail.

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



Your cost

\$5,371.20

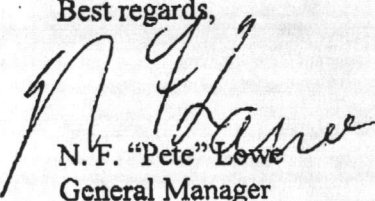
We suggest using the existing Floway discharge head and the existing combination gear drive and motor. Replacing the pump from the discharge head down. We have reduced the capacity of the pump to the conditions noted above in an effort to reduce the amount of iron bacteria this well is producing. We also set this pump slightly higher in the well to get the bowl unit out of the well screen area.

We suggest shocking the well with a strong chlorine solution to attempt to kill the iron bacteria. If you would like for us to offer a price for this treatment we will be glad to do so.

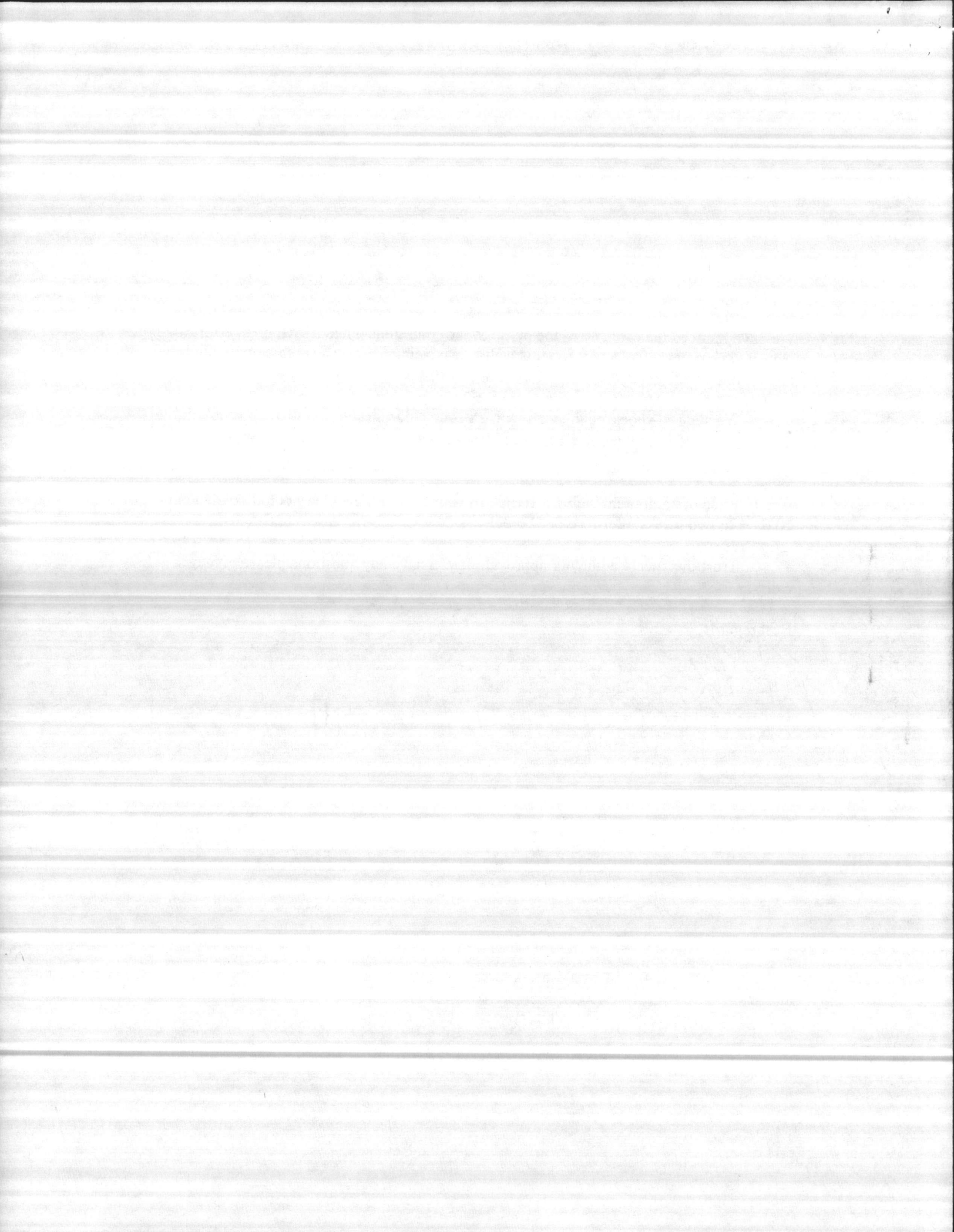
Price of equipment includes freight to your location. Delivery could be made in 10 days to two weeks after receipt of order.

Trust this meets with your approval. If you have any questions please give us a call.

Best regards,



N.F. "Pete" Lowe
General Manager



Charles Underwood, Inc.
 N.F. "Pete" Lowe
 Camp LeJeune, Well # 628

Goulds Turbine Pump Selection ver: 6.042
 02/23/01

PUMP DATA SHEET
 Goulds Turbine 60 Hz

Selection file: CLJ2.UFS
 Catalog: TURB60.MPC v 1.6.1

Curve: E3140

Design Point: Flow: 150 US gpm
 Head: 145 ft

Fluid: Water Temperature: 60 °F
 SG: 1
 Viscosity: 1.122 cP
 Vapor pressure: 0.2568 psi_a
 Atm pressure: 14.7 psi_a

Pump: TURBINE - 1800 Size: 7CLC` (6 stages)
 Speed: 1770 rpm Dia: 5.0625 in

Limits: Temperature: --- °F Sphere size: 0.43 in
 Pressure: 415 psi_g Power: --- bhp

NPSHa: --- ft

Specific Speed: Ns: 2183 Nss: ---

Piping: System: ---
 Suction: --- in
 Discharge: --- in

Vertical Turbine: Bowl Size: 7.13 in Max Lateral: 0.5 in
 Thrust K Factor: 3.5

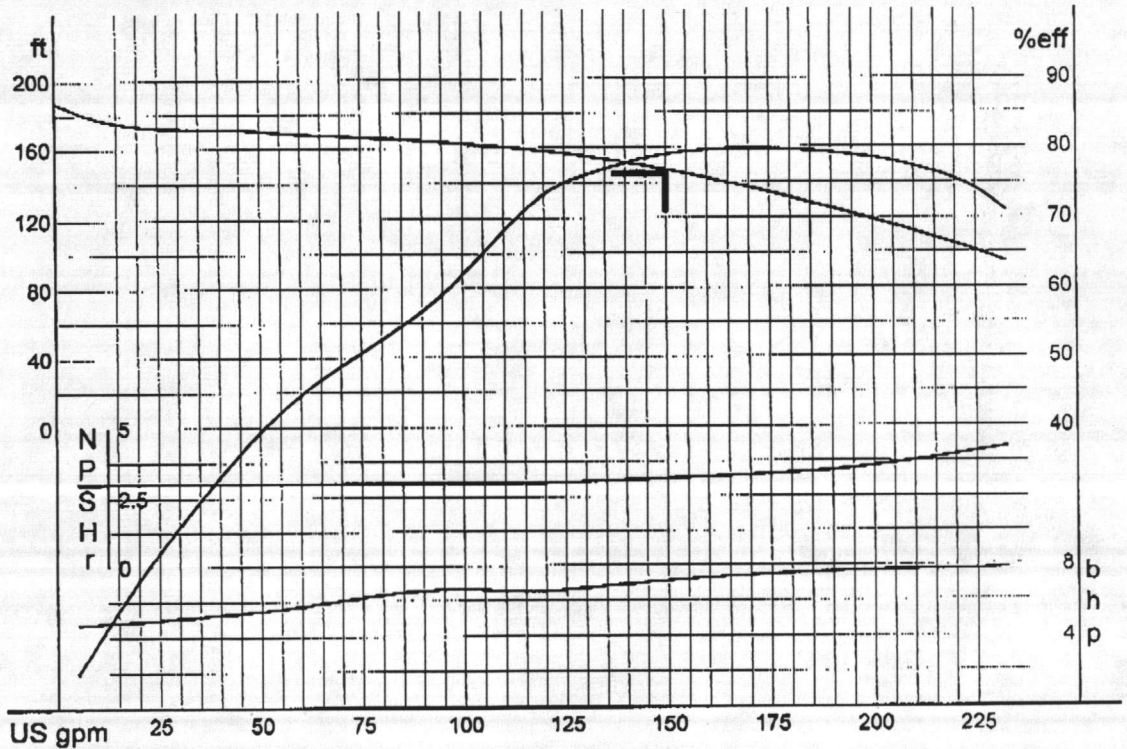
Motor: 10 hp Speed: 1800 Frame: 215T
 NEMA Standard ODP Enclosure
 sized for Max Power on Design Curve

Suction Size-5" Discharge Sizes-5",6"

--- Data Point ---
 Flow: 150 US gpm
 Head: 147 ft
 Eff: 78.9%
 Power: 7.06 bhp
 NPSHr: 3.14 ft

-- Design Curve --
 Shutoff Head: 187 ft
 Shutoff dP: 81 psi
 Min Flow: - US gpm
 BEP: 79.7% eff
 @ 173 US gpm
 NOL Pwr: 7.83 bhp
 @ 233 US gpm

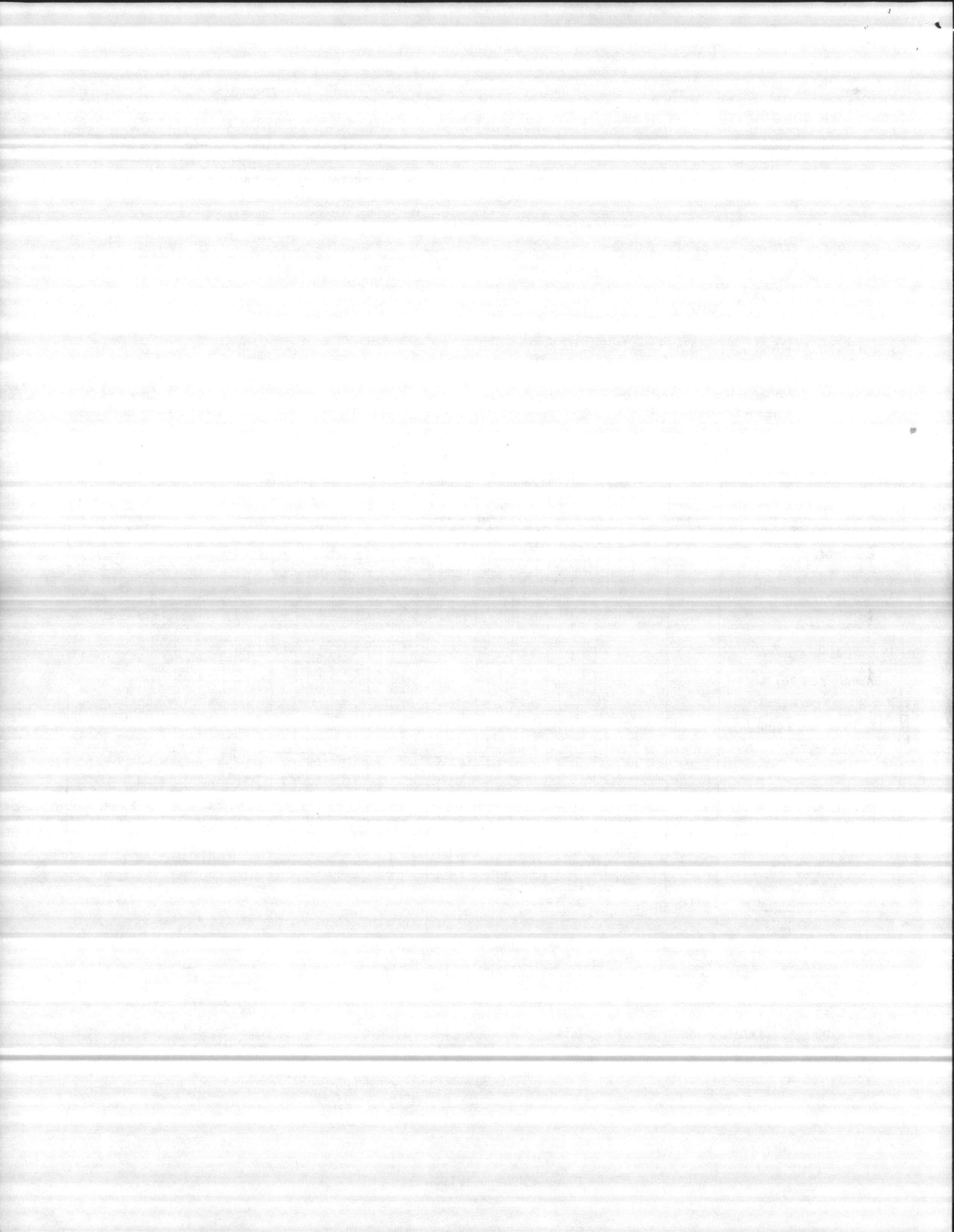
-- Max Curve --
 Max Pwr: 8.56 bhp
 @ 240 US gpm



--- PERFORMANCE EVALUATION ---

Flow	Speed	Head	Pump	Power	NPSHr	Motor	Motor	Hrs/yr	Cost
US gpm	rpm	ft	%eff	bhp	ft	%eff	kW		/kWh
150	1770	147	78.9	7.06	3.14	89.1	5.91	1500	0.08
120	1770	158	73.1	6.54	3	89.1	5.48	3000	0.08
90	1770	164	56.9	6.5	3	89.1	5.44	1000	0.06

Total Annual Power Consumption: 30,722 kWh
 Annual Operating Cost: \$2,349



GOULDS TURBINE HYDRAULIC ANALYSIS of DWT-CATM PUMP

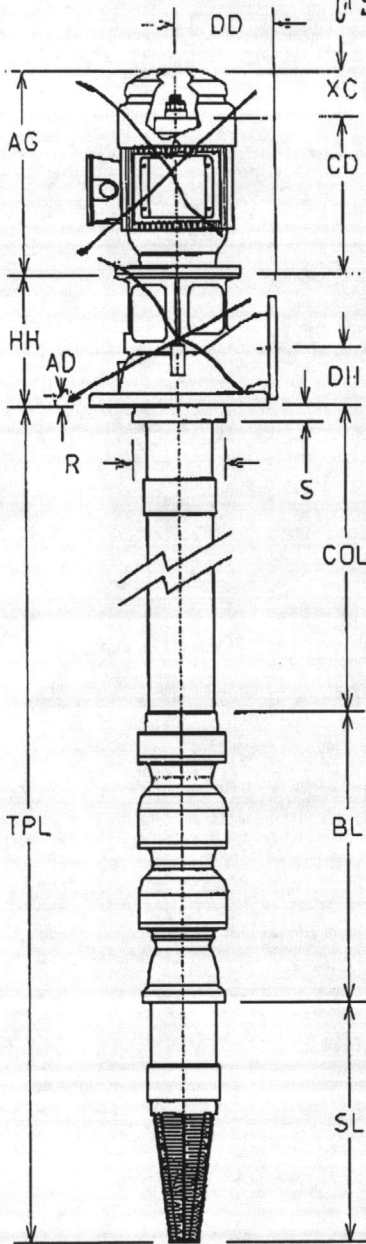
Date: 02-23-2001
6 Stage 6x7CLC

Version:



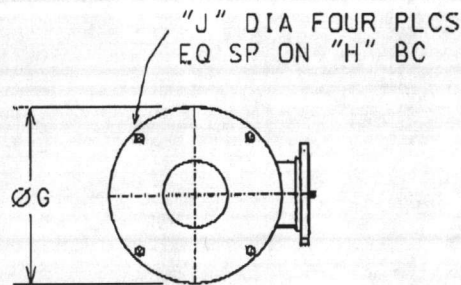
Pump Data

AD:		Size:	7CLC
AG:	26.75	Stages:	6
BD:	10.00	Impellers:	Bronze
BL:	46.50	Bowl:	Cast Iron
CAN:	0	Bearing:	Rubber
CD:	23.38	Basket:	No
CL:	0	LineShaft Type:	Open
COL:	840.00	Column:	Steel
DD:	0.00	Column:	5" Threaded
DH:	0.00	Bearing Spacing:	10 feet
G:	0.00	Section Length:	
H:	0.00	Head:	A:Cast
HH:	0.00	Flange (Disch.):	6" 125#
J:	0.00	Inlet:	
R:		Coupling:	416SS
S:		Seal:	Packing
SL:	13.00	LineShaft:	416SS 1"
TPL:	899.50	SubBase:	Other
UG:	0		
V:			
W:			
X:			
XC:	3.22		
Y:			
Z:			



Use Existing Motor

Use Existing Head



Hydraulic Data

Flow (gpm):	150
Pump Head (ft):	91.3
TDH (ft):	147.0
Speed (rpm):	1770
Fluid:	Water
Temperature (F):	60
Viscosity:	1.122
Spec.Grav:	1

Miscellaneous

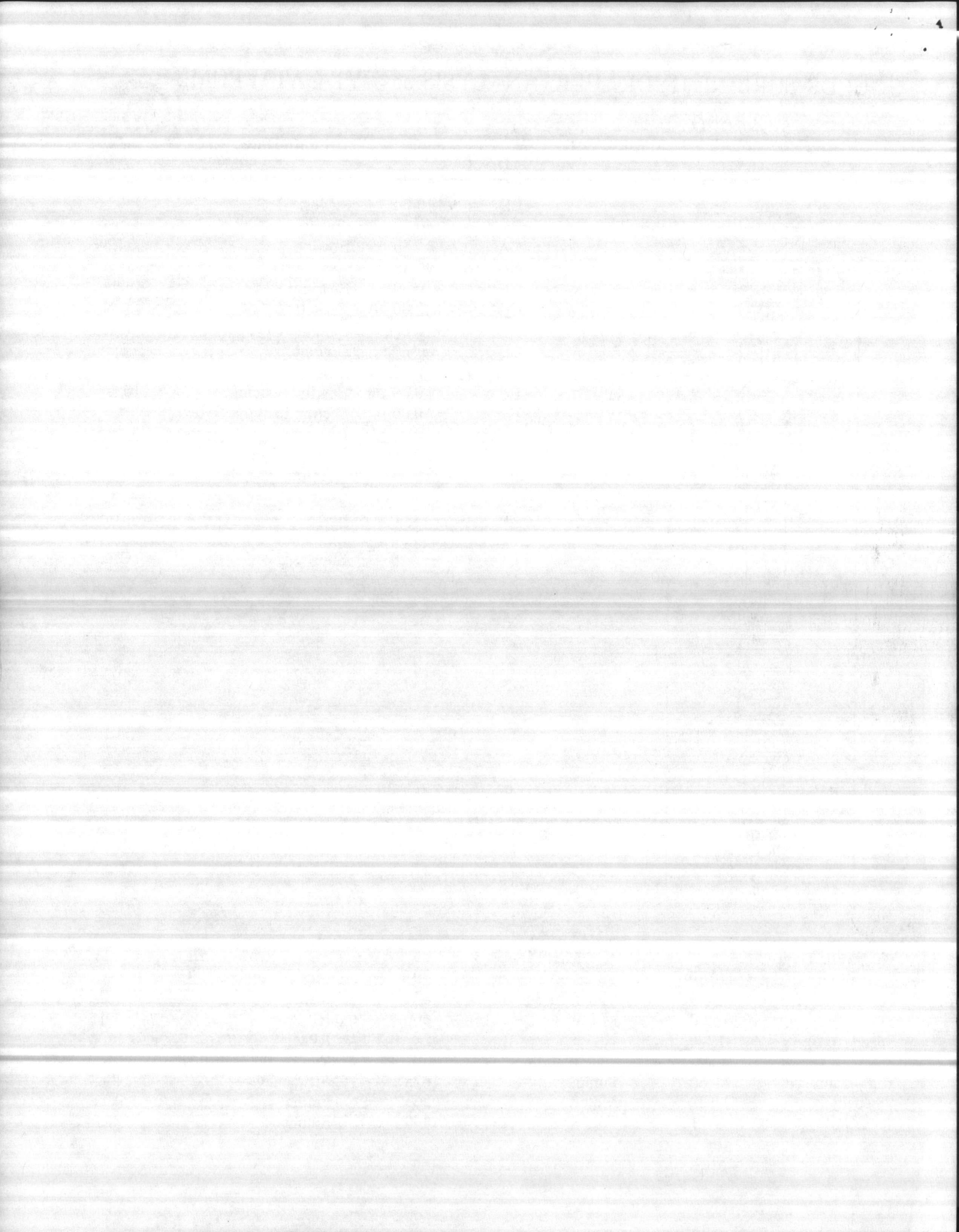
Thrust At Design:	707
Thrust At Shutoff:	847
Min Water Level(in):	660

Weight

Pump:	1625
Motor:	265
Total:	1890

Motor Data

Model Number:	F407
Make:	USEM
HP:	15
RPM:	1800
Type:	AU
Efficiency:	89.5
Frame:	254TP
Ratchet:	NRR



GOULDS TURBINE HYDRAULIC ANALYSIS of DWT-CATM PUMP

Date: 02-23-2001
6 Stage 6x7CLC

Version:

**Overall Pump Parameters**

Size and Model:	7CLC	Pump Operating Speed, RPM:	1770
Capacity, GPM:	150	Total Dynamic Head, Ft.:	147
Total Pump Length, In.:	899.5	Impeller Trim, In.:	5.0625
Pump Type:	OpenSump	Head Type:	A:Cast
Pump K-Factor:	3.5	Number of Stages:	6
		Pumping Level, In.:	660.0

LineShaft-Related Data

Shaft Diameter, In.:	1	Shaft Limit, HP:	71
Shaft Material:	416SS	Matl Correction Fact:	1.18
LineShaft Length, In.:	840.00	Shaft Elongation, w/o Adder:	0.02
		LineShaft Type:	Open

Bowl Data

Total Bowl Length, In.:	46.50	Bowl Diameter, In.:	7.125
		Bowl Shaft Limit, HP:	125

Column Data

Column Diameter, In.:	5	Column Load, Lb.:	340.7
Wall Thickness, In.:	Standard	Column Elongation, In.:	0.00

HorsePower Data

Shaft Friction Loss, Hp.:	0.37	Thrust Load Loss, Hp.:	0.09
Bowl HP At Design, Hp.:	7.06	Motor HorsePower, Hp.:	15

Head Data

Column Loss, Ft.:	0.66	Discharge Head Loss, Ft.:	0.03
		Total Loss, Ft.:	0.69

Other Data

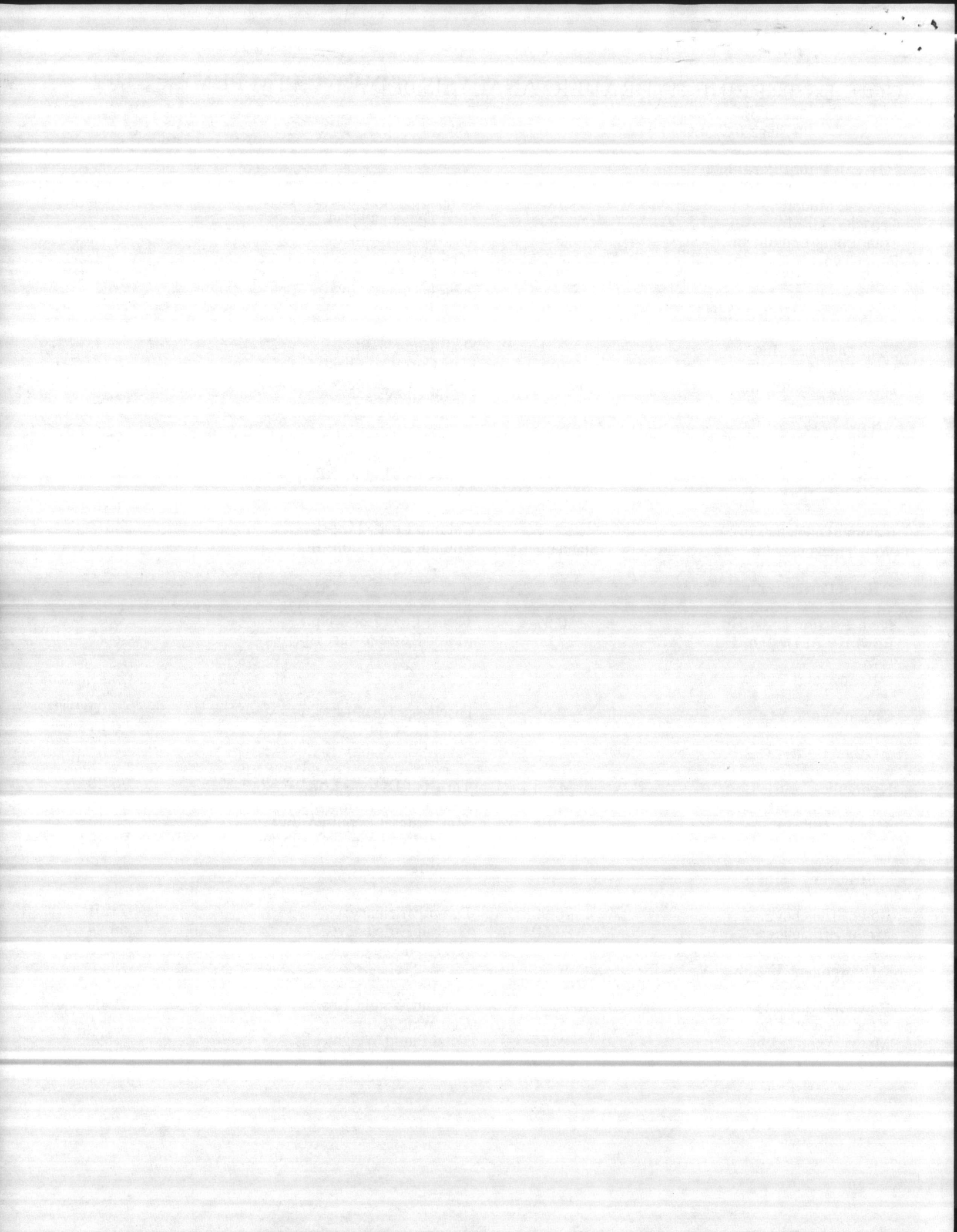
Hydraulic Thrust, Lb.:	514.5	Thrust at Design, Lb.:	707.0
Thrust at Shutoff, Lb.:	846.7	Design NPSH, Ft.:	3.14
Max Lateral, In.:	0.5	Min. Lateral Required, In.:	0.15
		Actual Head above Grade, Ft.:	91.31

Efficiency Data

Bowl Efficiency:	78.90	Pump Efficiency:	74.01
Motor Efficiency:	89.50	Overall Efficiency:	66.24
		KWH/1000 gallons:	0.70

Component Weights

Bowl Weight, Lbs.:	225	Column Weight, Lbs.:	1400
Head Weight, Lbs.:	0	Can Weight, Lbs.:	0
Motor Weight, Lbs.:	265	Total Pump Weight, Lbs.:	1890

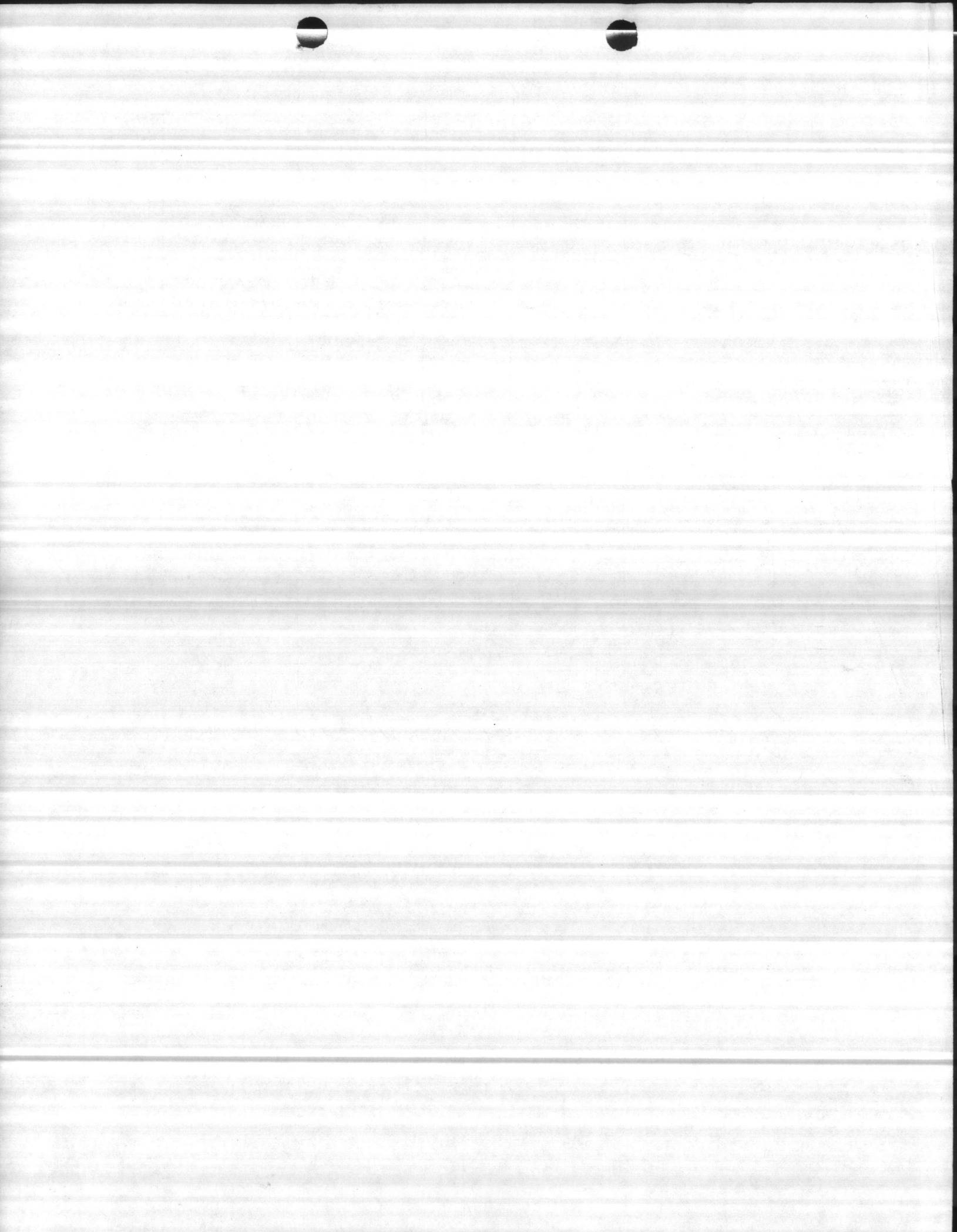


BLD 20

WELL NUMBER 628		BY SALAS/THOMAS			DATE 3-27-01	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
90	20	45	25	55	100	20
		60	40	45	137	30
		65	45	35	157	40
	SET AT ⇒	70	50	30	172	50
		85	65	25	178	60
						10

REMARKS D/H-75 SET PSI AT 30

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE



BANKCARD REQUEST
 BASE MAINTENANCE DIVISION
 CAMP LEJEUNE, NORTH CAROLINA 28542

84-228

SHOP () PHONE 451-7190 EXT DATE 2-26-01

SHOP EMPLOYEE Hill R/D

JUSTIFICATION To Replace well Pump TICKET

BUILDING Well 62P

PRIORITY

SUGGESTED SOURCE Charles Underwood Inc Vendor POC "Pete" Howe

Sanford N.C. Vendor PHONE 1-919-775-2463

QTY	U/I	MFR & P/N	NOMENCLATURE/DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	EA	7CLC	6 Stage water Lub. Bowl Assem.		
1	EA		5" GALVANIZED cone strainer		
1	EA		5" X 10" Suction P:Pe		
2	EA		5" X 5' Top Bottom Column P:Pe		
6	EA		5" X 10' Intermediate Column P:Pe		
1	EA		1" X 5' 416 SS Bottom shaft		
6	EA		1" X 10' 416 SS Intermediate shaft		
1	EA		1" X 63" 416 SS Top shaft		
6	EA		5" BRONZE BEARING RETAINER		
6	EA		1" RUBBER BEARING		
1	EA		Floway 1" PACKING Box Bearing		
1	EA		Set GFD PACKING		
1	EA		1" X 48" Motor shaft 416 SS		
1	EA		1" X 25.5" Comb Gear Dr. 416 SS shaft		
1	EA		1" head shaft nut		5,371.20

Sole Source only

SHOP SUPERVISOR'S SIGNATURE D. HILL [Signature]

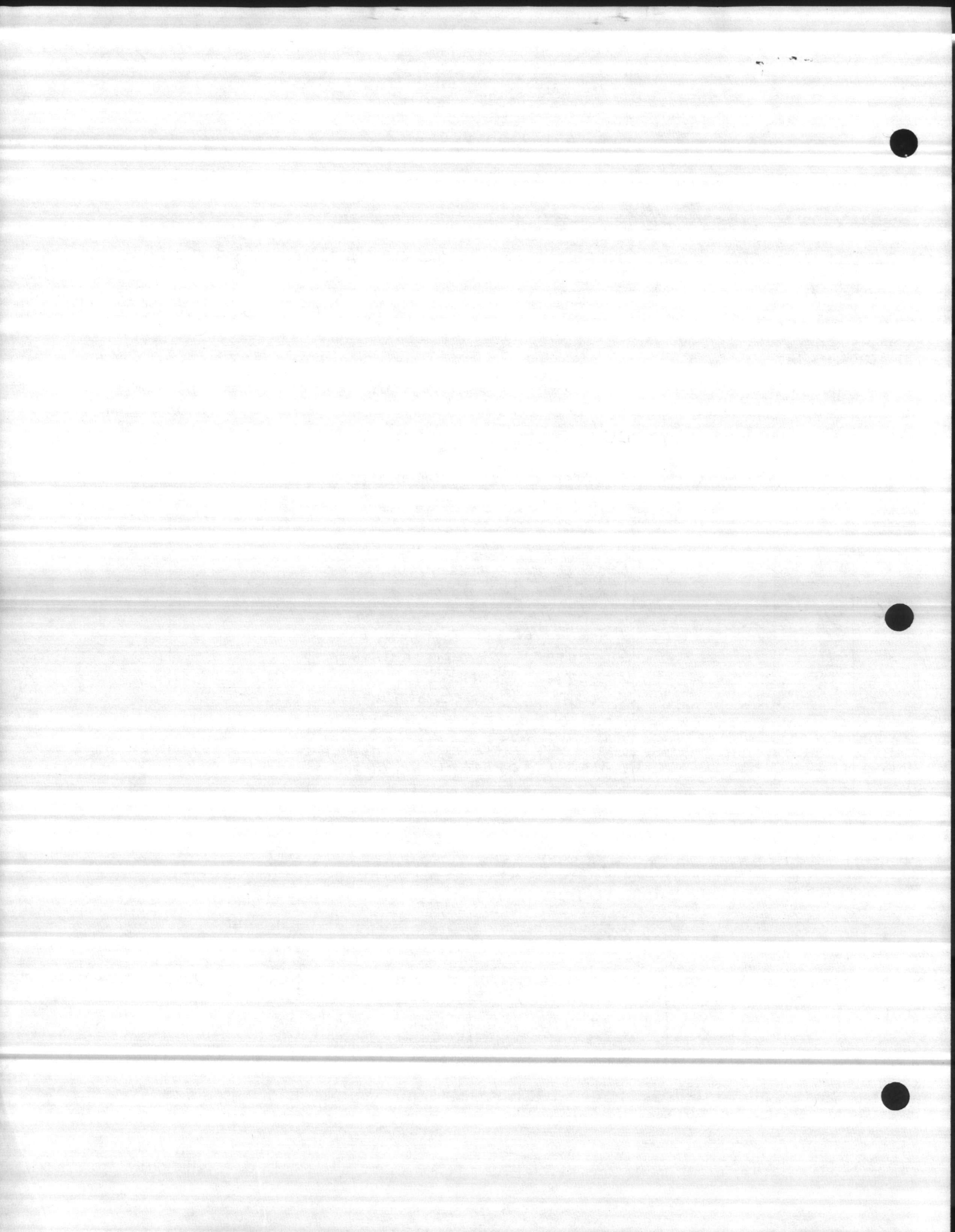
REMISSION OF REQUEST CONSTITUTES VERIFICATION OF STOCKAGE OF ITEM(S) ON EXCESS LISTINGS

SHOP WILL RECEIVE A COPY OF 2035 AFTER BUY IS MADE

AC	FA	WC	FC	OC/SOC	CAC	BRC	JON	RON	REC
7001	23	84	RP	2607	EAGO		EAGO		

***** TO BE COMPLETED BY SUPPLY ONLY *****

JULIAN DATE DOCUMENT NUMBER(S) ASSIGNED EACH ITEM ABOVE



Charles R. Underwood, Inc.
Municipal Pump Sales & Service

2189 Everett Dowdy Road
Sanford, North Carolina 27330

Phone (919) 775-2463
Fax (919) 708-7232

February 23, 2001

Quote # 01139-A

Commanding General
Att: Base Maintenance Division
Bin 1-83 Marine Corps Base
PSC Box 20004
Camp LeJeune, NC 28542-0004

Att: Danny Hill/Stanley Miller

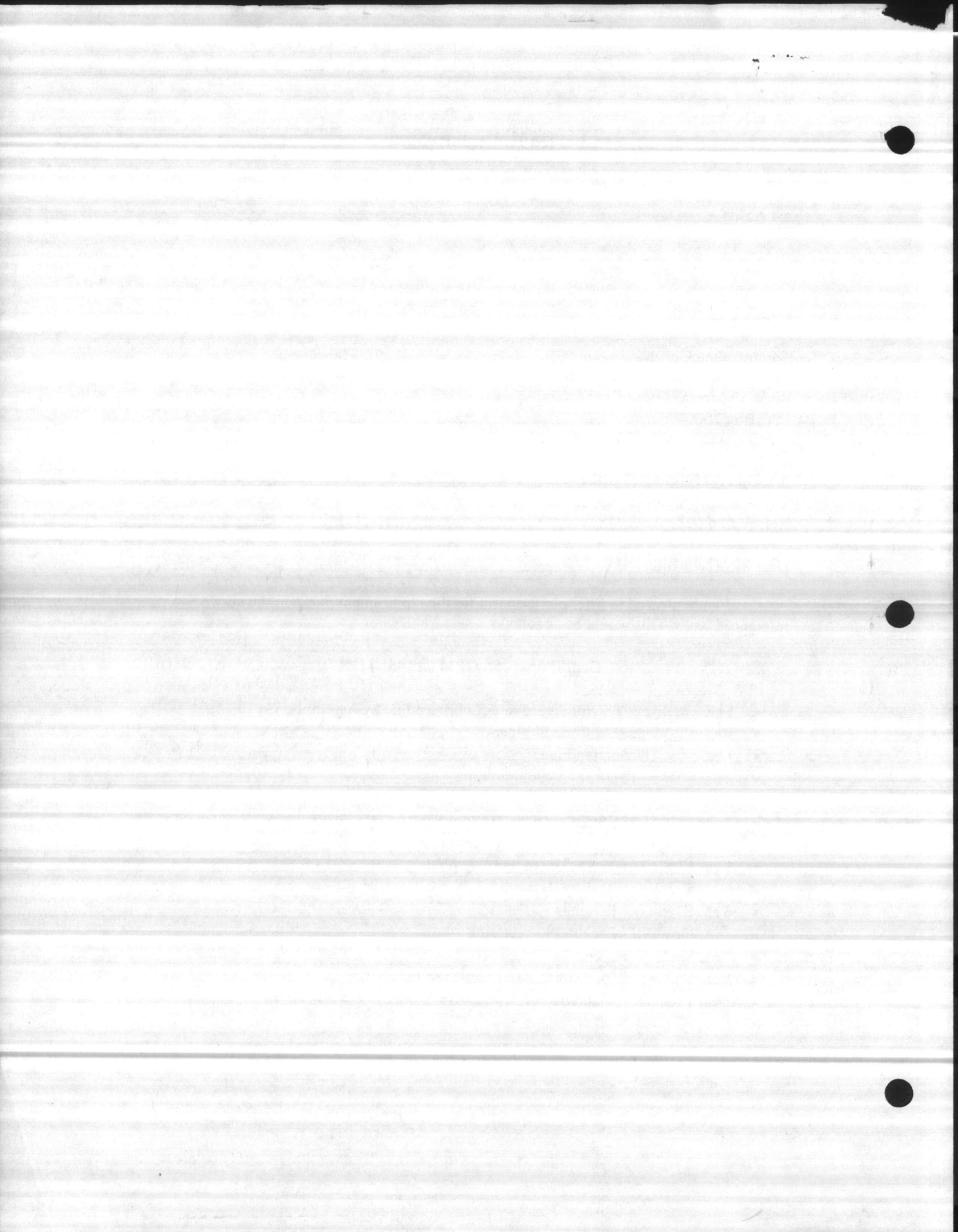
Ref: Well # 628

Dear Mr. Hill/Miller

We are pleased to offer our proposal for the replacement pump in the above referenced well. This would be as follows.

Conditions: 150 GPM @ 145' TDH

- 1 ea. Goulds 7CLC, 6 Stage, Water Lubricated Bowl Assembly
- 1 ea. 5" Galvanized Cone Strainer
- 1 ea. 5" X 10' Suction Pipe
- 2 ea. 5" X 5' Top/Bottom Column Pipe
- 6 ea. 5" X 10' Intermediate Column Pipe
- 1 ea. 1" X 5' 416 Stainless Steel Bottom Shaft
- 6 ea. 1" X 10' 416 Stainless Steel Intermediate Shaft
- 1 ea. 1" X 63" 416 Stainless Steel Top Shaft
- 6 ea. 5" Bronze Bearing Retainers
- 6 ea. 1" Rubber Bearings
- 1 ea. Floway 1" Packing Box Bearing
- 1 ea. Set GFO Packing
- 1 ea. 1" X 48" Motor Shaft, 416 Stainless Steel
- 1 ea. 1" X 25.5" Combination Gear Drive 416 Stainless Steel Shaft
- 1 ea. 1" Head Shaft Nut



DATE 7-25-00

PWSID 04-67-041

WELL # HP 628

WELL NAME HADNOT POINT HP20

BLDG. HP 628

CODE G.

AVAILABILITY P.

LOCATION SUEADS FERRY ROAD.

LATITUDE 34.65011

LONGITUDE 77.30952

WELL DIAMETER 8"

WELL DEPTH 200'

SCREEN INTERVAL _____

YIELD 86

STATIC LEVEL 26'

PUMPING LEVEL 46'

PUMP TYPE VERTICAL TURBINE

MOTOR HP 15

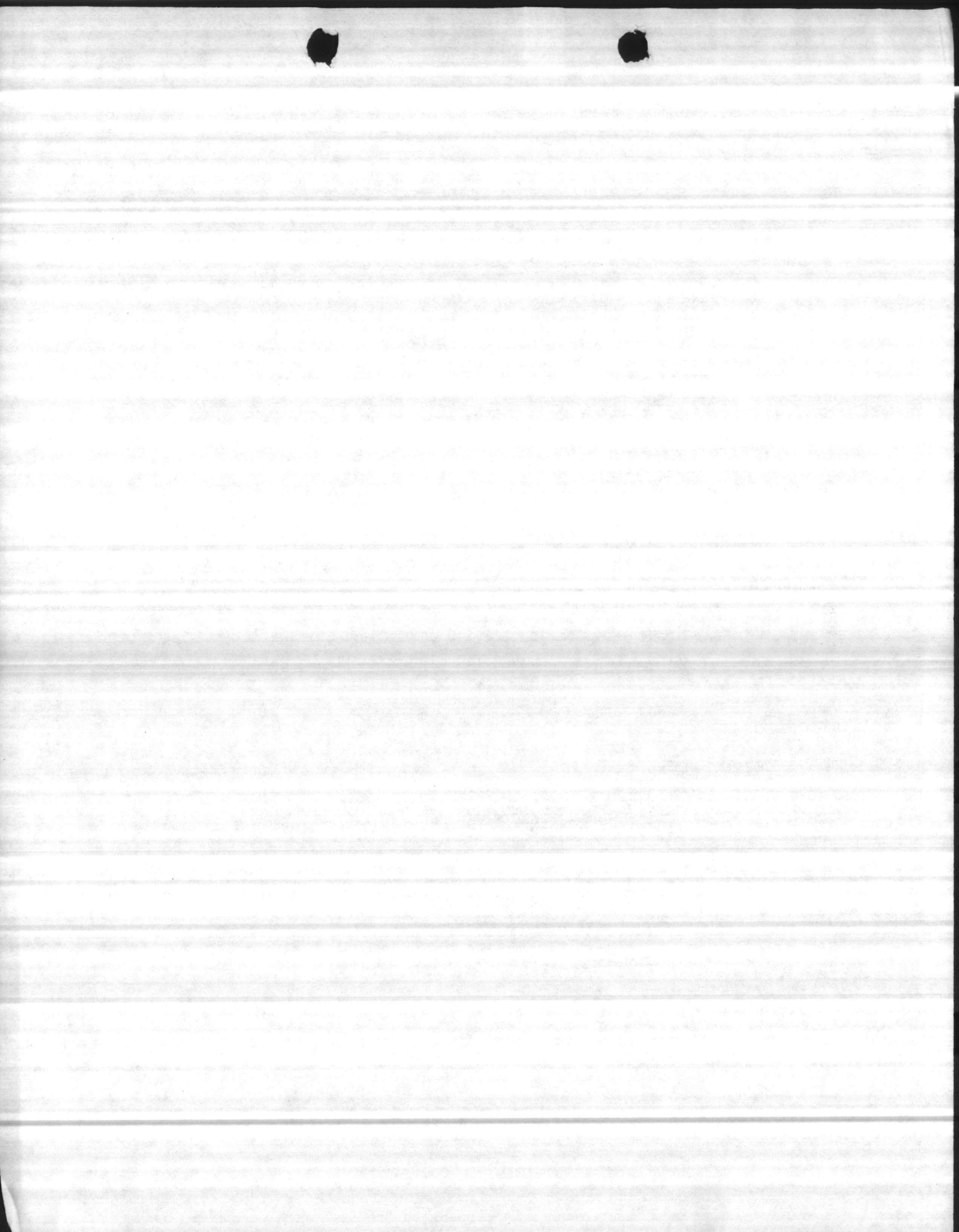
INTAKE DEPTH 70'

DESIGN CAPACITY 150

ACTUAL GPM 143

SIZE OF CONCRETE SLAB 12X14

HEIGHT OF CASING 12"



SOURCE INFORMATION GROUND WATER

Date Form Completed

M	M	D	D	Y	Y
0	1	2	5	9	5

P	W	S	I	D
0	4	6	7	0
4	1			

Owner Assigned Source Code: **628** Well Name (If purchase, name of system): **HADNOT POINT 628**

Code: **G**
G=Ground
W=Purchase/G
Y=O w/direct influence
Z=W w/direct influence

If Purchase, seller ID#: [] Source Begin Date: [] Source exempt—SWTR? Y N Direct Influence Date: [] Availability: **P**
P=Permanent
E=Emergency
S=Seasonal
I=Interim
O=Other

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

Latitude (N): **34° 39' 01.8"** Longitude (W): **077° 18' 35.3"** How Determined: **G** (G=GPS, M=Map, S=Surveyed) GPS Data: **44** (Q# or DOP #) No. of Sats. Locked on: **4**

(If purchase, use seller's primary source lat/long) Vulnerable (VOCs) Y N Assessment Date: []

ENTRY POINT INFORMATION

Owner Assigned Entry Point Code: **100** Use Code: **C** (C=Ground/Permanent, D=Ground/non-permanent) Availability: **P** (P=Year-round, E=Emergency, S=Seasonal, I=Interim, O=Other) Entry Point Name: **HR 628 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 @ 75'**

Surface water within 200'? Y N 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: **Electric heat**

Well: Diameter: **8"** Type: **SCREENED** Yield (gpm): **150** (150 GPM) Properly sealed? **Y** (Y,N)
Properly vented? **N** (Y,N) Casing depth **50** ft. (If unknown, put 'UNK') Well depth: **200'** Meter available? **Y** (Y,N)
Concrete slab adequate? **Y** (Y,N) If no, explain: _____ Size: **12x14**

Size of blow-off: **4" (v)** Sample tap: Before treatment? **Y** (Y,N) After treatment? _____ (Y,N)

Pumps: Capacity: GPM: **150 143** HP: **15** Pump intake depth: _____ Auxiliary Power? **Y** (Y,N)
Type pump: **VERTICAL TURBINE** Height above floor (pump/casing): **12"**

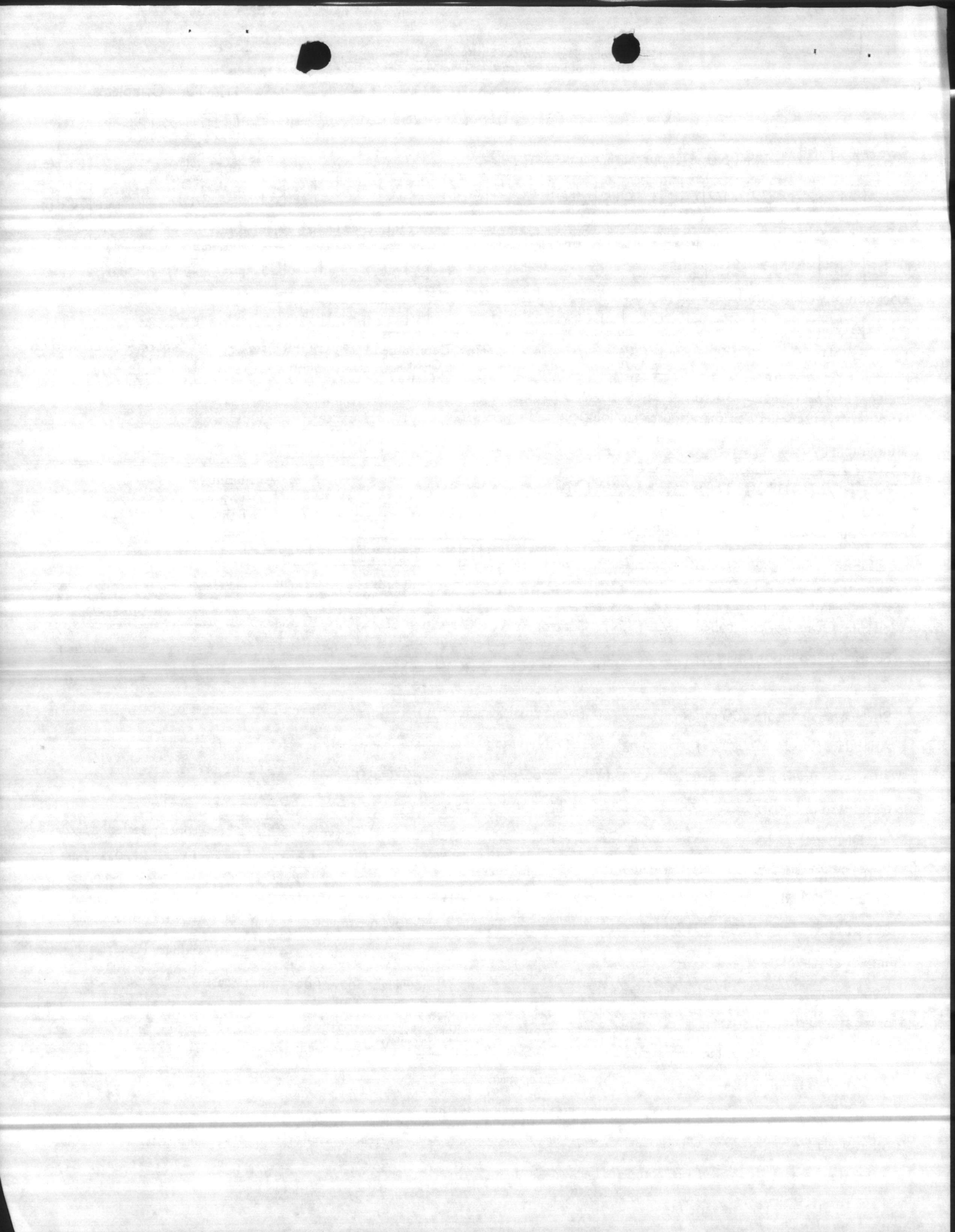
Storage at well site: Elev: [] Hydro: [] Ground: []

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? Y N 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 vent
2) sample tap 2/3 removed
3) seal pump pedestal



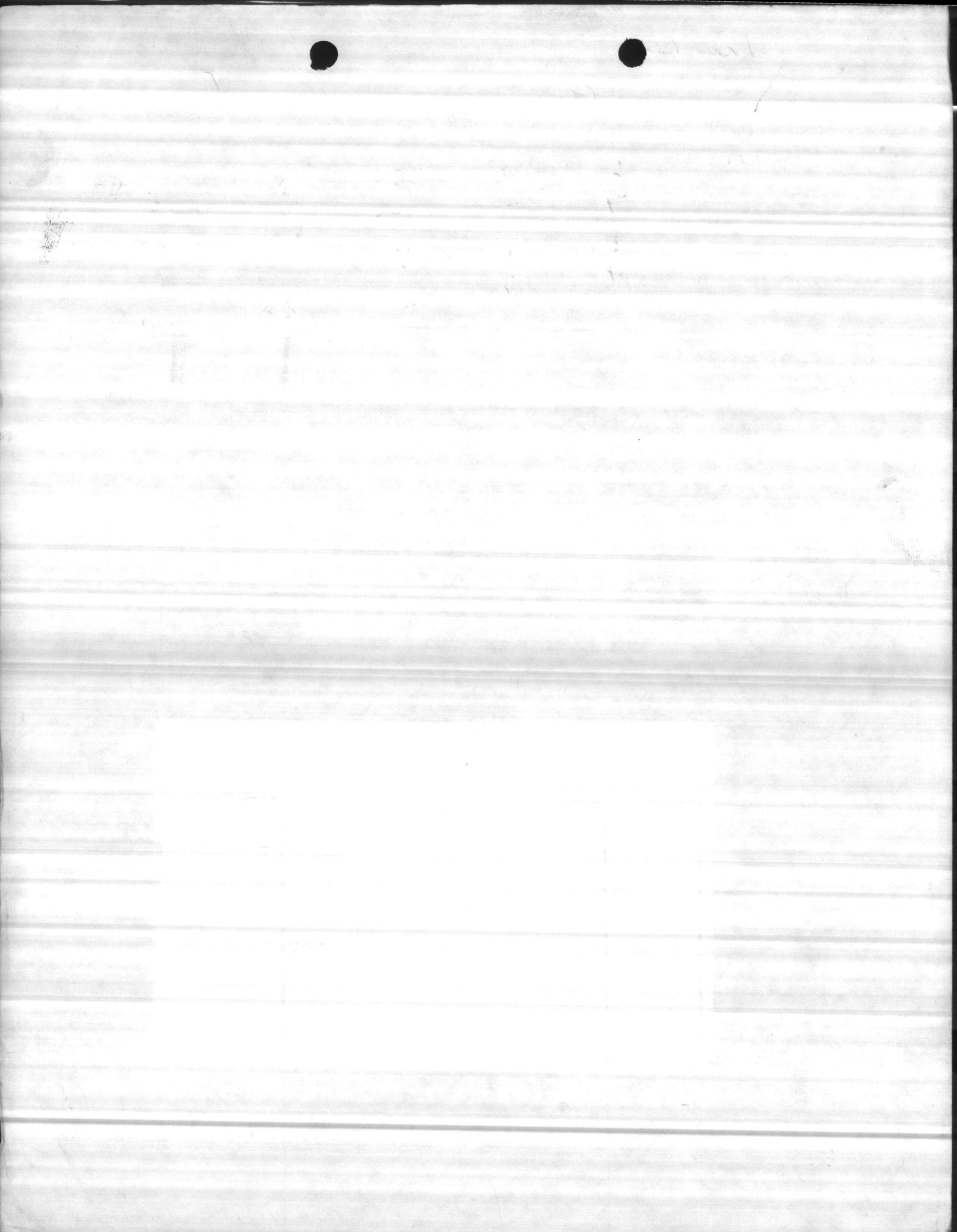
Deerhead 60

WELL NUMBER 628		BY Thomas [Signature]			DATE 10-18-88	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
88	20	46	26	42	115	60
		54	34	32	146	10
		61	41	22	170	20
		64	44	15	180	30
	→	68	48	10	190	40

REMARKS

MANUFACTURER _____ well 628 5-8-86 1PB _____ SIZE _____

AZ - 88'
 S-I - 18'
 P-L - 50' 43"
 D-D - 32'
 PSI - 34
 GPM - 150



Well 626

5-8-86

LRB

A-L 88'

S-1 18'

P-L 50' 43'

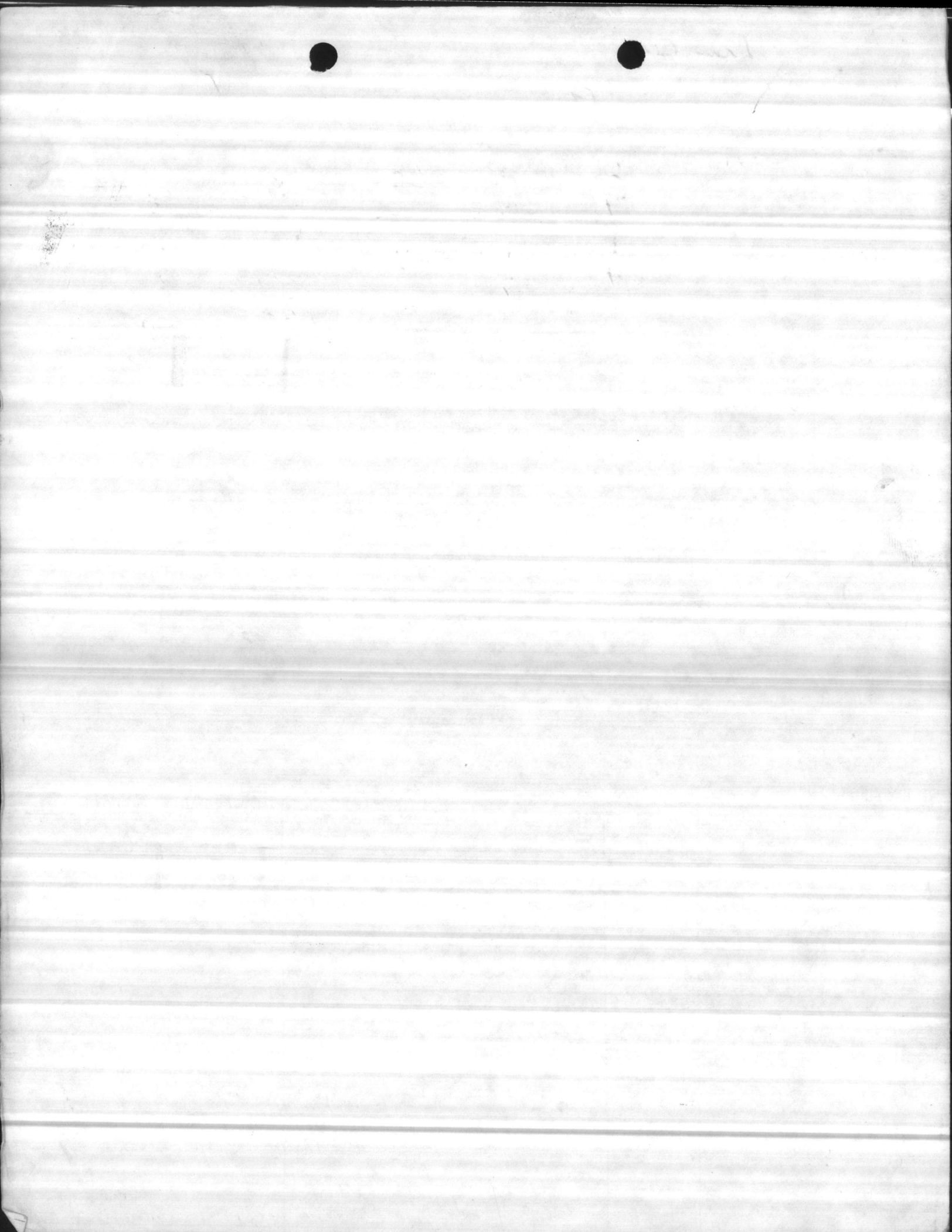
D-D 32'

PSI 34

G-AM 150

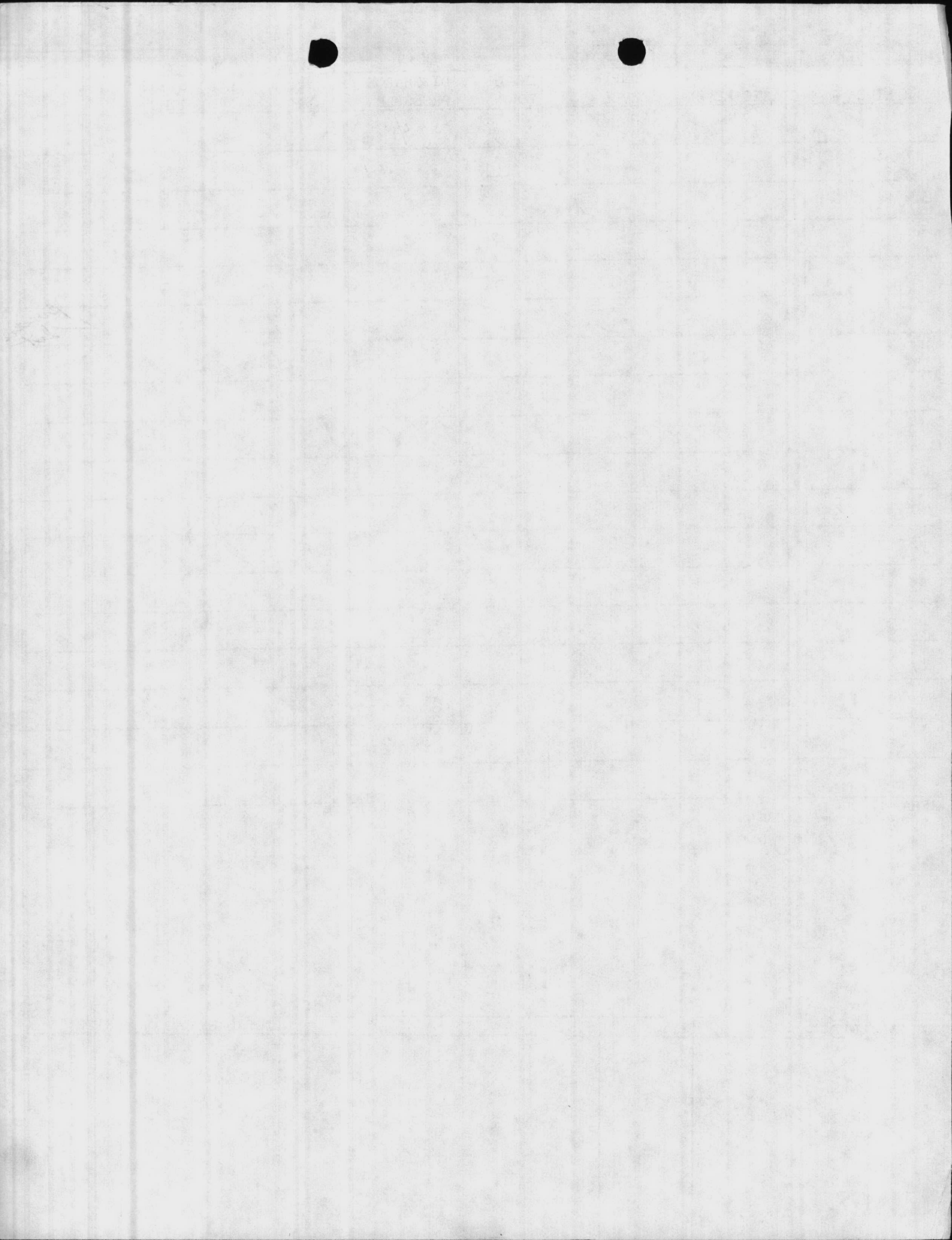
well 626

AL











628

DEPARTMENT OF THE NAVY

OFFICER IN CHARGE OF CONSTRUCTION
RESIDENT OFFICER IN CHARGE OF CONSTRUCTION
NAVAL FACILITIES ENGINEERING COMMAND CONTRACTS
CAMP LEJEUNE, NORTH CAROLINA 28542-5000

IN REPLY REFER TO:

N62470-82-C-2541
JAX/0033W/ms
24 March 1986

From: Resident Officer in Charge of Construction, Jacksonville, NC Area
To: Base Maintenance Officer, MCB, Camp Lejeune, NC (Attn: Mr. M. Frazzell)

Subj: CONTRACT N62470-82-C-2541, REPLACE WATER WELLS 612 AND 626, MCB, CAMP LEJEUNE, NC

Encl: (1) Well Data For Subject Contract

1. Enclosure (1) is provided for your information concerning the subject contract.

A handwritten signature in cursive script, appearing to read "J. L. Davis", is centered below the text.

J. L. DAVIS

NOTIFICATION
LOSS OF BOND

100-1-1-1-1

THE OFFICE OF THE ATTORNEY GENERAL
STATE OF TEXAS
DALLAS, TEXAS

1950

STATE OF TEXAS

25% COTTON

FOX RIVER BOND

69/102
102

File

CONTRACTOR'S SUBMITTAL TRANSMITTAL
LANTDIV NORFOLK 4-4355/3 (Rev. 11-80)

CONTRACT NO: 82-C-2541
TRANSMITTAL NO: 21
DATE: 11-24-84

FROM CONTRACTOR

ONSLOW UTILITIES, INC
TO ATLANTIC DIV, NAVAL FACILITIES
ENGR CMD, NAVAL STATION, NORFOLK

PROJECT TITLE AND LOCATION

Replace Water Wells, MCB, CMC
#612+626

CONTRACTOR USE ONLY WA, 23511

REVIEWER USE ONLY

*List only one specification division per form.

List only one of the following categories on each transmittal form,
and indicate which is being submitted

**ACTION CODES

- A-Approved
- D-Disapproved
- AN-Approved as noted
- RA-Receipt acknowledged.
- C-Comments
- R-Resubmit

Contractor Approved

OICC Approval

Deviation/Substitution
For OICC Approval

ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES **	REVIEWER'S INITIALS CODE AND DATE
1		WELL RECORD	3	A	CCS 405 10-31-84



CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

CONTRACTOR REPRESENTATIVE (Signature)

Charles P. Mallette

DATE RECEIVED BY REVIEWER

10-29-84

FROM (Reviewer)

Lantdiv

TO

Distribution

Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.

Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on ONE COPY of the transmittal form.

REVIEWER'S COMMENTS

COPY TO: FIELD
DATE: 12-11-84

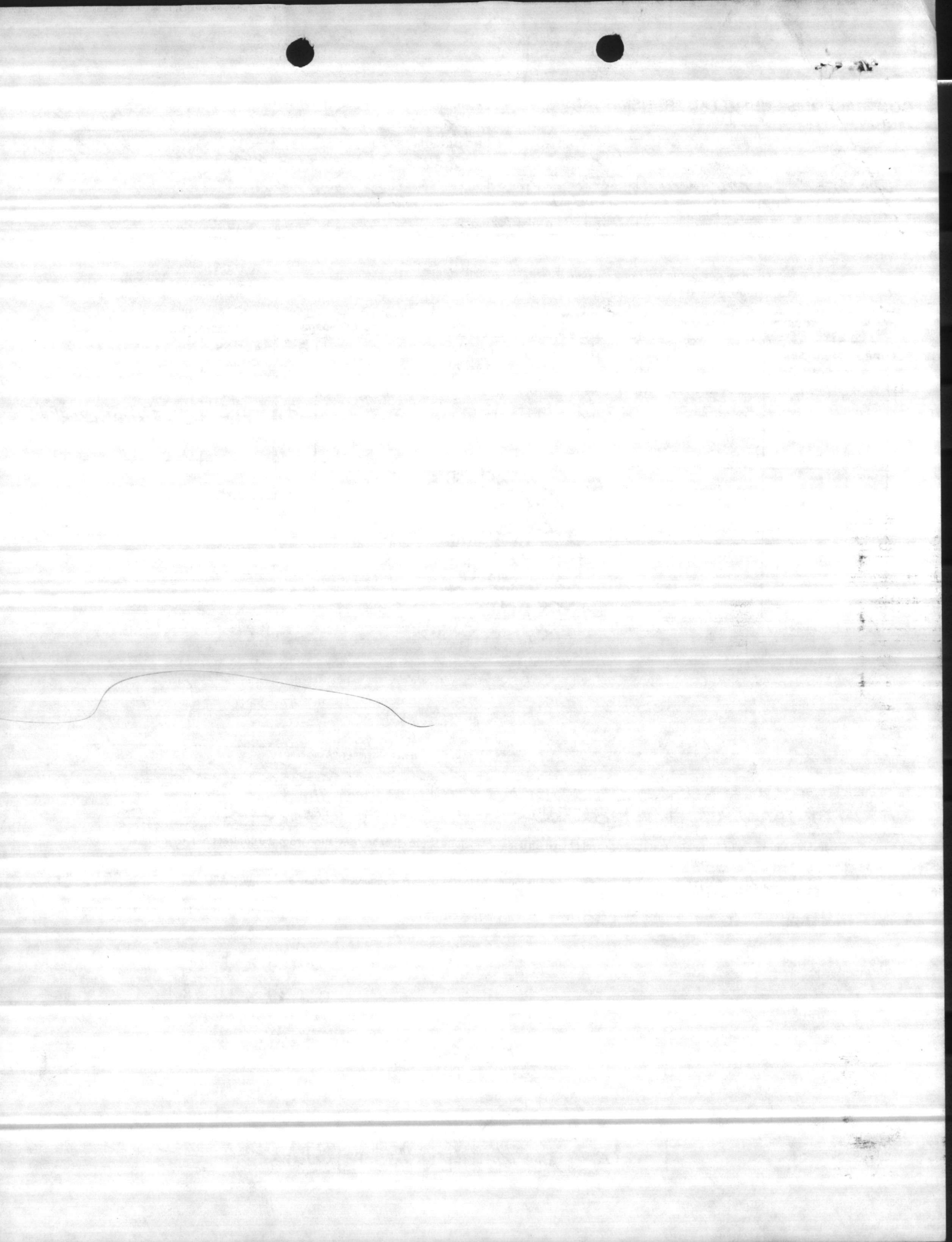
COPIES TO
ROICC (2)
LANTDIV (1)
A-E (1)

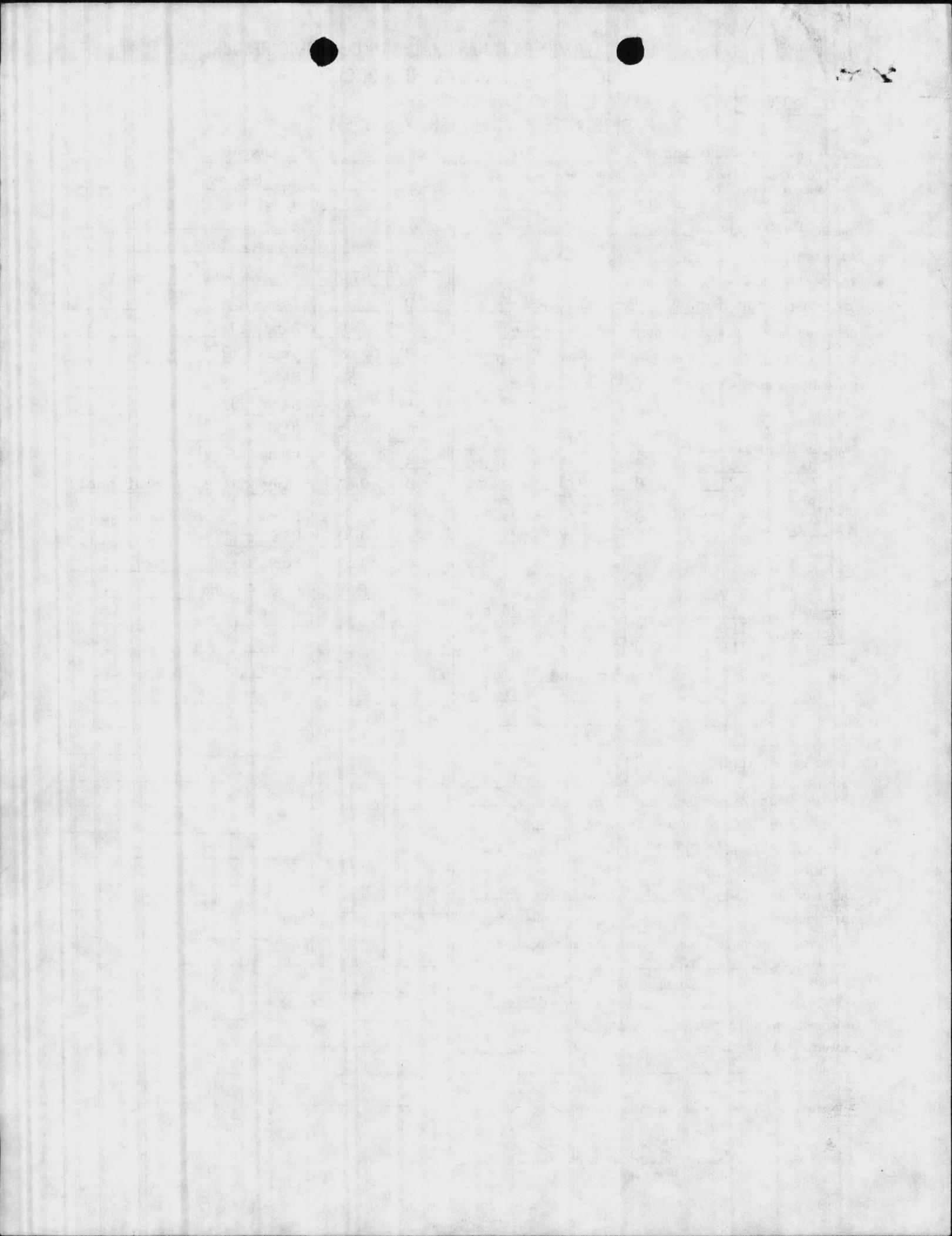
DATE

10-31-84

SIGNATURE

Dorell [Signature]





CONTRACTOR'S SUBMITTAL TRANSMITTAL
LANTDIV NORFOLK 4-4355/3 (Rev. 11-80)

Full

CONTRACT NO <i>N624 70-820-2341</i>	TRANSMITTAL NO <i>TEM (10)</i>	DATE <i>6-22-84</i>
PROJECT TITLE AND LOCATION <i>Replace water wells 612 & 626 Camp Lejeune NC (well # 626)</i>		

FROM CONTRACTOR
Onslow Utilities Inc

TO
ROICC

CONTRACTOR USE ONLY

REVIEWER USE ONLY

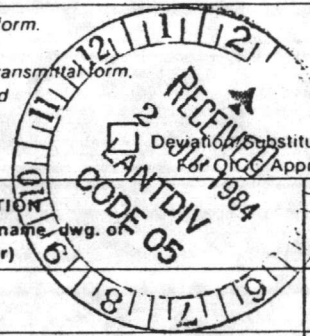
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****ACTION CODES**

List only one of the following categories on each transmittal form, and indicate which is being submitted

- A-Approved
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- C-Comments
- R-Resubmit

Contractor Approved OICC Approval



ITEM NO	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES **	REVIEWER'S INITIALS CODE AND DATE
<i>02734-</i>		<i>Drillers' Log</i>	<i>6</i>	<i>A</i>	<i>CCS 405 7-10-84</i>
		<i>Electric Log</i>	<i>6</i>	<i>↓</i>	<i>↓</i>
		<i>Water Analysis</i>	<i>6</i>	<i>↓</i>	<i>↓</i>
		<i>Recommendation and Data Submittal</i>	<i>6</i>	<i>↓</i>	<i>↓</i>

CONTRACTOR'S COMMENTS
Submittal for well # 626

COPY TO: **FIELD**
 DATE: *8-10-84*

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC _____

CONTRACTOR REPRESENTATIVE (Signature)
Ronald R. Allen

DATE RECEIVED BY REVIEWER *2 July 84* FROM (Reviewer) *LANTDIV* TO *ONSLow UTILITIES*

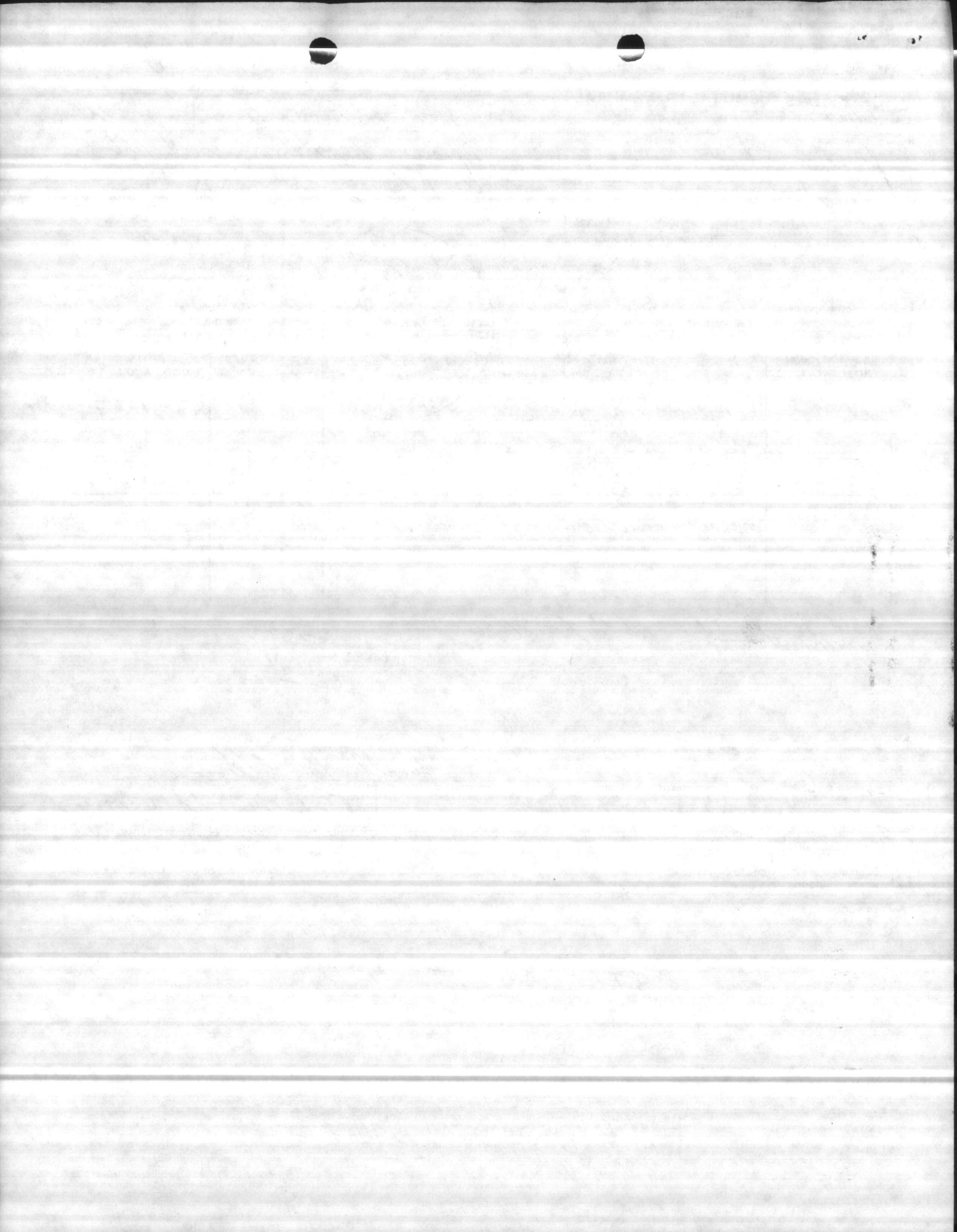
Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.

Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on ONE COPY of the transmittal form.

REVIEWER'S COMMENTS
APPROVED

COPIES TO
ROICC (2)
LANTDIV (1)
A-E (1)

DATE *12 July 84* SIGNATURE *J. Martin*



ONslow UTILITIES, INC.
General Contractors
Post Office Box 5498
Jacksonville, North Carolina 28540

June 25, 1984

Officer in Charge of Construction
Building 1005, Marine Corps Base
Camp LeJeune, N.C. 28542

Re: N62470-82-C-2541
Replace Water Wells 612 and 626
Camp LeJeune, N.C.
(Well No. 626)

Gentlemen: 628

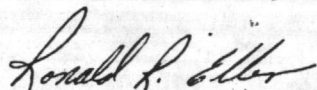
We are enclosing six (6) copies of the Driller's Log, Electric Log and Water Analysis for your review. The test well was drilled 202 feet deep. Water samples were taken at the 63 to 68, 117 to 122 and 144 to 149 levels.

We recommend a line of .16 slot screens set at the 60 to 70, 84 to 89, 110 to 120, and 135 to 145 levels for a total of 35 VG of screens. The gravel pack recommended is a medium sand. It is our best estimate that this well may yield 175 to 225 GPM.

Please review the data and advise if we are to proceed with developing a permanent well at this site.

Yours truly,

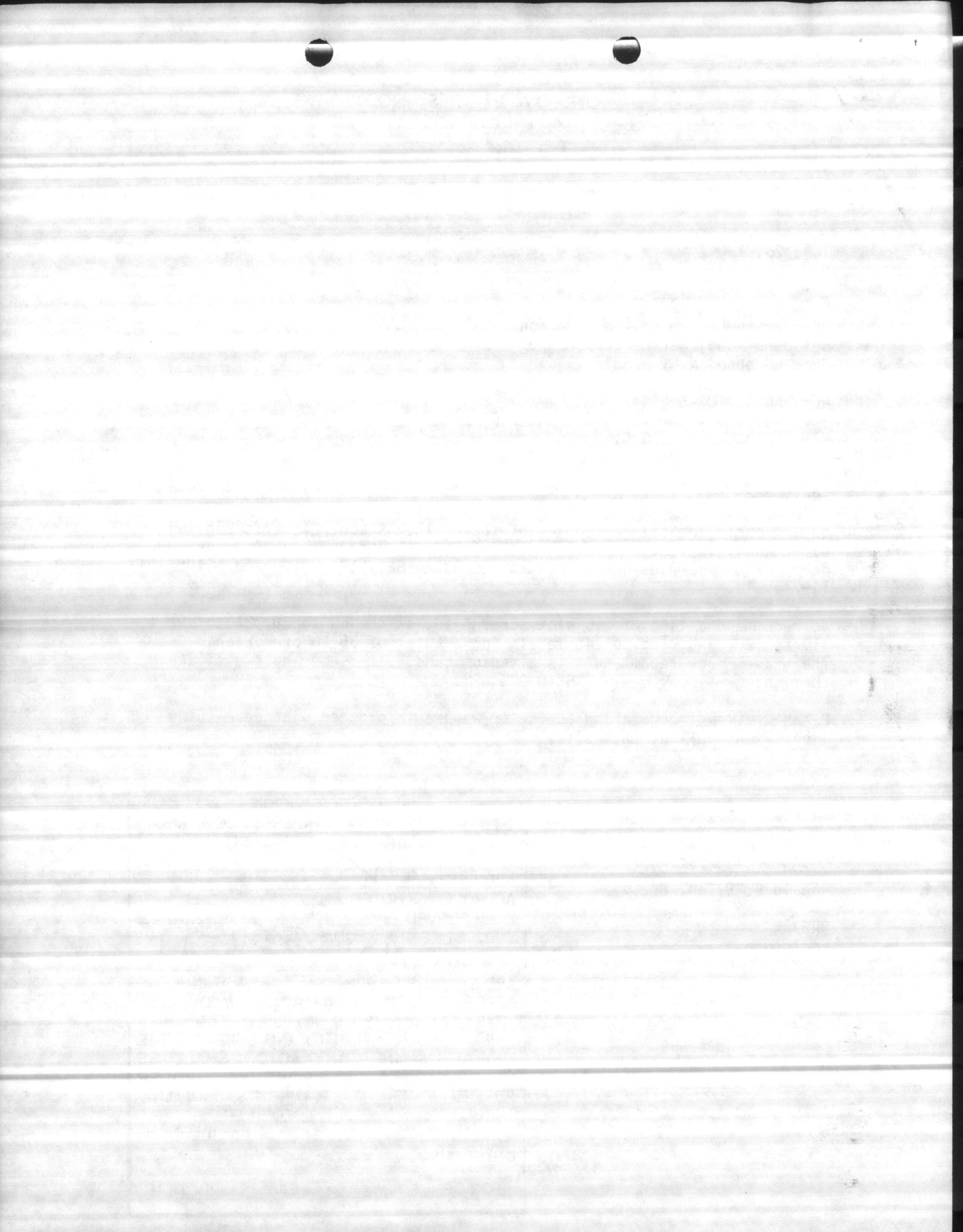
ONslow UTILITIES, INC.



Ronald R. Ellen, Pres.

RRE/ck
Enclosures

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511	
APPROVED <input checked="" type="checkbox"/>	_____
APPROVED AS NOTED	_____
DISAPPROVED	_____
SUBJECT TO THE REQUIREMENTS OF	
CONTRACT NO. <u>05-82-2541</u>	
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CONTRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIATION--THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER PHYSICAL DIMENSIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.	
REVIEWER <u>CCS</u>	DATE <u>10 JUL 1984</u>
FOR OFFICER IN CHARGE OF CONSTRUCTION	



CAROLINA WELL AND PUMP COMPANY, INC.

Complete Well and Pump Service

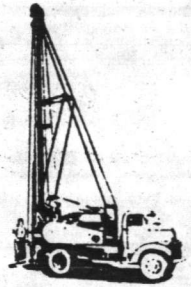
P. O. BOX 1085

TELEPHONE 776-3415

SANFORD, NORTH CAROLINA 27330



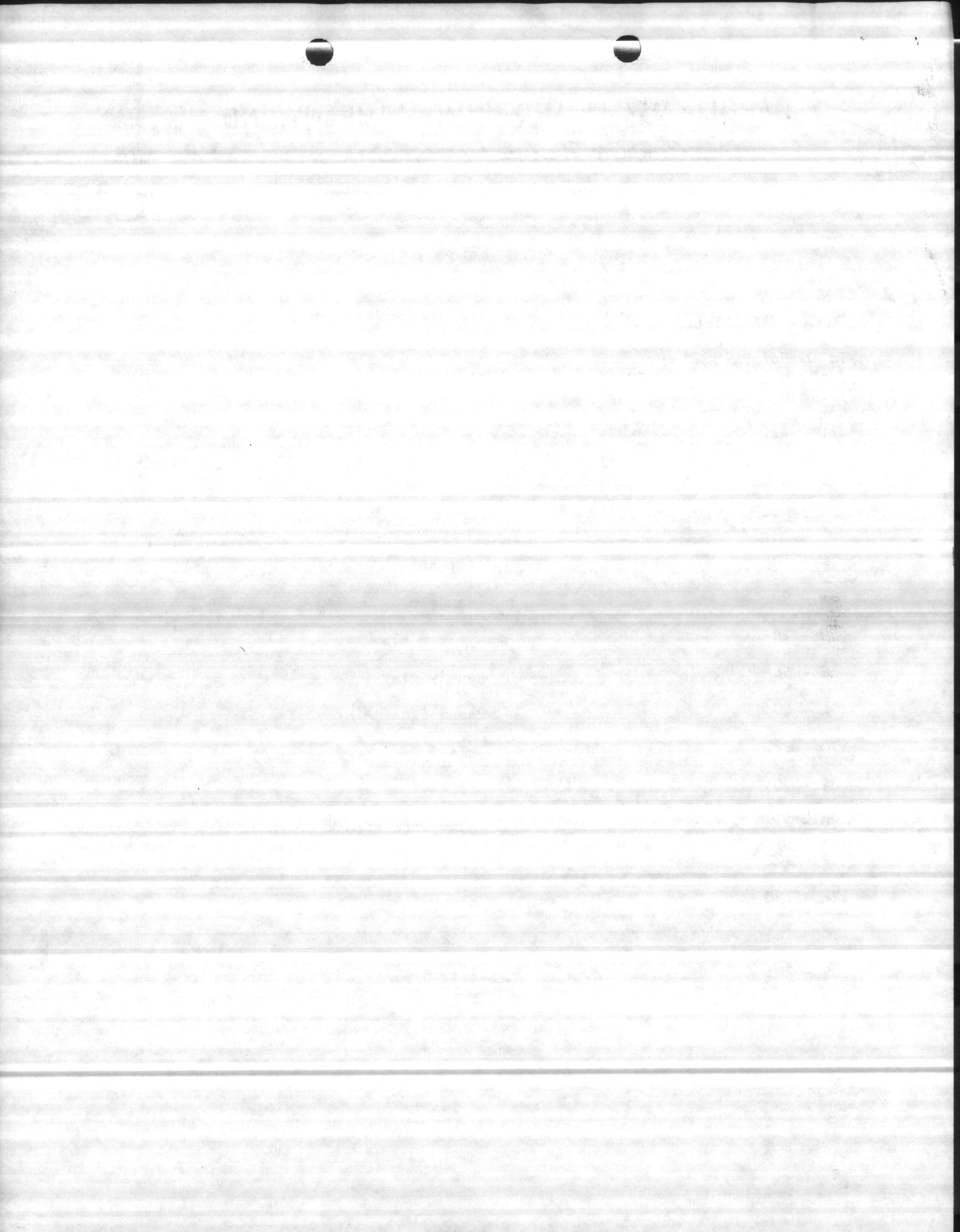
N.W.W.A.
N.C.W.W.A.



Onslow Utilities, Inc.
General Contractors
P. O. Box 5498
Jacksonville, N. C. 28540

Contract N62470-82-C-2541
Job Well 626
Location Camp LeJeune, N. C.

0 - 1	top soil
1 - 9	sandy clay
9 - 18	yellow clay
18 - 54	sandy clay
54 - 70	sand fine
70 - 82	clay
82 - 90	rock
90 - 112	clay with streak of shell
112 - 122	rock med.
122 - 130	clay
130 - 145	rock
145 - 201	clay & sand



WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA 29312

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

(R03) 479-4639

6,26

DATE: June 5, 1984

Report To: Carolina Well & Pump Co.
Sanford, N.C.

Date Analyzed: 6/5/84

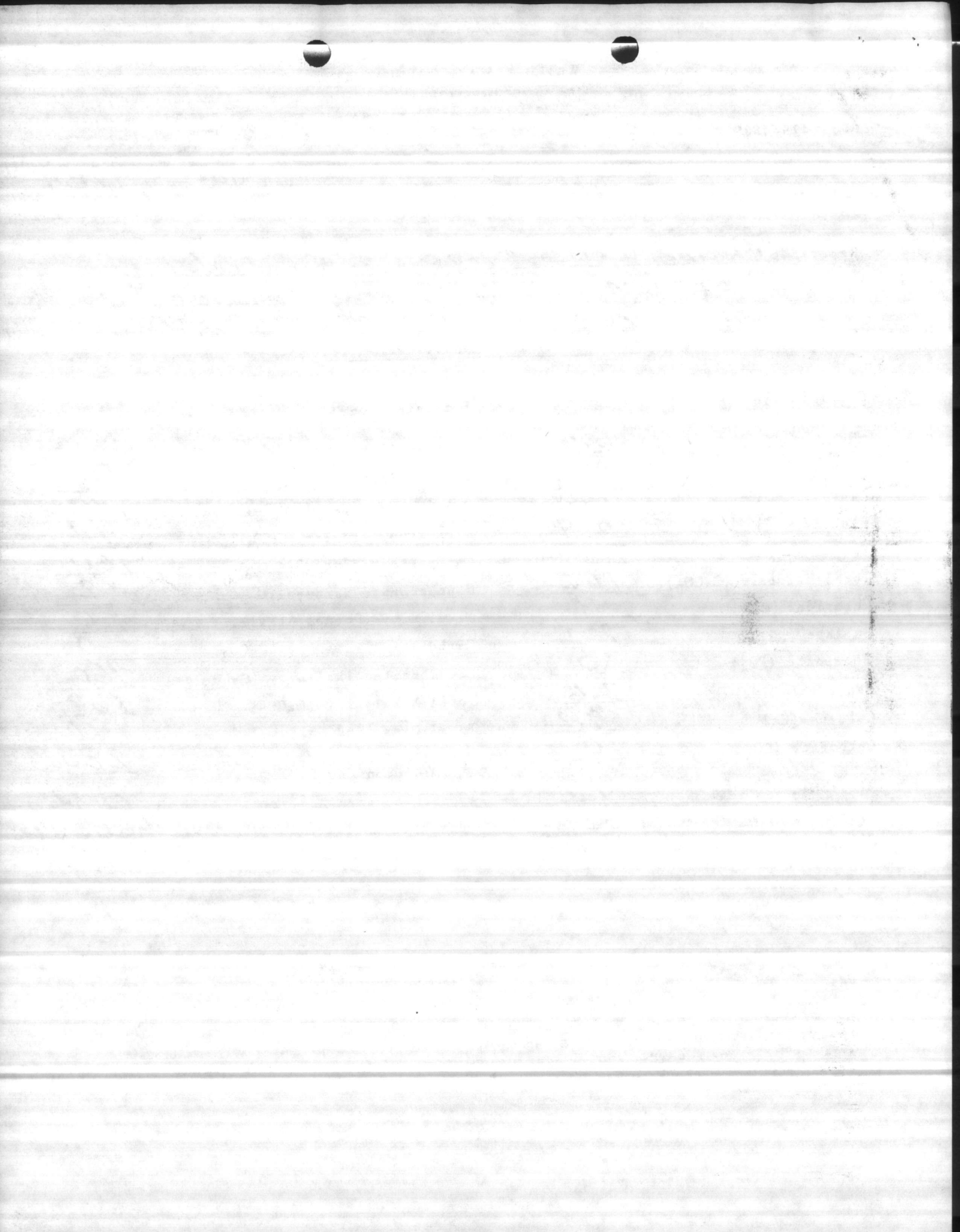
Sample Number: Sample #1
63-68'

Analysis Results--Parts Per Million

<u>Determination</u>		<u>Determination</u>	
pH	<u>6.6</u>	Carbon Dioxide (CO ₂)	<u>11</u>
Iron (Fe)	<u>0.1</u>	Total Acidity (CaCO ₃)	<u>15</u>
Nitrate (NO ₃)	<u>TRACE</u>	Calcium Hardness (CaCO ₃)	<u>148</u>
Fluoride (F)	<u>0.4</u>	Magnesium Hardness (CaCO ₃)	<u>14</u>
Manganese (Mn)	<u>TRACE</u>	Carbonate Hardness (CaCO ₃)	<u>160</u>
Total Hardness (CaCO ₃)	<u>162</u>	Noncarbonate Hardness (CaCO ₃)	<u>2</u>
Chlorides (Cl)	<u>8</u>	Alkalinity (Phenolphthalein) (CaCO ₃)	<u>0</u>
Sulfate (SO ₄)	<u>2.2</u>	Carbonate Alkalinity (CaCO ₃)	<u>0</u>
Phosphate (PO ₄)	<u>0</u>	Bicarbonate Alkalinity (CaCO ₃)	<u>160</u>
Magnesium (Mg)	<u>3.6</u>	Total Alkalinity (CaCO ₃)	<u>160</u>
Calcium (Ca)	<u>59.2</u>	Total Dissolved Solids	<u>196</u>
Carbonate (CO ₃)	<u>0</u>	Specific Conductance (micromhos at 25°C)	<u>280</u>
Bicarbonate (HCO ₃)	<u>195</u>	Appearance When Analyzed	<u>clear</u>
Hydroxide (OH)	<u>0</u>	Odor When Analyzed	<u>NOT objectionable</u>

SIGNED _____
LABORATORY DIRECTOR

ANALYTICAL METHODS REFERENCES: 'STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTE-WATER,' APHA, AWWA AND WPCF AND 'METHODS FOR COLLECTION AND ANALYSIS OF WATER SAMPLES,' WATER SUPPLY PAPER 1434 (1960), U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C.



WATER ANALYSIS LABORATORY
 302 HAMLET HIGHWAY
 BENNETTSVILLE, SOUTH CAROLINA
 29312

CONSULTANTS FOR:
 INDUSTRY
 MUNICIPALITIES
 HOME OWNERS
 DEVELOPERS
 IRRIGATION
 OTHERS

(RR3) 479-4639

126

DATE: June 5, 1984

Report To: CAROLINA Well & Pump Co.
SANFORD, N.C.

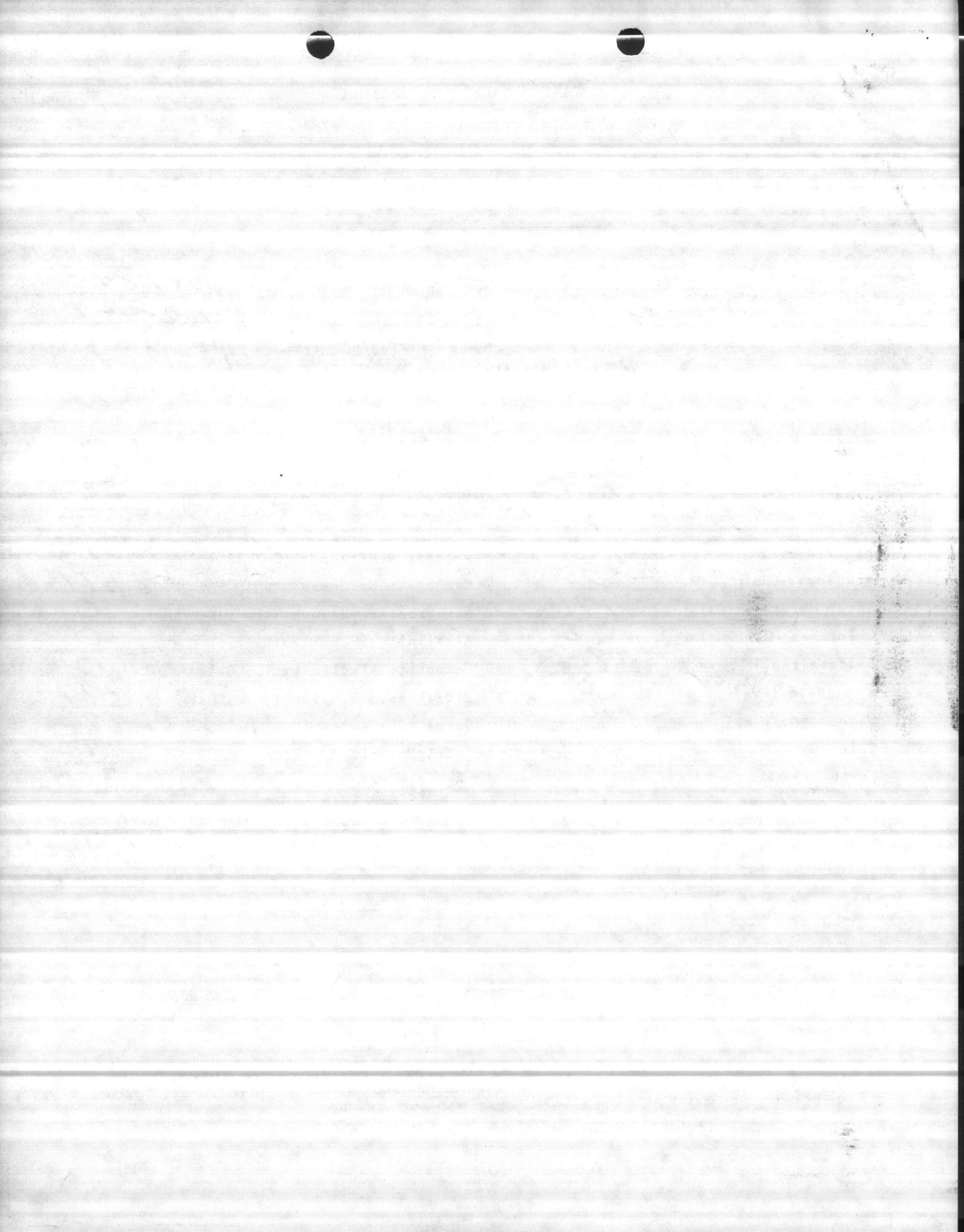
Date Analyzed: 6/5/84
 Sample Number: SAMPLE # 2
117'-122'

Analysis Results--Parts Per Million

<u>Determination</u>		<u>Determination</u>	
pH	<u>6.9</u>	Carbon Dioxide (CO ₂)	<u>6</u>
Iron (Fe)	<u>0.2</u>	Total Acidity (CaCO ₃)	<u>9</u>
Nitrate (NO ₃)	<u>TRACE</u>	Calcium Hardness (CaCO ₃)	<u>153</u>
Fluoride (F)	<u>0.5</u>	Magnesium Hardness (CaCO ₃)	<u>18</u>
Manganese (Mn)	<u>.05</u>	Carbonate Hardness (CaCO ₃)	<u>171</u>
Total Hardness (CaCO ₃)	<u>171</u>	Noncarbonate Hardness (CaCO ₃)	<u>0</u>
Chlorides (Cl)	<u>12</u>	Alkalinity (Phenolphthalein) (CaCO ₃)	<u>0</u>
Sulfate (SO ₄)	<u>8.6</u>	Carbonate Alkalinity (CaCO ₃)	<u>0</u>
Phosphate (PO ₄)	<u>0</u>	Bicarbonate Alkalinity (CaCO ₃)	<u>174</u>
Magnesium (Mg)	<u>4.2</u>	Total Alkalinity (CaCO ₃)	<u>174</u>
Calcium (Ca)	<u>61.2</u>	Total Dissolved Solids	<u>210</u>
Carbonate (CO ₃)	<u>0</u>	Specific Conductance (micromhos. at 25°)	<u>300</u>
Bicarbonate (HCO ₃)	<u>106</u>	Appearance When Analyzed	<u>Clear</u>
Hydroxide (OH)	<u>0</u>	Odor When Analyzed	<u>NOT objectionable</u>

SIGNED: _____
 LABORATORY DIRECTOR

ANALYTICAL METHODS REFERENCES: 'STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTE-WATER,' APHA, AWWA AND WPCF AND 'METHODS FOR COLLECTION AND ANALYSIS OF WATER SAMPLES,' WATER SUPPLY PAPER 1434 (1960), U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C.



WATER ANALYSIS LABORATORY
 802 HAMLET HIGHWAY
 BENNETTSVILLE, SOUTH CAROLINA
 29312

CONSULTANTS FOR:
 INDUSTRY
 MUNICIPALITIES
 HOME OWNERS
 DEVELOPERS
 IRRIGATION
 OTHERS

(803) 479-4639

DATE: June 5, 1984

Report To: CAROLINA Well & Pump Co. Date Analyzed: 6/5/84
SANFORD, N.C. Sample Number: SAMPLE #3

Analysis Results--Parts Per Million

144-149

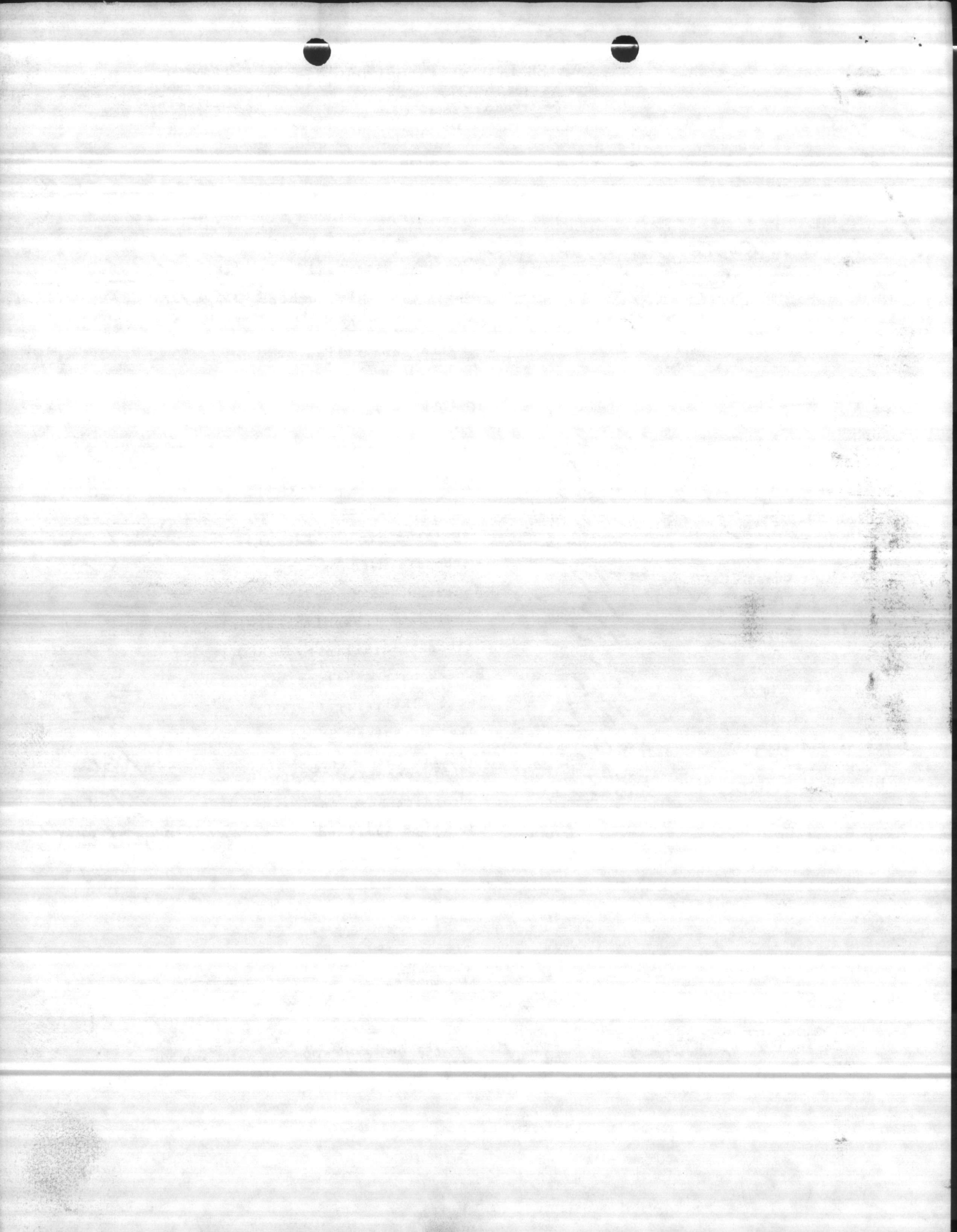
Determination	
pH	<u>7.2</u>
Iron (Fe)	<u>0.2</u>
Nitrate (NO ₃)	<u>TRACE</u>
Fluoride (F)	<u>0.4</u>
Manganese (Mn)	<u>.05</u>
Total Hardness (CaCO ₃)	<u>77</u>
Chlorides (Cl)	<u>13</u>
Sulfate (SO ₄)	<u>4.5</u>
Phosphate (PO ₄)	<u>0</u>
Magnesium (Mg)	<u>2.6</u>
Calcium (Ca)	<u>26.2</u>
Carbonate (CO ₃)	<u>0</u>
Bicarbonate (HCO ₃)	<u>6.3</u>
Hydroxide (OH)	<u>0</u>

Determination	
Carbon Dioxide (CO ₂)	<u>0</u>
Total Acidity (CaCO ₃)	<u>0</u>
Calcium Hardness (CaCO ₃)	<u>66</u>
Magnesium Hardness (CaCO ₃)	<u>11</u>
Carbonate Hardness (CaCO ₃)	<u>52</u>
Noncarbonate Hardness (CaCO ₃)	<u>25</u>
Alkalinity (Phenolphthalein) (CaCO ₃)	<u>0</u>
Carbonate Alkalinity (CaCO ₃)	<u>0</u>
Bicarbonate Alkalinity (CaCO ₃)	<u>52</u>
Total Alkalinity (CaCO ₃)	<u>52</u>
Total Dissolved Solids	<u>112</u>
Specific Conductance (micromhos at 25°C)	<u>160</u>
Appearance When Analyzed	<u>CLEAR</u>
Odor When Analyzed	<u>NOT objectionable</u>

SIGNED

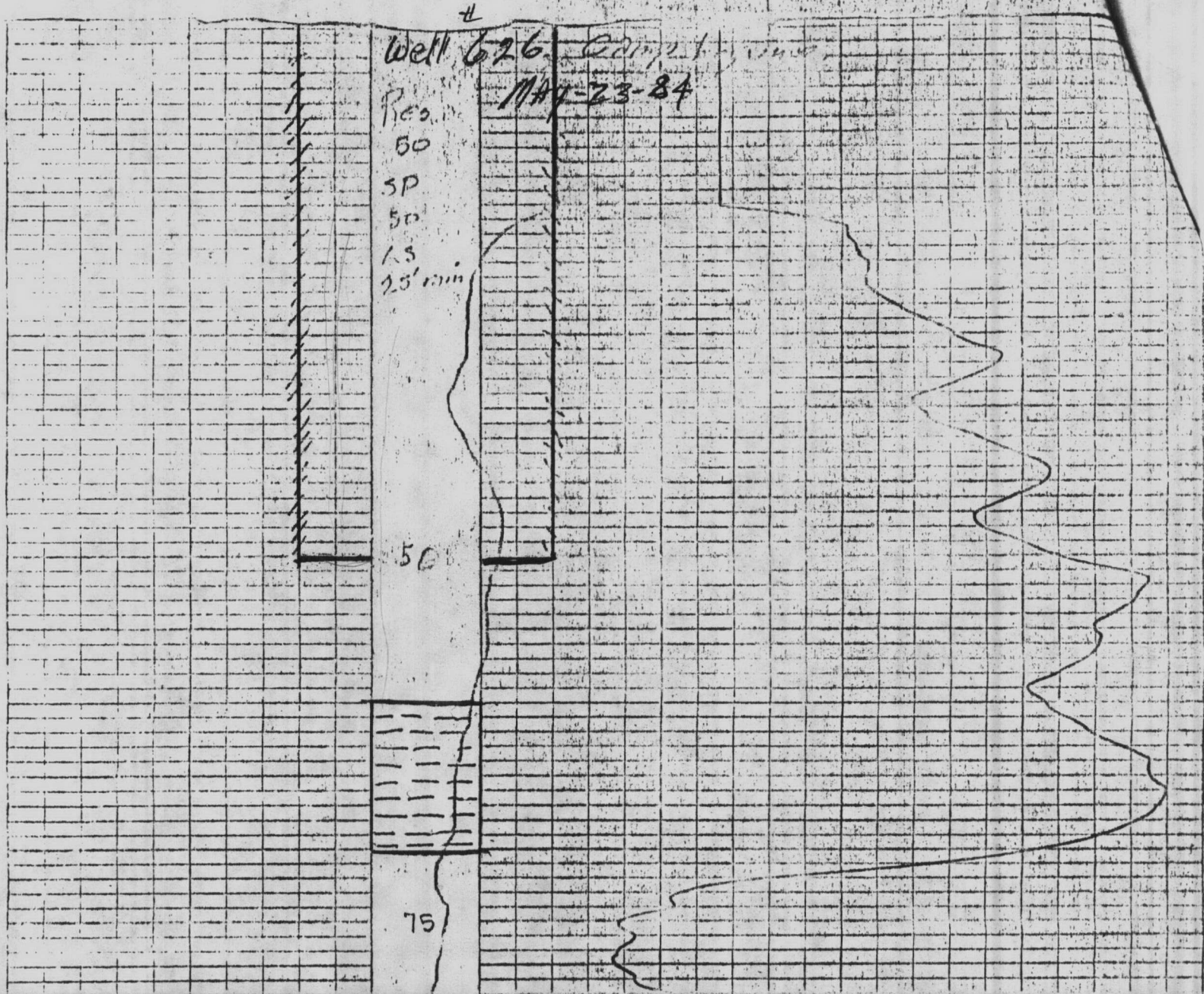
LABORATORY DIRECTOR

ANALYTICAL METHODS REFERENCES: "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTE WATER," APHA, AWWA AND WPCF AND "METHODS FOR COLLECTION AND ANALYSIS OF WATER SAMPLES," WATER SUPPLY PAPER 1454 (1960), U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C.



SP 50
Res 50
LS 25'

50
75





File

60/102

CONTRACTOR'S SUBMITTAL TRANSMITTAL

LANTDIV NORFOLK 4-4355/3 (Rev. 11-80)

CONTRACT NO 82-B-2541	TRANSMITTAL NO 18	DATE 10-18-84
--------------------------	----------------------	------------------

FROM CONTRACTOR

ONSLOW UTILITIES, INC.
 TO ATLANTIC DIV, NAVAL FAC ENGR
 CMD, NAVAL STATION, NORFOLK VA. 23511

PROJECT TITLE AND LOCATION

Replace Water Wells, MCB
 CLNC #626

CONTRACTOR USE ONLY

*List only one specification division per form.

List only one of the following categories on each transmittal form, and indicate which is being submitted

Contractor Approved

OICC Approval

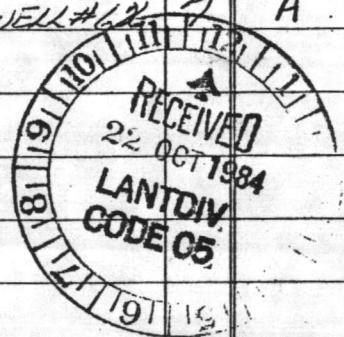
Deviation/Substitution For OICC Approval

REVIEWER USE ONLY

**ACTION CODES

- A-Approved
- D-Disapproved
- AN-Approved as noted
- RA-Receipt acknowledged.
- C-Comments
- R-Resubmit

ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DATE
1	02734.3.16	PUMPING TEST DATA - WELL #626	7	A	CCS 405 10-23-84



CONTRACTOR'S COMMENTS

Resubmitted as per our phone conversation, 10-18-84. Electric Log, Water Quality Analysis, Draw Down Test previously approved.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

CONTRACTOR REPRESENTATIVE (Signature)

Charles A. Mallette

DATE RECEIVED BY REVIEWER

10/22/84

FROM (Reviewer)

LANTDIV

TO

ONSLOW / ROICC

Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.

Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on ONE COPY of the transmittal form.

REVIEWER'S COMMENTS

COPY TO: FIELD

DATE: 11-15-84

COPIES TO
 ROICC (2)
 LANTDIV (1)
 A-E (1)

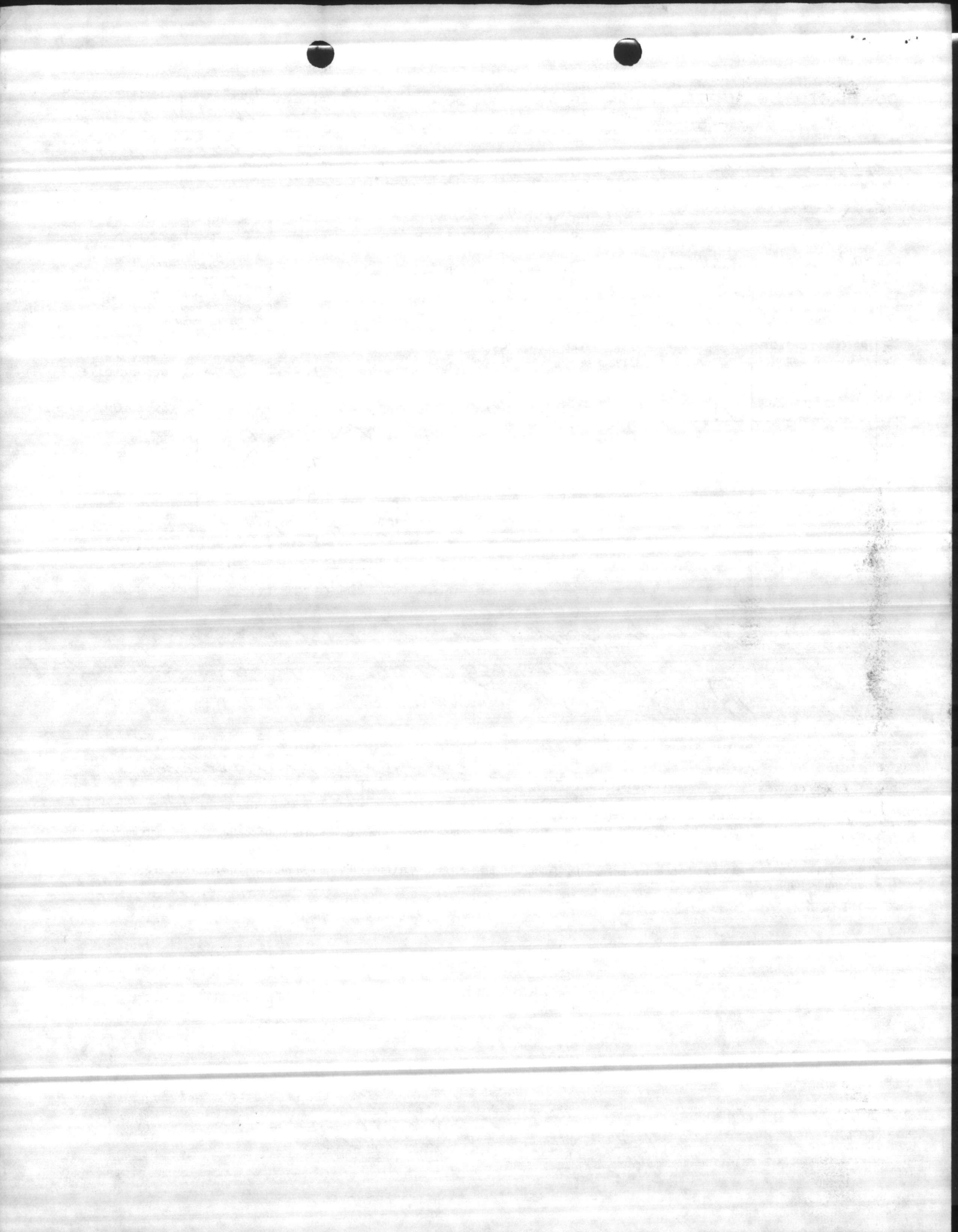
DATE

10/23/84

SIGNATURE

J. Harts

10/7/84

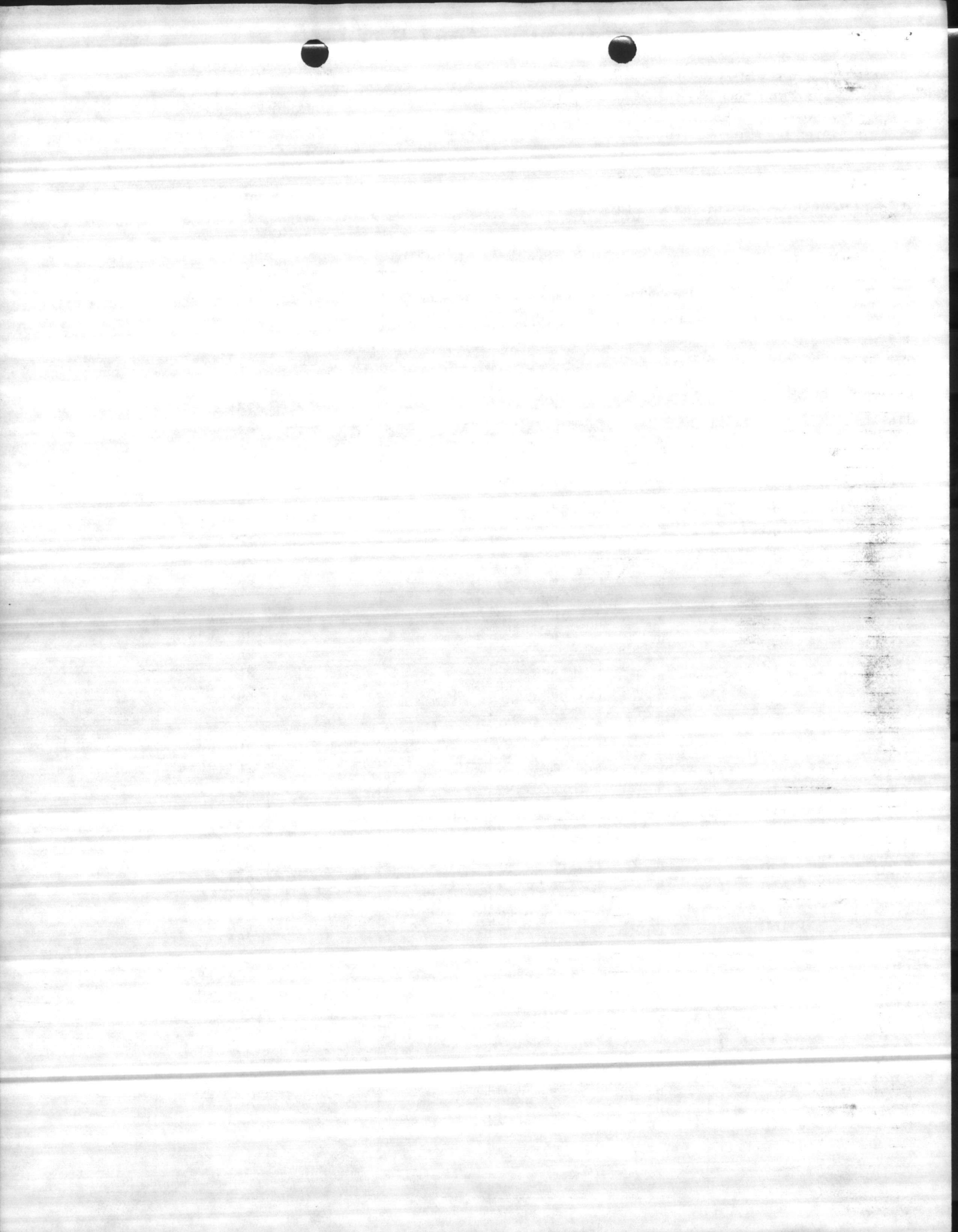


PUMPING TEST DATA

Conducted by: Carolina Well & Pump Co. Roger Thomas
 Owner: Camp Lejeune Address: _____
 Pumped Well No.: 626 Location: _____ County: Onslow
 Observation Well Locations: _____
 Airline Lengths: Pumped Well _____ Observation Wells _____
 Remarks: _____
 Pumping Rate Measured With: 4x6 orifice Water Levels Measured With: E. Tape

PUMP WELL DATA

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
10-2-84		6	160				
8:30	0	6	160			11	
8:35	5	"	"			22"	water clear
8:40	10	"	"			23' 2"	
8:45	15	"	"			23' 2"	
8:50	20	"	"			23' 2"	
8:55	25	"	"			23' 2"	
9:00	30	"	"			23' 3"	
9:05	35	"	"			23' 4"	
9:10	40	"	"			24'	
9:15	45	"	"			24'	
9:20	50	"	"			24'	
9:25	55	"	"			24'	
9:30	60	"	"			24' 1"	
9:35	65	"	"			24' 1"	
9:40	70	"	"			24' 1"	
9:45	75	"	"			24' 1"	
9:50	80	"	"			24' 1"	
9:55	85	"	"			24' 1"	
10:00	90	"	"			24' 1"	
10:05	95	"	"			24' 8"	
10:10	100	"	"			24' 8"	
10:15	105	"	"			24' 8"	
10:20	110	"	"			25'	
10:25	115	"	"			25'	
10:30	120	"	"			25'	
10:35	125	"	"			25'	
10:40	130	"	"			25'	
10:50	140	"	"			25'	
11:00	150	"	"			25'	
11:10	160	"	"			25'	
11:20	170	"	"			25'	
11:30	180	"	"			26' 1"	
11:40	190	"	"			26' 1"	
11:55	205	"	"			26' 3"	
12:10	220	"	"			26' 3"	
12:25	235	"	"			27'	
12:40	250	"	"			27' 1"	
1:40	310	"	"			28'	
2:40	370	"	"			30'	
3:40	430	"	"			30' 6"	



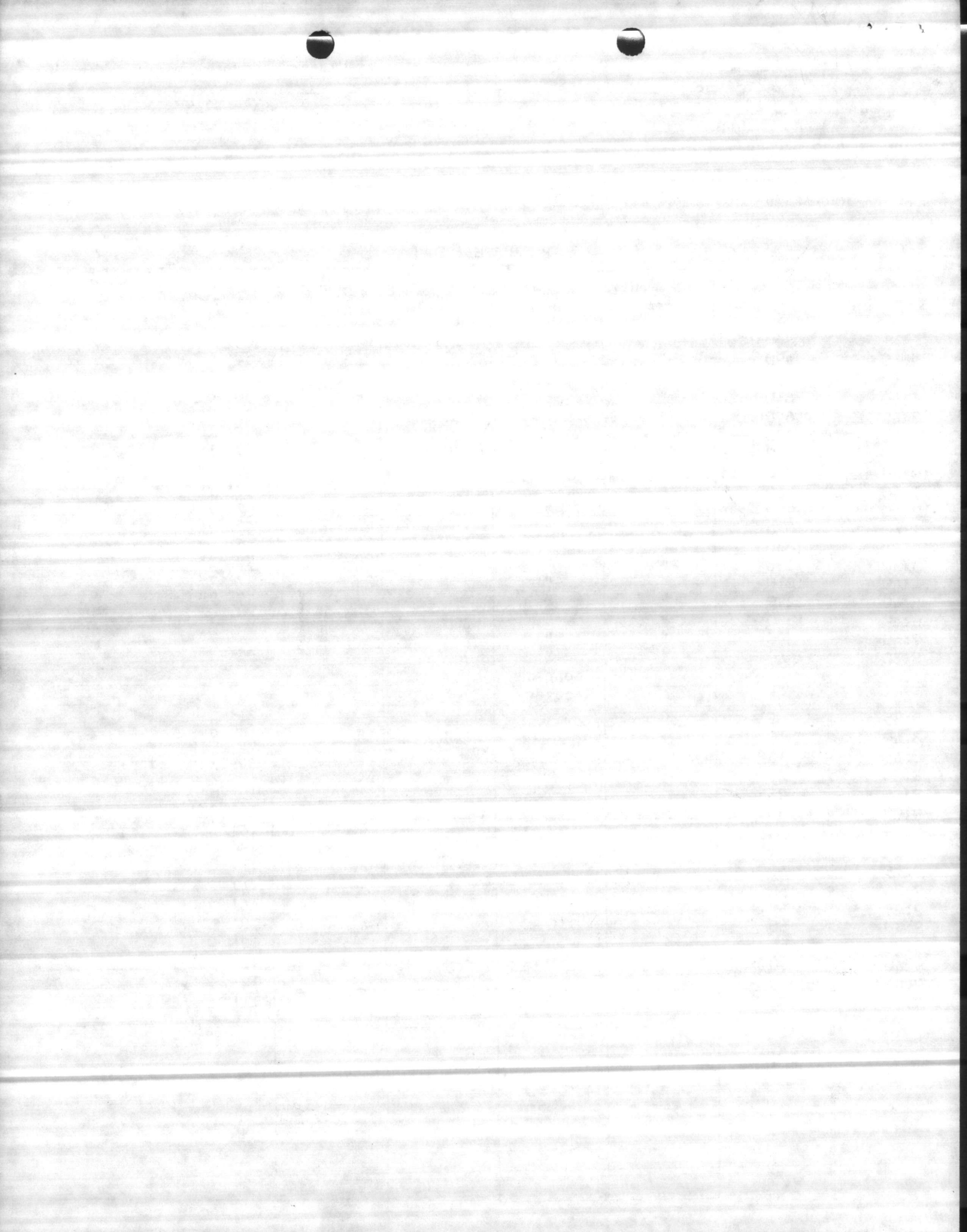
PUMPING TEST DATA

Test conducted by: Carolina Well & Pump Co. Roger Thomas
 Well Owner: Camp Lejeune Address: _____
 Pumped Well No: 626 Location: _____ County: Cnslow
 Observation Well Locations: _____
 Airline Lengths: Pumped Well _____ Observation Wells _____
 Remarks: _____

Pumping Rate Measured With: 4x6 orifice Water Levels Measured With: E. Tape

PUMP WELL DATA

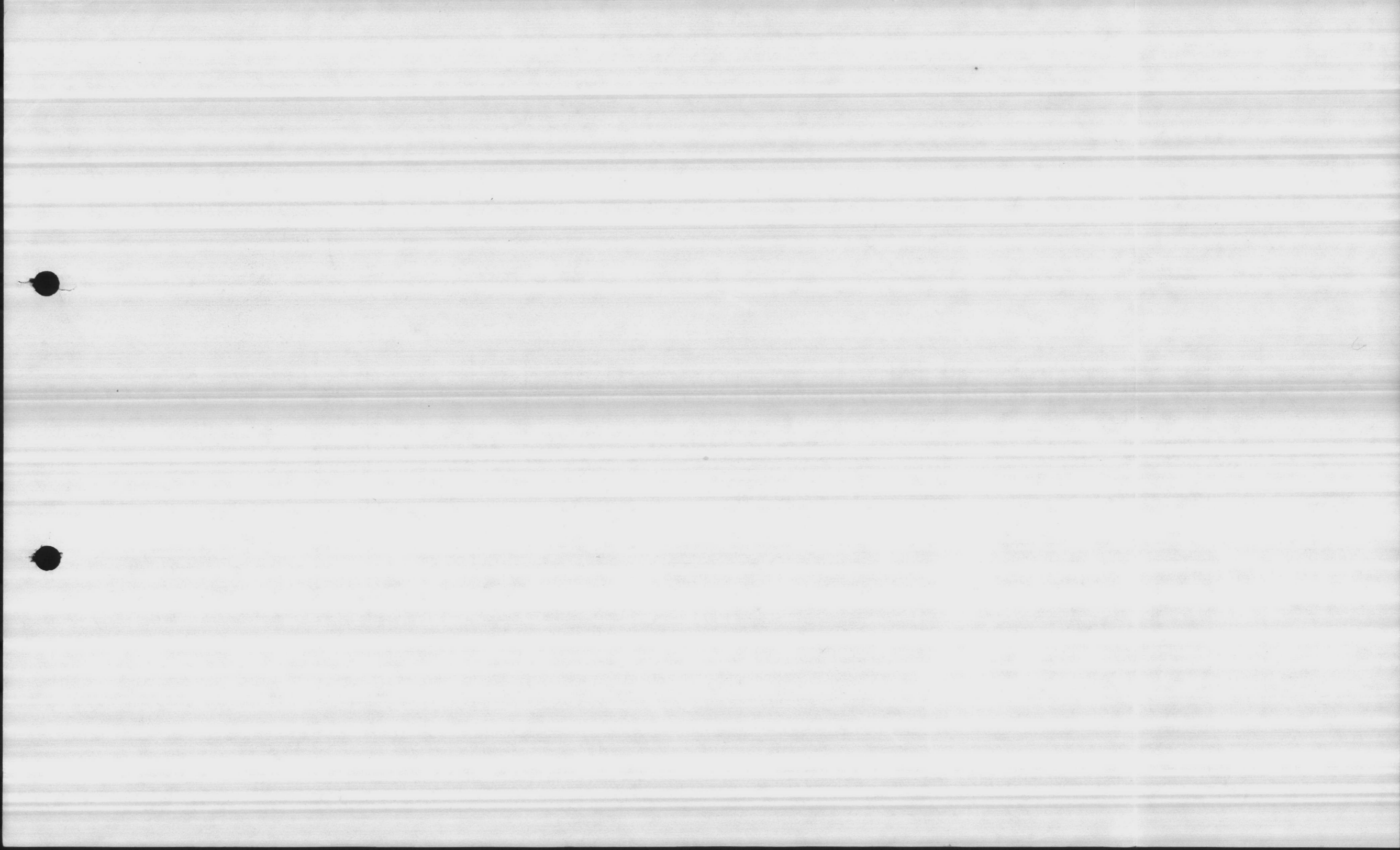
Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
4:40	490	"	"			30' 6"	
5:40	550	"	"			30' 6"	
6:40	610	"	"			30' 6"	
7:40	670	"	"			36' 7"	
8:40	730	"	"			37' 11"	
9:40	790	"	"			47' 11"	
10:40	850	"	"			57' 7"	
11:40	910	"	"			57' 7"	
12:40	970	"	"			57' 7"	
1:40	1030	"	"			57' 7"	
2:40	1090	"	"			57' 7"	
3:40	1150	"	"			57' 7"	
4:40	1210	"	"			57' 7"	
5:40	1270	"	"			57' 7"	
6:40	1330	"	"			57' 7"	
7:40	1390	"	"			57' 7"	
8:30	1440	"	"			57' 7"	
			Stopped Recovery				
8:35	5					21'	
8:40	10					18' 9"	
8:45	15					18' 9"	
8:50	20					18' 9"	
8:55	25					15' 8"	
9:00	30					15' 8"	
9:05	35					15'	
9:10	40					15'	
9:15	45					15'	
9:20	50					14'	
9:25	55					14'	
9:30	60					12' 5"	
9:35	65					12'	
9:40	70					12'	
9:45	75					12'	
9:50	80					11'	



8 WATER WELLS - MARINE CORP BASE - CAMP LEJERNE NC

WELL NO	LOCATION	Pump Data		Motor		Casing		Screens		Screens		Screens		Screens		PUMP RATE GPM
		Model	Size	HP	HP	Model	Size	1st Screen Setting	2nd Screen Setting	3rd Screen Setting	4th Screen Setting	5th Screen Setting	Static	Dynamic		
611	Barkley Manor	8ms	8	20	20	70	45	65-75	115-135	182-197	-	-	35	49	300	
614	Stone Street	8ms	8	20	20	80	44	106-120	150-170	217-227	-	-	15	80	300	
LGH 4006	MIDWAY PARK	8HL	8	36	40	80	42	90-114	116-134	-	-	100	25	70	450	
31	PINEY GREEN RD	8ms	6	15	20	70	40	60-70	125-135	160-170	220-230	-	18'-2"	54'-9"	200	
627	SNEEDS FERRY RD	8ms	6	15	20	70	40	50-65	87-102	125-135	-	-	14	44	175	
RR 221	RIPLE RANGE	8HL	8	25	40	80	35	190-210	223-235	242-247	-	100	23	58	300	
TT 638	TARAWA TERRACE	8ms	6	15	20	85	35	70-95	132-142	-	-	-	27	63	160	
639	SNEEDS FERRY RD	8ms	6	15	20	70	42	121-131	134-146	185-195	215-220	225-230	4	96	200	

Initials _____ Date _____



WELLHOUSE 628

629

04-04-02

A/L - 100

S/L - 40

P/L - 85

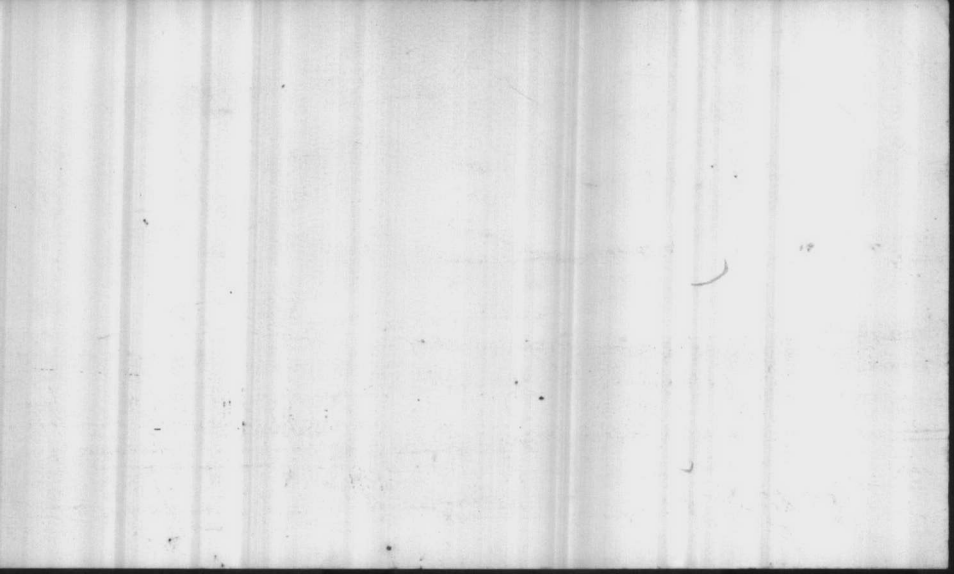
D/D - 45

P5I - 20

GPM - 133

D/H - 84

SALAS / THOMPAS



DATE 7-25-00

PWSID 04-67-011

WELL # HP 629

WELL NAME HAD NOT POINT HP20

BLDG. HP 629

CODE G.

AVAILABILITY P.

LOCATION OLD PINEY GREEN ROAD

LATITUDE 34.7143

LONGITUDE 77.3201

WELL DIAMETER 8"

WELL DEPTH ~~220~~ 240'

SCREEN INTERVAL _____

YIELD 137

STATIC LEVEL 38'

PUMPING LEVEL 74'

PUMP TYPE VERTICAL TURBINE

MOTOR HP 15

INTAKE DEPTH 70

DESIGN CAPACITY 200

ACTUAL GPM 150

SIZE OF CONCRETE SLAB _____

HEIGHT OF CASING 12"



SOURCE INFORMATION GROUND WATER

Date Form Completed

M M D D Y Y
0 1 2 5 9 5

PWSID
0
4
6
7
0
4
1

Owner Assigned Source Code

629

Well Name (If purchase, name of system)

HADNOT POINT 629

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
M M Y Y

Source exempt— SWTR?

Y
 N

Direct Influence Date

M M D D Y Y
M M D D Y Y

Availability

P

P=Permanent
E=Emergency I=Interim
S=Seasonal O=Other

Location of well within the system (If purchase, location of master meter)

OLD PINEY GORGEN RD

Latitude (N)

3 4 4 2 5 0 5

Longitude (W)

0 7 7 1 9 1 3 1

How Determined

G

G=GPS
M=Map
S=Surveyed

GPS Data

04

Q# or DOP #

No. of Sats. Locked on

3

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

Vulnerable (VOCs)

Y
 N

Assessment Date

M M D D Y Y
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

~~HADNOT POINT~~ WTP

Location:

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

Sources of pollution/distance: 75' to dirt road

Surface water within 200'? Y N 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: Elec heat

Well: Diameter: 8" Type: SCREENED Yield (gpm): 150-200 Properly sealed? Y (Y,N)

Properly vented? Y (Y,N) Casing depth 50 ft. (If unknown, put 'UNK') Well depth: 230' Meter available? Y (Y,N)

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

Size of blow-off: 4" (V) Sample tap: Before treatment? Y (Y,N) After treatment? (Y,N)

Pumps: Capacity: GPM: 200-150 HP: 15 Pump intake depth: 70 Auxiliary Power? Y (Y,N)

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 12"

Storage at well site: Elev: Hydro: Ground:

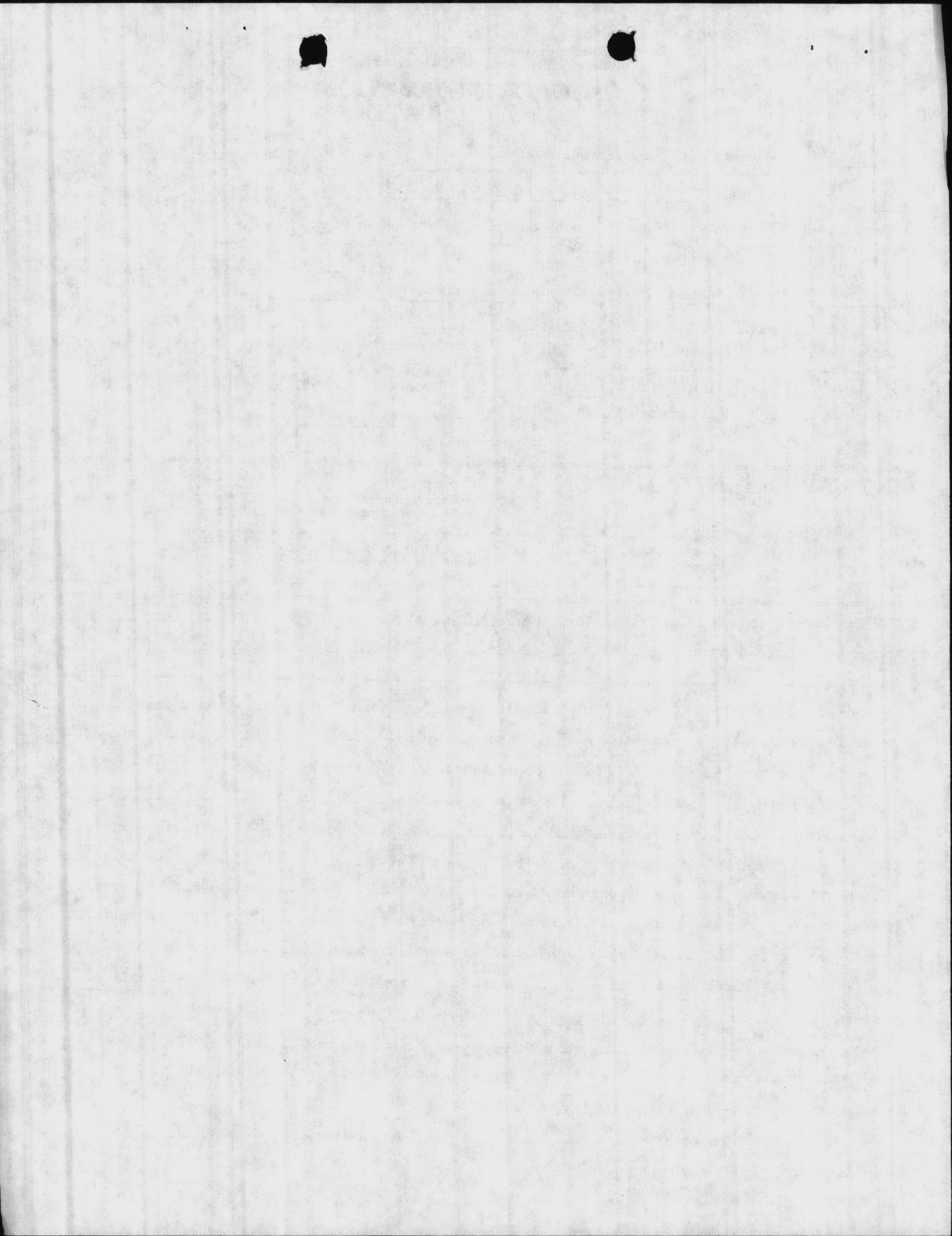
If hydroautomatic, air volume control? (Y,N) Safety valves? (Y,N) Coded? (Y,N)

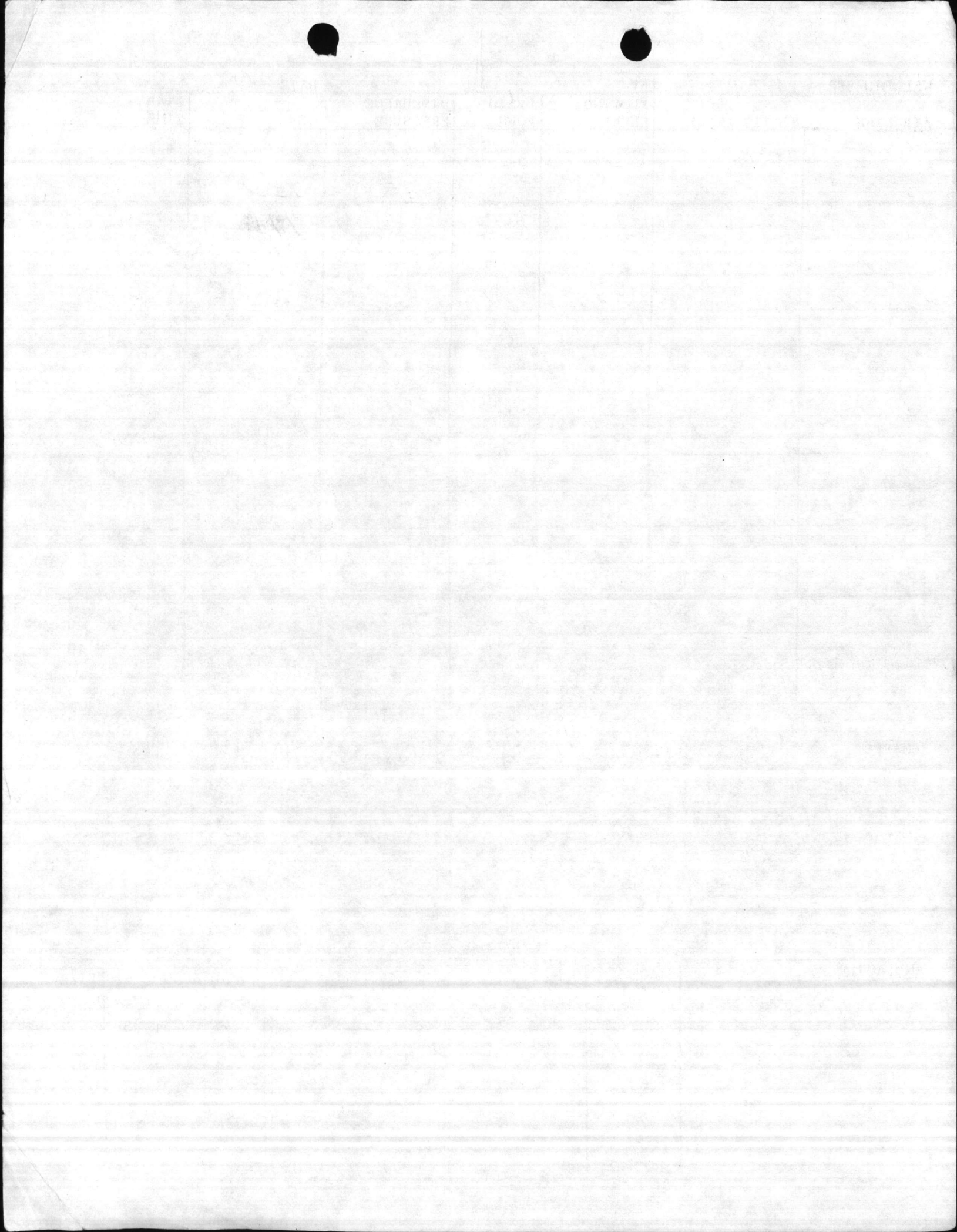
High service pumps: 1. gpm hp 2. gpm hp 3. gpm hp Auxiliary Power? (Y,N)

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

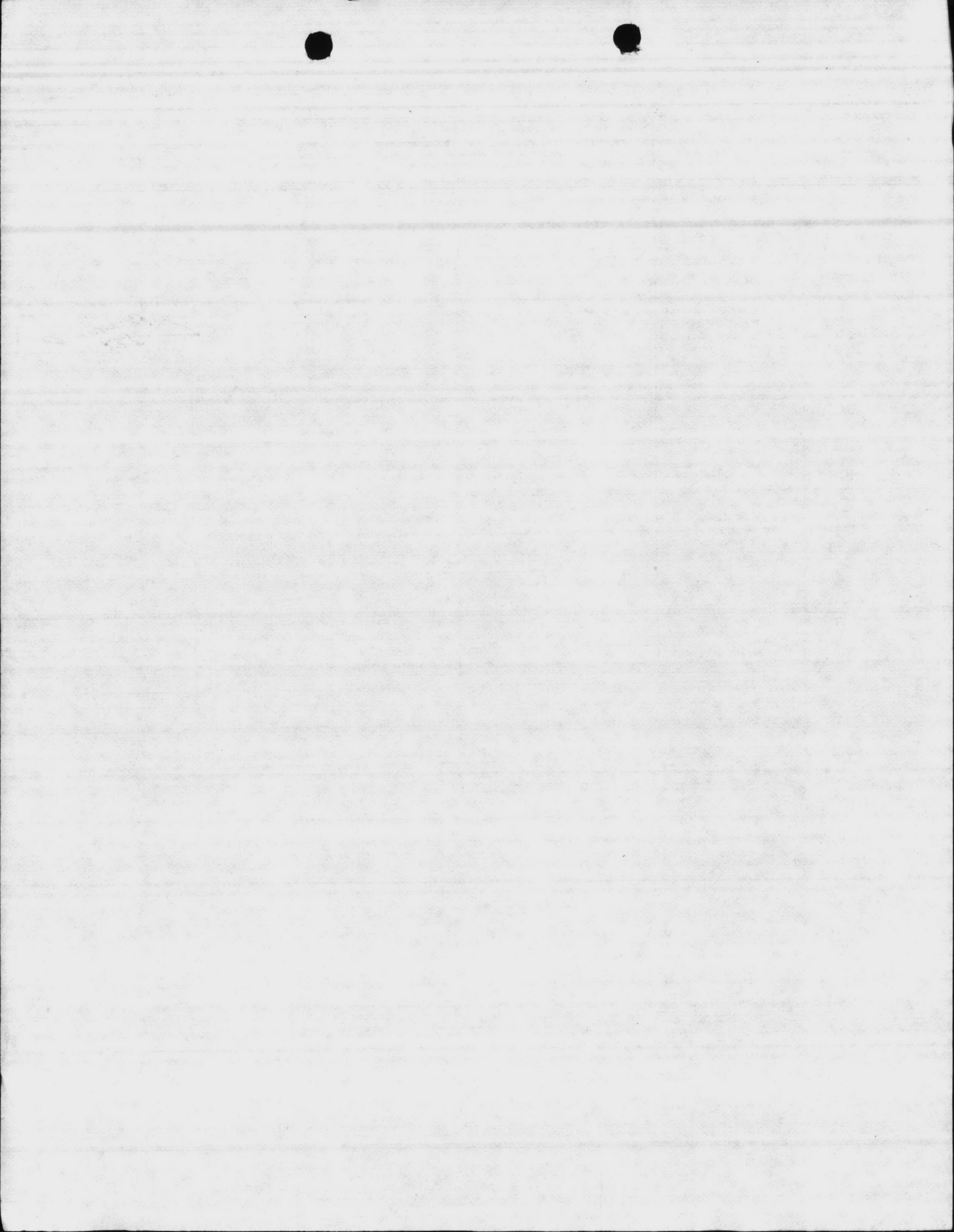
If other wells are treated here, which ones? _____ If treated elsewhere, where? HP-20 PLANT

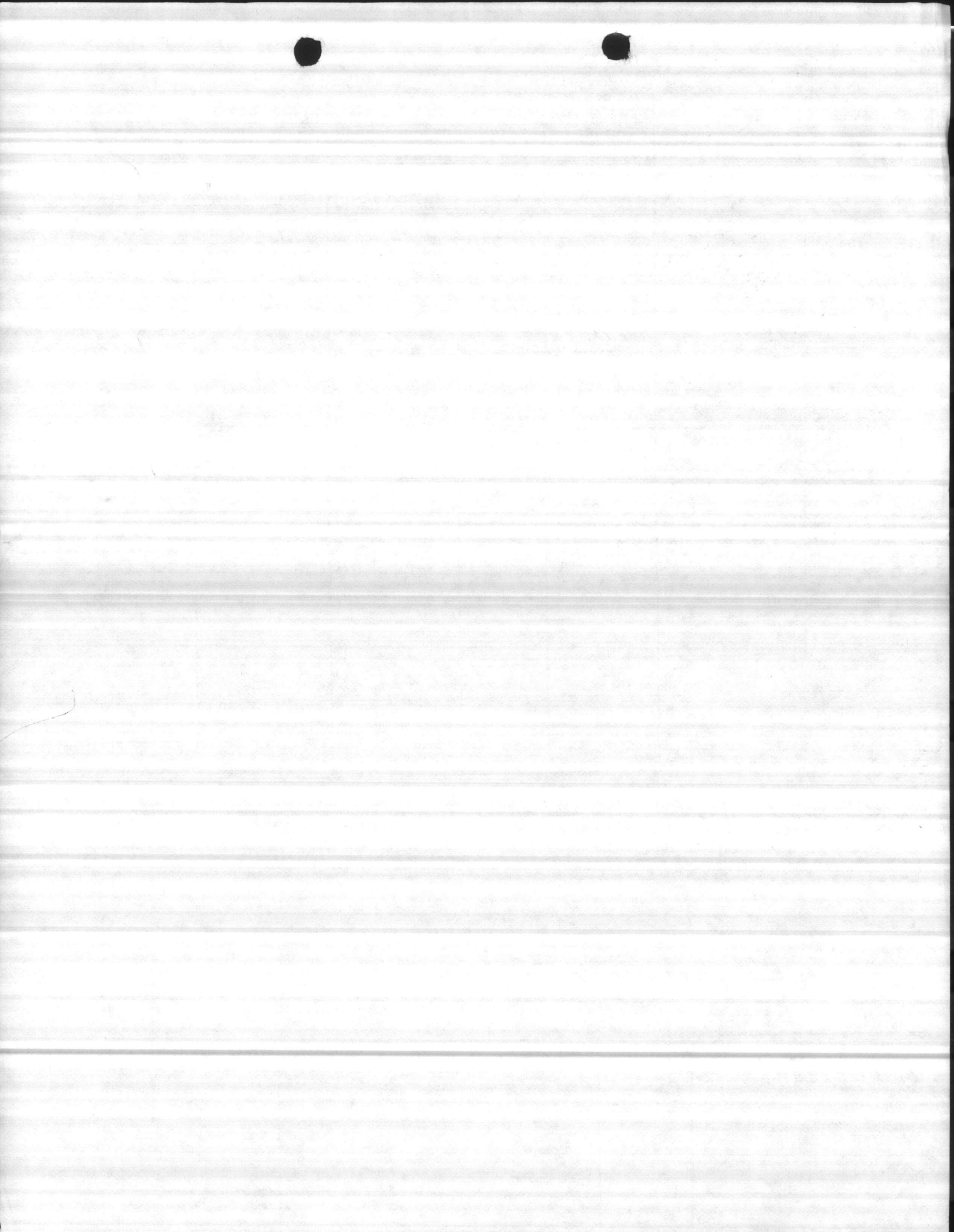
If purchase, retreat? Y N If yes, complete back of form.

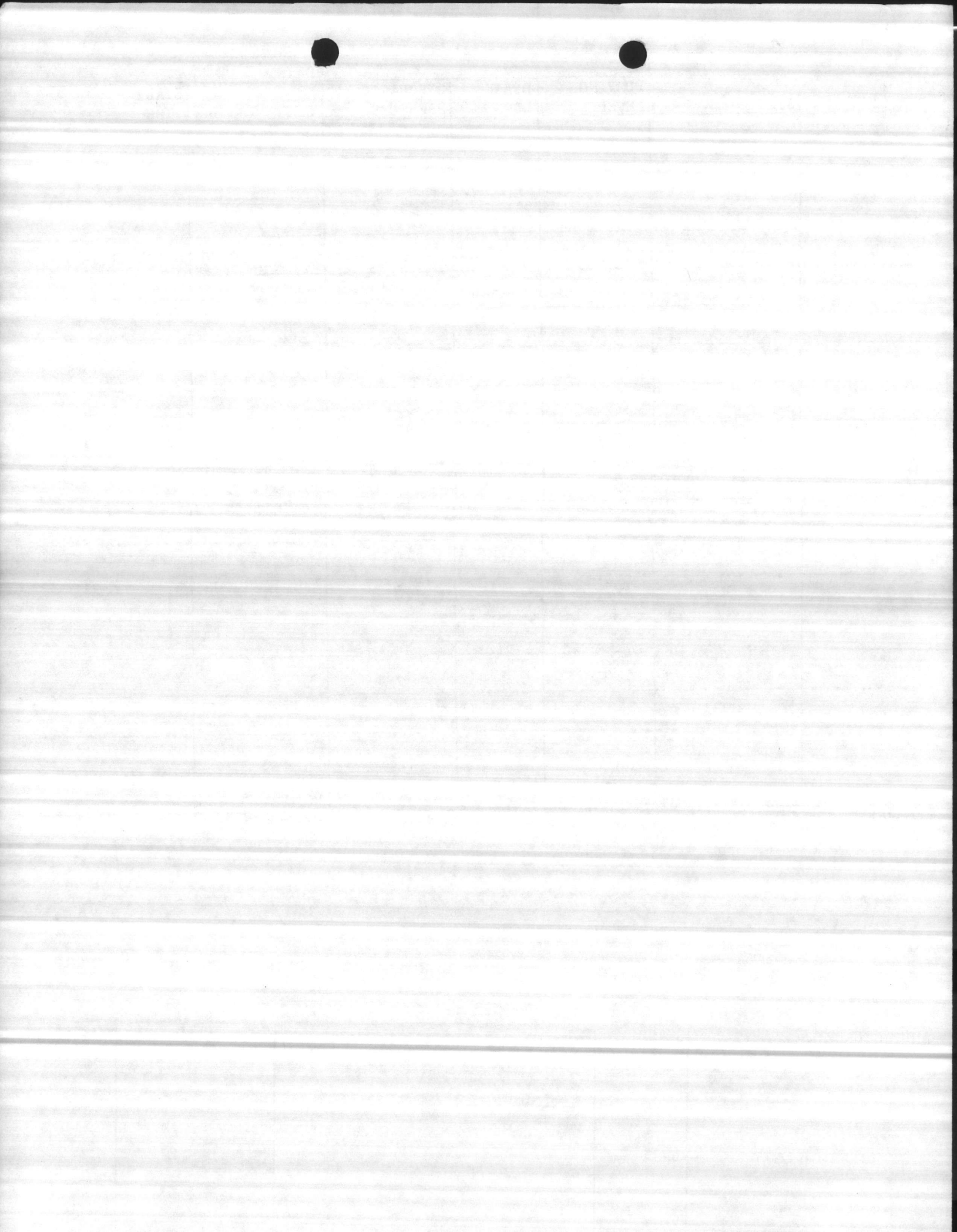




FDIOT





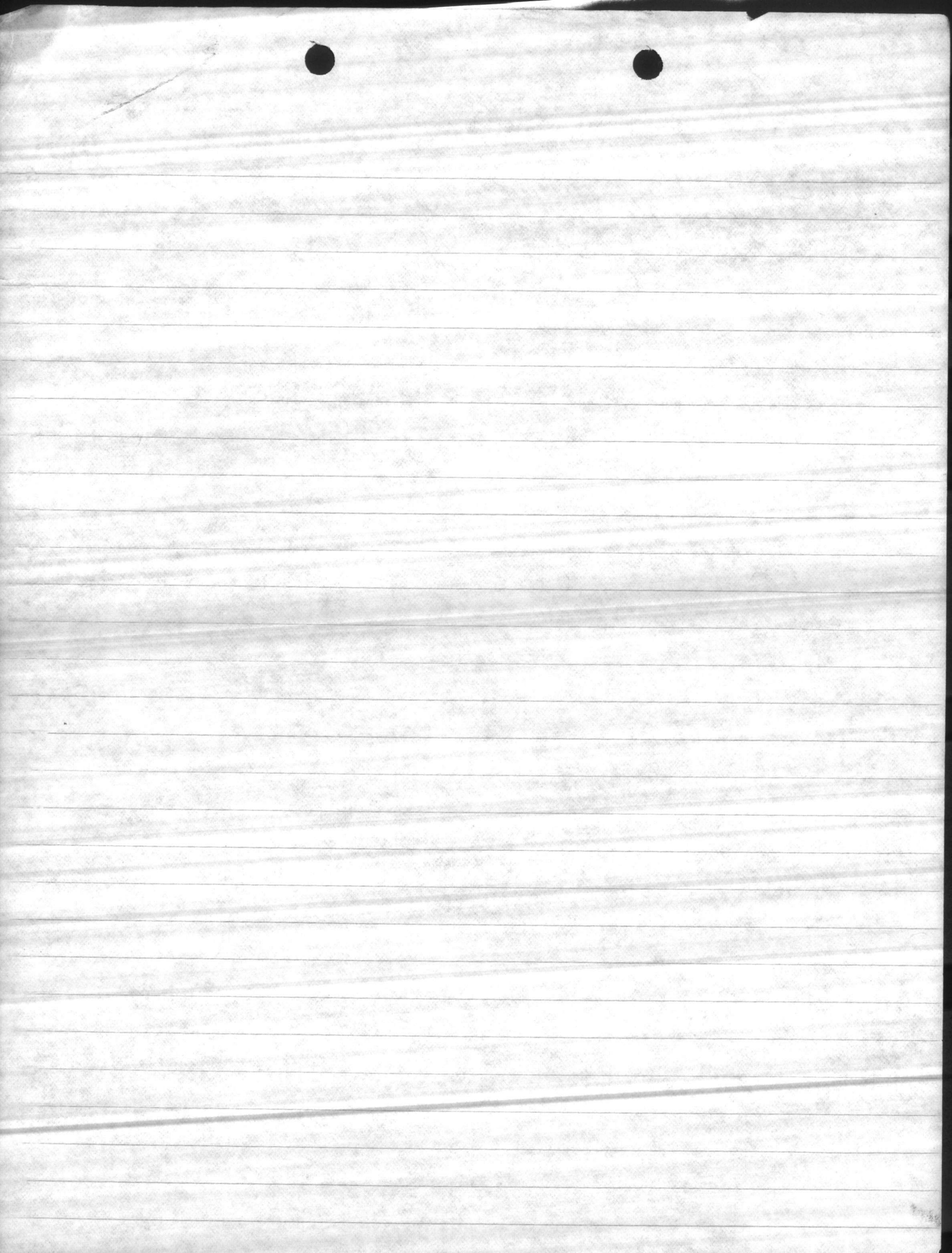




HP 621

9-6-85

A/L	S/L	P/L	O/O	PSI	GPM	Time
100	45	70	25	58	130	15
		80	35	47	195	15
		84	39	42	200	15



CONSOLIDATED PUMP & EQUIPMENT, INC.

DISTRIBUTORS AND MANUFACTURER REPRESENTATIVES • WATER & WASTE WATER TREATMENT
POST OFFICE BOX 3188 • ROCK HILL, SOUTH CAROLINA 29730 • 803/328-1891

March 28, 1983

SUBMITTAL DATA

JOB: Replace Water Wells
Camp Lejeune, N. C.

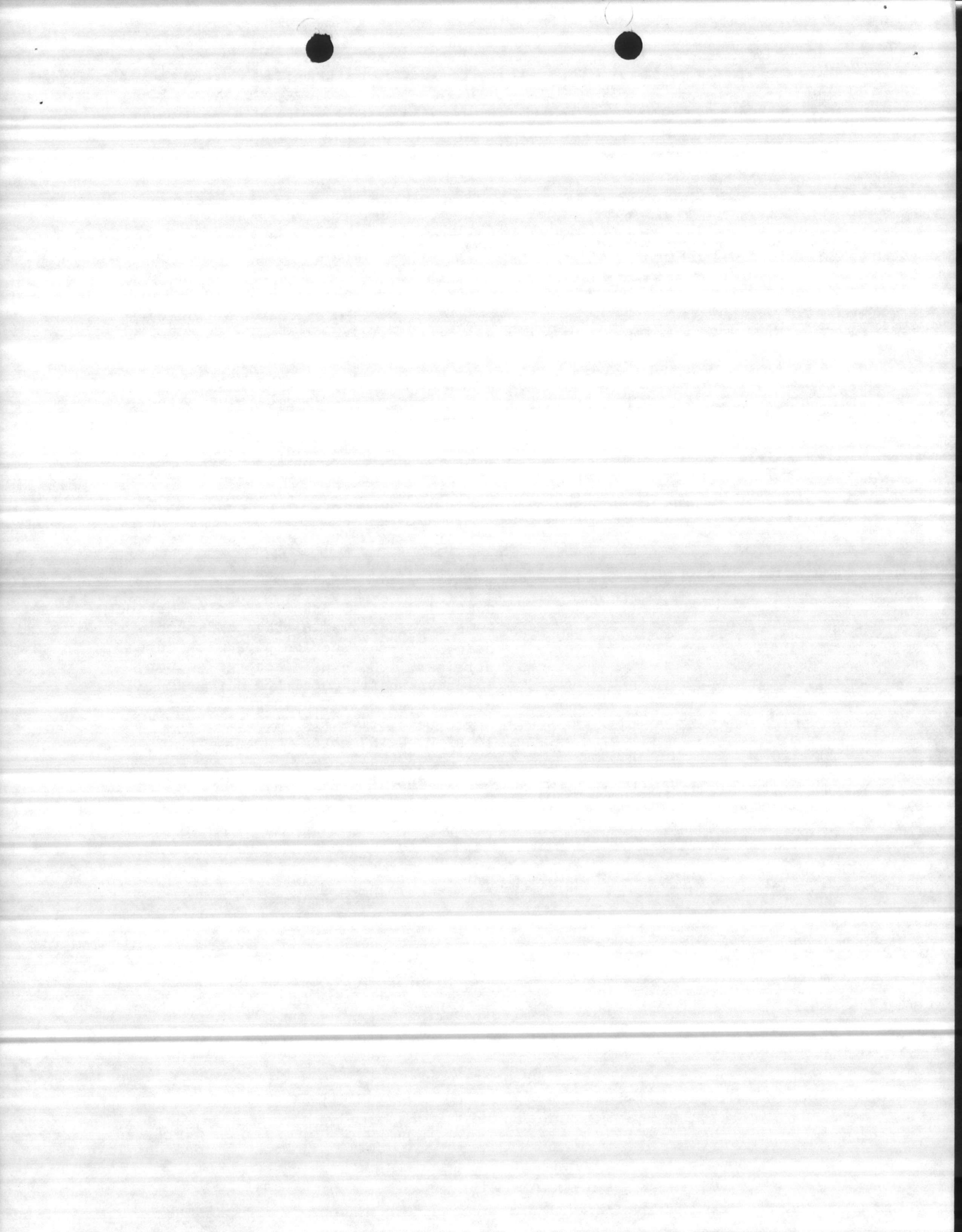
Engineer: Peirson & Whitman, Inc.

Contractor: East Coast Construction Co.

Material Submitted:

- 8 - Jacuzzi Model 15-8MSA6 Verticle Turbine Pump consisting of 6 stage 8MS pump head, 10' - 6" suction pipe with cone strainer, 100' - 6" discharge column, 1" drive shaft, model L6A discharge head, model S-20 Combination Right Angle Gear Drive, 1 : 1 Ratio, and 15 HP V. H. S. motor.

Conditions of service 200 GPM @ 190.5' TDH



8 WATER WELLS - MARINE CORP BRSC - Camp Lejeune

NO	LOCATION	Pump Data		PUMP			V. Depth	1 st Screen Setting	2 nd Screen Setting	3 rd Screen Setting	4 th Screen Setting	5 th Screen Setting	Ft. to Water		PUMP RATE GPM
		Model	Size	Motor HP	Grate Dia	6" Dia							18" Dia	Setting	
11	Barkley Manor	8MS	8	20	20	70	45	65-75	115-135	132-147	—	—	35	49	300
4	Stone Street	8MS	8	20	20	80	44	106-100	150-170	217-227	—	—	15	80	300
14	4006 MIDWAY PARK	8HL	8	30	40	80	42	90-119	116-139	—	—	—	25	70	450
621	Piney Green Rd	8MS	6	15	20	70	40	60-70	125-135	160-170	220-230	—	18	54	200
27	Sneeds Ferry Rd	8MS	6	15	20	70	40	50-65	87-102	125-135	—	—	14	44	175
R 227	RIPLE ROAD C	8HL	8	25	40	80	35	190-210	223-233	242-247	—	—	23	58	300
638	TARAWA TERRACE	8MS	6	15	20	85	35	70-95	132-142	—	—	—	27	63	160
39	Sneeds Ferry Rd	8MS	6	15	20	70	42	121-131	134-146	185-195	215-220	225-230	4	96	200

These wells — 10-10-84

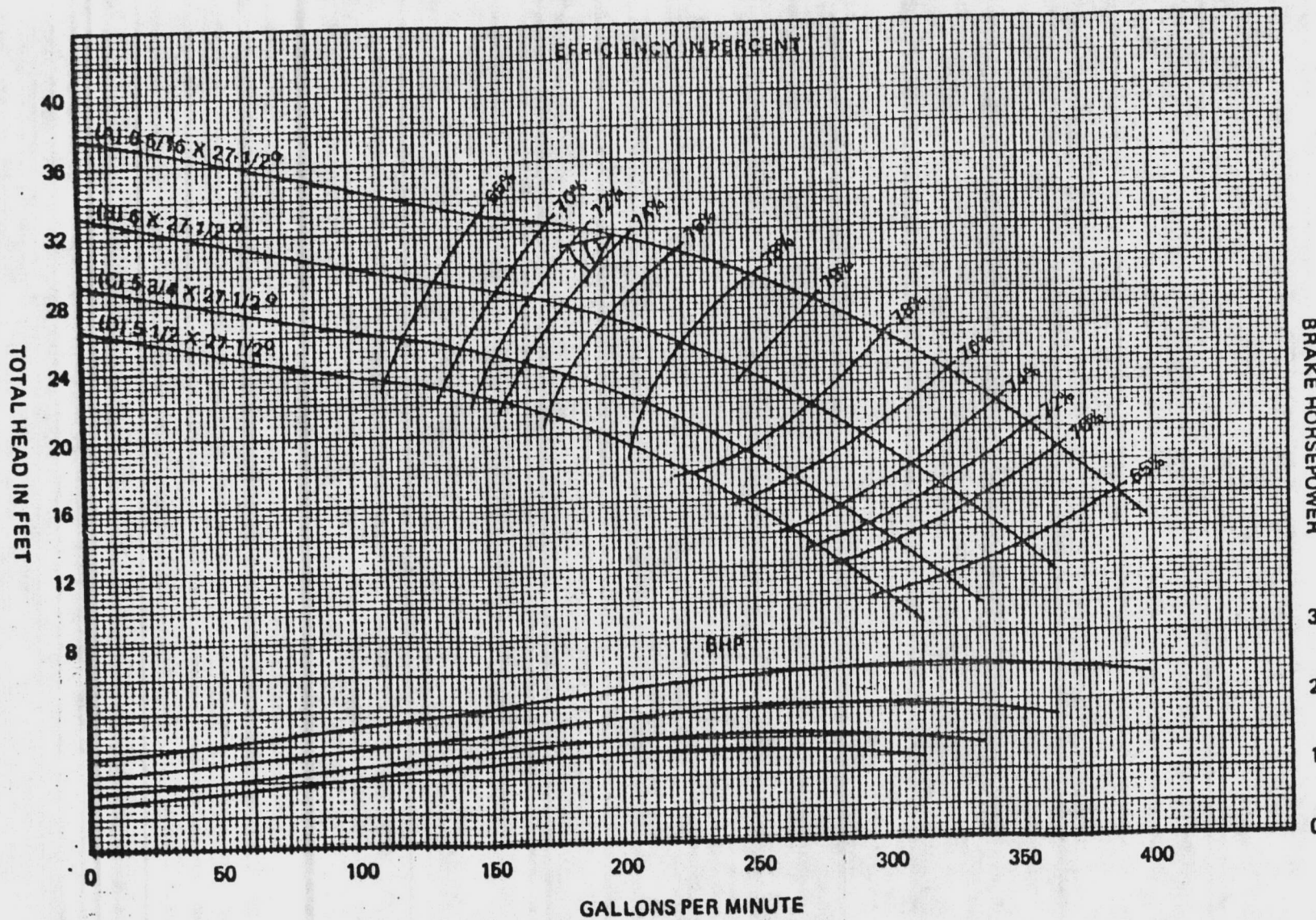


TURBINE PUMP CURVE

MAY 15, 1970

SECTION
2120

8MS



NUMBER OF BOWLS	CHANGE EFFICIENCY AS FOLLOWS
1	-4
2	-3
3	-2
4	-1

Change in efficiency may affect both head and horsepower

Bowl Dia.	7-1/2 In.
Bowl No.	3591-S, C.I., ENAM.
Impeller No.	3590, BRONZE
Eye Area	6.6 Sq. In.
Imp. Type	SEMI-OPEN K = 4.28

STAGE PERFORMANCE

Curve No.	8M-172
R. P. M.	1780
Bowl	8MS

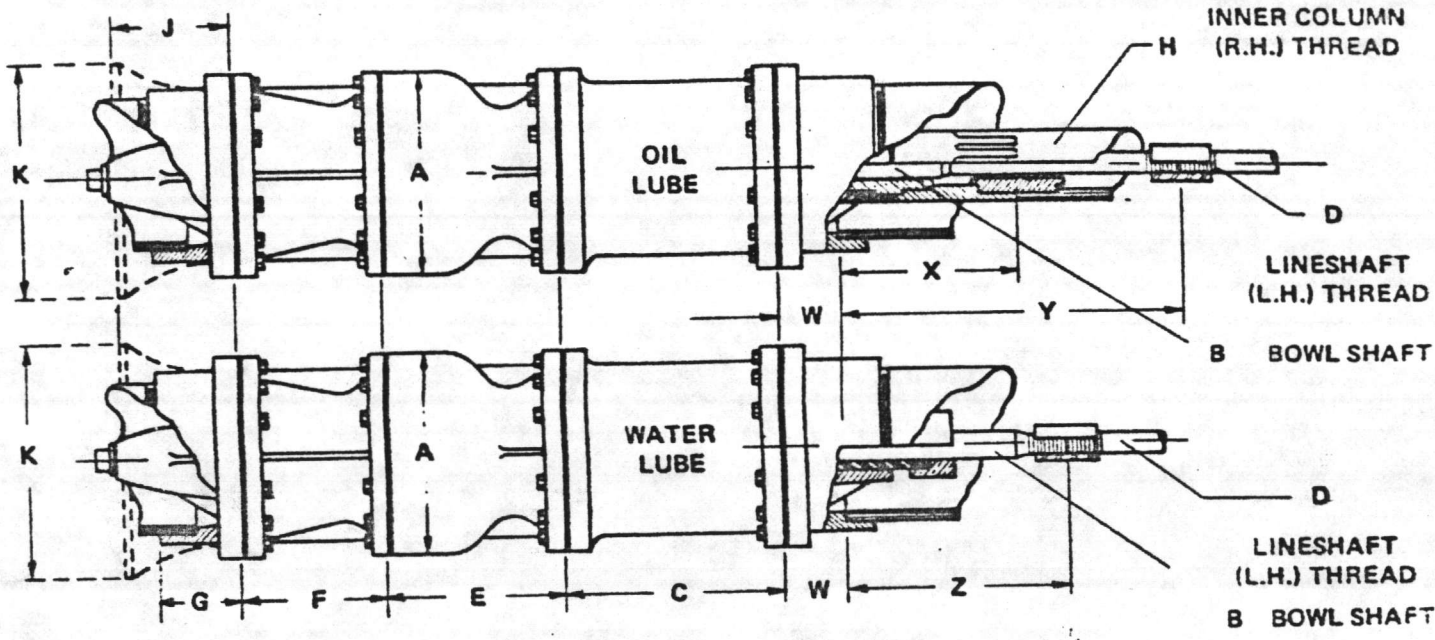
Performance based on pumping clear, fresh water at a temperature not over 85°F., and free of gas, air or abrasives, and with bowls properly adjusted and submerged.

BRAKE HORSEPOWER

3
2
1
0



Turbine Bowl



ALL DIMENSIONS IN INCHES

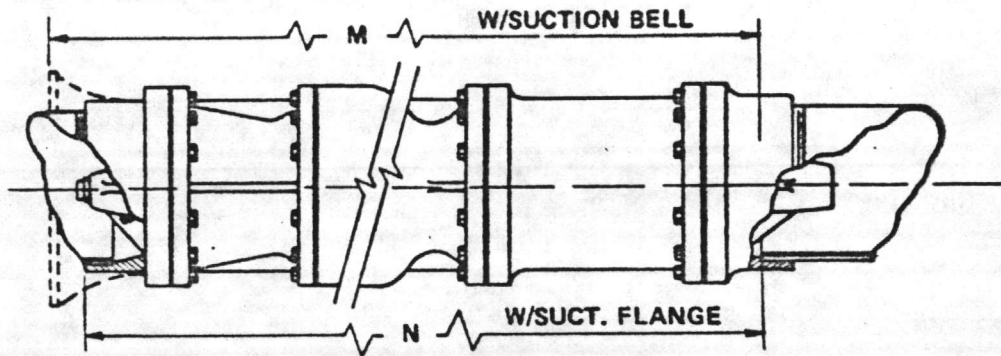
Nom. Bowl Size	Bowl Figure Number	Bowl Dia. Max. O.D. STD. A	Bowl Dia. Turned ALT. A	B	C	E	F	Max. G	Suction Bell			O.L.			W.L.	Available Outer Column and Suction tip
									J	K	W	X	Y	Z		
6	6J,6L	5 5/8		3/4	4 1/2	3 3/4	3 3/4	5	4	7 1/4	3	9 1/2	22	7 1/2		3, 4, 5
	1			4 3/4		4, 5, 6										
8	8J,8L,8K,8H,8Y	7 7/8	7 1/2	1	6	5 5/8	4	5	4 1/2	9 1/4	3	9 1/2	22	7 1/2		4, 5, 6, 7
	7 1/8	1 1/8		7 1/2		4, 5, 6, 7										
10	10L,10M,10H	9 1/2	9 1/4	1 1/2	8	7	6	4 1/8	5 1/4	11 1/4	3	9 1/2	22	7 1/2		4, 5, 6, 7, 8
10	10W,10Y,10Z	9 3/8	9 1/2	1 1/8	8 1/2	8 1/2	6 1/2	5 1/8	7	14 1/4	3	9 1/2	22	7 1/2		6, 8, 10
12	12L, 12M, 12H, 12X	11 1/8	11 1/4	1 1/8	9	10 1/2	5 1/2	3 3/4	6	13 1/4	3	9 1/2	22	7 1/2		6, 8, 10
12	12W	12 1/8	12	1 1/8	9	11 1/4	5 1/2	3 3/4	6	13 1/4	3	9 1/2	22	7 1/2		6, 8, 10
14	14L,14M, 14H,14X	13 1/4	13 1/4	1 1/8	9 1/8	12 1/2	7 1/8	5 1/8	8	15 1/4	3	9 1/2	22	7 1/2		8, 10, 12
14	14W	14 1/8	13 3/4	1 1/8	9 1/8	13 1/4	7 1/8	5 1/8	8	15 1/4	3	9 1/2	22	7 1/2		8, 10, 12
16	ALL	15 1/4	15 1/4	1 1/8	9 1/8	15	8	6 1/8	10	22	3	9 1/2	22	7 1/2		10, 12, 14
20	ALL	19 1/4	19 1/4	1 1/8	14	18	12	6 1/8	12 1/2	27	3	9 1/2	22	7 1/2		12, 14, 16
24	ALL	23 1/4	23 1/4	2 1/8	20	21	14	3 3/8	14	32	1	16 1/2	29	14 1/2		12, 14, 16, 18
28	ALL	27	27	2 1/8	24	24	15	3 3/8	16	38	1	16 1/2	29	14 1/2		14, 16, 18, 20
																18, 20, 22, 24

* Note: Maximum Diameter for 24" Bowl is Discharge Column Flange at 25" and for 28" is 27 1/2".

D	Lineshaft Dia. & Pitch (L.H.)	3/8	1	1 1/8	1 1/2	1 5/8	1 3/4	2 1/8	2 1/4	2 3/8	2 1/2
		H	O.L. Inner Col. & Thread (R.H.)	1 1/4-12P.	1 1/2-12P.	2 1/8-12P.	2 1/2-12P.	3 3/8-12P.	3 1/2-12P.	3 1/2-12P.	4-8P.

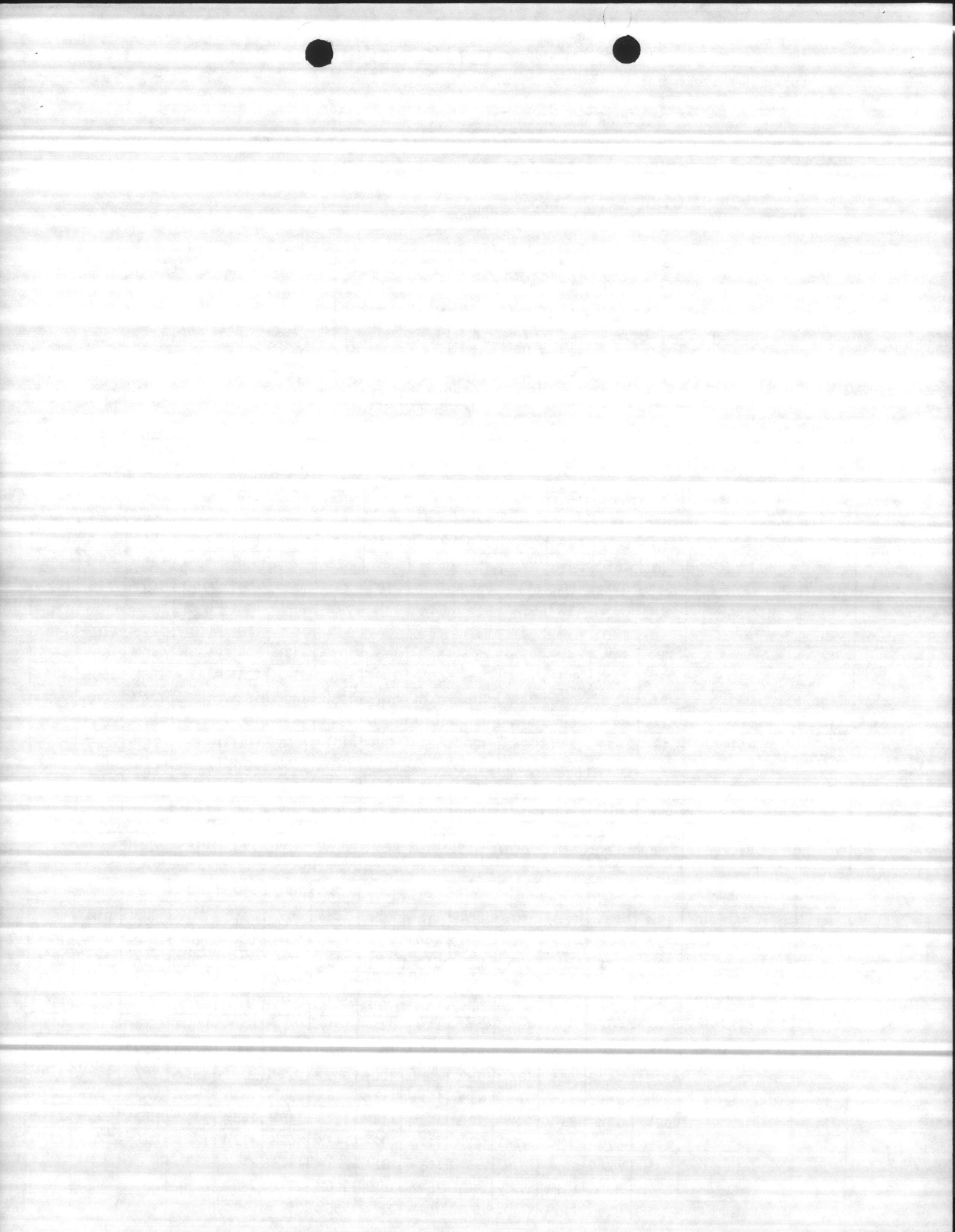


Turbine Bowl

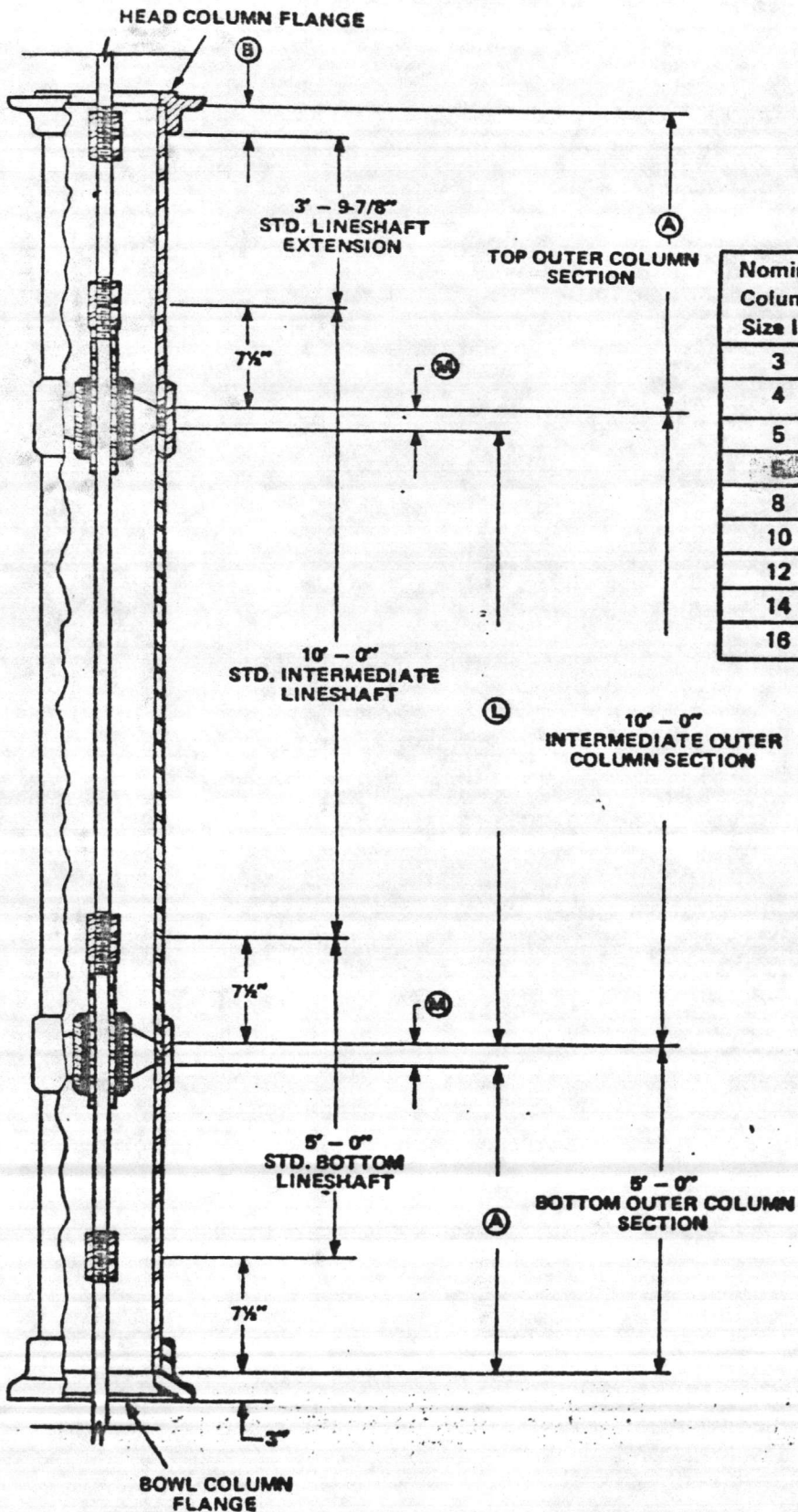


Nom. Bowl Size	Bowl Figure Number	(M) = BOWL ASSEMBLY LENGTH W/SUCTION BELL - INCHES													
		NUMBER OF BOWLS													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
6	6L	18½	22	25½	29	32½	36	39½	43	46½	50	53½	57	60½	64
	6M,H,X,W,Y	19½	24½	29½	34	38½	43½	48½	53	57½	62½	67½	72	76½	81½
	8J,8L,8K,8M,8H	23½	28½	34½	40	45½	51½	56½	62½	68½	73½	79½	85	90½	96½
8	8Y	25	32½	40	47½	55	62½	70	77½	85	92½	100	107½	115	122½
10	10L,M,H	29½	36½	43½	50½	57½	64½	71½	78½	85½	92½	99½	106½	113½	120½
10	10W,Y,Z	34½	42½	51½	59½	68½	76½	85½	93½	102½	110½	119½	127½	136½	144½
12	12L, M, H, X	33½	44½	54½	65½	75½	86½	96½	107½	117½	128½	138½	149½	159½	170½
12	12W	34½	45½	57	68½	79½	90½	102	113½	124½	135½	147	158½	169½	180½
14	14L,M,H,X	40½	53½	65½	78½	90½	103½	115½	128½	140½	153½	165½	178½	190½	203½
14	14W	41½	54½	68	81½	94½	107½	121	134½	157½	160½	174	187½	200½	213½
16	ALL	46	61	76	91	106	121	136	151	166	181	196	211	226	241
20	ALL	59½	77½	95½	113½	131½	149½	167½	185½	203½	221½	239½			
24	ALL	70	91	112	133	154	175	196	217	238	259				
28	ALL	80	104	128	152	176	200	224	248	272					

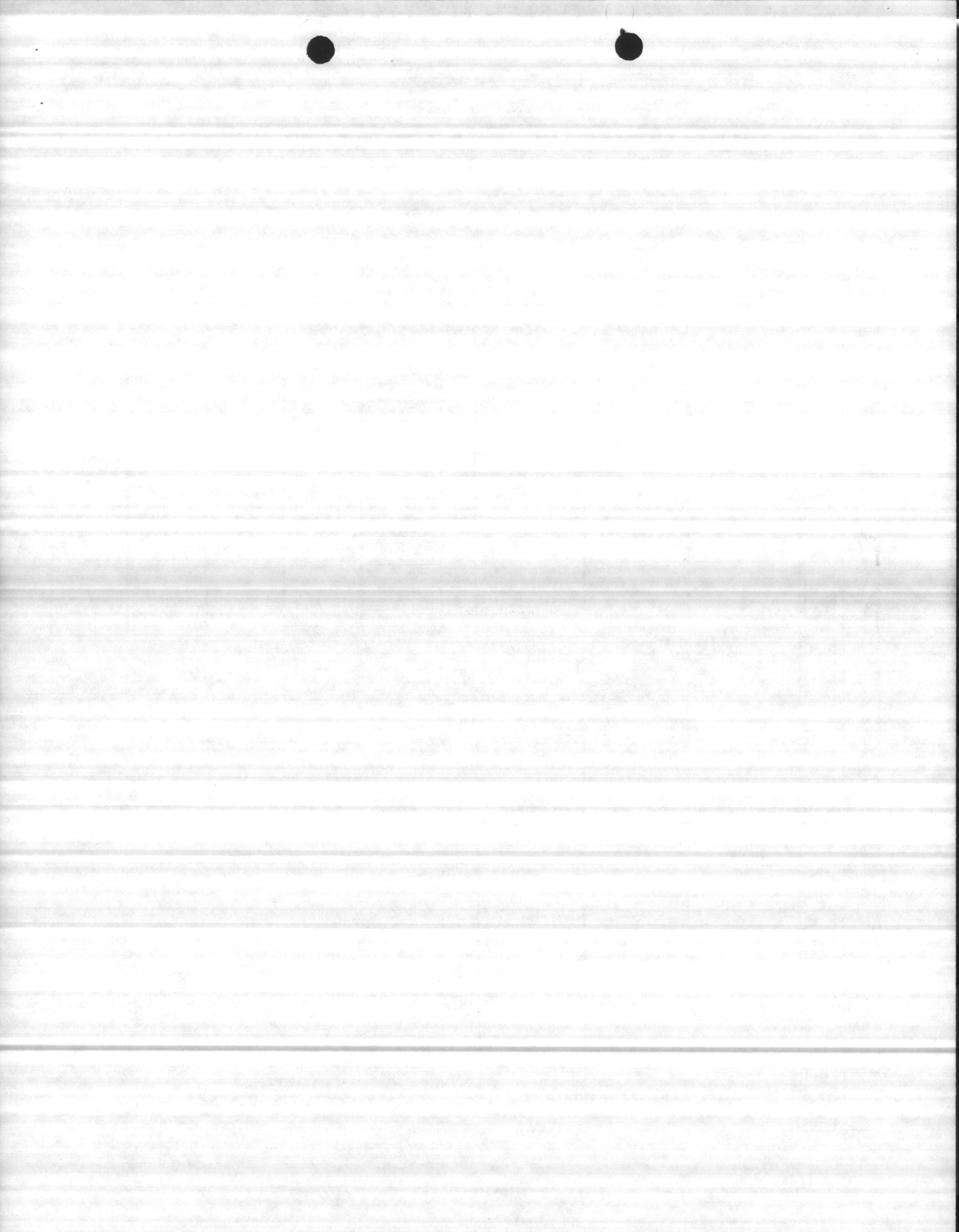
Nom. Bowl Size	Bowl Figure Number	(N) = BOWL ASSEMBLY LENGTH W/SUCTION FLANGE - INCHES													
		NUMBER OF BOWLS													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
6	6L	19½	23	26½	30	33½	37	40½	44	47½	51	54½	58	61½	65
	6M,H,X,W	20½	25½	30½	35	39½	44½	49½	54	58½	63½	68½	73	77½	82½
8	8J,8L,8K,8M,8H	23½	29½	34½	40½	46½	51½	57½	63	68½	74½	79½	85½	91½	96½
8	8Y	25½	33	40½	48	55½	63	70½	78	85½	93	100½	108	115½	123
10	10L,M,H	28½	35½	42½	49½	56½	63½	70½	77½	84½	91½	98½	105½	112½	119½
10	10W,Y,Z	33½	41½	50½	58½	67½	75½	84½	92½	101½	109½	118½	126½	135½	143½
12	12L, M, H, X	31½	42	52½	63	73½	84	94½	105	115½	126	136½	147	157½	168
12	12W	32½	44½	55½	67	78½	89½	100½	112	123½	134½	145½	157	168½	179½
14	14L,M,H,X	38½	51½	63½	76½	88½	101½	113½	126½	138½	151½	163½	176½	188½	201½
14	14W	39½	52½	65½	79½	92½	105½	118½	132½	145½	158½	171½	185½	198½	211½
16	ALL	42½	57½	72½	87½	102½	117½	132½	147½	162½	177½	192½	207½	222½	237½
20	ALL	53½	71½	89½	107½	125½	143½	161½	179½	197½	215½	233½			
24	ALL	59½	80½	101½	122½	143½	164½	185½	206½	227½	248½				
28	ALL	67½	91½	115½	139½	163½	187½	211½	235½	259½					



Turbine Column – Water-Lube, Butt Joint



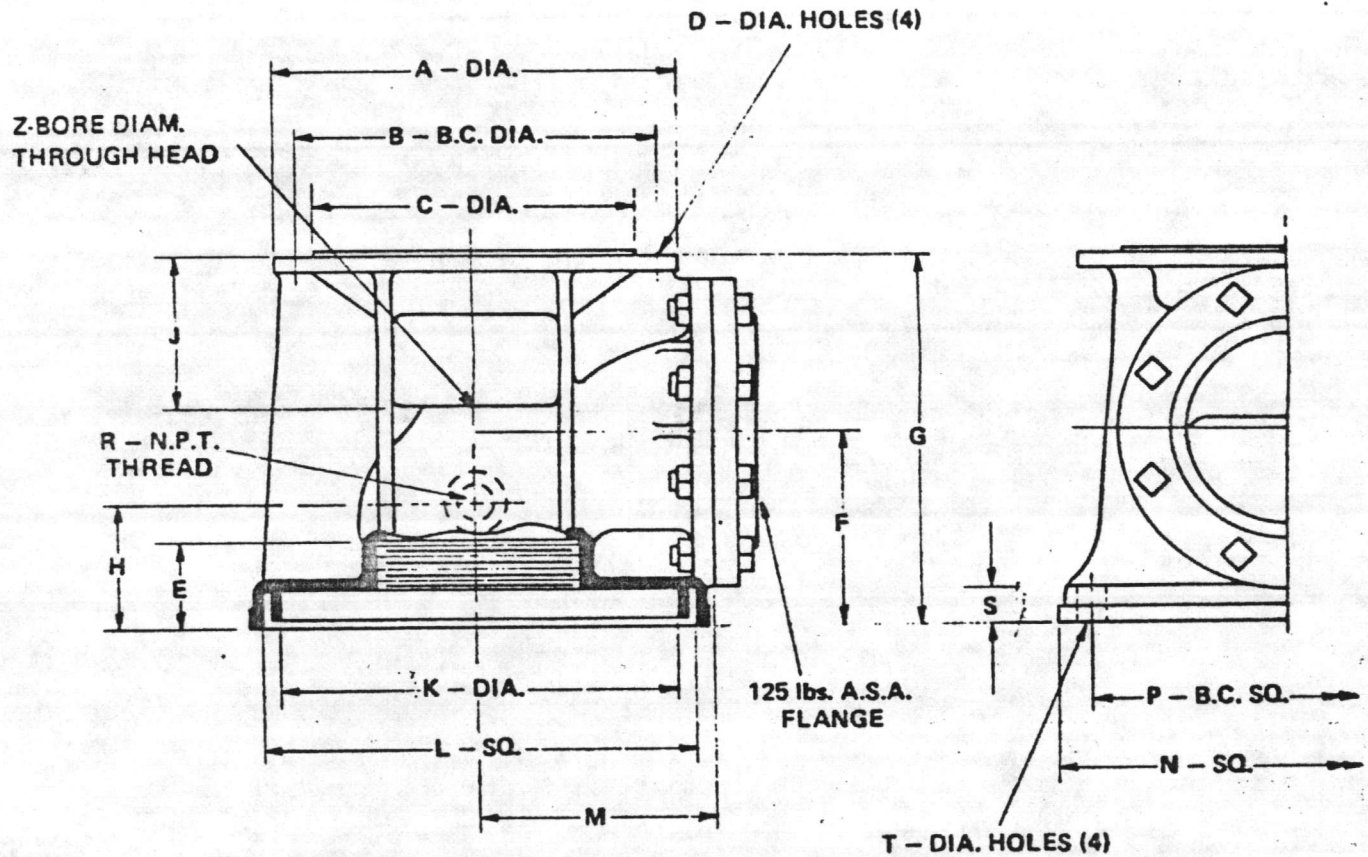
Nominal Column Size In.	A	B	L	M
3	4'11 1/2"	6 1/2"	9'11 1/2"	1/2"
4				
5	4'11 1/2"	5 1/2"	9'11 1/2"	1/2"
8				
10				
12				
14				
16				



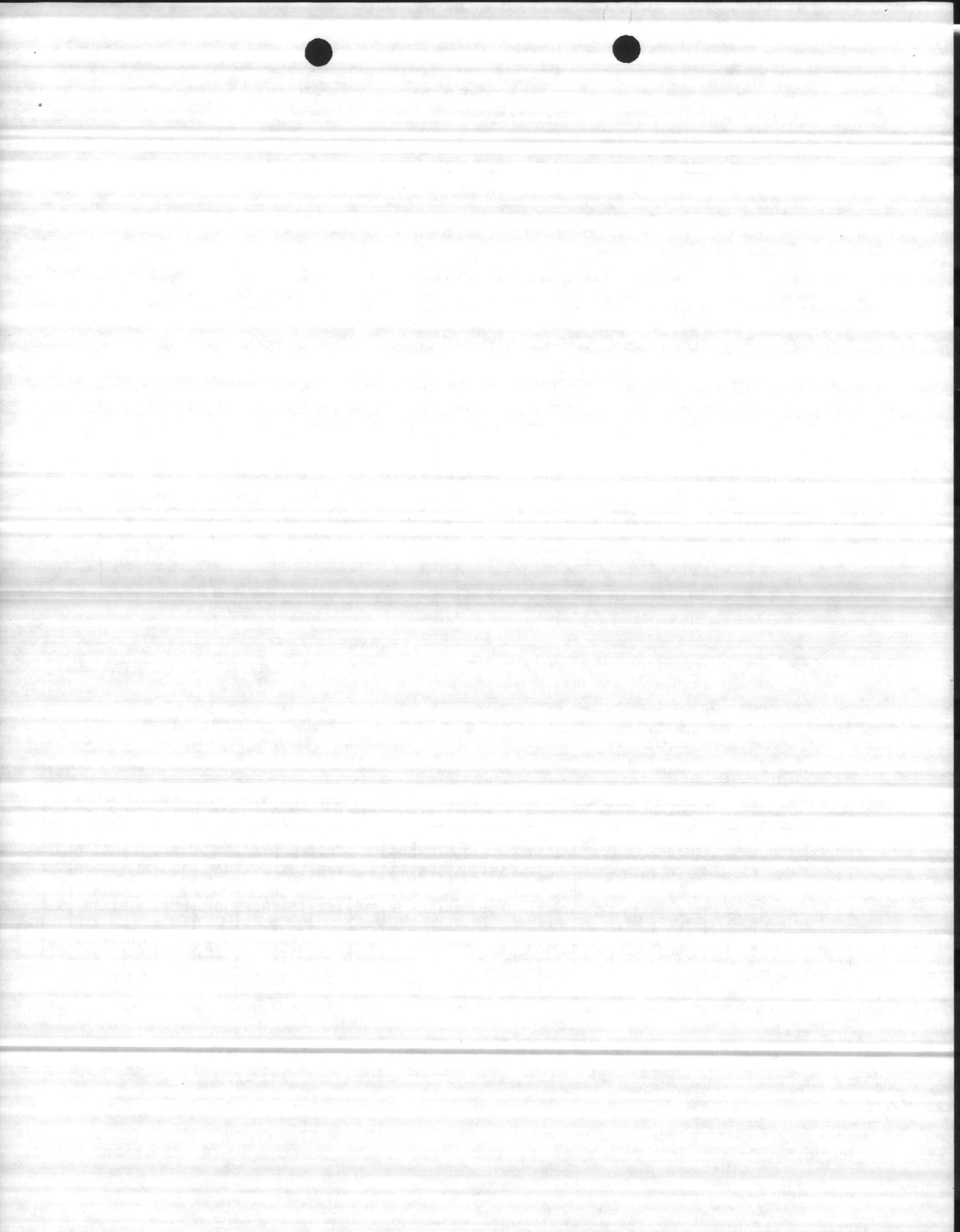
JACUZZI

DIMENSIONS

Cast, Standard Discharge Heads



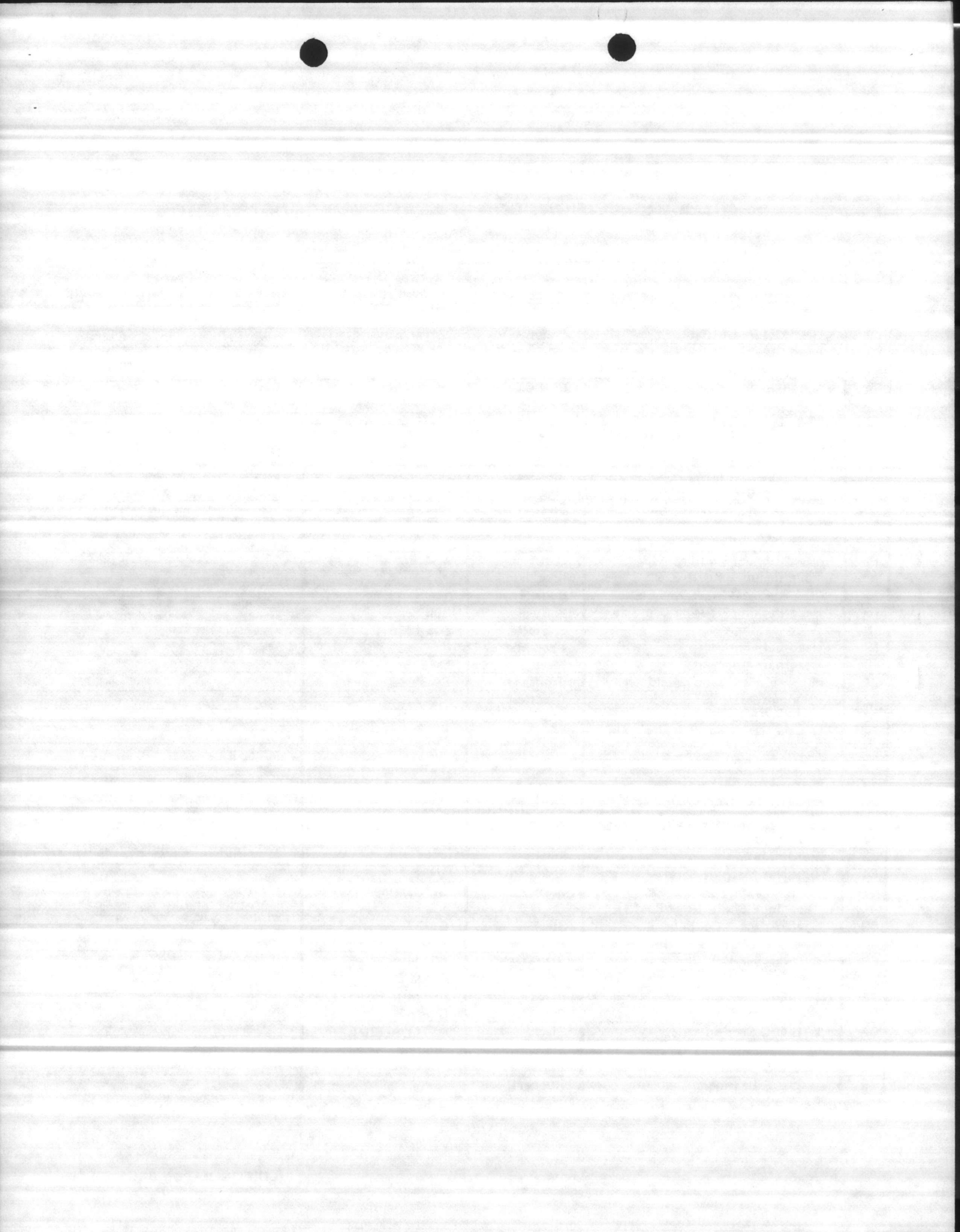
Head Fig. No.	Max. Size (In.) Disch.	Inner Col. (In.)	Outer Col. (In.)	DIMENSIONS INCHES																		
				A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	Z	
L5A L5AB	6	1½	5	10	9¾	8¾	¾	3¾	8¾	15¾	4¾	6¾	14¾	14¾	8¾	15¾	13¾	1	1¾	¾	2¾	3¾
L6A L6AB	6	1½	6	10	9¾	8¾	¾	3¾	8¾	15¾	4¾	6¾	14¾	14¾	8¾	15¾	13¾	1	1¾	¾	2¾	3¾
L8C L8CD	8	2	8	16¾	14¾	13¾	¾	3¾	7¾	15¾	4¾	6¾	16¾	17¾	9¾	18¾	15¾	1¾	1¾	1¾	3¾	3¾
L10C	10	2½	10	16¾	14¾	13¾	¾	4¾	9¾	18¾	5¾	6¾	16¾	18¾	10¾	19¾	16¾	1¾	1¾	1¾	3¾	3¾



Water Lubricated Turbine Pump

MATERIAL SPECIFICATIONS OF STANDARD CONSTRUCTION

KEY NO.	DESCRIPTION	MATERIAL	SPECIFICATION IF APPLICABLE	PART ORDER NUMBER
1	Discharge Head	Cast Iron	ASTM A48 CL.30	
2	Head Column Flange	Cast Iron	ASTM A48 CL.30	
3	Head Column Flange Gasket	Asbestos		
4	Studs (Hd. Column Flange Assy)	Steel	C1137	
5	Nuts (Used W/Key No. 4 Head Column Flange Assy)	Low Carbon Steel	ASTM A-307	
6	Head Discharge Flange	Cast Iron	ASTM A-126	
7	Head Discharge Flange Gasket	Asbestos		
8	Discharge Fig. Assy. Cap Scr.	Steel	ASTM A-301	
9	Discharge Fig. Assy. Nuts (Used with Key No. 8)	Low Carbon Steel	ASTM A-307	
10	Head Dsch. Fig. Assy. Studs	Steel	C1137	
11	Head Dsch. Fig. Assy. Nuts (Used With Key No. 10)	Low Carbon Steel	ASTM A-307	
14	Head Packing Housing W/Brg. Includes Key No. 32	Cast Iron (Pkg. Hsg.)	ASTM A48 CL.30	
15	"O" Ring	Buna-N		
16	Head Packing Housing Cap Scr.	S. Steel	300 Series	
18	W/L Headshaft	S. Steel	AISI 316	
19	Headshaft Flinger	Neoprene		
20	Headshaft Adj. Nut	Steel	C-1213	
21	Hd. Pkg. Hsg. Sand Shield	Bronze	SAE 660	
22	Packing (Set)	Asbestos		
23	Packing Follower	Bronze	SAE 40	
25	Hd. Pkg. Housing Grease Fittings	Steel		
26	Packing Follower Studs	S. Steel	AISI 416	
27	Packing Follower Retn. Nuts	S. Steel	300 Series	
28	Adapter Flange	Cast Iron	ASTM A48 CL45	
29	Adapter Flange O-Ring	Buna-N		
30	Adapter Fig. Assy. Cap Screws	S. Steel	300 Series	
32	W/L Headshaft Bearing	Bronze	SAE 660	
33	Headshaft Gib Key	Steel		
34	Adj. Nut Machine Screw	S. Plated		
67	Shaft Coupling (Hd. Shaft, Line Shaft, Bowl Shaf.)	Steel	C1137	
68	Shaft Adapter Coupling Hd/Sht, L/Sht., Bowl/Sht	Steel	C1137	
69	O/C Coupling	Blk. Steel	ASTM A-120-57T Grade B	
76	W/L O/C Section	Black Steel	ASTM A-120-57T Grade B	
77	W/L O/C Section	Black Steel	ASTM A-120-57T Grade B	
78	W/L L/S Bearing Spider	Brass		
79	W/L L/S Bearing	Rubber		

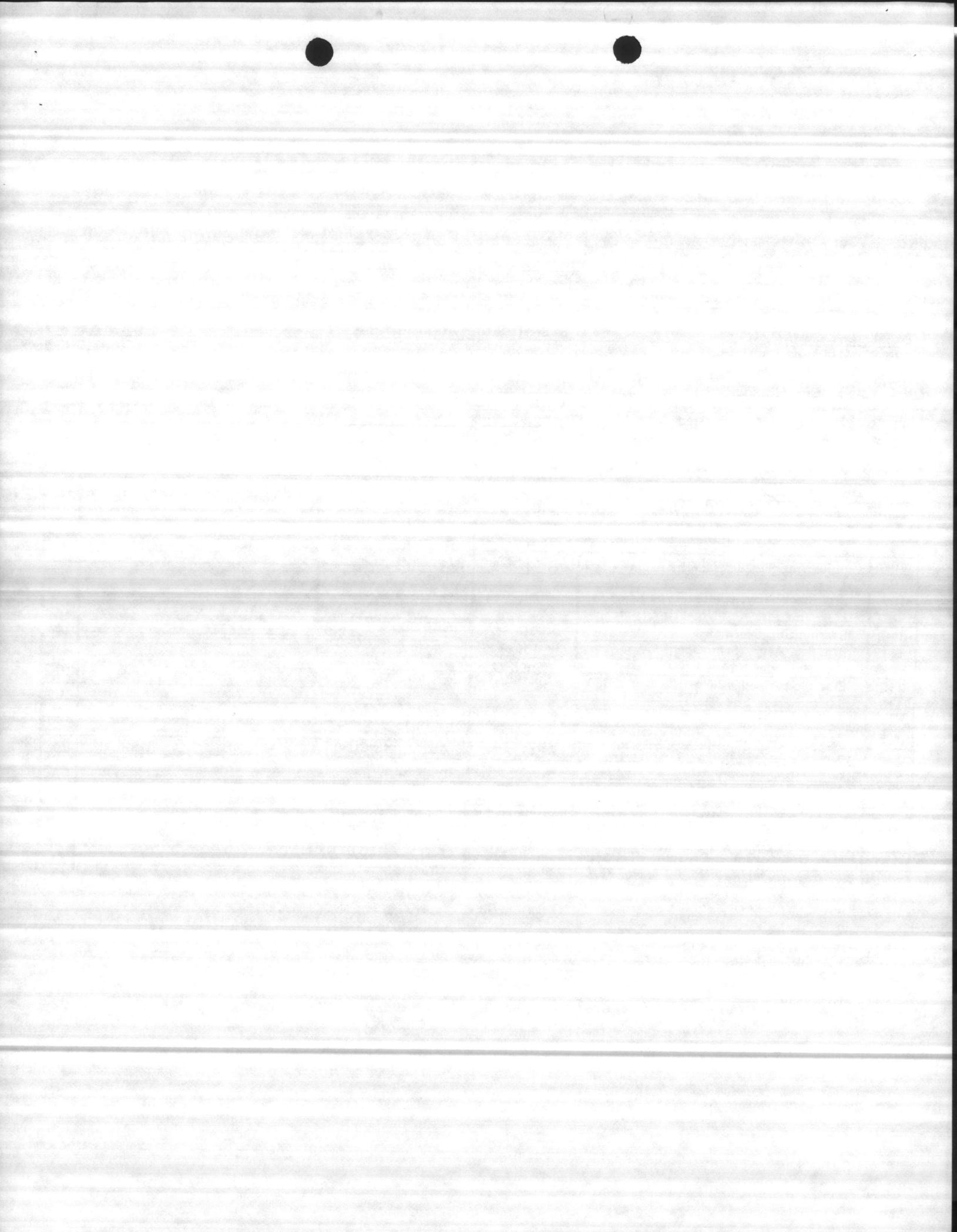


June 1, 1974

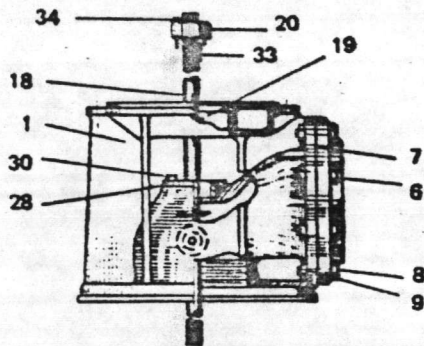
Water Lubricated Turbine Pump

MATERIAL SPECIFICATIONS OF STANDARD CONSTRUCTION

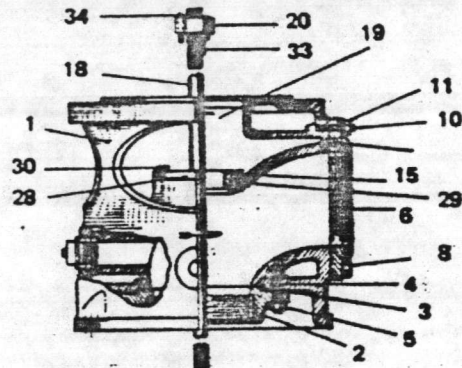
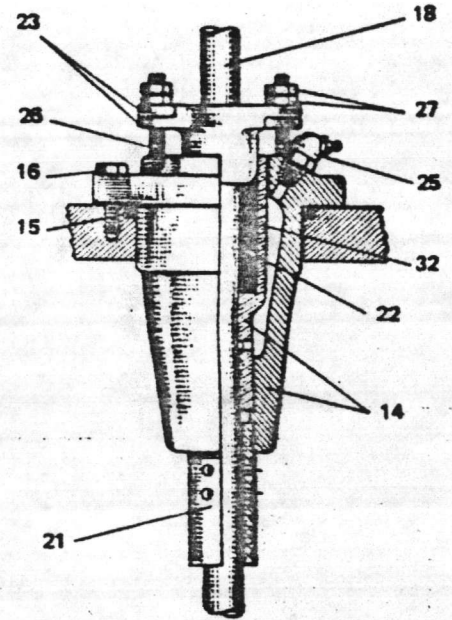
KEY NO.	DESCRIPTION	MATERIAL	SPECIFICATION IF APPLICABLE	PART ORDER NUMBER
80	W/L S/S Sleeve	S. Steel	304	
81	W/L L/S Extension 3' - 9 7/8" Lg.	Steel	C-1045	
82	W/S L/S Section (5' - 0" Lg.)	Steel	C-1045	
83	W/L L/S Section 10' - 0" Lg.	Steel	C-1045	
84	W/L Bowl Shaft	S. Steel	AISI 416	
90	W/L Discharge Housing Assy (Includes Key No. 91 & No. 92)	Cast Iron	ASTM A48 CL30	
91	W/L Upper Disch. Hsg. Brg.	Neoprene		
92	W/L Lower Disch. Hsg. Brg.	Neoprene		
93	W/L Disch. Hsg. Brg. Sand Cap	Bronze	SAE 40	
94	Sand Cap Set Screws (For K. No. 93)	S. Steel	300 Series	
103	Bowl Assy. (Closed Type) Includes Key No. 104	Cast Iron	ASTM A48 CL 30	
104	Bowl Bearing	Bronze	SAE 794	
105	Bowl Assy. (Semi-Open Type) Includes Key No. 104	Cast Iron	ASTM A48 CL30	
106	Impeller (Closed Type)	Bronze	SAE 40	
107	Impeller (Semi-Open Type)	Bronze	SAE 40	
108	Taper Lock	S. Steel	416 SS	
109	Brg. Stage Assy. (Closed Type) Includes Key No. 110	Cast Iron	ASTM A48 CL30	
110	Bearing Stg. Bearing	Bronze	SAE 660	
111	Brg. Stg. Assy. (Semi-Open) Includes Key No. 110	Cast Iron	ASTM A48 CL30	
112	Pipe Plug (For Key No. 109 & No. 111)	Galv. Steel		
113	Bearing Stage End Plug	Galv. Steel		
114	Bearing Stage Sand Cap	Bronze	SAE 40	
115	Sand Cap Set Screws (For K. No. 114)	S. Steel	300 Series	
116	Bowl Suction Flange	Cast Iron	ASTM A48 CL30	
117	Bowl Assy. Cap Screws	S. Steel	300 Series	
119	Suction Bell (Optional; Delete Key No. 116 if Suct. Bell is Used)	Cast Iron	ASTM A48 CL30	
152	W/L O/C Assy. T & C (Nom. 5' Lg.) (Assy of Key No. 69 & No. 76)	Black Steel	ASTM A-120-57T Grade B	
153	W/L O/C Assy T & C (Nom. 10' Lg.) (Assy of Key No. 69 & No. 77)	Black Steel	ASTM A-120-57T Grade B	



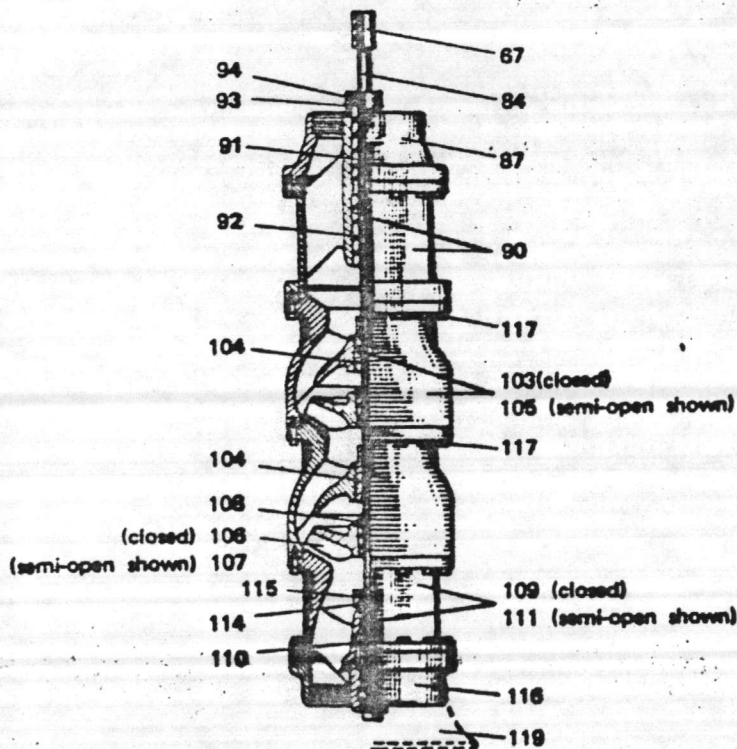
WATER LUBRICATED TURBINE PUMP PARTS DIAGRAM



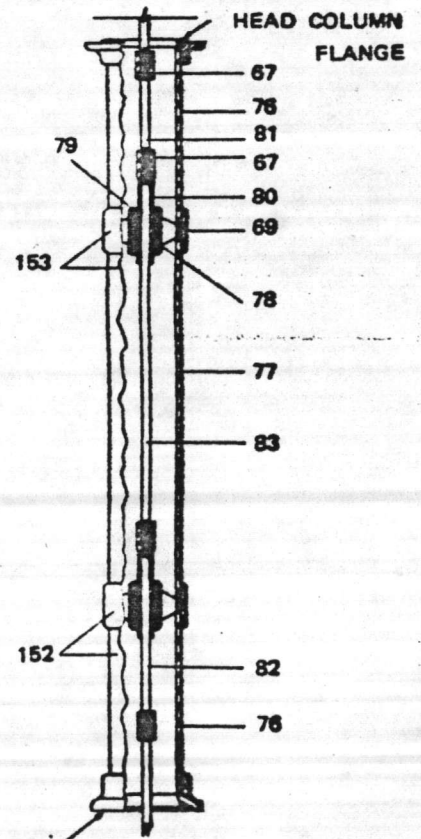
TYPICAL STANDARD HEAD



TYPICAL HEAVY DUTY HEAD



BOWL ASSEMBLY



BOWL COLUMN FLANGE

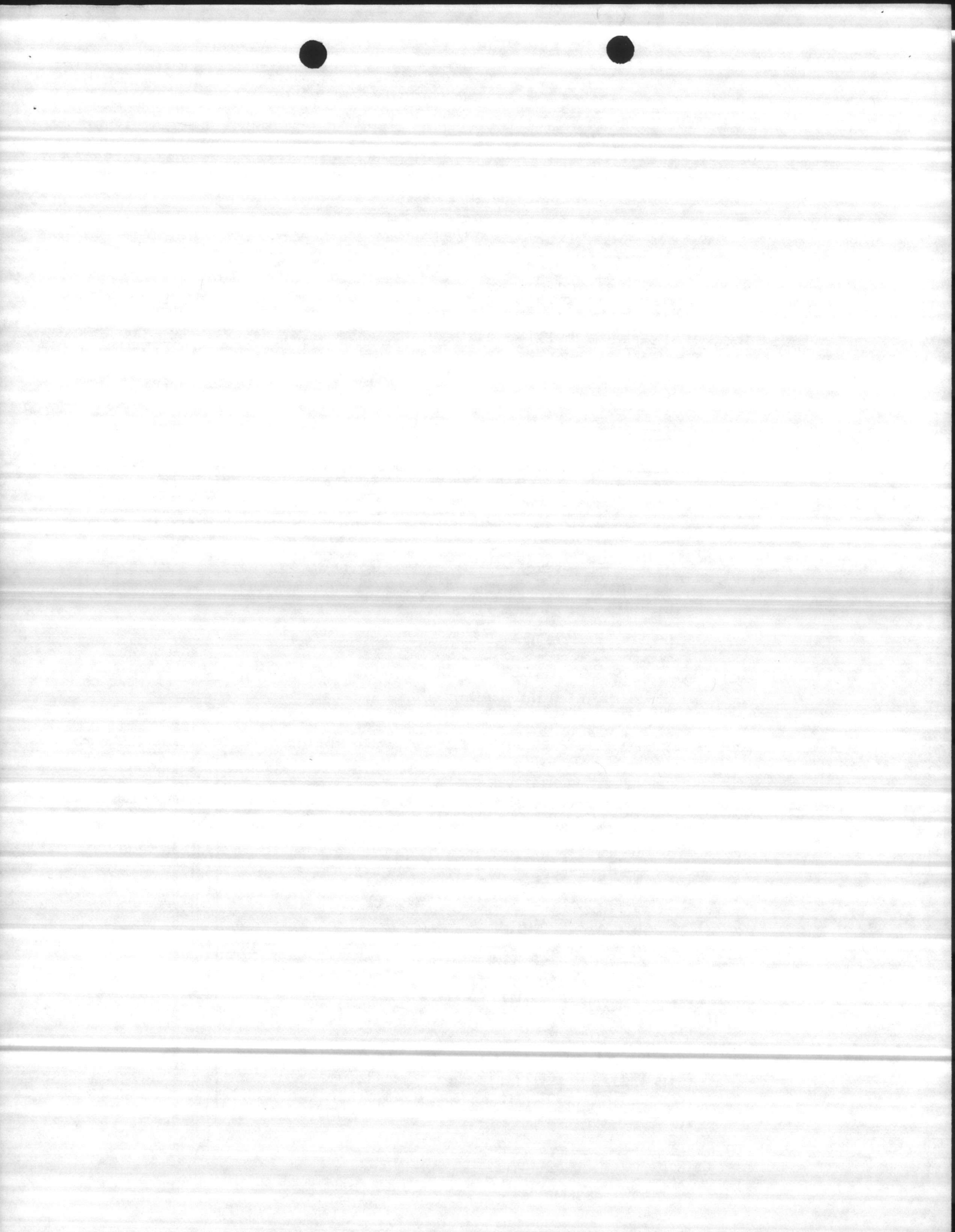


TABLE 3

NOTE: Drives that are rated at 1760 RPM vertical speed ARE NOT LIMITED to 1760 RPM. See Table 1.

MODEL	Vertical Shaft RPM	H.P. Rating	DOWNTHRUST CAPACITY IN POUNDS													
			HOLLOW SHAFT						SOLID SHAFT						COMB.	
			Type SL		Type S		Type SH		Type SSL		Type SS		Type SSH		Type C	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
20	1160	15	0	978	797	2358	797	3680	0	978	0	2358			0	2358
	1460	18	0	901	760	2173	760	3392	0	901	0	2173			0	2173
	1760	20	0	850	700	2050	700	3200	0	850	0	2050			0	2050
	3460	30	0	680	534	1640	534	2560	0	680	0	1640			0	1640
40	1160	30	0	1495	1138	3565	1138	5520	0	1495	0	3565			0	3565
	1460	35	0	1378	1055	3286	1055	5088	0	1378	0	3286			0	3286
	1760	40	0	1300	1000	3100	1000	4800	0	1300	0	3100			0	3100
60	960	39	0	2074	1490	5002	1490	7320	0	2074	0	5002			0	5002
	1160	45	0	1955	1422	4715	1422	6900	0	1955	0	4715			0	4715
	1460	53	0	1802	1331	4346	1331	6360	0	1802	0	4346			0	4346
	1760	60	0	1700	1250	4100	1250	6000	0	1700	0	4100			0	4100
80	960	52	0	3904	2085	6954	2085	11224	0	3904	0	6954			0	6954
	1160	60	0	3680	1991	6555	1991	10580	0	3680	0	6555			0	6555
	1460	70	0	3392	1846	6042	1846	9752	0	3392	0	6042			0	6042
	1760	80	0	3200	1750	5700	1750	9200	0	3200	0	5700			0	5700
100	960	66	0	3904	2101	7198	2101	11224	0	3904	0	7198			0	7198
	1160	75	0	3680	1991	6785	1991	10580	0	3680	0	6785			0	6785
	1460	88	0	3392	1856	6254	1856	9752	0	3392	0	6254			0	6254
	1760	100	0	3200	1750	5900	1750	9200	0	3200	0	5900			0	5900
125	720	68	0	5535	3135	7965	3135	12420	0	5535	0	7965			0	7965
	960	83	0	5002	2722	7198	2722	11224	0	5002	0	7198			0	7198
	1160	94	0	4715	2560	6781	2560	10580	0	4715	0	6781			0	6781
	1460	110	0	4346	2387	6254	2387	9752	0	4346	0	6254			0	6254
150	720	80	0	6750	3520	9180	3520	14243	0	6750	0	9180	0	14243	0	9180
	960	98	0	6100	3234	8296	3234	12871	0	6100	0	8296	0	12871	0	8296
	1160	112	0	5750	3059	7820	3059	12133	0	5750	0	7820	0	12133	0	7820
	1460	132	0	5300	2864	7208	2864	11183	0	5300	0	7208	0	11183	0	7208
200	720	80	0	6750	3520	9180	3520	14243	0	6750	0	9180	0	14243	0	9180
	960	98	0	6100	3234	8296	3234	12871	0	6100	0	8296	0	12871	0	8296
	1160	112	0	5750	3059	7820	3059	12133	0	5750	0	7820	0	12133	0	7820
	1460	132	0	5300	2864	7208	2864	11183	0	5300	0	7208	0	11183	0	7208
275	720	107	0	6750	3531	9180	3531	14243	0	6750	0	9180	0	14243	0	9180
	960	131	0	6100	3242	8296	3242	12871	0	6100	0	8296	0	12871	0	8296
	1160	150	0	5750	3072	7820	3072	12133	0	5750	0	7820	0	12133	0	7820
	1460	176	0	5300	2864	7208	2864	11183	0	5300	0	7208	0	11183	0	7208
375	720	147	0	8100	3920	17213	3920	25650	0	8100	0	13973	3920	25650		
	960	180	0	7320	3600	15555	3600	23180	0	7320	0	12627	3600	23180		
	1160	206	0	6900	3410	14663	3410	21850	0	6900	0	11903	3410	21850		
	1460	241	0	6360	3169	13515	3169	20140	0	6360	0	10971	3169	20140		
450	720	172	0	8700	4871	27550	4871	36250	0	8700	0	15008	4871	27550		
	960	201	0	8100	4586	25650	4586	33750	0	8100	0	13973	4586	25650		
	1160	246	0	7320	4209	23180	4209	30500	0	7320	0	12627	4209	23180		
	1460	281	0	6900	3979	21850	3979	28750	0	6900	0	11903	3979	21850		
600	580	329	0	6360	3702	20140	3702	26500	0	6360	0	10971	3702	20140		
	720	375	0	6000	3500	19000	3500	25000	0	6000	0	10350	3500	19000		
	960	458	0	5583	27550	5583	36250	0	8700	0	15008	5583	27550			
	1160	527	0	8480	4765	26500	4765	25000	0	8480	0	10971	4765	26500		
750	580	207	0	8700	5583	27550	5583	36250	0	8700	0	15008	5583	27550		
	720	241	0	8100	5236	25650	5236	33750	0	8100	0	13973	5236	25650		
	960	295	0	7320	4807	23180	4807	30500	0	7320	0	12627	4807	23180		
	1160	337	0	6900	4545	21850	4545	28750	0	6900	0	11903	4545	21850		
CONSULT FACTORY	1460	395	0	6360	4232	20140	4232	26500	0	6360	0	10971	4232	20140		
	1760	450	0	6000	4000	19000	4000	25000	0	6000	0	10350	4000	19000		
	580	275	0	11600	6259	36250			0	11600	0	15008	6259	36250		
	720	321	0	10800	5885	33750			0	10800	0	13973	5885	33750		
CONSULT FACTORY	870	367	0	10080	5568	31500			0	10080	0	13041	5568	31500		
	960	393	0	9760	5404	30500	CONSULT FACTORY		0	9760	0	12627	5404	30500		
	1160	449	0	9200	5109	28750	CONSULT FACTORY		0	9200	0	11903	5109	28750		
	1460	527	0	8480	4765	26500	CONSULT FACTORY		0	8480	0	10971	4765	26500		
CONSULT FACTORY	1760	600	0	8000	4500	25000	CONSULT FACTORY		0	8000	0	10350	4500	25000		
	580	344	0	11310	6959	36250			0	11310	0	15008	6259	36250		
	720	401	0	10530	6535	33750			0	10530	0	13973	5885	33750		
	870	458	0	9828	6177	31500			0	9828	0	13041	5568	31500		
CONSULT FACTORY	960	491	0	9516	6001	30500	CONSULT FACTORY		0	9516	0	12627	5404	30500		
	1160	561	0	8970	5674	28750	CONSULT FACTORY		0	8920	0	11903	5109	28750		
	1460	659	0	8268	5296	26500	CONSULT FACTORY		0	8268	0	10971	4765	26500		
	1760	750	0	7800	5000	25000	CONSULT FACTORY		0	7800	0	10350	4500	25000		

Please see pages 13 and 14 for all information on Model 1200 Drives.



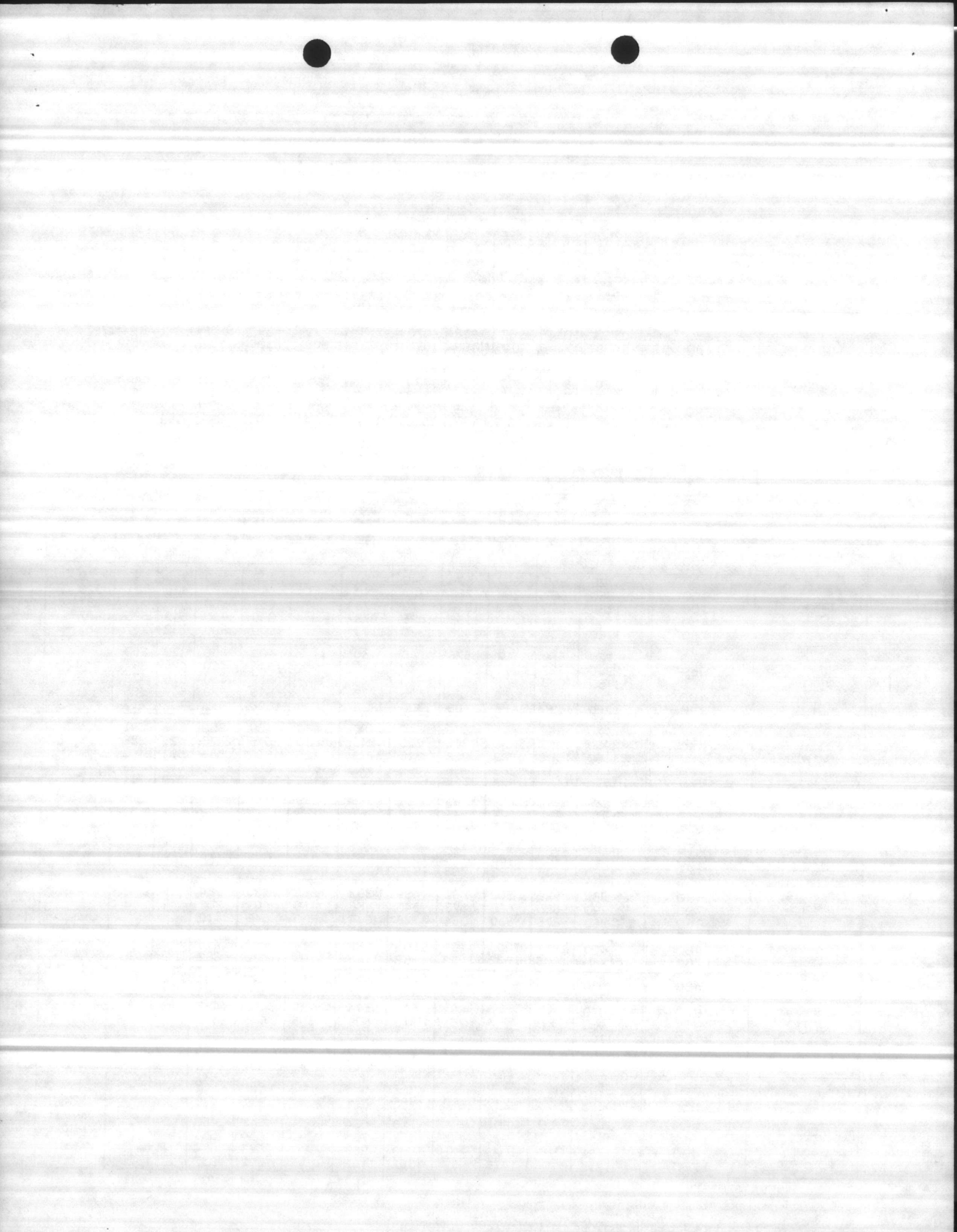
TABLE 4

NOTE: Drives that are rated at 1760 RPM vertical speed ARE NOT LIMITED to 1760 RPM. See Table 1.

MODEL	VERTICAL SHAFT RPM	ENGINE RPM											
		1:1	10:11	5:6	4:5	3:4	2:3	5:8	4:7	1:2	4:9	2:5	1:3*
20	1160	1160		967		870	773			580			387
	1460	1460		1217		1095	973			730			487
	1760	1760		1467		1320	1173			880			587
	3460	3460		2883		2595	2307			1730			1153
40	1160	1160		967		870	773		667	580			387
	1460	1460		1217		1095	973		840	730			487
	1760	1760		1467		1320	1173		1012	880			587
60	960	960	864	800	768	720	640	597	545	480		398	320
	1160	1160	1044	967	928	870	773	721	659	580		481	387
	1460	1460	1314	1217	1168	1095	973	908	830	730		605	487
	1760	1760	1584	1467	1408	1320	1173	1094	1000	880		730	587
80	960	960	864	800	768	720	640	597	545	480		398	320
	1160	1160	1044	967	928	870	773	721	659	580		481	387
	1460	1460	1314	1217	1168	1095	973	908	830	730		605	487
	1760	1760	1584	1467	1408	1320	1173	1094	1000	880		730	587
100	960	960	864	800	768	720	640	597	545	480		398	
	1160	1160	1044	967	928	870	773	721	659	580		481	
	1460	1460	1314	1217	1168	1095	973	908	830	730		605	
	1760	1760	1584	1467	1408	1320	1173	1094	1000	880		730	
125	720	720	650	600	576	540	480						
	960	960	867	800	768	720	640						
	1160	1160	1048	967	928	870	773						
	1460	1460	1319	1217	1168	1095	973						
1760	1760	1590	1467	1408	1320	1173							
150	720	720	650	597	576	540	480		409	360	320	293	240
	960	960	867	796	768	720	640		545	480	426	391	320
	1160	1160	1048	960	928	870	773		659	580	516	473	387
	1460	1460	1319	1210	1168	1095	973		830	730	649	595	487
1760	1760	1590	1458	1408	1320	1173		1000	880	782	717	587	
200	720	720	650	597	576	540	480		409	360	320	293	
	960	960	867	796	768	720	640		545	480	426	391	
	1160	1160	1048	960	928	870	773		659	580	516	473	
	1460	1460	1319	1210	1168	1095	973		830	730	649	595	
1760	1760	1590	1458	1408	1320	1173		1000	880	782	717		
275	720	720	656	623	576	540	480	450	409	352	318	291	
	960	960	875	830	768	720	640	600	546	470	425	388	CONSULT FACTORY
	1160	1160	1058	1003	928	870	773	725	660	568	513	468	
	1460	1460	1331	1263	1168	1095	973	913	830	715	646	590	
1760	1760	1605	1522	1408	1320	1173	1100	1000	862	778	711		
375	580	580	529	502	464	439	392	363	330	284			
	720	720	656	623	576	545	486	450	409	352			
	960	960	875	830	768	726	648	600	546	470			CONSULT FACTORY
	1160	1160	1058	1003	928	875	783	725	660	568			
1460	1460	1331	1263	1168	1105	985	913	830	715				
1760	1760	1605	1522	1408	1332	1188	1100	1000	862				
450	580	580	529	502	461	439	392	363	330	284			
	720	720	656	623	573	545	486	450	409	352			
	960	960	875	830	764	726	648	600	546	470			CONSULT FACTORY
	1160	1160	1058	1003	923	878	783	725	660	568			
1460	1460	1331	1263	1161	1105	985	913	830	715				
1760	1760	1605	1522	1400	1392	1188	1100	1000	862				
600	580	580			461	432	383	360	327	285			
	720	720			573	536	475	447	406	353			
	870	870			692	648	574	539	490	427			CONSULT FACTORY
	960	960			764	715	634	595	541	471			
1160	1160			923	864	766	719	654	569				
1460	1460			1161	1087	964	905	823	717				
1760	1760			1400	1311	1162	1091	992	864				
750	580	565		486		429	383		327	276			
	720	700		603		533	475		406	342			
	870	846		729		643	574		490	414			CONSULT FACTORY
	960	933		804		710	634		541	456			
1160	1128		972		858	766		654	551				
1460	1421		1223		1080	963		823	694				
1760	1712		1475		1302	1162		992	837				

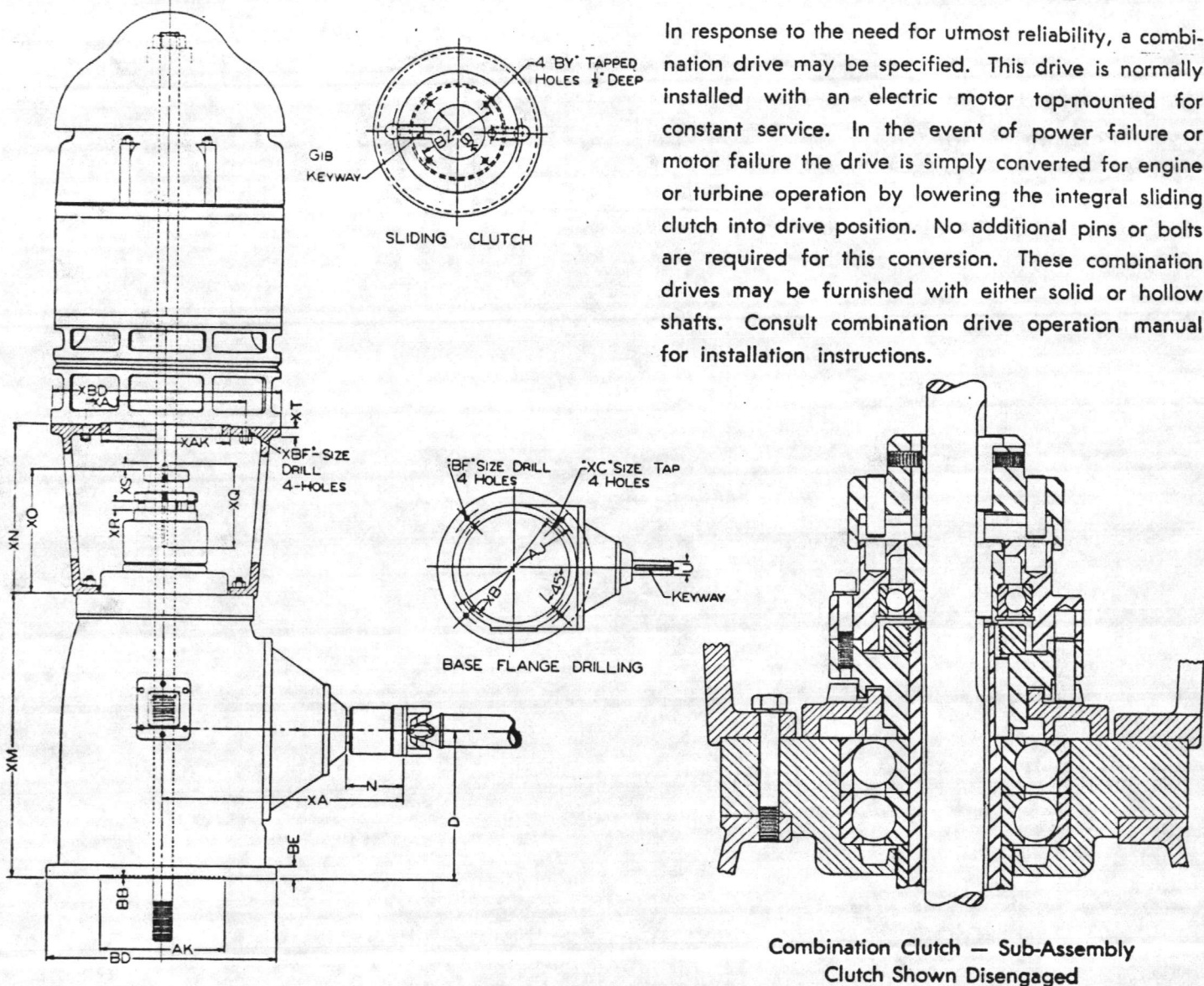
*Model 20 1:3 ratio not available with Figure 2 or Figure 3 rotation.

Please see pages 13 and 14 for all information on Model 1200 Drives.



COMBINATION DRIVE

In response to the need for utmost reliability, a combination drive may be specified. This drive is normally installed with an electric motor top-mounted for constant service. In the event of power failure or motor failure the drive is simply converted for engine or turbine operation by lowering the integral sliding clutch into drive position. No additional pins or bolts are required for this conversion. These combination drives may be furnished with either solid or hollow shafts. Consult combination drive operation manual for installation instructions.



Combination Clutch — Sub-Assembly
Clutch Shown Disengaged

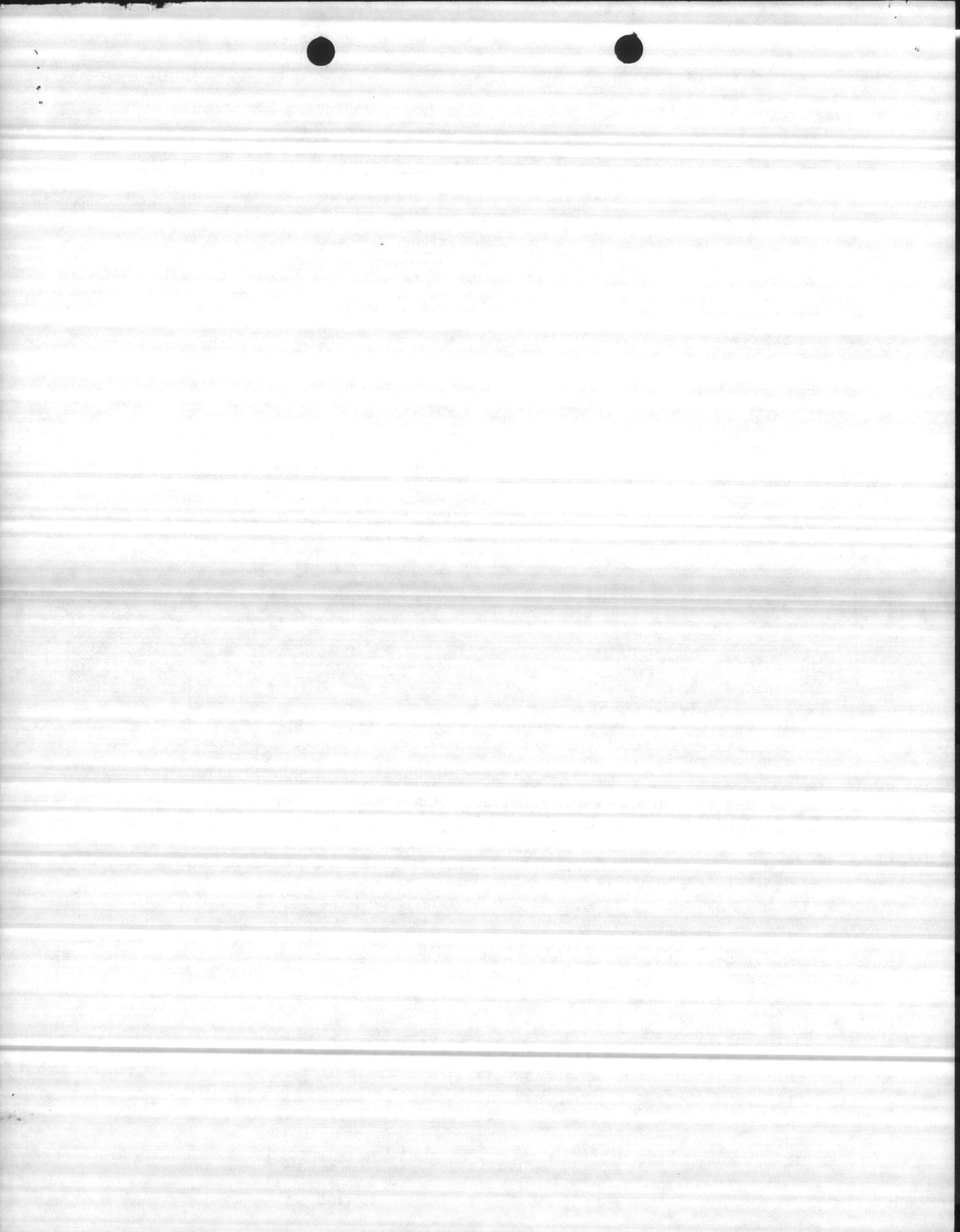
TABLE OF DIMENSIONS — COMBINATION DRIVE
TABLE 7

MODEL	D	N	HORIZONTAL SHAFT U			AJ	AK	BB	BD	BE	BF	XA	XB	XC	XL	XM	XN	XO	XQ	XR	XS	XT	XAJ	XAK	XBD	XBF	BX BORE	
			NOM. INAL.	ACTUAL	KEYWAY																						MAXIMUM	
C20	6 3/4	2 5/8	1 1/4	1.249	5/16 X 5/32	9/8	8.250	3/16	10	5/8	7/16	10/8			9/32	12 1/4	12 1/2	5 1/2	5 1/4	2	1 1/2	7/16						1 *
C40A	8 1/2	4 3/8	1 1/2	1.499	3/8 X 3/16	9/8	8.250	1/4	12	13/16	7/16	15 5/8			9/32	16 3/8	16	6 1/2	7	5/8	2	5/8						1 1/4
C40B	8 1/2	4 3/8	1 1/2	1.499	3/8 X 3/16	14 3/4	13.500	1/4	16 1/2	13/16	11/16	15 5/8			9/32	16 3/8	16	6 1/2	7	5/8	2	5/8						1 1/4
C60	11 1/2	4 1/4	1 1/2	1.499	3/8 X 3/16	14 3/4	13.500	1/4	16 1/2	3/4	11/16	16 3/4			9/32	20 1/4	18	7 13/16	7 3/4	3/4	2 1/4	3/4						1 1/2
C80	11 1/2	4 1/4	1 7/8	1.874	3/8 X 3/16	14 3/4	13.500	1/4	16 1/2	3/4	11/16	16 3/4			9/32	20 3/8	18	7 13/16	7 3/4	3/4	2 1/4	3/4						1 1/2
C100	11 1/2	4 1/4	1 7/8	1.874	3/8 X 3/16	14 3/4	13.500	1/4	16 1/2	3/4	11/16	16 3/4			9/32	20 3/8	18	7 13/16	7 3/4	3/4	2 1/4	3/4						1 1/2
C125	11 1/2	4 1/2	2 1/16	2.436	5/8 X 5/16	14 3/4	13.500	1/4	16 1/2	5/4	11/16	18 3/4			9/32	21 1/8	18	7 1/2	9	3/4	2 1/4	3/4						1 1/16
C150	13 3/4	5 1/4	2 1/16	2.436	5/8 X 5/16	18 1/4	13.500	1/4	20	1 1/8	11/16	20 3/4	14 3/8	5-11-NC	9/32	25 5/8	20	9	10	7/8	2 1/4	7/8						2 *
C200	13 3/4	5 1/4	2 1/16	2.436	5/8 X 5/16	18 1/4	13.500	1/4	20	1 1/8	11/16	20 3/4	14 3/8	5-11-NC	9/32	25 5/8	20	9	10	7/8	2 1/4	7/8						2
C275	16	6	2 15/16	2.936	3/4 X 3/8	23	13.500	1/4	24 1/2	1 1/8	13/16	25 1/2	14 3/8	5-11-NC	9/32	27	12 1/2	11 1/2	1 1/8	3 1/2	1							2 7/16
C375	16	6	2 15/16	2.936	3/4 X 3/8	23	13.500	1/4	24 1/2	1 1/8	13/16	25 1/2	14 3/8	5-11-NC	9/32	27	12 3/8	11 1/2	1 1/8	3 1/2	1							2 7/16
C450	16	6	3 3/4	3.749	7/8 X 7/16	23	13.500	1/4	24 1/2	1 1/8	13/16	25 1/2	14 3/8	5-11-NC	9/32	27	12 3/8	11 1/2	1 1/8	3 1/2	1							2 7/16
C600	18	6	3 3/4	3.749	7/8 X 7/16	23	13.500	1/4	24 1/2	1 1/8	13/16	26 3/4	14 3/8	5-11-NC	9/32	27	12 3/8	11 1/2	1 1/8	3 1/2	1							2 7/16
C750	21	8	4	3.998	1 X 7/8	28 1/2	22.000	1/4	30 1/2	1 1/4	13/16	36 3/8	26 3/4	4-10-NC	7/16	30	16 1/4	15	1 3/16	4	1 1/4							2 15/16

* Model C20, ratio 1:3, maximum clutch bore 7/8"; Model C150, ratio 1:3, maximum 1-11/16". Consult factory for maximum clutch bore for Fig. 2 and Fig. 3 rotation. Model C20, 1:3 ratio, not available with Fig. 2 or Fig. 3 rotation.

** Horizontal shaft dimensions shown for Model 450 apply to ratios in Table 4 only. Consult factory for dimensions of all others.

10† "XA" dimensions shown apply to ratios in Table 4 and reducing ratios 11:10, 6:5 and 4:3 only. Consult factory for dimensions of all others.



amarillo

MARMON

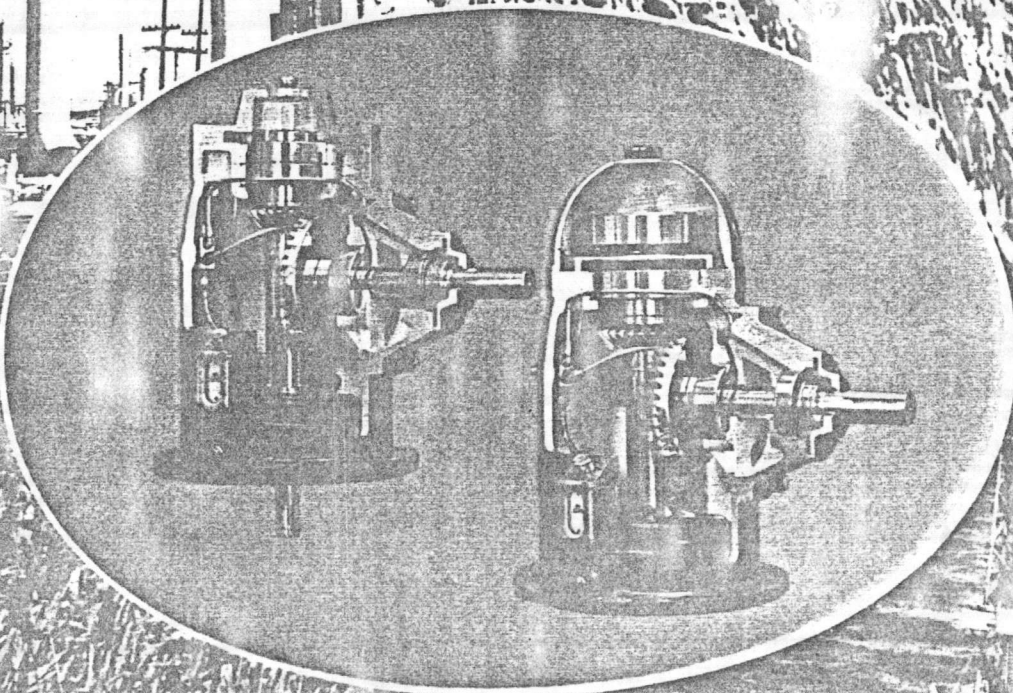
RIGHT
ANGLE
GEAR
DRIVES



CATALOG NUMBER 30 • MARCH 1981

New Wells Replace These - 10-10-84

- 639 RR-227
- 621 TT- New well
- 611 By MAINT.
- 614
- LCH-4006
- 627



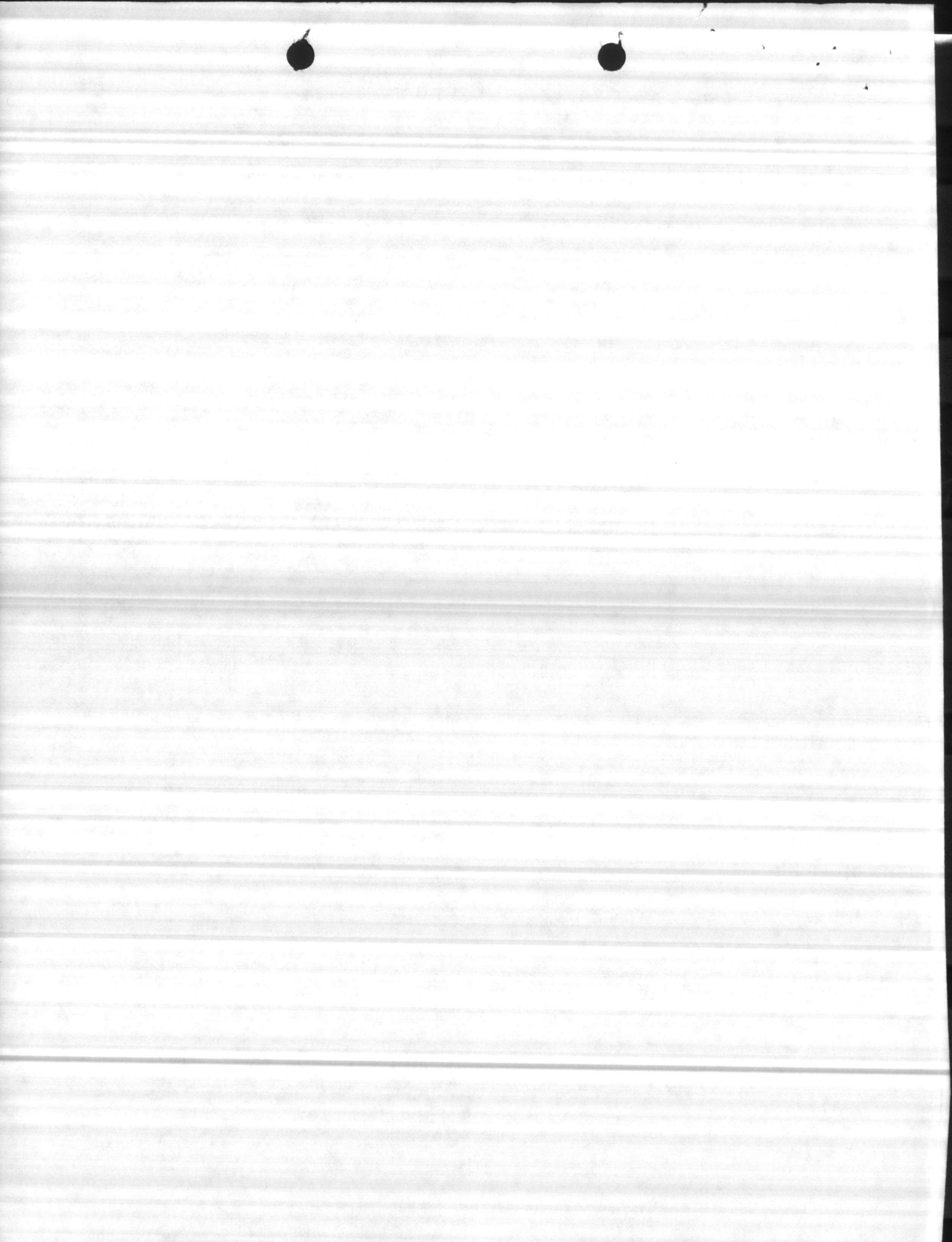
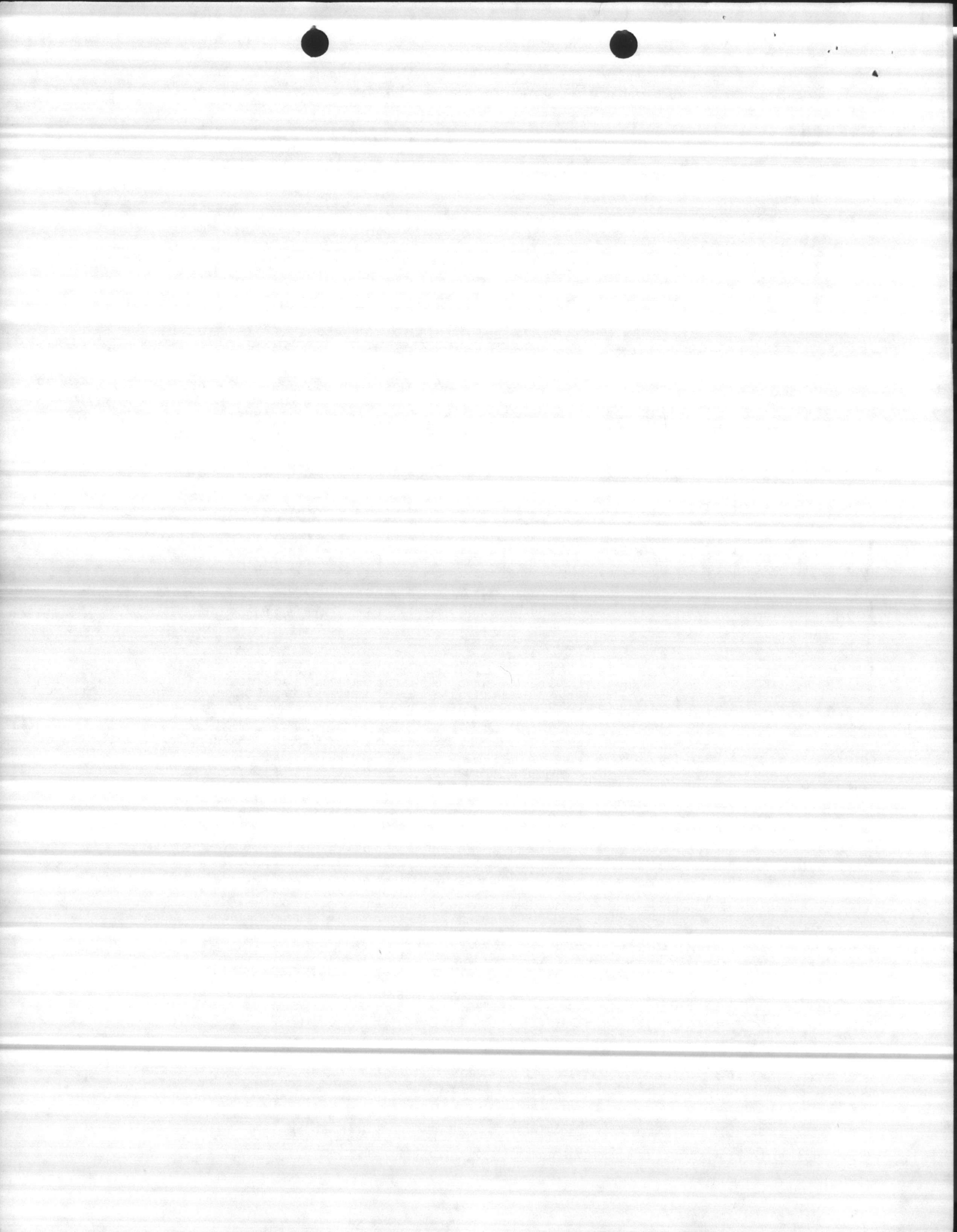


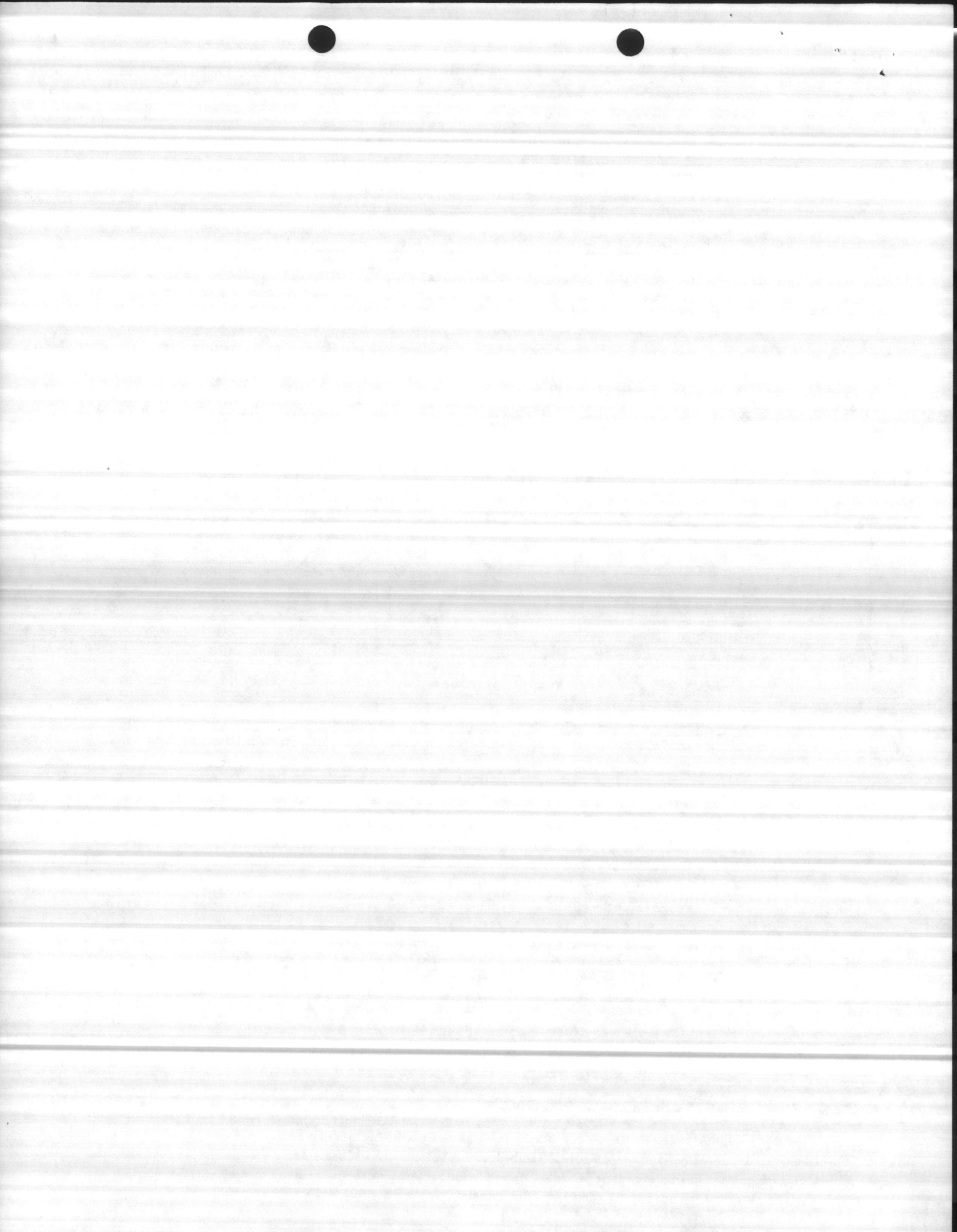
TABLE 3

NOTE: Drives that are rated at 1760 RPM vertical speed ARE NOT LIMITED to 1760 RPM. See Table 1.

MODEL	Vertical Shaft RPM	H.P. Rating	DOWNTHRUST CAPACITY IN POUNDS													
			HOLLOW SHAFT						SOLID SHAFT						COMB.	
			Type SL		Type S		Type SH		Type SSL		Type SS		Type SSH		Type C	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
20	1160	15	0	978	797	2358	797	3680	0	978	0	2358			0	2358
	1460	18	0	901	760	2173	760	3392	0	901	0	2173			0	2173
	1760	20	0	850	700	2050	700	3200	0	850	0	2050			0	2050
	3460	30	0	680	534	1640	534	2560	0	680	0	1640			0	1640
40	1160	30	0	1495	1138	3565	1138	5520	0	1495	0	3565			0	3565
	1460	35	0	1378	1055	3286	1055	5088	0	1378	0	3286			0	3286
	1760	40	0	1300	1000	3100	1000	4800	0	1300	0	3100			0	3100
60	960	39	0	2074	1490	5002	1490	7320	0	2074	0	5002			0	5002
	1160	45	0	1955	1422	4715	1422	6900	0	1955	0	4715			0	4715
	1460	53	0	1802	1331	4346	1331	6360	0	1802	0	4346			0	4346
	1760	60	0	1700	1250	4100	1250	6000	0	1700	0	4100			0	4100
80	960	52	0	3904	2085	6954	2085	11224	0	3904	0	6954			0	6954
	1160	60	0	3680	1991	6555	1991	10580	0	3680	0	6555			0	6555
	1460	70	0	3392	1846	6042	1846	9752	0	3392	0	6042			0	6042
	1760	80	0	3200	1750	5700	1750	9200	0	3200	0	5700			0	5700
100	960	66	0	3904	2101	7198	2101	11224	0	3904	0	7198			0	7198
	1160	75	0	3680	1991	6785	1991	10580	0	3680	0	6785			0	6785
	1460	88	0	3392	1856	6254	1856	9752	0	3392	0	6254			0	6254
	1760	100	0	3200	1750	5900	1750	9200	0	3200	0	5900			0	5900
125	720	68	0	5535	3135	7965	3135	12420	0	5535	0	7965			0	7965
	960	83	0	5002	2722	7198	2722	11224	0	5002	0	7198			0	7198
	1160	94	0	4715	2560	6781	2560	10580	0	4715	0	6781			0	6781
	1460	110	0	4346	2387	6254	2387	9752	0	4346	0	6254			0	6254
150	720	80	0	6750	3520	9180	3520	14243	0	6750	0	9180	0	14243	0	9180
	960	98	0	6100	3234	8296	3234	12871	0	6100	0	8296	0	12871	0	8296
	1160	112	0	5750	3059	7820	3059	12133	0	5750	0	7820	0	12133	0	7820
	1460	132	0	5300	2864	7208	2864	11183	0	5300	0	7208	0	11183	0	7208
1760	720	150	0	5000	2700	6800	2700	10550	0	5000	0	6800	0	10550	0	6800
	960	107	0	6750	3531	9180	3531	14243	0	6750	0	9180	0	14243	0	9180
	1160	131	0	6100	3242	8296	3242	12871	0	6100	0	8296	0	12871	0	8296
	1460	150	0	5750	3072	7820	3072	12133	0	5750	0	7820	0	12133	0	7820
200	1460	176	0	5300	2864	7208	2864	11183	0	5300	0	7208	0	11183	0	7208
	1760	200	0	5000	2700	6800	2700	10550	0	5000	0	6800	0	10550	0	6800
	720	107	0	6750	3531	9180	3531	14243	0	6750	0	9180	0	14243	0	9180
	960	131	0	6100	3242	8296	3242	12871	0	6100	0	8296	0	12871	0	8296
275	1160	150	0	5750	3072	7820	3072	12133	0	5750	0	7820	0	12133	0	7820
	1460	176	0	5300	2864	7208	2864	11183	0	5300	0	7208	0	11183	0	7208
	1760	200	0	5000	2700	6800	2700	10550	0	5000	0	6800	0	10550	0	6800
	720	147	0	8100	3920	13973	3920	25650	0	8100	0	13973	3920	25650		
375	960	180	0	7320	3600	12627	3600	23180	0	7320	0	12627	3600	23180		
	1160	206	0	6900	3410	11903	3410	21850	0	6900	0	11903	3410	21850		
	1460	241	0	6360	3169	10971	3169	20140	0	6360	0	10971	3169	20140		
	1760	275	0	6000	3000	10350	3000	19000	0	6000	0	10350	3000	19000		
450	580	172	0	8700	4871	27550	4871	36250	0	8700	0	15008	4871	27550		
	720	201	0	8100	4586	25650	4586	33750	0	8100	0	13973	4586	25650		
	960	246	0	7320	4209	23180	4209	30500	0	7320	0	12627	4209	23180		
	1160	281	0	6900	3979	21850	3979	28750	0	6900	0	11903	3979	21850		
600	1460	329	0	6360	3702	20140	3702	26500	0	6360	0	10971	3702	20140		
	1760	375	0	6000	3500	19000	3500	25000	0	6000	0	10350	3500	19000		
	580	207	0	8700	5583	27550	5583	36250	0	8700	0	15008	5583	27550		
	720	241	0	8100	5236	25650	5236	33750	0	8100	0	13973	5236	25650		
750	960	295	0	7320	4807	23180	4807	30500	0	7320	0	12627	4807	23180		
	1160	337	0	6900	4545	21850	4545	28750	0	6900	0	11903	4545	21850		
	1460	395	0	6360	4232	20140	4232	26500	0	6360	0	10971	4232	20140		
	1760	450	0	6000	4000	19000	4000	25000	0	6000	0	10350	4000	19000		
1000G	580	275	0	11600	6259	36250	6259	44645	0	11600	0	15008	6259	36250		
	720	321	0	10800	5885	33750	5885	41841	0	10800	0	13973	5885	33750		
	870	367	0	10080	5568	31500	5568	39532	0	10080	0	13041	5568	31500		
	960	393	0	9760	5404	30500	5404	38382	0	9760	0	12627	5404	30500		
	1160	449	0	9200	5109	28750	5109	36263	0	9200	0	11903	5109	28750		
	1460	527	0	8480	4765	26500	4765	33845	0	8480	0	10971	4765	26500		
1000G	1760	600	0	8000	4500	25000	4500	32000	0	8000	0	10350	4500	25000		
	580	344	0	11310	6959	36250	6959	44645	0	11310	0	15008	6259	36250		
	720	401	0	10530	6535	33750	6535	41841	0	10530	0	13973	5885	33750		
	870	458	0	9828	6177	31500	6177	39532	0	9828	0	13041	5568	31500		
	960	491	0	9516	6001	30500	6001	38382	0	9516	0	12627	5404	30500		
	1160	561	0	8970	5674	28750	5674	36263	0	8920	0	11903	5109	28750		
1000G	1460	659	0	8268	5296	26500	5296	33845	0	8268	0	10971	4765	26500		
	1760	750	0	7800	5000	25000	5000	32000	0	7800	0	10350	4500	25000		
	580	460	0	11310	9306	36250	9306	46738	0	11310						
	720	535	0	10530	8719	33750	8719	43802	0	10530						
	870	611	0	9828	8241	31500	8241	41385	0	9828	CONSULT FACTORY	CONSULT FACTORY			CONSULT FACTORY	
	960	654	0	9516	7994	30500	7994	40181	0	9516	CONSULT FACTORY	CONSULT FACTORY			CONSULT FACTORY	
1000G	1160	747	0	8970	7556	28750	7556	37963	0	8920						
	1460	877	0	8268	7048	26500	7048	35432	0	8268						
	1760	1000	0	7800	6667	25000	6667	33500	0	7800						

Please see pages 12, 13 and 14 for all information on Models 1000A, 1200, 1500 and 1800.





CUSTOMER NAME East Coast Co.
 CUST. ORD. NO. 1217
 U.S. ORD. NO.
 MARK: Camp Lejeune
 QTY. 1 HP 30 FRAME 286 TP PHASE 3
 HERTZ 60 R.P.M. 1800 VOLTS 208



Vertical Motors

Section 505
 Page 1

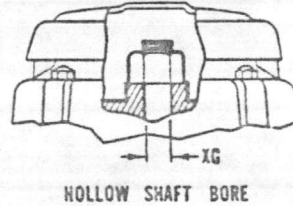
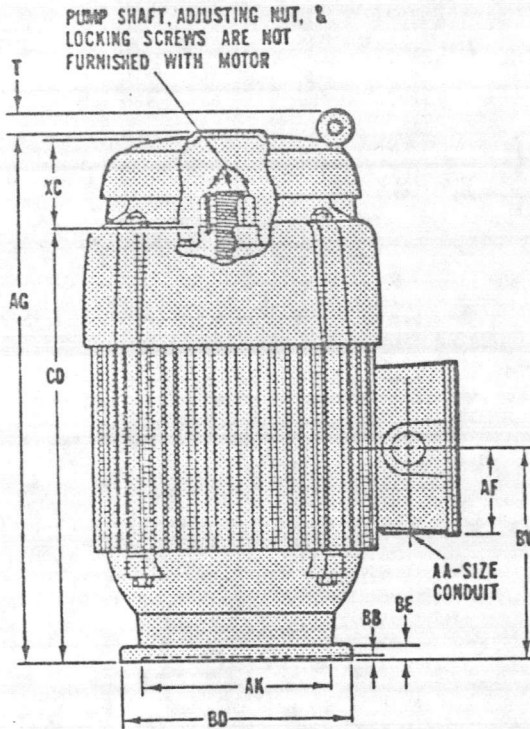
WPI-TYPE AU
 FRAMES 182 THRU 256TPA

HIGH THRUST
 VERTICAL HOLLOSHAFT
 NEMA P BASE

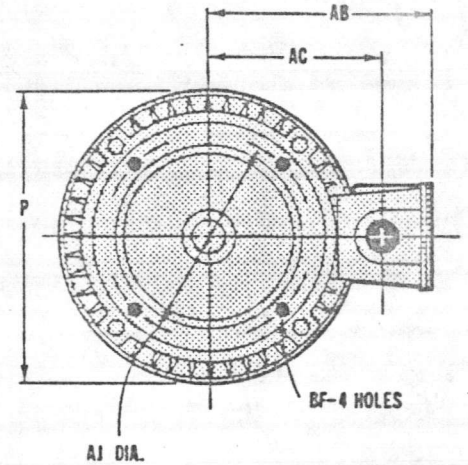
DIMENSIONS

FEATURES: 30 HP, 1800 rpm, frame 286 TP, 1.15 S.F. continuous duty

Building LCH4006



Conduit opening may be located in steps of 90°. Standard as shown with conduit down.



ALL DIMENSIONS ARE IN INCHES

FRAME	P*	T	AA	AB	AC	AF	AG	AJ DIA.	AK -.003	BB	BD	BE	BF TAP SIZE	BV	CD	XC	XG	UNIMOUNT BRKT. P/N
182TP 184TP	12-7/8	1-1/2	1	6-5/16	5-3/8	2-5/8	21-1/4	9-1/8	8-1/4	3/16	10	3/4	7/16	8	17-9/16	3-11/32	1-1/16	682186
213TP 215TP	12-7/8	1-1/2	1	7-9/16	6-7/16	3-5/16	21-1/4	9-1/8	8-1/4	3/16	10	3/4	7/16	8	17-9/16	3-11/32	1-1/16	682186
254TP 256TP	14	—	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	9-1/8	8-1/4	1/4	10	15/16	7/16	11-7/16	23-7/16	3-3/8	1-1/4	347107
254TPH 256TPH	14	—	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	9-1/8	8-1/4	1/4	12	15/16	7/16	11-7/16	23-7/16	3-3/8	1-1/4	347109
254TPA 256TPA	14	—	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	14-3/4	13-1/2	1/4	16-1/2	15/16	11/16	11-7/16	23-7/16	3-3/8	1-1/4	347111
284TP 286TP	14	—	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	9-1/8	8-1/4	1/4	10	15/16	7/16	12-1/4	24-13/16	3-3/8	1-1/4	347107
284TPA 286TPA	14	—	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	9-1/8	8-1/4	1/4	12	15/16	7/16	12-1/4	24-13/16	3-3/8	1-1/4	347109
284TPH 286TPH	14	—	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	14-3/4	13-1/2	1/4	16-1/2	15/16	11/16	12-1/4	24-13/16	3-3/8	1-1/4	347111

All rough casting dimensions may vary by 1/4" due to casting variations.

* Largest Motor Diameter

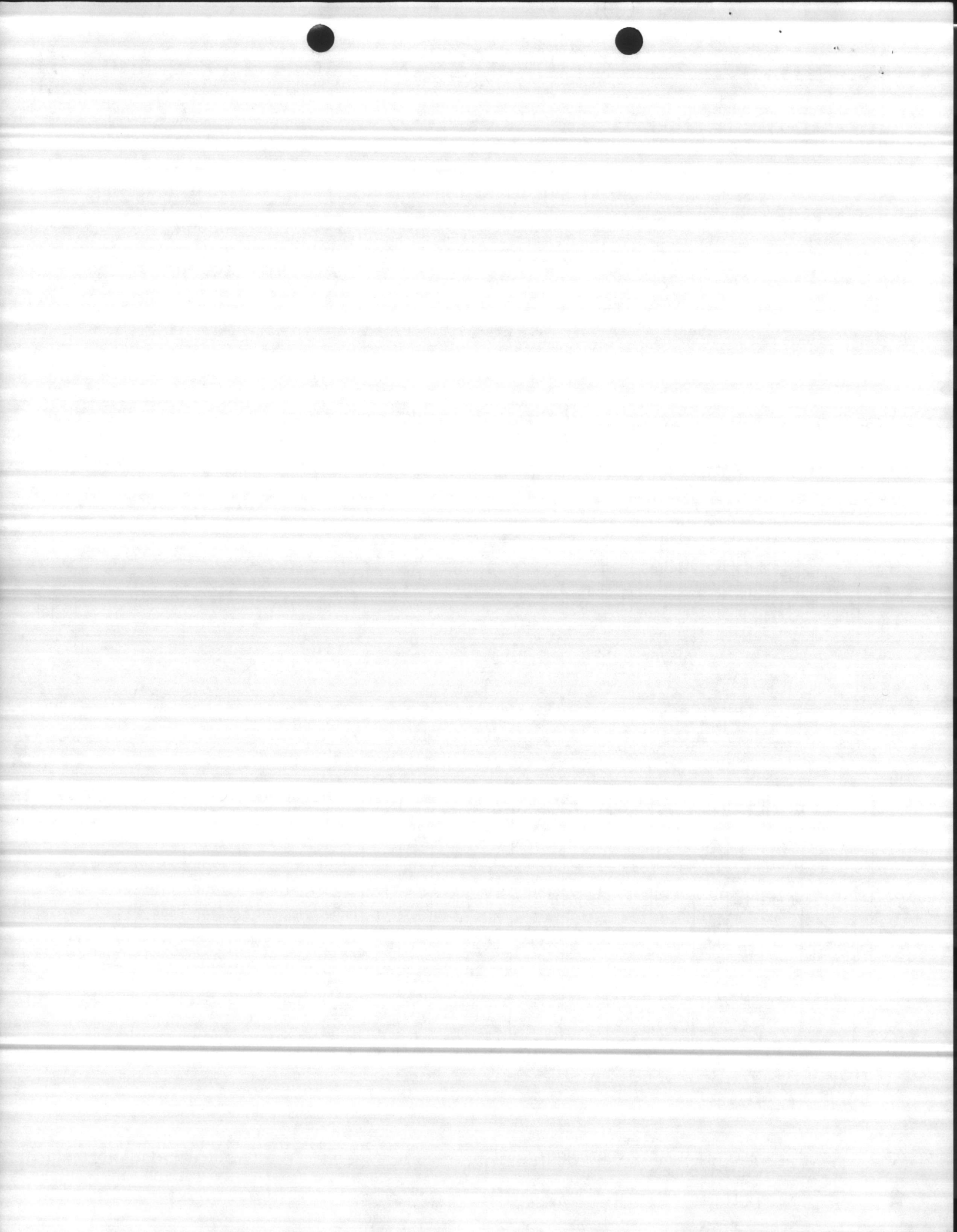
TOLERANCES: "AK" Dimension: +.003, Face Runout: .004 F.I.R.
 Permissible Eccentricity of Mounting Rabbet: .004 F.I.R.

All tapped holes are Unified National Course, right hand thread.

U. S. ELECTRICAL MOTORS DIVISION
 EMERSON ELECTRIC CO.
 EMERSON

Effective: MAY 18, 1980
 Supersedes: FEBRUARY 3, 1980

If properly endorsed this print is correct
 for frame & assembly positions indicated
 By _____ Date _____





Vertical Motors

Section 504
Page 1

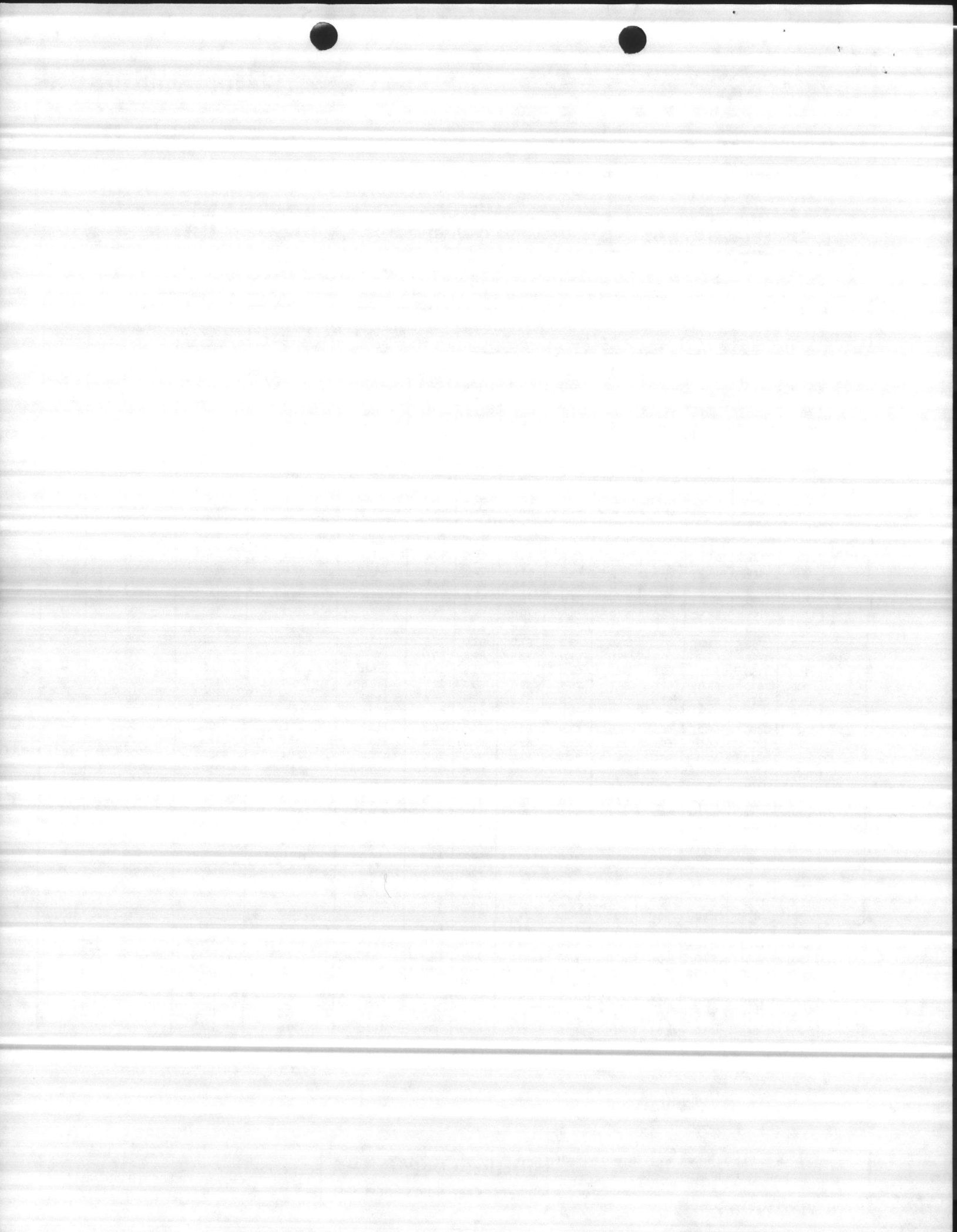
3 PHASE 60 CYCLES
230,460,575 VOLTS
40°C. AMBIENT-C.RISE WP-1

HOLLOSHAFT & SOLIDSHAFT
MOTORS
OPERATING CHARACTERISTICS

**ENGINEERING
DATA**

HP	RPM		% EFFICIENCY			% POWER FACTOR			CURRENT IN AMPHERES 460 VOLTS		TORQUE AT FULL VOLTAGE			NEMA CODE
	NO LOAD	FULL LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	LOCKED (STARTING)	FULL LOAD TORQUE AT FULL LOAD SPEED (LB.FT.)	LOCKED	PULL OUT	
												(STARTING)	(BREAKDOWN)	
											PERCENT OF FULL LOAD			
2	900	860	75.0	74.5	70.0	68.0	60.0	47.5	3.9	18.0	12.2	130	210	J
	1800	1720	80.0	79.5	75.5	81.0	72.5	59.5	4.4	32.0	9.2	215	250	K
3	1200	1155	78.5	78.0	75.0	69.0	61.0	49.0	5.4	23.0	13.6	155	230	G
	900	860	78.5	79.0	75.5	67.5	59.0	46.0	5.8	30.5	18.3	130	205	K
	3600	3480	81.0	82.0	80.5	86.0	80.5	69.5	6.9	45.0	7.5	150	215	H
5	1800	1725	81.5	82.0	79.5	84.0	76.5	63.5	7.0	47.0	15.2	185	225	J
	1200	1160	81.0	81.0	78.0	71.0	62.5	50.0	8.5	40.0	22.6	150	215	G
	900	875	80.5	80.0	77.0	72.0	64.0	51.0	8.2	44.0	30.0	130	205	H
	3600	3460	84.0	85.0	84.0	88.0	84.0	75.5	9.8	63.0	11.4	140	200	H
7-1/2	1800	1740	83.5	84.0	82.5	84.0	80.0	71.5	10.4	63.5	22.6	175	215	H
	1200	1170	83.0	83.5	81.0	80.5	74.0	61.5	10.5	63.0	33.7	150	205	H
	900	875	80.5	80.5	77.5	71.5	63.0	50.5	12.5	63.0	45.0	125	200	K
	3600	3500	83.5	84.0	83.0	87.0	84.0	76.5	13.4	79.0	15.0	135	200	H
10	1800	1740	86.5	87.0	85.5	81.0	75.0	64.0	13.3	82.0	30.2	165	200	H
	1200	1165	82.5	82.5	80.0	78.5	70.0	57.0	14.0	80.0	45.1	150	200	H
	900	875	86.0	86.5	84.5	72.0	65.0	53.0	15.5	81.0	60.0	125	200	H
	3600	3485	85.0	86.5	86.0	88.5	87.0	82.0	19.5	112.0	22.8	130	200	G
15	1800	1765	85.5	86.5	85.0	81.0	73.5	61.5	20.5	112.0	44.5	160	200	G
	1200	1160	87.5	89.0	89.0	85.0	82.0	74.5	19.4	115.0	68.0	140	200	G
	900	870	86.0	87.5	86.5	75.5	69.5	58.5	22.5	116.0	90.6	125	200	G
	3600	3515	85.5	87.0	87.0	89.0	87.5	82.5	25.4	145.0	29.9	130	200	G
20	1800	1765	88.0	89.0	89.0	85.0	82.5	75.0	26.0	143.0	59.5	150	200	G
	1200	1160	88.0	89.5	89.0	85.0	81.5	74.0	25.8	145.0	90.5	135	200	G
	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	3600	3510	89.0	90.0	89.0	88.5	87.0	81.0	30.4	172.0	37.4	130	200	F
25	1800	1755	88.5	90.0	89.5	83.0	78.5	68.5	32.5	180.0	74.8	150	200	G
	1200	1180	85.5	87.0	86.5	84.0	79.0	68.0	33.5	193.0	111.5	135	200	G
	900	880	86.0	88.0	87.5	77.0	72.0	61.0	36.5	175.0	150.0	125	200	G
	3600	3510	89.5	90.5	89.5	87.5	85.0	78.0	37.0	218.0	44.9	130	200	G
30	1800	1755	89.0	90.0	89.5	80.5	75.0	63.5	40.0	217.0	89.8	150	200	G
	1200	1175	86.5	88.5	89.5	86.0	84.0	78.0	38.5	215.0	134.0	135	200	G
	900	880	88.0	89.5	89.5	75.0	70.0	59.5	43.5	205.0	179.0	125	200	G
	3600	3515	90.0	91.0	90.0	86.5	83.0	75.0	48.5	310.0	59.8	125	200	G
40	1800	1770	88.0	89.5	89.0	86.0	82.0	73.0	51.0	292.5	119.0	140	200	G
	1200	1175	87.5	89.5	90.0	84.5	81.0	72.0	52.0	292.0	179.0	135	200	G
	900	875	88.0	90.0	90.0	76.0	71.5	61.0	57.5	280.0	240.0	125	200	F
	3600	3540	88.0	89.5	89.0	87.0	84.5	78.0	63.0	350.0	74.2	120	200	G
50	1800	1765	89.0	90.5	90.5	84.5	81.0	72.0	64.0	339.5	150.0	140	200	G
	1200	1170	88.0	90.5	91.0	85.0	83.0	76.5	64.0	370.0	224.5	135	200	G
	900	875	88.5	90.0	90.0	80.0	76.0	67.0	68.0	325.0	300.0	125	200	G
	3600	3540	89.5	91.0	91.0	89.0	89.0	86.0	72.5	410.0	89.0	120	200	G
60	1800	1770	90.0	91.0	91.0	86.0	83.0	75.0	75.0	454.5	178.0	140	200	G
	1200	1175	88.5	90.0	89.5	85.5	82.0	72.5	76.0	460.0	268.0	135	200	G
	900	875	89.0	90.5	90.5	80.5	77.0	68.0	80.5	410.0	360.0	125	200	G

See Page 2 for higher horsepowers and notes.



CUSTOMER NAME East Coast Const. Co.
 CUST. ORD. NO. 1217
 U.S. ORD. NO.
 MARK: Camp Lefebvre
 QTY. 2 HP 20 FRAME 256 TP PHASE 3
 HERTZ 60 R.P.M. 1800 VOLTS 208



Vertical Motors

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 Page 1

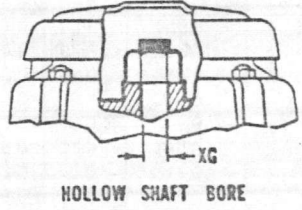
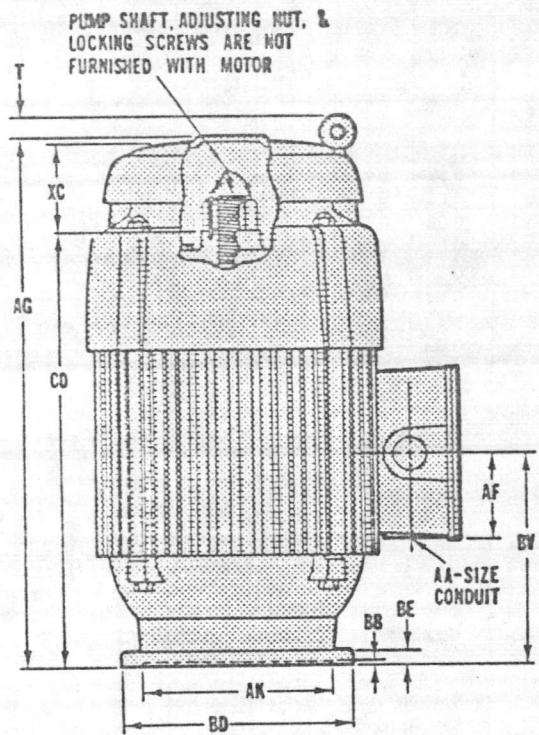
WPI-TYPE AU
 FRAMES 182 THRU 256TPA

HIGH THRUST
 VERTICAL HOLLOSHAFT
 NEMA P BASE

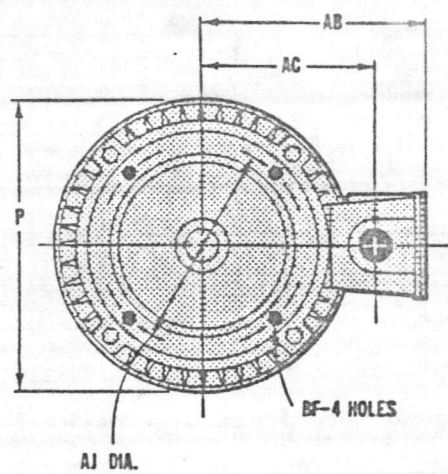
DIMENSIONS

FEATURES: 20 HP, 1800 rpm, frame 256 TP, 1.15 S.F. continuous duty

Building 611 and 614



Conduit opening may be located in steps of 90°. Standard as shown with conduit down.



ALL DIMENSIONS ARE IN INCHES

FRAME	P*	T	AA	AB	AC	AF	AG	AJ DIA.	AK - .003	BB	BD	BE	BF TAP SIZE	BV	CD	XC	XG	UNIMOUNT BRKT. P/N
182TP 184TP	12-7/8	1-1/2	1	6-5/16	5-3/8	2-5/8	21-1/4	9-1/8	8-1/4	3/16	10	3/4	7/16	8	17-9/16	3-11/32	1-1/16	682186
213TP 215TP	12-7/8	1-1/2	1	7-9/16	6-7/16	3-5/16	21-1/4	9-1/8	8-1/4	3/16	10	3/4	7/16	8	17-9/16	3-11/32	1-1/16	682186
254TP 256TP	14	-	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	9-1/8	8-1/4	1/4	10	15/16	7/16	11-7/16	23-7/16	3-3/8	1-1/4	347107
254TPH 256TPH	14	-	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	9-1/8	8-1/4	1/4	12	15/16	7/16	11-7/16	23-7/16	3-3/8	1-1/4	347109
254TPA 256TPA	14	-	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	14-3/4	13-1/2	1/4	16-1/2	15/16	11/16	11-7/16	23-7/16	3-3/8	1-1/4	347111
284TP 286TP	14	-	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	9-1/8	8-1/4	1/4	10	15/16	7/16	12-1/4	24-13/16	3-3/8	1-1/4	347107
284TPA 286TPA	14	-	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	9-1/8	8-1/4	1/4	12	15/16	7/16	12-1/4	24-13/16	3-3/8	1-1/4	347109
284TPH 286TPH	14	-	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	14-3/4	13-1/2	1/4	16-1/2	15/16	11/16	12-1/4	24-13/16	3-3/8	1-1/4	347111

All rough casting dimensions may vary by 1/4" due to casting variations.

* Largest Motor Diameter

TOLERANCES: "AK" Dimension: +.003, Face Runout: .004 F.I.R.
 Permissible Eccentricity of Mounting Rabbet: .004 F.I.R.

All tapped holes are Unified National Course, right hand thread.

U. S. ELECTRICAL MOTORS DIVISION
 EMERSON ELECTRIC CO.
 EMERSON

Effective: MAY 18, 1980
 Supersedes: FEBRUARY 3, 1980

If properly endorsed this print is correct
 for frame & assembly positions indicated.
 By _____ Date _____



Vertical Motors

Section 504

Page 1

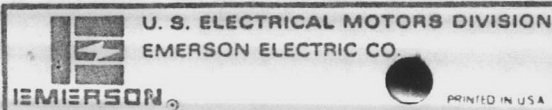
3 PHASE 60 CYCLES
230,460,575 VOLTS
40°C. AMBIENT-C.RISE WP-1

HOLLOSHAFT & SOLIDSHAFT
MOTORS
OPERATING CHARACTERISTICS

ENGINEERING
DATA

HP	RPM		% EFFICIENCY			% POWER FACTOR			CURRENT IN AMPHERES 460 VOLTS		TORQUE AT FULL VOLTAGE			NEMA CODE
											FULL LOAD TORQUE AT FULL LOAD SPEED (LB.FT.)	LOCKED	PULL OUT	
	NO LOAD	FULL LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	LOCKED (STARTING)		(STARTING) PERCENT OF FULL LOAD	(BREAKDOWN)	
2	900	860	75.0	74.5	70.0	68.0	60.0	47.5	3.9	18.0	12.2	130	210	J
	1800	1720	80.0	79.5	75.5	81.0	72.5	59.5	4.4	32.0	9.2	215	250	K
3	1200	1155	78.5	78.0	75.0	69.0	61.0	49.0	5.4	23.0	13.6	155	230	G
	900	860	78.5	79.0	75.5	67.5	59.0	46.0	5.8	30.5	18.3	130	205	K
	3600	3480	81.0	82.0	80.5	86.0	80.5	69.5	6.9	45.0	7.5	150	215	H
5	1800	1725	81.5	82.0	79.5	84.0	76.5	63.5	7.0	47.0	15.2	185	225	J
	1200	1160	81.0	81.0	78.0	71.0	62.5	50.0	8.5	40.0	22.6	150	215	G
	900	875	80.5	80.0	77.0	72.0	64.0	51.0	8.2	44.0	30.0	130	205	H
	3600	3460	84.0	85.0	84.0	88.0	84.0	75.5	9.8	63.0	11.4	140	200	H
7-1/2	1800	1740	83.5	84.0	82.5	84.0	80.0	71.5	10.4	63.5	22.6	175	215	H
	1200	1170	83.0	83.5	81.0	80.5	74.0	61.5	10.5	63.0	33.7	150	205	H
	900	875	80.5	80.5	77.5	71.5	63.0	50.5	12.5	63.0	45.0	125	200	K
	3600	3500	83.5	84.0	83.0	87.0	84.0	76.5	13.4	79.0	15.0	135	200	H
10	1800	1740	86.5	87.0	85.5	81.0	75.0	64.0	13.3	82.0	30.2	165	200	H
	1200	1165	82.5	82.5	80.0	78.5	70.0	57.0	14.0	80.0	45.1	150	200	H
	900	875	86.0	86.5	84.5	72.0	65.0	53.0	15.5	81.0	60.0	125	200	H
	3600	3485	85.0	86.5	86.0	88.5	87.0	82.0	19.5	112.0	22.6	130	200	G
15	1800	1765	85.5	86.5	85.0	81.0	73.5	61.5	20.5	112.0	44.5	160	200	G
	1200	1160	87.5	89.0	89.0	85.0	82.0	74.5	19.4	115.0	68.0	140	200	G
	900	870	86.0	87.5	86.5	75.5	69.5	58.5	22.5	116.0	90.6	125	200	G
	3600	3515	85.5	87.0	87.0	89.0	87.5	82.5	25.4	145.0	29.9	130	200	G
20	1800	1765	88.0	89.0	89.0	85.0	82.5	75.0	26.0	143.0	59.5	150	200	G
	1200	1160	88.0	89.5	89.0	85.0	81.5	74.0	25.8	145.0	90.5	135	200	G
	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	3600	3510	89.0	90.0	89.0	88.5	87.0	81.0	30.4	172.0	37.4	130	200	F
25	1800	1755	88.5	90.0	89.5	83.0	78.5	68.5	32.5	180.0	74.8	150	200	G
	1200	1180	85.5	87.0	86.5	84.0	79.0	68.0	33.5	193.0	111.5	135	200	G
	900	880	86.0	88.0	87.5	77.0	72.0	61.0	36.5	175.0	150.0	125	200	G
	3600	3510	89.5	90.5	89.5	87.5	85.0	78.0	37.0	218.0	44.9	130	200	G
30	1800	1755	89.0	90.0	89.5	80.5	75.0	63.5	40.0	217.0	89.8	150	200	G
	1200	1175	86.5	88.5	89.5	86.0	84.0	78.0	38.5	215.0	134.0	135	200	G
	900	880	88.0	89.5	89.5	75.0	70.0	59.5	43.5	205.0	179.0	125	200	G
	3600	3515	90.0	91.0	90.0	86.5	83.0	75.0	48.5	310.0	59.8	125	200	G
40	1800	1770	88.0	89.5	89.0	86.0	82.0	73.0	51.0	292.5	119.0	140	200	G
	1200	1175	87.5	89.5	90.0	84.5	81.0	72.0	52.0	292.0	179.0	135	200	G
	900	875	88.0	90.0	90.0	76.0	71.5	61.0	57.5	280.0	240.0	125	200	F
	3600	3540	88.0	89.5	89.0	87.0	84.5	78.0	63.0	350.0	74.2	120	200	G
50	1800	1765	89.0	90.5	90.5	84.5	81.0	72.0	64.0	339.5	150.0	140	200	G
	1200	1170	88.0	90.5	91.0	85.0	83.0	76.5	64.0	370.0	224.5	135	200	G
	900	875	88.5	90.0	90.0	80.0	76.0	67.0	68.0	325.0	300.0	125	200	G
	3600	3540	89.5	91.0	91.0	89.0	89.0	86.0	72.5	410.0	89.0	120	200	G
60	1800	1770	90.0	91.0	91.0	86.0	83.0	75.0	75.0	454.5	178.0	140	200	G
	1200	1175	88.5	90.0	89.5	85.5	82.0	72.5	76.0	460.0	268.0	135	200	G
	900	875	89.0	90.5	90.5	80.5	77.0	68.0	80.5	410.0	360.0	125	200	G

See Page 2 for higher horsepowers and notes.



Effective: NOVEMBER 15, 1979
Supersedes: NOVEMBER 13, 1978

REFER TO COMPANY FOR CERTIFIED VALUES

PRINTED IN U.S.A.

CUSTOMER NAME East Coast Const. Co.
 CUST. ORD. NO. 1217
 U.S. ORD. NO.
 MARK: Camp Lefeune
 QTY. 1 HP 25 FRAME 284 TP PHASE 3
 HERTZ 60 R.P.M. 1800 VOLTS 208



Vertical Motors

Section 505
 Page 1

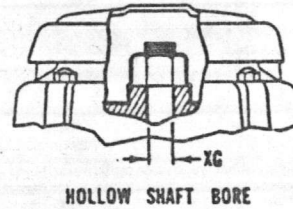
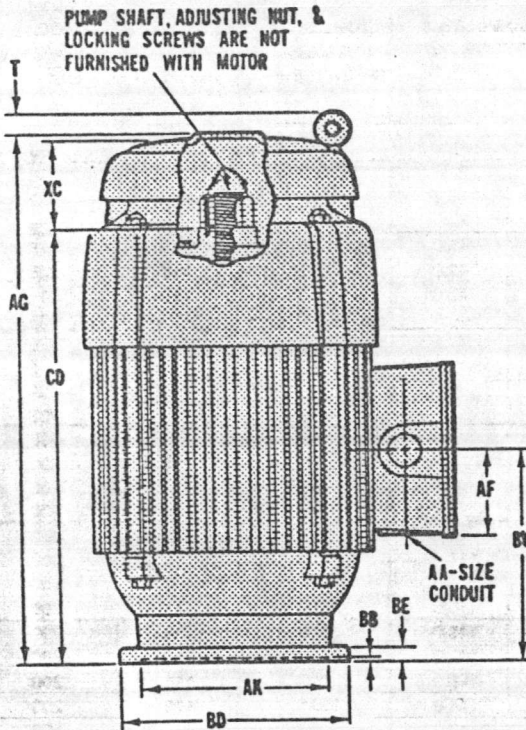
WPI-TYPE AU
 FRAMES 182 THRU 256TPA

HIGH THRUST
 VERTICAL HOLLOSHAFT
 NEMA P BASE

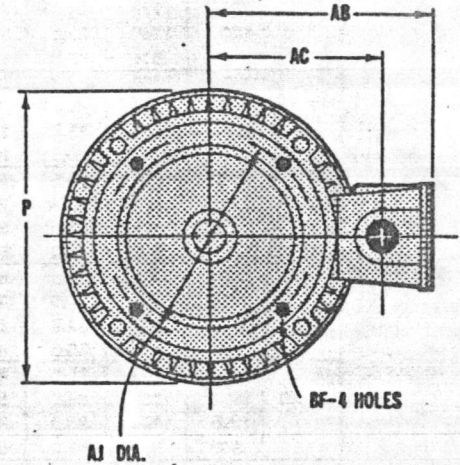
DIMENSIONS

FEATURES: 25 HP, 1800 rpm, frame 284 TP, 1.15 S.F. continuous duty

Building 227



Conduit opening may be located in steps of 90°. Standard as shown with conduit down.



ALL DIMENSIONS ARE IN INCHES

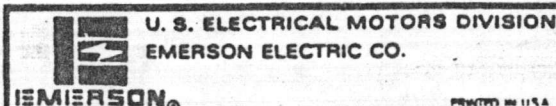
FRAME	P*	T	AA	AB	AC	AF	AG	AJ DIA.	AK -.003	BB	BD	BE	BF TAP SIZE	BV	CD	XC	XG	UNIMOUNT BRKT. P/N
182TP 184TP	12-7/8	1-1/2	1	6-5/16	5-3/8	2-5/8	21-1/4	9-1/8	8-1/4	3/16	10	3/4	7/16	8	17-9/16	3-11/32	1-1/16	682186
213TP 215TP	12-7/8	1-1/2	1	7-9/16	6-7/16	3-5/16	21-1/4	9-1/8	8-1/4	3/16	10	3/4	7/16	8	17-9/16	3-11/32	1-1/16	682186
254TP 256TP	14	-	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	9-1/8	8-1/4	1/4	10	15/16	7/16	11-7/16	23-7/16	3-3/8	1-1/4	347107
254TPH 256TPH	14	-	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	9-1/8	8-1/4	1/4	12	15/16	7/16	11-7/16	23-7/16	3-3/8	1-1/4	347109
254TPA 256TPA	14	-	1-1/4	8-15/16	7-3/4	3-19/32	26-13/16	14-3/4	13-1/2	1/4	16-1/2	15/16	11/16	11-7/16	23-7/16	3-3/8	1-1/4	347111
284TP 286TP	14	-	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	9-1/8	8-1/4	1/4	10	15/16	7/16	12-1/4	24-13/16	3-3/8	1-1/4	347107
284TPA 286TPA	14	-	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	9-1/8	8-1/4	1/4	12	15/16	7/16	12-1/4	24-13/16	3-3/8	1-1/4	347109
284TPH 286TPH	14	-	1-1/2	9-3/16	7-5/8	4-7/16	28-3/16	14-3/4	13-1/2	1/4	16-1/2	15/16	11/16	12-1/4	24-13/16	3-3/8	1-1/4	347111

All rough casting dimensions may vary by 1/4" due to casting variations.

* Largest Motor Diameter

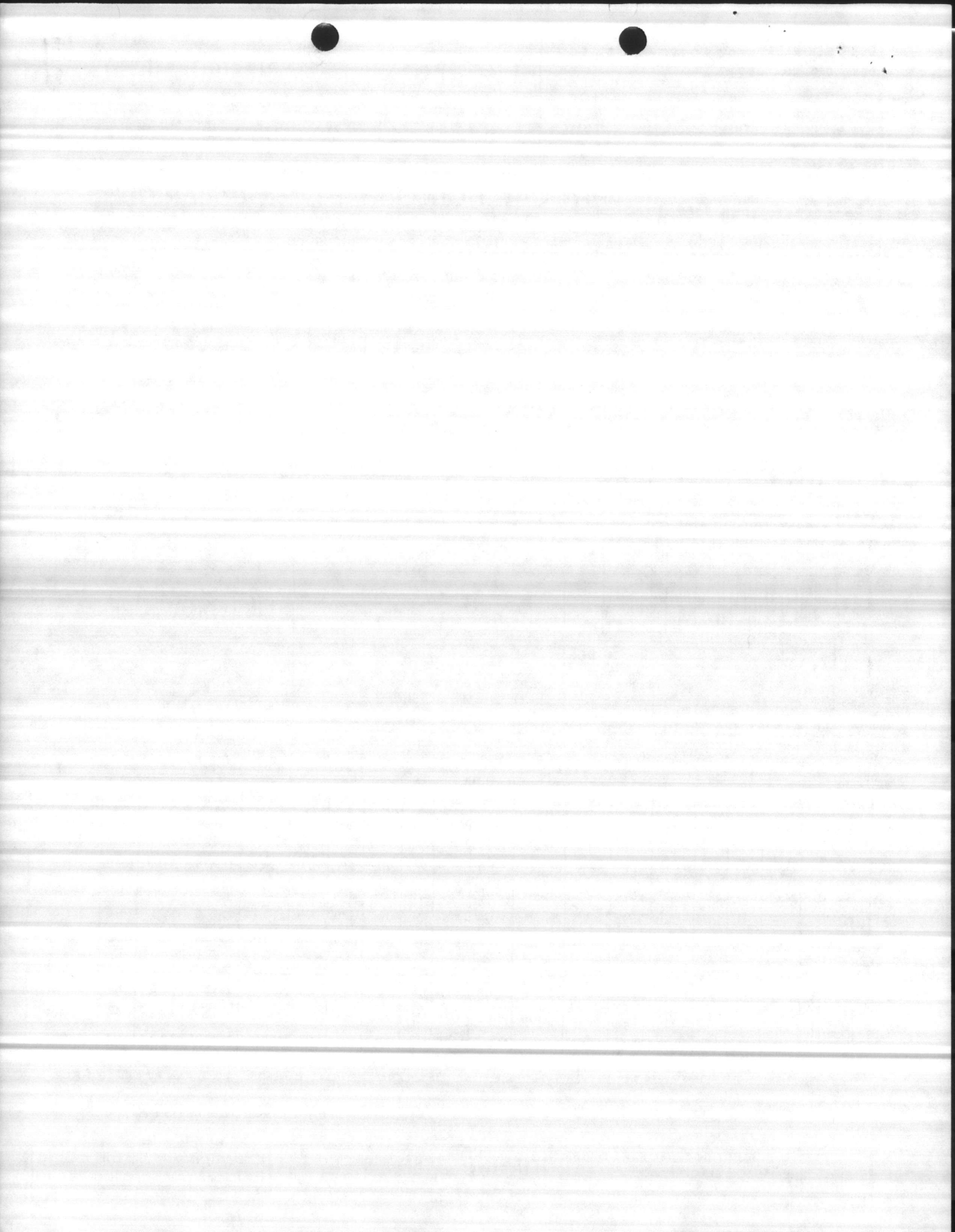
TOLERANCES: "AK" Dimension: +.003, Face Runout: .004 F.I.R.
 Permissible Eccentricity of Mounting Rabbet: .004 F.I.R.

All tapped holes are Unified National Course, right hand thread.



Effective: MAY 18, 1980
 Supersedes: FEBRUARY 3, 1980

If properly endorsed this print is correct
 for frame & assembly positions indicated
 By _____ Date _____





Vertical Motors

Section 504

Page 1

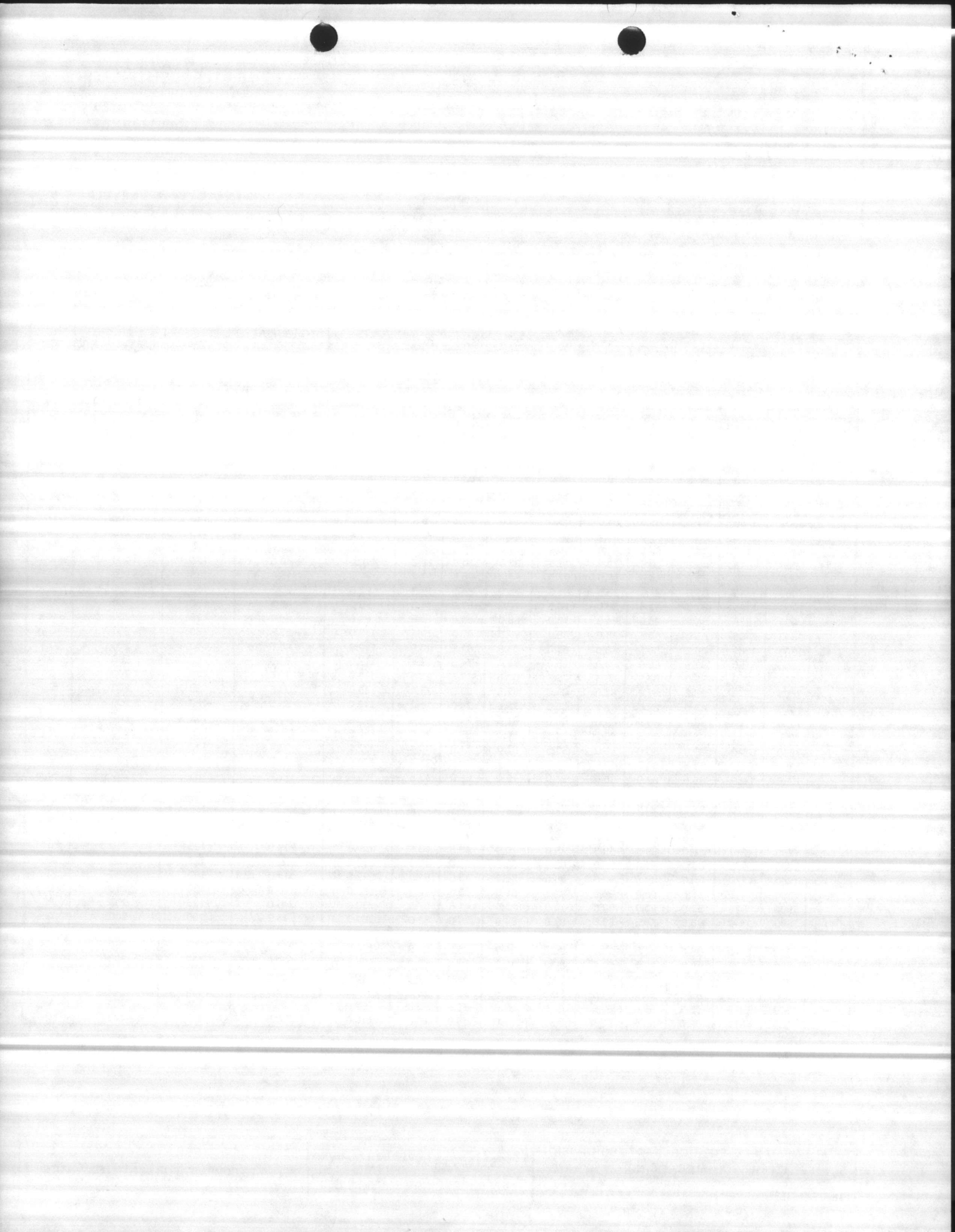
**3 PHASE 60 CYCLES
230,460,575 VOLTS
40°C. AMBIENT-C.RISE WP-1**

**HOLLOSHAFT & SOLIDSHAFT
MOTORS
OPERATING CHARACTERISTICS**

**ENGINEERING
DATA**

HP	RPM		% EFFICIENCY			% POWER FACTOR			CURRENT IN AMPHERES 460 VOLTS		TORQUE AT FULL VOLTAGE			NEMA CODE
											FULL LOAD TORQUE AT FULL LOAD SPEED (LB.FT.)	LOCKED	PULL OUT	
	NO LOAD	FULL LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	LOCKED (STARTING)		(STARTING) PERCENT OF FULL LOAD	(BREAKDOWN)	
2	900	860	75.0	74.5	70.0	68.0	60.0	47.5	3.9	18.0	12.2	130	210	J
	1800	1720	80.0	79.5	75.5	81.0	72.5	59.5	4.4	32.0	9.2	215	250	K
3	1200	1155	78.5	78.0	75.0	69.0	61.0	49.0	5.4	23.0	13.6	155	230	G
	900	860	78.5	79.0	75.5	67.5	59.0	46.0	5.8	30.5	18.3	130	205	K
	3600	3460	81.0	82.0	80.5	86.0	80.5	69.5	6.9	45.0	7.5	150	215	H
5	1800	1725	81.5	82.0	79.5	84.0	76.5	63.5	7.0	47.0	15.2	185	225	J
	1200	1160	81.0	81.0	78.0	71.0	62.5	50.0	8.5	40.0	22.6	150	215	G
	900	875	80.5	80.0	77.0	72.0	64.0	51.0	8.2	44.0	30.0	130	205	H
7-1/2	3600	3460	84.0	85.0	84.0	88.0	84.0	75.5	9.8	63.0	11.4	140	200	H
	1800	1740	83.5	84.0	82.5	84.0	80.0	71.5	10.4	63.5	22.6	175	215	H
	1200	1170	83.0	83.5	81.0	80.5	74.0	61.5	10.5	63.0	33.7	150	205	H
	900	875	80.5	80.5	77.5	71.5	63.0	50.5	12.5	63.0	45.0	125	200	K
10	3600	3500	83.5	84.0	83.0	87.0	84.0	76.5	13.4	79.0	15.0	135	200	H
	1800	1740	86.5	87.0	85.5	81.0	75.0	64.0	13.3	82.0	30.2	165	200	H
	1200	1165	82.5	82.5	80.0	78.5	70.0	57.0	14.0	80.0	45.1	150	200	H
	900	875	86.0	86.5	84.5	72.0	65.0	53.0	15.5	81.0	60.0	125	200	H
15	3600	3485	85.0	86.5	86.0	88.5	87.0	82.0	19.5	112.0	22.6	130	200	G
	1800	1765	85.5	86.5	85.0	81.0	73.5	61.5	20.5	112.0	44.5	160	200	G
	1200	1160	87.5	89.0	89.0	85.0	82.0	74.5	19.4	115.0	68.0	140	200	G
	900	870	86.0	87.5	86.5	75.5	69.5	58.5	22.5	116.0	90.6	125	200	G
20	3600	3515	85.5	87.0	87.0	89.0	87.5	82.5	25.4	145.0	29.9	130	200	G
	1800	1765	88.0	89.0	89.0	85.0	82.5	75.0	26.0	143.0	59.5	150	200	G
	1200	1160	88.0	89.5	89.0	85.0	81.5	74.0	25.8	145.0	90.5	135	200	G
	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
25	3600	3510	89.0	90.0	89.0	88.5	87.0	81.0	30.4	172.0	37.4	130	200	F
	1800	1755	88.5	90.0	89.5	83.0	78.5	68.5	32.5	180.0	74.8	150	200	G
	1200	1180	85.5	87.0	86.5	84.0	79.0	68.0	33.5	193.0	111.5	135	200	G
	900	880	86.0	88.0	87.5	77.0	72.0	61.0	36.5	175.0	150.0	125	200	G
30	3600	3510	89.5	90.5	89.5	87.5	85.0	78.0	37.0	218.0	44.9	130	200	G
	1800	1755	89.0	90.0	89.5	80.5	75.0	63.5	40.0	217.0	89.8	150	200	G
	1200	1175	86.5	88.5	89.5	86.0	84.0	78.0	38.5	215.0	134.0	135	200	G
	900	880	88.0	89.5	89.5	75.0	70.0	59.5	43.5	205.0	179.0	125	200	G
40	3600	3515	90.0	91.0	90.0	86.5	83.0	75.0	48.5	310.0	59.8	125	200	G
	1800	1770	88.0	89.5	89.0	86.0	82.0	73.0	51.0	292.5	119.0	140	200	G
	1200	1175	87.5	89.5	90.0	84.5	81.0	72.0	52.0	292.0	179.0	135	200	G
	900	875	88.0	90.0	90.0	76.0	71.5	61.0	57.5	280.0	240.0	125	200	F
50	3600	3540	88.0	89.5	89.0	87.0	84.5	78.0	63.0	350.0	74.2	120	200	G
	1800	1765	89.0	90.5	90.5	84.5	81.0	72.0	64.0	339.5	150.0	140	200	G
	1200	1170	88.0	90.5	91.0	85.0	83.0	76.5	64.0	370.0	224.5	135	200	G
	900	875	88.5	90.0	90.0	80.0	76.0	67.0	68.0	325.0	300.0	125	200	G
60	3600	3540	89.5	91.0	91.0	89.0	89.0	86.0	72.5	410.0	89.0	120	200	G
	1800	1770	90.0	91.0	91.0	86.0	83.0	75.0	75.0	454.5	178.0	140	200	G
	1200	1175	88.5	90.0	89.5	85.5	82.0	72.5	76.0	460.0	268.0	135	200	G
	900	875	89.0	90.5	90.5	80.5	77.0	68.0	80.5	410.0	360.0	125	200	G

See Page 2 for higher horsepowers and notes.



CUSTOMER NAME EAST COAST CONST.
 CUST. ORD. NO. 1217
 U.S. ORD. NO.
 MARK: CAMP LEJUENE
 QTY. 8 HP 15 FRAME 254 TCV PHASE 3
 HERTZ 60 R.P.M. 1800 VOLTS 208



Vertical Motors

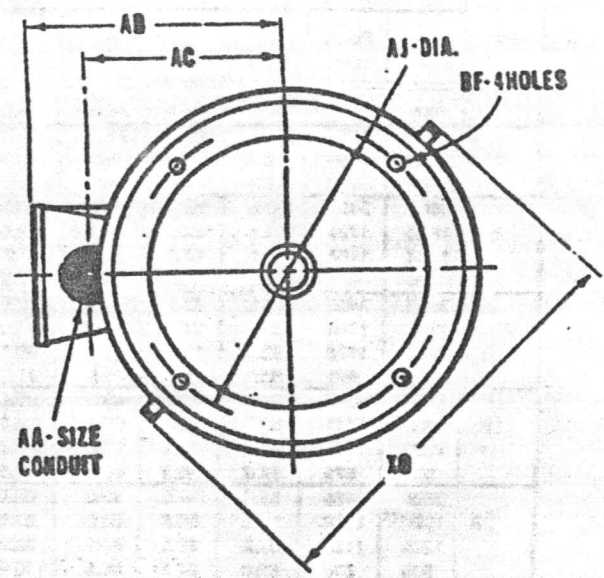
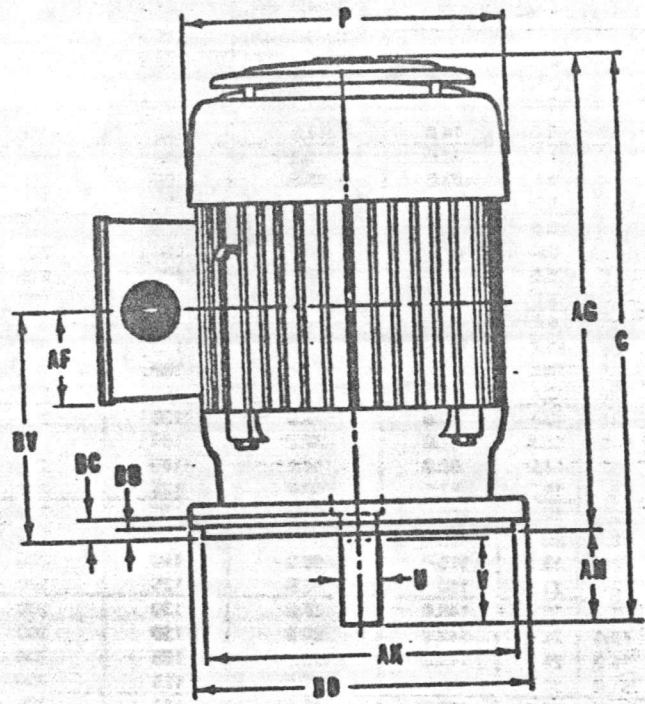
Section 505
 Page 51

OPEN DRIPPROOF TYPE AV
 FRAMES 182TC THRU 286TCV

NORMAL THRUST:
 VERTICAL SOLID-SHAFT
 NEMA C BASE

DIMENSIONS

FEATURES: 15 HP, 1800 RPM, Frame 254TCV 1.15 SF
 Continuous Duty



Conduit opening may be located in steps of 90 deg.
 Standard as shown with conduit down.

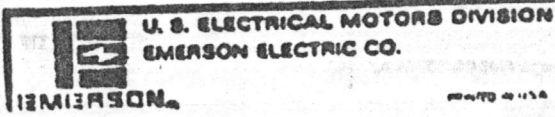
ALL DIMENSIONS ARE IN INCHES

FRAME	C	P*	U	V MIN.	AA	AB	AC	AF	AG	AH	AJ DIA.
182,184 TC	17-3/4	9-1/2	1-1/8	2-1/2	3/4	6-5/16	5-3/8	2-5/8	15-1/8	2-5/8	7-1/4
213,216 TCV	22-7/32	11-1/8	1-3/8	3-1/8	1	7-1/2	6-7/16	3-5/16	19-3/32	3-1/8	7-1/4
254,258 TCV	24-1/16	14	1-5/8	3-3/4	1-1/4	8-15/16	7-3/4	3-9/16	20-5/16	3-3/4	7-1/4
284,288 TCV	26-3/16	14	1-7/8	4-3/8	1-1/2	9-1/8	7-9/16	4-7/16	21-11/16	4-1/2	9
284,288 TCV	26-3/16	14	1-7/8	4-3/8	1-1/2	9-1/8	7-9/16	4-7/16	21-11/16	4-1/2	9

FRAME	AK	BB MIN.	BC	BO	BF - TAP	BV	XO	SO. KEY	BASIC BRACKET PART NUMBER
182,184 TC	8-1/2	1/4	1/8	9	1/2-13 X 3/4	6-3/8	11-3/16	1/4 X 1-3/4	168101
213,216 TCV	8-1/2	1/4	1/4	9	1/2-13 X 3/4	8	12-3/4	5/16 X 2-3/8	168237
254,258 TCV	8-1/2	1/4	1/4	8-1/2	1/2-13 X 3/4	11-7/16	16-7/8	3/8 X 2-15/16	347101
284,288 TCV	10-1/2	1/4	1/8	10-1/2	1/2-13 X 3/4	12-1/4	16-7/8	1/2 X 3-5/16	347103
284,288 TCV	10-1/2	1/4	1/8	12-1/2	1/2-13 X 3/4	12-1/4	16-7/8	1/2 X 3-5/16	347105

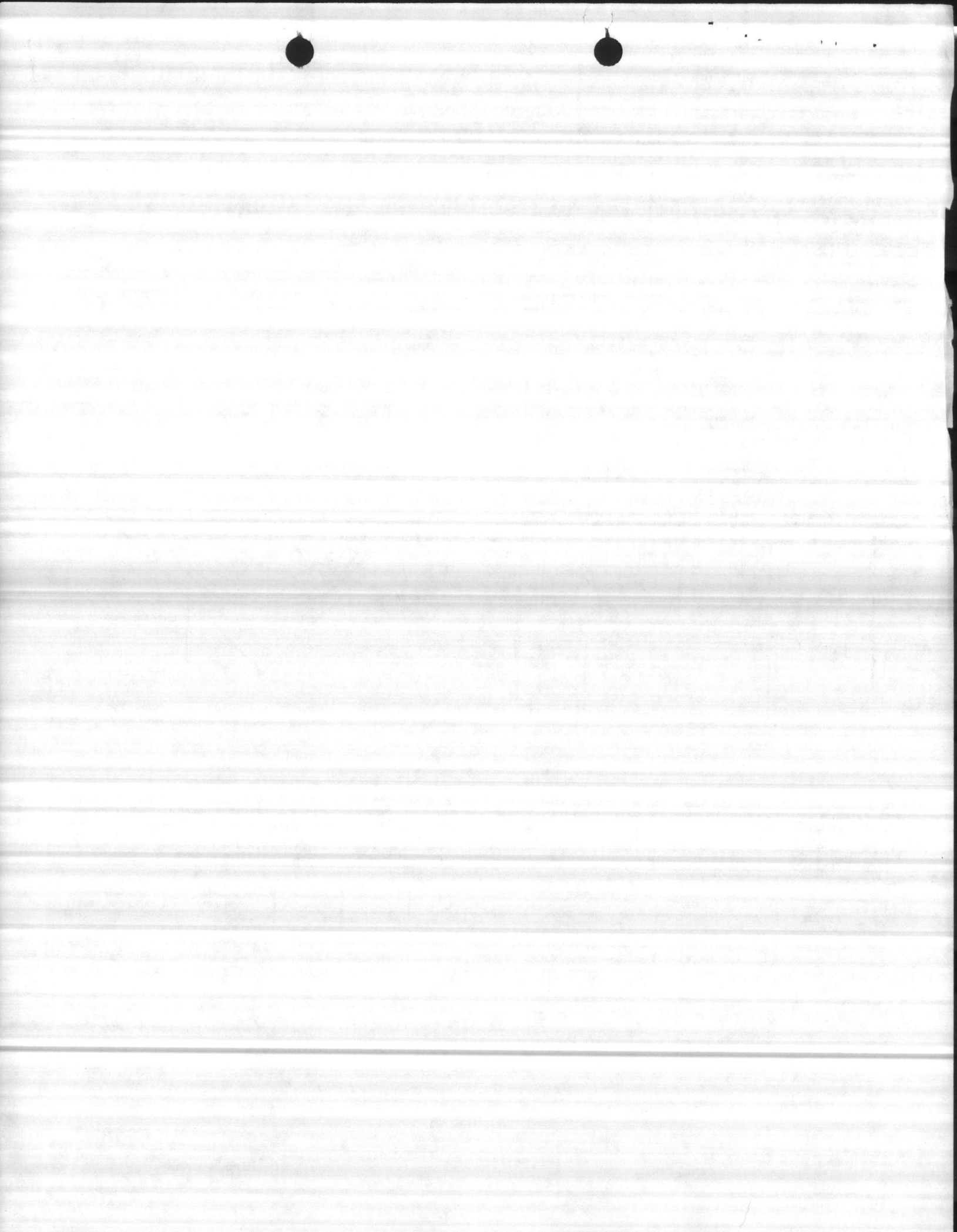
All rough casting dimensions may vary by 1/4" due to casting variations.
 All tapped holes are Unified National Course, right hand thread.
 *Largest Moser Diameter

TOLERANCES:
 Face runout: .004 F.I.R.
 Shaft Extension Diameter: 1-1/8" thru 1-1/2" "U" Dia. +.0000", -.0008"
 1-5/8" "U" Dia. +.000", -.001"
 Permissible Eccentricity of Mounting Rabbet: .004" F.I.R.
 Permissible Shaft Runout: .003" F.I.R.
 "AK" Dimension +.003"; -.003"



Effective: JUNE 16, 1969
 Supersedes: MAY 22, 1979

If properly endorsed this print is correct
 for frame & assembly position indicated.
 By WRS Date 11/2/82





Vertical Motors

Section 504

Page 1

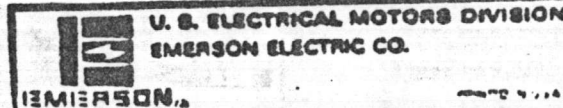
3 PHASE 60 CYCLES
208 VOLTS
40°C. AMBIENT-C.RISE WP-1

HOLLOSHAFT & SOLIDSHAFT
MOTORS
OPERATING CHARACTERISTICS

ENGINEERING
DATA

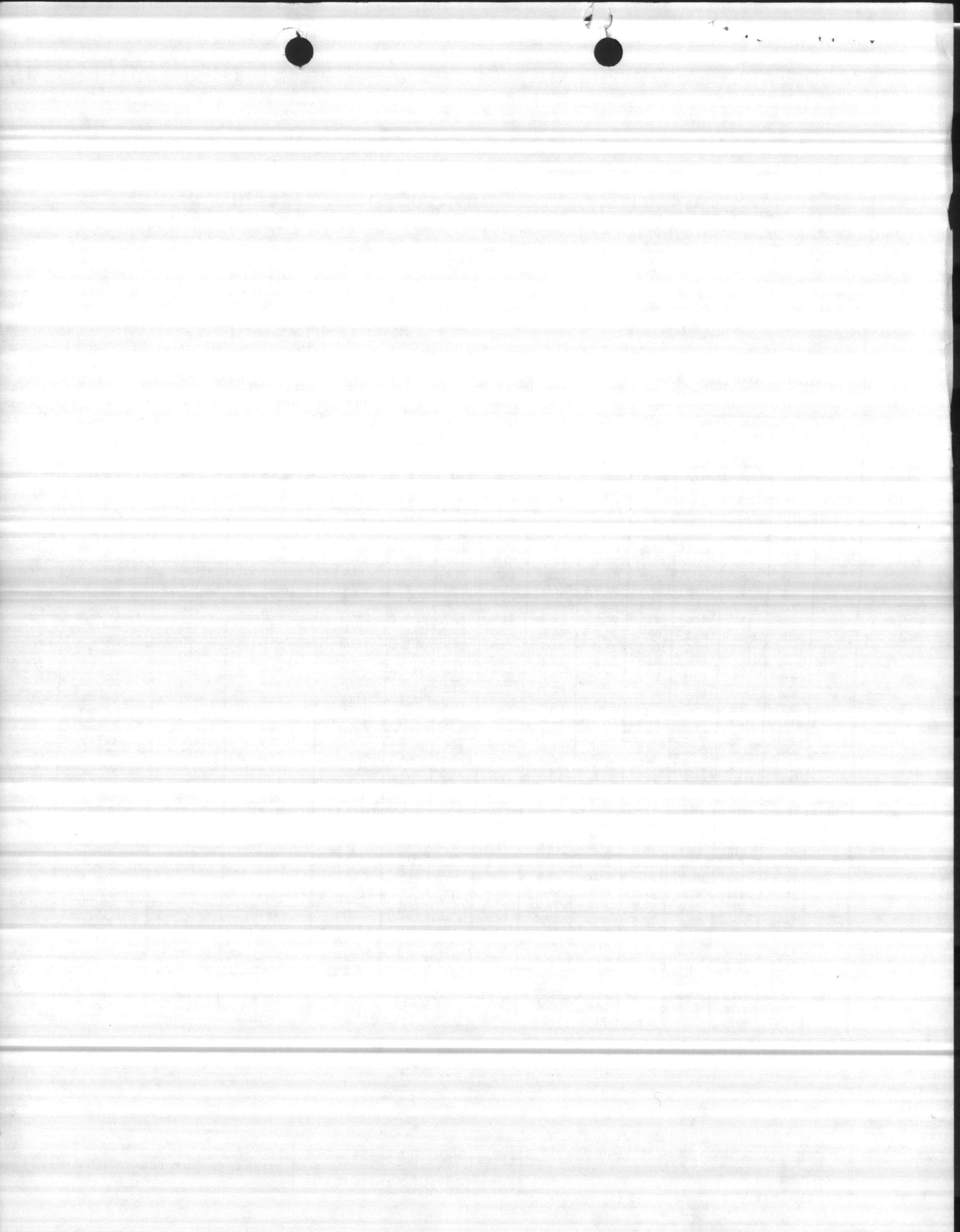
HP	RPM		% EFFICIENCY			% POWER FACTOR			CURRENT IN AMPHERES 480 VOLTS		TORQUE AT FULL VOLTAGE			NEMA CODE
	NO LOAD	FULL LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	LOCKED (STARTING)	FULL LOAD TORQUE AT FULL LOAD SPEED (L.B.F.T.)	LOCKED (STARTING) PERCENT OF FULL LOAD	FULL OUT (BREAKDOWN) PERCENT OF FULL LOAD	
2	900	880	75.0	74.5	70.0	68.0	60.0	47.5	3.9	18.0	12.2	130	210	J
	1800	1720	80.0	79.5	75.5	81.0	72.5	58.5	4.4	32.0	8.2	218	260	K
	1200	1158	78.5	78.0	75.0	69.0	61.0	48.0	5.4	23.0	13.8	158	230	G
3	900	880	78.5	78.0	75.5	67.5	58.0	46.0	5.8	30.8	18.3	130	208	K
	1800	1725	81.0	82.0	78.5	88.0	80.5	69.5	6.9	45.0	7.8	160	218	H
	1200	1160	81.0	81.0	78.0	71.0	62.5	50.0	8.5	40.0	15.2	185	225	J
5	900	875	80.5	80.0	77.0	72.0	64.0	51.0	8.2	44.0	30.0	130	208	H
	1800	1740	83.5	84.0	82.5	84.0	80.0	71.5	10.4	63.5	22.8	175	218	H
	1200	1170	83.0	83.5	81.0	80.5	74.0	61.5	10.5	63.0	33.7	180	208	H
7-1/2	900	875	80.5	80.5	77.5	71.5	63.0	50.5	12.5	63.0	45.0	125	200	K
	1800	1740	83.5	84.0	82.5	84.0	80.0	71.5	10.4	63.5	22.8	175	218	H
	1200	1170	83.0	83.5	81.0	80.5	74.0	61.5	10.5	63.0	33.7	180	208	H
10	900	875	80.5	80.5	77.5	71.5	63.0	50.5	12.5	63.0	45.0	125	200	K
	1800	1740	83.5	84.0	82.5	84.0	80.0	71.5	10.4	63.5	22.8	175	218	H
	1200	1165	82.5	82.5	80.0	78.5	70.0	57.0	14.0	80.0	45.1	150	200	H
15	900	875	80.5	80.5	77.5	71.5	63.0	50.5	12.5	63.0	45.0	125	200	H
	1800	1708	88.5	88.5	85.5	88.5	87.0	82.0	19.5	112.0	22.8	130	200	G
	1200	1180	87.5	88.0	88.0	85.0	82.0	74.5	19.4	115.0	44.5	160	200	G
20	900	870	86.0	87.5	88.5	75.5	68.5	58.5	22.5	118.0	90.8	125	200	G
	1800	1708	88.5	88.5	85.5	88.5	87.0	82.0	19.5	112.0	22.8	130	200	G
	1200	1180	87.5	88.0	88.0	85.0	82.0	74.5	19.4	115.0	44.5	160	200	G
25	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1180	88.0	88.5	88.0	85.0	81.5	74.0	25.8	145.0	90.5	135	200	G
30	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1180	88.0	88.5	88.0	85.0	81.5	74.0	25.8	145.0	90.5	135	200	G
40	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1175	88.5	88.5	88.5	86.0	84.0	78.0	38.5	215.0	134.0	138	200	G
50	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1175	88.5	88.5	88.5	86.0	84.0	78.0	38.5	215.0	134.0	138	200	G
60	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1175	88.5	88.5	88.5	86.0	84.0	78.0	38.5	215.0	134.0	138	200	G
75	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1175	88.5	88.5	88.5	86.0	84.0	78.0	38.5	215.0	134.0	138	200	G
90	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1175	88.5	88.5	88.5	86.0	84.0	78.0	38.5	215.0	134.0	138	200	G
100	900	880	85.0	86.5	86.0	74.5	69.0	57.0	30.5	140.0	120.0	125	200	G
	1800	1758	88.5	88.0	88.0	85.0	82.5	75.0	28.0	143.0	58.5	150	200	G
	1200	1175	88.5	88.5	88.5	86.0	84.0	78.0	38.5	215.0	134.0	138	200	G

See Page 2 for higher horsepower and notes.



Effective: NOVEMBER 18, 1978
Supersedes: NOVEMBER 13, 1970

REFER TO COMPANY FOR CERTIFIED VALUES



New Well Replacement ~~629~~

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