DATE 6-19-00

PWSID 04-67-043

WELL # 698

WELL NAME Holcomb Blvd 698

BLDG. 698

CODE G

AVAILABILITY P

LOCATION Brewster Blvd

LATITUDE 34.71664

LONGITUDE -77.3613

WELL DIAMETER 10"

WELL DEPTH 124'

SCREEN INTERVAL 78'-98'

YIELD 260 GPM

STATIC LEVEL 25'

PUMPING LEVEL 53'

PUMP TYPE Vertical Turbine

MOTOR HP 15

INTAKE DEPTH 86'

DESIGN CAPACITY 250 GPM

ACTUAL GPM 170 GPM

SIZE OF CONCRETE SLAB 32½"X32½

HEIGHT OF CASING 18"

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

SOURCE INFORMATION GROUND WATER

Date Form Completed (MM DD YY): 01 27 95

PWSID: 04 67 043

Owner Assigned Source Code: 698

Well Name (If purchase, name of system): HoLComb. Blvd 698

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

If Purchase, seller ID#:

Source Begin Date (MM YY):

Source exempt—SWTR? Y / N

Direct Influence Date (MM DD YY):

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

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

Latitude (N) Deg. Min. Sec.: 34 43 00.9

Longitude (W) Deg. Min. Sec.: 077 21 40.9

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

GPS Data: Q3 (Q# or DOP #)

No. of Sats. Locked on: 4

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

Vulnerable (VOCs) Y / N

Assessment Date (MM DD YY):

ENTRY POINT INFORMATION

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

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

Owner Assigned Entry Point Code: 200

Entry Point Name: ~~HB670~~ MCB HOLCOMB BLVD WTP

Location:

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

Sources of pollution/distance:

Surface water within 200'? N (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: 10" Type: Gravel Packed Yield (gpm): 260 Properly sealed? Y (Y,N)

Properly vented? N ① (Y,N) Casing depth 50 ft. (If unknown, put 'UNK') Well depth: ~~2__~~ 124' Meter available? Y (Y,N)

Concrete slab adequate? ~~N~~ (Y,N) If no, explain: Size: 6x6

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

Pumps: Capacity: GPM: 159 HP: 15 Pump intake depth: 86 Auxiliary Power? N (Y,N)

Type pump: Vertical Turbine Height above floor (pump/casing): 18" /

Storage at well site: Elev: Hydro: Ground:

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

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

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

If other wells are treated here, which ones? ___ If treated elsewhere, where? HB670 PLANT

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

① No Vent
② Leaking gate valve

WELL NUMBER 098		BY SACHS / THOMAS			DATE 3-25-02	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
75	25	57	32	15	100	15
		60	35	10	104	35

REMARKS D/H - 48

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 698 BY Stevenson & Salas DATE 2-6-01

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
25	20	36	16	25	Less than 100	

REMARKS D/H ~~75~~ 50

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

ELL NUMBER 698 | BY THomas / CROSBY | DATE 3-1-90

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
85	23	35	12	47	108	10
		42	19	41	137	20
		45	22	37	151	30
		49	26	30	178	40
		52	29	25	201	50
		52	29	20	201	00
Left Test @ →		56	33	15	216	10
		69	46	10	226	20

MARKS Dead head 61 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	698	BY	Stevenson & Petersen	DATE	7-22-97	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
75	25	37	12	50	100	20
		42	17	45	128	30
		45	20	40	133	40
		48	23	35	149	50
		51	26	30	159	60
		53	28	25	170	

REMARKS

D/H - 60 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 698 BY Stevens & Peterson DATE 4-12-95

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
75'	25	37	12	44	100	40
		45	20	40	137	50
		53	28	35	183	00
		60	35	30	216	
Left		65	40	25	244	

PUMP SET 75

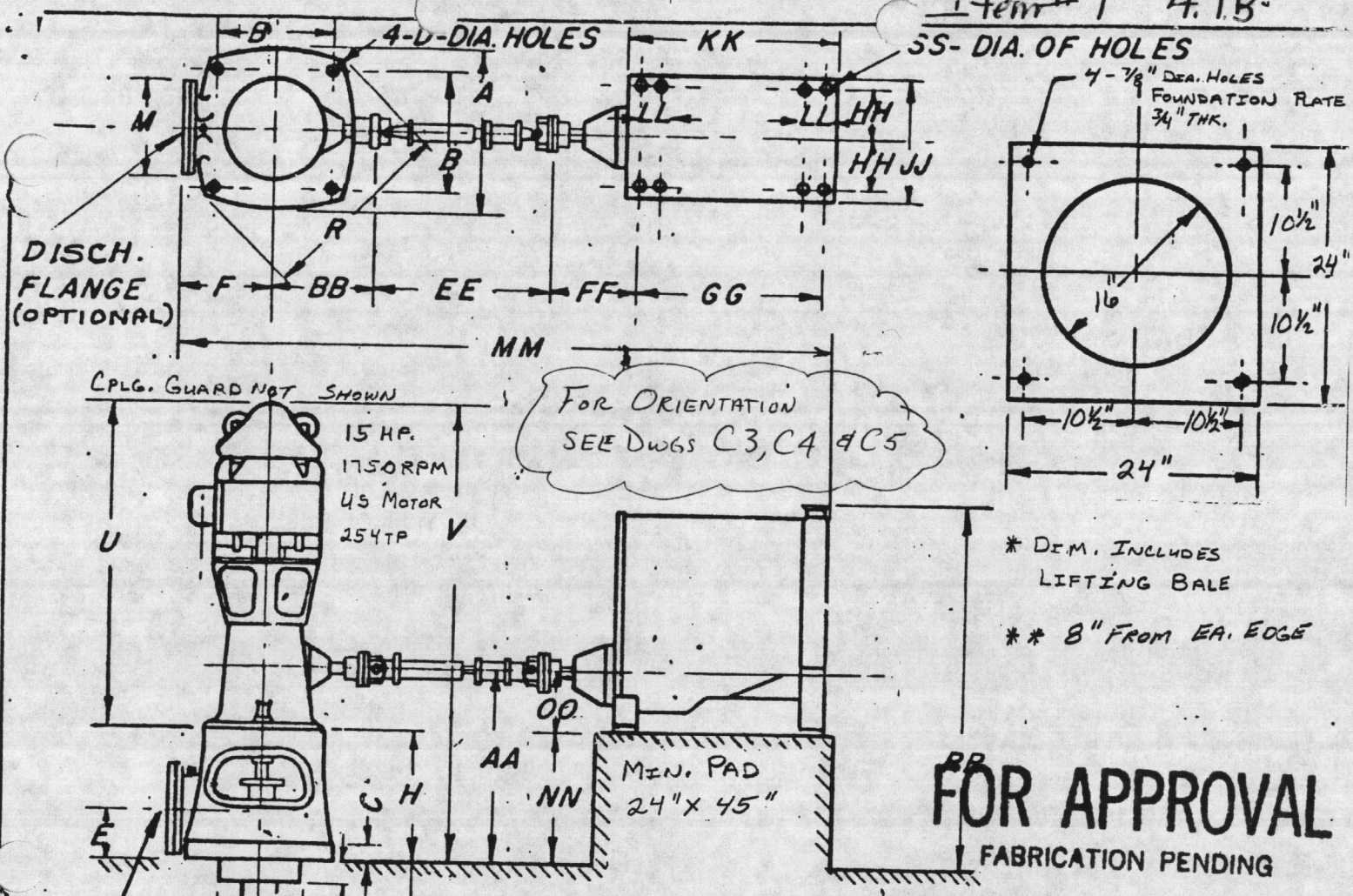
EMARKS

Pulled pump & clean removed 11' tail & one joint of column.

D/H 52 PSI

RER	STAGE	S.N.	TOTAL HEAD	SIZE

Item # 1 4.1B-



* DIM. INCLUDES LIFTING BALE

** 8" FROM EA. EDGE

FOR APPROVAL

FABRICATION PENDING

P.O. C642-0001

HARRY PEPPER & ASSOC. INC. S.O. 1635-01

DIMENSIONS

A	17"	Z	11'-0 3/8"
B	14 1/2"	CS	85'-11 1/4"
C	2"	OA	101'-0 3/8"
D	7/8"	AA	1'-10 1/4"
E	6 1/2"	BB	10 7/8"
F	9"	EE	24"
G	3 3/4"	FF	21 1/16"
H	15 1/2"	GG	29"
J	9 7/8"	HH	11 1/4"
M	11"	JJ	20"
N	6"	KK	45"
R	23"	LL	—
T		MM	7'-4 7/8"
U	4'-3 9/16"	NN	10 1/4"
V	5'-7 1/16"	OO	12"
W	6 1/4"	RR	56 1/4" *
X	7 1/2"	SS	5/8" **
Y	4'-0 3/4"	TT	5"

CAMO LEJEUNE NO. 1 WELL

TITLE

VERTICAL TURBINE PUMP WITH COMBINATION RIGHT ANGLE GEAR DRIVE WITH ENGINE & MOTOR

DATE OF ISSUE 3-1-85

DESTROY ALL PREVIOUS PRINTS

THE DEMING CO.
SALEM, OHIO
RPW

DATE 1-26-81 | SCALE NONE

FIG. 4700 SIZE M8

DRAWING NO. T82508

"It is hereby certified that the (material) (equipment) shown and marked in this submittal, shop drawings, catalog cut(s), etc., and approved/proposed to be incorporated into Contract Number N62470-81-C-1644 is in compliance with the Contract Drawings and Specifications and can be installed in the allocated space, and is:

X Approved for use.

_____ Submitted for Government approval.

_____ Approved for use subject to Government approval of specific deviation.

Authorized Reviewer _____ DATE _____

Signature CQC Rep. Phil Reese DATE 5-7-85

LOA Approved

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO.	TRANSMITTAL NO.	DATE
81-C-1644	55	6-20-85

FROM CONTRACTOR: HARRY PUPPE & Associates Inc.

TO: Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION: Holcomb Blvd Water Treatment Plant, MCB, Cp Lejeune, North Carolina

CONTRACTOR USE ONLY

*List only one specification division per form.

02734 *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
6	2.1.5	Manufacturer's Certification on Air Line	4	RA/a	
7	2.1.6	Manufacturer's Certification on Air Guage	4	RA	
8	2.1.6	Manufacturer's Data on Air Guage	4	RA	
9	2.1.7	Manufacturer's Certification on Drilling Clay	4	RA	
10	2.1.7	Manufacturer's Data on Drilling Clay	4	RA	

CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC: ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Phil Payne

DATE RECEIVED BY REVIEWER | FROM (Reviewer) | TO

☐ 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

Phil Payne 6-25-85

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

DATE | SIGNATURE

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO.	TRANSMITTAL NO.	DATE
81-C-1644	66	6-18-85

FROM CONTRACTOR
Harry Pepper & Associates, Inc.

TO
Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION
Holcomb Blvd Water Treatment Plant

MCB, Cp Lejeune, North Carolina

CONTRACTOR USE ONLY

*List only one specification division per form.

02734

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
	02734	ROTARY-DRILLED WATER WELLS			
1	2.1.1	Manufacturer's Certification on Casings	4	RA	
2	2.1.2	Manufacturer's Certification on Well Screens	4	RA	
3	2.1.2	Manufacturer's Data on Well Screens	4	RA	
4	2.1.3	Manufacturer's Certification on Gravel	4	RA	
5	2.1.4	Manufacturer's Certification on Cement Grout	4	RA	

CONTRACTOR'S COMMENTS

Shop Drawings per Para 1.2.1 and Sample of Gravel is forthcoming.

Phil Peace 6-25-85

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC
ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature) Phil Peace

DATE RECEIVED BY REVIEWER 6/27/85

FROM (Reviewer) Henry Von Oesen and Assoc., Inc.

TO

☐ 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

"Minor corrections were made by the reviewer. The contracotr is requested to update his copies of this submittal, acknowledge corrections below, and forward this submittal to the ROICC".

CORRECTIONS ACKNOWLEDGE

Phil Peace 6-25-85

SIGNATURE DATE

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

DATE 6/27/85

SIGNATURE

Item #21
Para 2.1.1

VALLEY STEEL PRODUCTS COMPANY

A Division of Valley Industries, Inc.
P.O. Box 503
St. Louis, Mo. 63166-0503
314/231-2160

May 22, 1985

R.L. MAGETTE COMPANY
Box 149
Smithfield, VA 23430

ATTN: CARL KELLOGG

RE: Your P.O. #496

Dear Sir:

We hereby certify the following material provided to you on your above referenced order meets the minimum chemical and physical requirements of ASTM A120:

2520' 10.750" O.D. X .365" WALL EW PIPE
700' 18.000" O.D. X .375" WALL EW PIPE

Thank you for your order.

Very truly yours,
VALLEY STEEL PRODUCTS CO.

GRM Mergel

Geoffrey R. Mergel
Quality Assurance Manager

GRM: lsr

CITY OF ST. LOUIS)
STATE OF MISSOURI) ss

CERTIFIED AND SUBSCRIBED BEFORE ME, A NOTARY PUBLIC IN AND FOR THE ABOVE CITY AND STATE, THIS DAY AND DATE.

DATED: 5-22-85

Carolyn M. Landwehr
CAROLYN M. LANDWEHR
NOTARY PUBLIC

Item #3
Para 2.1.2

FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

To Whom It May Concern:

We hereby certify that the Well Screen will meet the following specifications:

Type 304 Stainless Steel.
10" inside diameter.
Continuous slot wire wound type.
Screen will have adequate strength to resist all external forces to which they are subjected, both during and after installation.
Water velocity through the openings will not exceed 0.1 feet per second.
Joints will be of the same material as the screen, either threaded or butt type welding rings.

FCR Magette Well and Pump Company
Boyd O. Kellogg
Boyd O. Kellogg, Manager

Certified and subscribed before me, a Notary Public, this day and date.

June 5, 1985

Signed Malinda B. Reynolds
Malinda B. Reynolds
9-20-85

PIPE SIZE - SCREEN ATTACHED TO CASING

NOMINAL SIZE OF SCREEN (INSIDE DIAMETER)	EFFECTIVE INLET AREA * (SQUARE INCHES OF OPEN AREA PER FOOT OF SCREEN)								
	.008	.010	.012	.014	.016	.020	.030	.040	.050
1-1/4"	7	9	10	12	13	15	21	25	28
1-1/2"	9	11	13	14	16	19	26	31	35
2"	12	15	17	20	22	26	35	41	47
2-1/2"	13	16	19	21	24	28	38	45	51
3"	16	19	23	26	29	34	45	54	62
4"	20	24	28	32	36	43	57	68	77
5"	25	30	35	40	45	53	71	85	96
6"	20	25	29	34	38	45	62	77	89
8"	27	33	38	44	49	59	81	100	116
10"	33	40	48	55	61	74	101	124	144
12"	32	39	46	53	60	72	101	126	147
14" O.D.	35	43	51	58	65	79	111	138	162
16" O.D.	40	49	58	67	75	91	127	158	185

* OPEN AREA PER FOOT OF SCREEN MAY VARY SLIGHTLY WITH DESIGN OF SCREEN.

NOMINAL SCREEN SIZE (INSIDE DIAMETER)	ACTUAL OUTSIDE DIAMETER	CLEAR OPENINGS THRU SCREEN	APPROX. SHIP. WGT. – LBS. PER FT. OF SCREEN
1-1/4"	1-3/4"	1-3/16"	2
1-1/2"	2-1/8"	1-5/8"	3
2"	2-3/4"	2"	3-1/2
2-1/2"	3"	2-1/2"	5
3"	3-1/2"	3"	7
4"	4-1/2"	4"	11
5"	5-1/2"	5"	12
6"	6-5/8"	6"	14
8"	8-5/8"	8"	20
10"	10-3/4"	10"	25
12"	12-3/4"	12"	38
14" O.D.	14"	13-1/8"	42
16" O.D.	16"	15-1/4"	48

...llowbrook Avenue, Dunkirk, N.Y. 14048

CERTIFICATE OF TEST

PURCHASE ORDER NO. AND DATE	ACCEPTING MILL	MILL ORDER NO.	DATE SHIPPED	INVOICE NO
10580 03/12/85	DUNKIRK	4-0-80247	03/18/85	H232749

SOLD TO
HOWARD SMITH SCREEN CO
PO BOX 666
HOUSTON TX 77001

SHIP TO
HOWARD SMITH SCREEN CO
1907 SABINE
HOUSTON TX 77007

PRODUCT SPECIFICATIONS T.R.
AL TECH STAINLESS STEEL TYPE 304
HRAP AISI NO COAT

ITEM	DESCRIPTION	QUANTITY	POUNDS	C/P
?	R .2170 COIL	35 C	19463	C

CHEMICAL ANALYSIS:

HEAT NO.	STANDARD ELEMENTS & PERCENTAGES												ADDITIONAL ELEMENTS
	C	MN	P	S	SI	CR	NI	AL	MO	CU	N2	V	W
3051	.069	.95	.025	.029	.340	18.33	8.08		.450	.580	.055		CO .12

PHYSICAL PROPERTIES:

HEAT NO.	TENSILE KSI	YIELD KSI	ELONG %	RED AREA %	HARDNESS	G.S.	FERRITE	TEST NO. MAGNAFLUX	CH. IMPACT
3051	90.0								

CAPABILITIES:

HARDENABILITY

JK RATING A B C D E
THIN
HEAVY

A. Longiglia

ANALYSES AND RESULTS CERTIFIED AS ABOVE
AL TECH SPECIALTY STEEL CORPORATION

Item #4
Para 2.1.3

FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

To Whom It May Concern:

We hereby certify that the gravel meets the following specifications:

Clean, round, hard, water-worn quartz or granite with less than 5% felspar, no fossils, carbonate or orgamisms and of proper size and graduation to allow free flow of water in the well and prevent the infiltration of sand. Gravel size will be selected by the government, based upon the analysis of the sand in the water bearing stratta. Gravel will be sterilized with hypochlorite before using.

FCR Magette Well and Pump Company

Boyd O. Kellogg, Manager

Boyd O. Kellogg

Certified and subscribed before me, a Notary Public, this day and date.

June 5, 1985

Signed Malinda B. Reynolds
Malinda B. Reynolds
My Commission expires
9-20-85

Item #5
Para 2.1.4

FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

To Whom It May Concern:

We hereby certify that the Grout meets the following specifications:

Cement grout, type 1 or type 2.
Portland cement confirming to ASTMC 150 and water.
The mixed grout will contain no more than 6 gallons of water per cubic foot of cement.

FCR Magette Well and Pump Company

Boyd O. Kellogg

Boyd O. Kellogg, Manager

Certified and subscribed before me, a Notary Public, this day and date.

June 5, 1985

Signed Malinda B. Reynolds
Malinda B. Reynolds
My Commission Expires
9-20-85

Item #6
Para 3.1.5

FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

To Whom It May Concern:

We hereby certify the air line meets the following specifications: ASTM B88

Type K Copper tubing - 1/4" diameter.

FCR Magette Well and Pump Company

Boyd O. Kellogg

Boyd O. Kellogg, Manager

Certified and subscribed before me, a Notary Public, this day and date.

June 5, 1985

Signed Malinda B. Reynolds
Malinda B. Reynolds

My commission expires
9-20-85

Item #7
Page 2.1.6

FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

To Whom It May Concern:

We hereby certify that the air gauge will meet the following specifications:

Class 1, Style X, 4 1/2", brass case, bronze tube calibrated in feet of water.

FCR Magette Well and Pump Company

Boyd O. Kellogg

Boyd O. Kellogg, Manager

Certified and subscribed before me, a Notary Public, this day and date.

June 5, 1985

Signed Malinda B. Reynolds

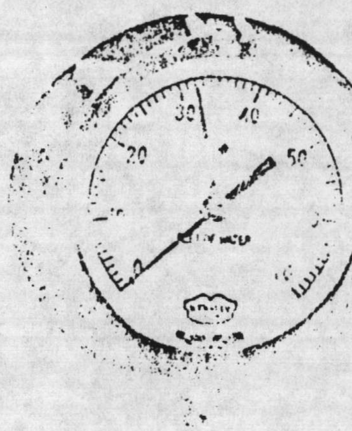
Malinda B. Reynolds

My commission expires
9-30-85

Item # 8
Paper 2.1.6

WEKSLER INSTRUMENTS

ALTITUDE GAUGE
1% ACCURACY



ALTITUDE GAUGE RANGES

TOTAL GRADUATIONS	FIGURE INTERVALS	GRADUATION
30 ft.	5 ft.	[illegible]
[illegible]	10 ft.	[illegible]
100 ft.	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
200 ft.	[illegible]	[illegible]
250 ft.	[illegible]	[illegible]
300 ft.	[illegible]	[illegible]
400 ft.	[illegible]	[illegible]
500 ft.	[illegible]	[illegible]
600 ft.	[illegible]	[illegible]
750 ft.	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
1,000 ft.	[illegible]	[illegible]

TYPE BA1 ... GAUGE

ALTITUDE ... OF WATER

RECOMMENDED USES: Bourdon tube and scale are designed specifically to indicate height of water in tanks, reservoirs, standpipes, ... Scale readings are in "Feet of Water." Standard range for domestic water heating systems is 0 to ... feet.

Modified with : Blowout Disc, Micrometer Pointer, & Plexiglass Lens

DIAL SIZES: .... 3½", 4½", 6", 8½".

BOURDON TUBE: .... Seamless phosphor bronze, Grade A, over pressure and stress relieved.

SOCKET & TIP: .... Forged brass.

MOVEMENT: .... Bronze bushed rotary with nickel silver pinion ... and shaft; phosphor bronze sector ... hairspring: stainless steel ... s are brass.

DIAL: .... White ...

POINTER: .... able pointer and red set ...

CASE TYPES: .... For Wall, Direct, Semi-Flush, or Flush mounting.

CASE MATERIALS: .... Phenol, Aluminum, Brass, Steel and Stainless Steel.

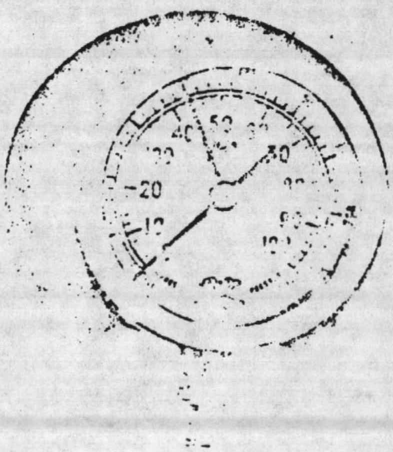
CONNECTIONS: .... ¼" male N. P. T. Special connections on application.

CASE SELECTION: .... See page ... for illustrated case descriptions and identifying suffix letters.

HOW TO ORDER: .... Give ordering information listed below.

WEKSLER INSTRUMENTS

COMBINATION ... GAUGE
1% ACCURACY



TYPE BN1 ... GAUGE

COMBINATION - PRESSURE & ALTITUDE

RECOMMENDED USES: Designed specifically to indicate both height of water and corresponding pressure — in tanks, reservoirs, stand pipes, etc. For domestic water heating systems standard range is 30 ... and ...

SPECIFICATIONS: Same as for Type BA1.

WHEN ORDERING: Specify (1) Gauge Type i.e. AA1, BA1, etc.; (2) ... size ... symbol; i.e. ... = 3½", 4 = 4½", 6 = 6", 8 = 8½" and ... (3) To the resultant 4-digit number, refer to page ... and appropriate case ... symbol. Example: "Type AA ... denote 4½ dial size ... gauge in black phenol case. ... addition to gauge Type Number ... Specify Range; Connection ... or special.

STANDARD COMBINATION RANGES

TOTAL GRADUATION	FIGURE INTERVALS	GRADUATION
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

CASE STYLES: 3½", 4½", 6", 8½" and 12" Dial Sizes

Stan[illegible] turret type Phenol case, for surface or direct mounting. Bottom connection standard. [illegible] available. [illegible] case style P foot illustrated [illegible] for flush mounting purposes. [illegible] standard with back connection, bottom connection available.

CASE		RING AND FINISH	CASE TYPE
MATERIAL	FINISH		
Phenol	Glossy Black	Snap [illegible] Finish	P
		Snap Flush, Black Finish	PF

Style P case not available in 6" dia. 4½" case [illegible]

P

Back flange permits surface or direct mounting. Bottom connection standard; back connection available.

Aluminum	Black Textured Enamel	Chrome-like [illegible] Ring	G
		[illegible] Ring, Black Finish	A
Cast Brass	Satin	Brass Screw Ring, Satin Finish	[illegible]
Stainless Steel	Polished	[illegible]	[illegible]

*4½ [illegible] only.

G

For direct mounting only. Bottom connection standard; back connection available.

Aluminum	Black Textured Enamel	Chrome-like [illegible]	[illegible]
		Aluminum [illegible] Black Ring	
Cast Brass	Satin	[illegible]	C
Stainless Steel	Polished	[illegible]	[illegible]

*4½" dial size only.

V

Cast aluminum surface mounting case with aluminum flush ring. Back connection standard; bottom connection available.

Aluminum	Black Textured Enamel	Threaded Aluminum Ring, Black Finish	AF
Cast Brass	Satin	Threaded Brass Ring, Satin Finish	[illegible]

AF

Front flanged case, for semi-flush surface mounting. Available with back connection only.

Aluminum	Black Textured Enamel	Chrome-like [illegible]	H
		Aluminum Bayonet Lock Ring, Black Finish	H*
Cast Brass	Satin	Brass Screw Ring, Satin Finish	K

*Except 8½" dial size.

H

For flush mounting, with "U" clamp. Also available without "U" clamp for direct (stem) mounting; specify case style "O". Type "OF" case is furnished with back connection only. Bottom connection only for style "O" case.

Drawn Steel	Cadmium Plated	Press Fit, Chrome Plated Brass	OF*

*3½" dial size only.

OF

Cast aluminum case for flush mounting. Available with back connection only.

Aluminum	Black Textured Enamel	Hinged Steel Ring, Black Finish	W*

*4½" and 6" dial sizes only.

W

SAFETY CASE TYPES

Specifically designed for severe and dangerous services, safety [illegible] solid [illegible] wall between the dial [illegible] maximum protection [illegible] due to over[illegible] release, [illegible] protection.

SAFETY STYLES	
[illegible] Case: Similar to style "[illegible]" except [illegible]	[illegible]
Back [illegible] Case: Similar to style [illegible]	[illegible]
[illegible] Front Case: Similar to style [illegible]	[illegible]
[illegible] Navy Case:	
Aluminum Case [illegible] Snap Ring, Gray Finish	4½ & 3½

*Also available for flush mounting [illegible] case only.

TYPE [illegible]

Item # 9
Page 2.1.7

FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems

Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

To Whom It May Concern:

We certify that the drilling clay will meet the following specifications:

Bentonite type, readily thinned with commericial mud thinner or biodegradable polymer mud which will break down naturally.
The specific gravity and the character of the mud-laden fluid shall be such that the production of the aquifers will not be impaired.

FCR Magette Well and Pump Company

Boyd O. Kellogg

Boyd O. Kellogg, Manager

Certified and subscribed before me, a Notary Public, this day and date.

June 5, 1985

Signed Malinda B. Reynolds
Malinda B. Reynolds

My commission expires
9-20-85

4700 INSTRUCTIONS

INSTALLATION and CARE of WATER LUBRICATED VERTICAL TURBINE PUMPS

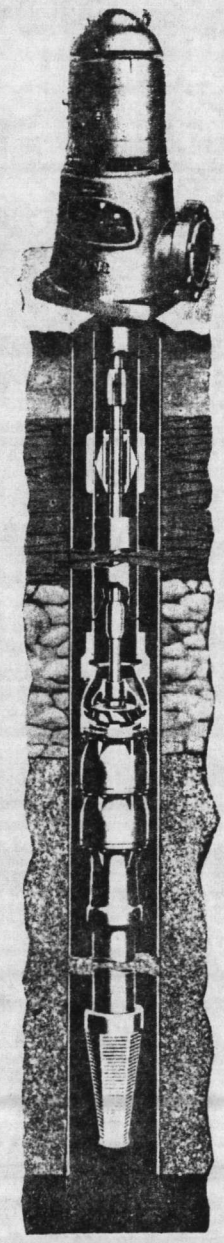


FIG. 4700

CRANE®

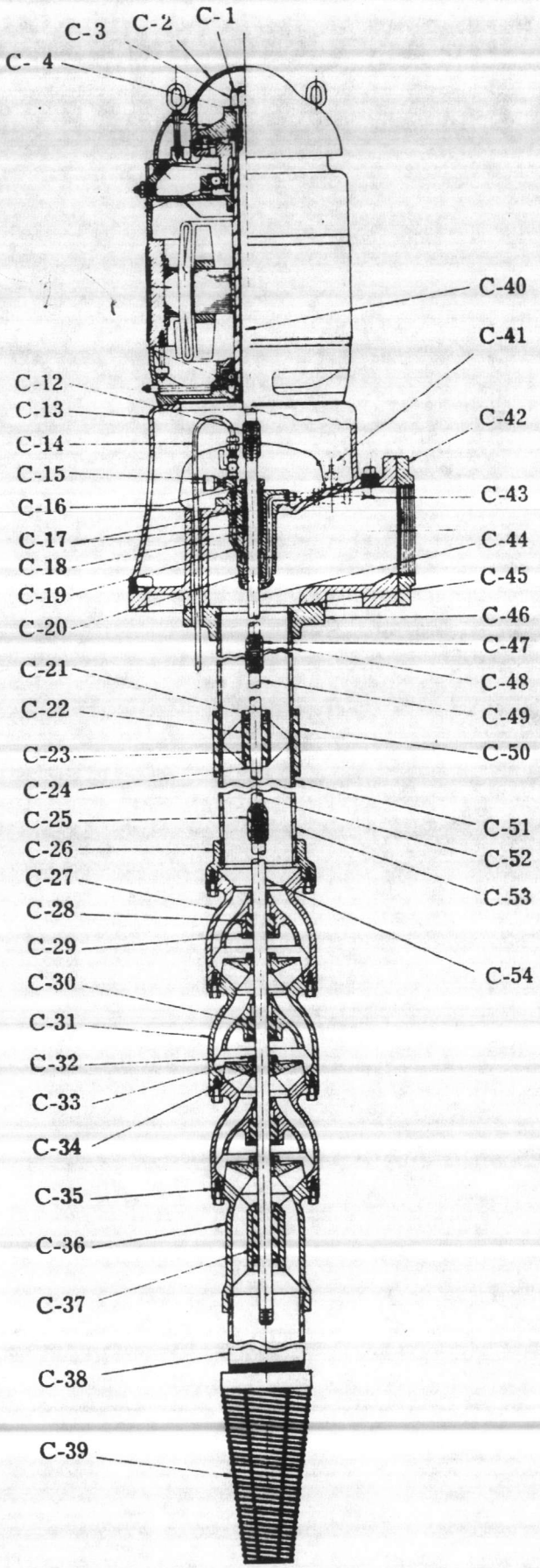
VALVES • PUMPS • FITTINGS • WATER TREATMENT • PLUMBING

DEMING PUMPS

Form 914

CRANE CO. DEMING DIV. · 884 SOUTH BROADWAY · SALEM, OHIO 44460

DEMING VERTICAL TURBINE PUMPS



Parts List No. 50 - Fig. 4700 Water Lubricated Pumps

C- 1 Adjusting Nut Lock Screw
C- 2 Canopy
C- 3 Impeller Adjusting Nut
C- 4 Gib Key
C-12 Head Shaft Coupling
C-13 Discharge Head
C-14 Stuffing Box Relief Assembly
C-15 Grease Cup
C-16 Stuffing Box Gland
C-17 Lantern Rings
C-18 Stuffing Box Packing
C-19 Stuffing Box
C-20 Stuffing Box Bushing
C-21 Snap Ring & Cover Plate
C-22 Bearing Housing
C-23 Column Bearing – Cutless Rubber
C-24 Shaft Sleeve
C-25 Impeller Shaft Coupling
C-26 Column Adapter
C-27 Discharge or Top Intermediate Bowl
C-28 Discharge or Intermediate Bowl Bearing
C-29 Snap Ring and Cover Plate
C-30 Bowl Bearing
C-31 Intermediate Bowl
C-32 Impeller Nut
C-33 Impeller
C-34 Impeller Sleeve
C-35 Bowl Gasket
C-36 Suction Bowl
C-37 Suction Bowl Bearing
C-38 Suction Pipe
C-39 Strainer
C-40 Head Shaft
C-41 Pre-lubricating Valve
C-42 Discharge Flange
C-43 Pre-lubricating Pipe
C-44 Stuffing Box Shaft
C-45 Top Column Flange Gasket
C-46 Top Column Flange
C-47 Shaft Coupling
C-48 Top Column Pipe
C-49 Intermediate Shaft
C-50 Column Coupling
C-51 Intermediate Column
C-52 Bottom Shaft
C-53 Bottom Column
C-54 Impeller Shaft

NOTE

Specify pump serial number when ordering replacement parts. This will be found on the nameplate attached to the discharge head casting or to the bowl assembly.

WELL

Measure the well to make sure it is of ample size and depth to receive the pump. The well must be sufficiently straight to allow the pump to hang freely with no misalignment.

FOUNDATION

A concrete foundation should be constructed before the pump is installed to permit aligning the pump head with the well while lifting equipment is available. Provide an opening in the foundation large enough for the top column flange with ample clearance. If the well is out of plumb, the pump head must be placed so that the drive shaft will be on the same inclination as the well casing. This is important. The foundation should be large enough to carry the weight of the pump without settling.

TOOLS

The following tools and equipment are required for satisfactory installation:

Derrick, gin pole with chain hoist, winch truck, well rig or similar equipment with at least 12 foot clearance (more for long bowl assemblies) and sufficient capacity to safely handle the weight of the complete unit.

Two pipe clamps or pipe elevators of proper size for pump column.

Two chain pipe tongs (if column has screwed couplings).

Two small pipe wrenches for screwing shaft together.

Small tools including wire brush, three-cornered file, wrenches, can of pipe compound, etc.

PREPARATION

Immediately on receipt of pump check carefully with packing list. Report any loss or damage to transportation company and to factory. Keep all parts in good dry storage. When ready to install, unpack material and lay out on skids or boxes near well.

Place the column pipe with the coupling end toward the well. Check shafts for straightness. Roll on ways if any question as shafts must be almost perfectly straight. Place a shaft inside each length of column with the bearing sleeve toward the well. Screw a shaft coupling on the opposite end.

Note -- Short-coupled turbine pumps are usually shipped assembled except for mounting motor. To install these pumps it is only necessary to raise the pump over the sump or reservoir and lower it on foundation. Then mount motor or drive as explained later.

IMPORTANT NOTES

1. Column pipe threads are right hand; shaft threads are left hand.
2. Protect all parts from dirt; especially column and shaft threads, couplings, and all machined surfaces. Any dirt or foreign material between ends of shafts or other parts may cause misalignment and unsatisfactory operation.
3. Handle shaft with extreme care to avoid bending.
4. All shaft and column must butt solidly in couplings; otherwise, differences in length may develop during installation. Ends of shafts should be even with small hole in side of shaft coupling.

INSTALLING BOWL ASSEMBLY

If headroom permits, screw strainer on suction pipe and suction pipe into bowl assembly before raising bowl assembly from ground. Where headroom is limited or assembly is long, lower suction pipe into well with strainer attached and hold with clamp. Then if headroom permits, assemble the bottom section of shaft, and column pipe on the top of the bowl assembly. Raise the complete assembly, taking particular care not to place too much strain on the bowls, and screw the bowl assembly on the suction pipe. If necessary to place clamp on bowl assembly, make sure this is located over joint and not on the shell of a bowl.

Loosen clamp on suction pipe and lower assembly into the well until the upper clamp or elevator rests on top of casing or foundation.

INSTALLING COLUMN

Place clamp or elevator under coupling on upper end of the bottom section of column and raise over the well. Support the shaft by hand or with a rope sling, taking particular care not to bend the shaft. On larger pumps a small clamp to fit the shaft or a length of manila rope will assist in supporting the shaft. Carry the lower end of the column or slide it on a plank so as not to damage threads. Make sure all threads are perfectly clean. Paint outside pipe threads with a good thread lubricant. Oil shaft threads and wipe off excess oil.

Screw the bottom shaft into the impeller shaft coupling and tighten. Then screw the column into the column adapter or if the adapter is flanged, bolt it to the top bowl. Lower the complete assembly into the well and hold with clamp.

Place a bearing assembly over the shaft with the snap ring at the top and slip it firmly in place in the column coupling.

Repeat this procedure until all of the column has been installed. Each section must butt rigidly in the couplings. Intermediate column lengths are regularly 10 feet for pumps up to 2200 RPM and 5 feet for pumps to operate over 2200 RPM. Rubber bearing should center in bearing sleeve in each column coupling. The top section of column has a flange for attaching to the discharge head. The top shaft which goes through the stuffing box is regularly of stainless steel, several inches longer than the top pipe.

INSTALLING HEAD ASSEMBLY

Hold the pump with clamps under the upper column coupling. This will support the top column flange several feet above the foundation where it is convenient to attach the discharge head. Remove the stuffing box assembly from the head. It may be necessary ro bump it lightly with a wooden block. Place a double chain sling through the head and raise it over the pump. Make sure flange on lower side of head is clean and that studs are not damaged. Clean the top column flange and place paper gasket on it. Line up studs and the opening through the head with holes in top flange and lower the head carefully onto the top flange. Make sure the register fits and tighten stud nuts securely.

Then raise the complete pump assembly and remove the clamps. Rotate the unit until the discharge flange is in the desired direction and lower onto foundation. If the head does not rest evenly on the foundation, lift the unit and place metal shims under each corner. The head must be supported on the foundation so that it is in line with the column and shaft. Never level a pump head on the foundation with a spirit level.

Place paper gasket over stuffing box studs. Make sure the flange is clean and lower the stuffing box over the shaft using care not to damage packing. Tighten stud nuts securely and tighten gland nuts finger tight. Run stuffing box relief tube down through opening in head to return by-pass water to well; or place tube through drain opening in back of head and pipe to drain. If pump is to operate under pressure; leave relief valve partially open to relieve the pressure on the upper packing. Give grease cup several turns to lubricate packing and stuffing box bearing. Screw headshaft coupling on upper end of stuffing box shaft. Place a cloth over coupling to avoid any possibility of dirt or foreign material dropping into it while motor is being mounted.

INSTALLING MOTOR OR DRIVE

Check motor nameplate to make sure it is suitable for the electric current available and the proper speed for the pump. Use eye bolts in top of motor for lifting motor only. Do not use these eye bolts for lifting motor and pump together. Set motor on pump head making sure that base of motor and top of head are clean and that register fits properly. Bolt motor in place with bolts or cap screws furnished. Remove motor canopy and top drive coupling. Lower headshaft through hollowshaft of motor with end of shaft having keyway at the top. Tighten in headshaft coupling. It is important that shafts butt in coupling but do not use excessive force which might cause misalignment.

ALIGNING PUMP

Check alignment of pump head on foundation by noting the clearance around the headshaft at top of motor. If the headshaft stands to one side in hollowshaft, place metal shims between the head and foundation on the opposite side so that the headshaft will stand exactly in the center. The straightness of the headshaft, stuffing box shaft and coupling may be checked by installing the top drive coupling, raising the impellers and turning the rotating assembly 180°. Then remove the top drive coupling and the shaft should remain in the center of the hollowshaft. Raise the complete pump assembly and without moving the shims, spread a layer of cement on the foundation. Then let the pump down until it rests in exactly the same position as before. Recheck position of top shaft. After cement sets tighten foundation bolts.

CHECKING ROTATION

Have the motor wired and check rotation before installing the top drive coupling. Rotation must be counter-clockwise when looking at top of motor. (See arrow on pump head.) Motors with built-in non-reverse ratchet may be energized momentarily without injury to the ratchet assembly. If rotation is incorrect, reverse two leads on three phase motor. Refer to diagram on single phase motor.

ADJUSTING IMPELLERS

Place top drive coupling over shaft and insert gib key. Tighten adjusting nut until impellers are raised off bowl seats and shaft just turns freely by hand. Then raise approximately one-half turn for each 100 feet of setting. It is better to raise more than necessary for starting and then make closer adjustment gradually. Install lock screw and tighten before starting pump. For maximum performance, impellers should be adjusted so that they run as close as possible and yet do not rub at maximum pressure. If there is any unusual noise or vibration, stop the pump and recheck impeller adjustment. A watt meter or ammeter may be used to obtain very close adjustment. If well may contain sand, raise impellers about twice normal amount when first starting pump and then readjust after well has cleared up. If the well does not produce sufficient water to supply the pump, the capacity of the pump should be reduced by raising the impellers.

PRELUBRICATING AND STARTING PUMP

Before starting deep well pumps the Cutless Rubber bearings above the static water level must be prelubricated with water. Connect pre-lube tank to opening in stuffing box assembly with fittings provided and fill tank with clean water. Allow at least half the tank of water to run down the shaft before starting pump. Then leave valve open and allow pre-lube water to continue to flow until the water from the pump reaches the surface. Allow tank to refill before closing valve. On large pumps with deep static water level refill tank from another source to provide ample prelubrication while the pump is coming up to speed. If such pumps are to be operated manually, it may be more convenient to install a 30 or 50 gallon barrel for prelubrication.

Pumps discharging into pressure systems are normally prelubricated by connecting a line around the check valve and installing the globe valve in this line. A small "V" groove should be filed in the valve seat so that the valve cannot be closed accidentally. Four to five gallons of water per hour is generally sufficient

to keep the bearings moist and in condition for automatic operation. Where pumps operate frequently and the water level is less than 50 feet from the surface, the bearings will normally remain sufficiently moist for smooth starting without prelubrication. Where pumps are started infrequently or the amount of water available for prelubrication is limited or on large installations to be operated automatically an electric solenoid operated valve should be installed in the pre-lube line with a timing relay to delay the starting of the pump until the bearings have been properly lubricated.

A gate valve should be placed in the discharge line. Leave this valve about three quarter closed when the pump is started. After the water reaches the surface, open the valve slowly to avoid over pumping the well and to maintain normal discharge pressure on the pump. Check the stuffing box and tighten gland, if necessary, with a small wrench, until there is only a small trickle of water to keep the packing lubricated.

LUBRICATION

PUMP LINE SHAFT AND BOWL BEARINGS

On Fig. 4700 Water Lubricated Pumps all bearings below ground are lubricated by the water flowing through the pump. Prelubrication during the starting period should be provided where necessary as explained on Page 4.

The water level in the well should be checked occasionally while the pump is in operation. If the water level draws down below the bowls, additional column and shaft should be installed, or the capacity of the pump should be reduced by either raising the impellers or throttling the discharge. The pump must not be allowed to operate if the water level drops to the strainer and the pump breaks suction.

STUFFING BOX

Apply a small amount of a good water resistant lubricant to the grease fitting on the stuffing box each time the pump is started or once a day if the pump is operated continously. Special turbine stuffing box grease may be obtained from Deming Division, Crane Co. in 1 lb. cans. If necessary, an automotive water pump grease may be used.

MOTOR WITH GREASE LUBRICATED BEARINGS
(Lubricated at factory before shipment)

A. Motor with grease fitting and drain plug in each bearing housing.

Once each six months or once a year, depending on operating conditions, the motor should be relubricated as follows:

1. Remove drain plug or grease ejector.
2. Apply pressure gun to grease fitting and inject new grease until all old grease has been forced out of the bearing through the grease drain. If a grease ejector is supplied, assist flushing of old grease by slowly working the plunger back and forth several times to remove grease from the drain.
3. Run motor for approximately five minutes to relieve bearing of excess grease using ejector immediately upon starting to assist removal of grease from drain.
4. Replace drain plug or ejector.

B. Motor with grease fitting only in each bearing housing.

Once each six months or once a year, depending upon operating conditions, add a small amount of grease. Then remove grease fitting and operate the motor about one-half hour before replacing the fitting to allow any excess grease to be expelled. The bearing may run warm (without injury) until the excess grease has been expelled. An approval motor bearing grease may be obtained from Deming Division, Crane Co., in 1 lb. cans.

MOTOR WITH OIL LUBRICATED BEARINGS, BELT DRIVE OR FLEXIBLE COUPLING DRIVE
(Fill with oil before starting)

Oil lubricated motors and drives are shipped without oil and should be filled with proper grade oil before starting. Check oil level once a week with pump idle. Change oil once a year or every 2000 hours operation, whichever occurs first. Change oil more frequently for continuous operation or under dusty conditions. For proper turbine oils refer to table. While special turbine motor oil is preferred, if necessary a SAE10 or SAE20 non-detergent pure paraffin base motor oil may be used temporarily.

MOTOR WITH OIL LUBRICATED TOP BEARING AND GREASE LUBRICATED LOWER BEARING
(Fill top oil reservoir before starting. Lower bearing greased at factory.)

Relubricate according to instructions outlined above.

RIGHT ANGLE DRIVE
(Fill before starting)

Refer to manufacturer's instructions which usually recommend changing oil once a year or after 2000 hours of operation, whichever occurs first. Use only an approved turbine oil as recommended by the drive manufacturer; SAE automotive oils are **Not** satisfactory for Right Angle Drives.

NOTE

See Page 6 for list of recommended oils and greases for motors.

RECOMMENDED OILS AND GREASES FOR MOTORS

Manufacturer	Trade Name of Grease	Trade Name of Oil
Continental Oil Co.	Conoco Race Lube	Conoco Turbine Oil Light
Esso Standard Oil Co.	Andok Lubricant B	Teresso 43
Magnolia Petroleum Co.	Mobilux Grease #2	Mobil DTE 797
Shell Oil Company	Alvania Grease #2	Tellus 27
Socony-Mobil Oil	Mobilux Grease #2	Mobil DTE 797
Standard Oil of California	Chevron Industrial Grease, Medium	Chevron OC Turbine 9
Standard Oil of Ohio	Sohio #78 or Lubtec Grease	Sohivis 43
Sun Oil Company	Sun N-52X	Sunvis 916
The Texas Company	Regal Starfak #2	Regal A (R & O)
Tidewater Oil Co.	Veedol All-Purpose	Tycol Aturbrio 50

CAUTION

Due to the high speed at which the smaller size units may operate, and since most of the pumping unit is underground, extreme care must be used in assembling and installing it and thoroughly checking the entire installation before it is put into operation.

If, after the well has been drilled and cased, it is crooked, the water supply is doubtful, the water level has dropped, or the water contains considerable sand, gravel or gas, the Crane Deming sales office from whom the unit was purchased should be consulted before it is started.

Under no circumstances will the Company guarantee the pump against the effects of corrosion, erosion or electrolytic action, those being entirely beyond the control of the Company.

In case any unusual vibration appears when starting the unit, or if vibration develops later, the unit should not be continued in operation, but Crane-Deming or authorized representative, should be requested to service the installation to place it in proper running condition.

If the above instructions are not followed or if the pump is operated without the proper submergence recommended by the Company, all guarantees are withdrawn and Crane-Deming will not assume any responsibility for the proper operation of the unit or the life of any of its parts.

LIMITED WARRANTY

APPLICABLE ONLY TO CONSUMER SALES

Crane Co., Deming Division gives a limited one-year warranty on the machinery of its own manufacture sold herewith. Crane Co., Deming Division warrants to any buyer or consumer that the machinery shall be free of defects in material and workmanship during normal use and service for a period of one year from the date of shipment.

Under this limited warranty, Crane Co., Deming Division shall, within 45 days from the date of notification, (1) repair the product at the factory or the nearest point of repair OR, (2) replace the product or any parts proven defective in material or workmanship OR, (3) refund the purchase price. The choice of such remedies shall be at the sole discretion of Crane Co., Deming Division.

This written warranty is the only warranty made by Crane Co., Deming Division. IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IF ANY, ARE LIMITED TO THE SAME TERM AS THIS WRITTEN WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

HOWEVER, SOLELY WITH RESPECT TO A BUYER WHO IS NOT A CONSUMER, THE FOREGOING WARRANTY IS IN LIEU OF ANY AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, AND NO OTHER WARRANTY IS MADE OR AUTHORIZED TO BE MADE.

The buyer or consumer must promptly and within the applicable limited warranty period notify the installing dealer or contractor in writing of any defect in the machinery and shall permit Crane Co., Deming Division to inspect the product so that it may determine its obligations under the warranty. The buyer or consumer must pay all labor costs, freight charges to the factory or the nearest point of repair, if any, and any charges for the installation of replacement parts, incurred by the Dealer, Contractor or this Company. Upon settlement of its obligations, if any, under this warranty, Crane Co., Deming Division, at its option, shall be entitled to the return of the defective product or part (s) (transportation prepaid).

This limited warranty does not cover unsatisfactory performance or failure due to misuse or abuse of the product, nor will Crane Co., Deming Division be responsible for unsatisfactory performance or failure due to improper installation, adjustment or repair of the product. The specifications for the machinery are descriptive and are not warranties.

This limited warranty does not cover equipment and accessories manufactured by third parties.

CRANE CO., DEMING DIVISION IS NOT RESPONSIBLE FOR CONSEQUENTIAL, SPECIAL, CONTINGENT, INCIDENTAL OR ANY OTHER DAMAGES WHATSOEVER IN CONNECTION WITH REPLACEMENT, REPAIR OR REFUND AS SET FORTH ABOVE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

CRANE CO., DEMING DIVISION
884 South Broadway
Salem, Ohio 44460

Form 167 - JANUARY 2, 1977

Printed in U.S.A.

WARRANTY

APPLICABLE WHEN THE MACHINERY IS SOLD AND INSTALLED ON A COMMERCIAL OR INDUSTRIAL APPLICATION, AND NOT AS A CONSUMER PRODUCT.

INDUSTRIAL PUMPS
CRANE CO., DEMING DIVISION
SALEM, OHIO, 44460

The following warranty, which is not a consumer warranty, is made in lieu of any and all implied or express warranties including, without limitation, implied warranties of merchantability and fitness for a particular purpose and no other warranty is made or authorized to be made.

Service under this warranty is the responsibility of the installing dealer or contractor. In the event service is required, the Buyer should request such service directly from the installing dealer or contractor. If for any reason the installing dealer or contractor is unknown or cannot be located, the Buyer should write Crane., Deming Division for the name and address of the nearest dealer or contractor.

If within one (1) year following date of delivery, any material supplied by Crane Co. hereunder proves defective or fails to meet the agreed specifications, Buyer shall not return it unless requested to do so but shall immediately notify the installing dealer or contractor, stating full particulars in support of his claim and if faulty workmanship or material is involved, or if material fails to meet the agreed specifications, Crane Co. will adjust the matter fairly and promptly. Under no circumstances shall Crane Co. be obligated to allow claims for subsequent or consequential damages or for any labor expense incurred by reason of the use or sale of any material which is defective or fails to meet the agreed specifications. The sole measure of damages shall be the price received therefore by Crane Co.

Form 168 - JANUARY 2, 1977

Printed in U.S.A.

X 1/02 — Hunt

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO	TRANSMITTAL NO	DATE
[illegible]-1344	14	1-14

FROM CONTRACTOR
[illegible]arry Pepper [illegible] Associates, Inc.

TO
[illegible] Von Oesen [illegible] Associates, Inc.

PROJECT TITLE AND LOCATION
[illegible]olcomb Blvd Water Treatment Plant
[illegible] C. Lejeune, North Carolina

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
	02734	ROTARY DRILLED WATER WELLS - Well [illegible] 1			
1		Step Test		RA	MB 1/21/86

CONTRACTOR'S COMMENTS

Well [illegible] 1 was drilled an additional 25 feet and an additional 20 feet of screen was added. See Transmittal # 04, dated 9-20-85.

A/E Please advise Rate to Pump for 24 hours test.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC
[illegible] COPY TO ROICC

CONTRACTOR REPRESENTATIVE *(Signature)*
Phil [illegible] [signature]

DATE RECEIVED BY REVIEWER	FROM (Reviewer)	TO
1/20/86	Henry von Oesen & Assoc	LANTDIV, 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

SEE MY LETTER 1/21/86 TO PF KRUG WITH INFO ON PREVIOUS WELLS DRILLED FOR BLDG 670. SUGGEST TESTING THIS WELL AT 200 GPM, WHICH IS A PUMPING LEVEL OF ABOUT 60 FT.

COPIES TO	DATE	SIGNATURE
ROICC (2) LANTDIV (1) A-E (1)	1/21/86	M Bunn[illegible]

☆ U.S. GPO:1984-537-003/11170 Region 3-11

Well # 1
Step Test
12/16/85

Item # 1

TIME	STATIC	PUMPING LEVEL	PUMPING RATE
1:00PM	13'6"	39'5"	100 GPM
1:15PM		40'1"	"
1:30PM		40'4"	"
1:45PM		40'6"	"
2:00PM		40'8"	"
2:15PM		40'8"	"
2:30PM		40'8"	"
3:00PM		40'8"	"
3:30PM		40'8"	"
4:00PM		40'8"	"
4:30PM		40'8"	"
4:45PM		49'10"	150"GPM
5:00PM		50'3"	"
5:15PM		50'4"	"
5:45PM		50'4"	"
6:15PM		50'4"	"
6:45PM		50'4"	"
7:15PM		50'4"	"
7:30PM		61'2"	200 GPM
7:45PM		61'6"	"
8:00PM		61'7"	"
8:30PM		61'7"	"
9:00PM		61"7"	"
9:30PM		61'7"	"
10:00 PM		61'7"	"
10:15PM		67'4"	250 GPM
10:30PM		67'6"	"
10:45PM		67'7"	"
11:15PM		67'7"	"
11:45PM		67'7"	"
12:15AM		67'7"	"
12:45AM		67'7"	"
1:00AM		72'8"	275 GPM
1:15AM		72'10"	"
1:30AM		73'	"
2:00AM		73"	"
2:30AM		73'	"
3:00AM		73'	"
3:30AM		73'	"

"It is hereby certified that the (material) (equipment) shown and marked in this submittal, shop drawings, catalog cut(s), etc., and approved/proposed to be incorporated into Contract Number N62470-81-C-1644 is in compliance with the Contract Drawings and Specifications and can be installed in the allocated space, and is:

_____ Approved for use.

X Submitted for Government approval.

_____ Approved for use subject to Government approval of specific deviation.

Authorized Reviewer _____ DATE _____

Signature CQC Rep. Phil Reese DATE _____

Hunt

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO	TRANSMITTAL NO	DATE
81-C-1644	183	3-19-86

FROM CONTRACTOR: Harry Pepper & Associates, Inc.

TO: Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION: Holcomb Blvd Water Treatment Plant

MCB, Cp Lejeune, North Carolina

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
	02734	ROTARY DRILLED WATER WELLS WELL # 1			
1	3.1.6	24 Hour Pump Test	7	A	JRB
2	3.1.6	2 Hour Recovery Test	7	A	JRB

CONTRACTOR'S COMMENTS

Note: This Well had a 24 hour Pump Test and 2 Hour recovery test completed on 1-30-86 The Pumping Rate was at 200 GPM, See Transmittal # 163, dated 2-5-86. Based on a request by the A/E, the 24 Hour Pump Test conducted on 3-13-86 is based on a Pumping Rate of 250 GPM.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC	CONTRACTOR REPRESENTATIVE (Signature)
ONE COPY TO ROICC	Phil Reese Phil Reese

DATE RECEIVED BY REVIEWER	FROM (Reviewer)	TO
3/24/86	Henry von Oesen & Assoc., Inc.	

☒ 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

Contractor's approval appears to be appropriate.

COPIES TO	DATE	SIGNATURE
ROICC (2) LANTDIV (1) A-E (1)	4/2/86	H Bowman Jr

☆ U.S. GOP: 1983 - 739-003/2122 Region 3-11

24 Hour Pump Test
Well # 1

3-13-86

Pumping Rate 250GPM

ITEM # 1

TIME	PUMP SETTING	STATIC
11:00AM	84'	13'6"
	PUMPING LEVEL	DRAWDOWN
11:00	56'1"	42'7"
11:01	58'1"	2'
11:02	58'7"	6"
11:03	58'7"	-
11:04	58'8"	1"
11:05	58'11"	3"
11:06	58'	-
11:07	58'4"	4"
11:08	58'9"	5"
11:09	58'9"	-
11:10	58'9"	-
11:15	59'1"	-
11:20	59'5"	4"
11:25	59'11"	6"
11:30	60'4"	5"
11:35	60'11"	7"
11:40	61'3"	4"
11:45	61'11"	8"
11:50	62'5"	6"
11:55	62'5"	-
12:00PM	62'8"	3"
1:00	62'8"	-
2:00	"	-
3:00	"	-
4:00	63'2"	6"
5:00	"	-
6:00	63'6"	4"
7:00	63'11"	5"
8:00	64'5"	6"
9:00	64'5"	-
10:00	64'7"	2"
11:00	64'8"	1'
12:00AM	"	-
1:00	"	-
2:00	"	-
3:00	64'9"	1"
4:00	64'9"	-
5:00	64'10"	1"-
6:00	"	-
7:00	"	-
8:00	"	-
9:00	"	-
10:00	65'1"	3"
11:00	65'1"	-

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED X
APPROVED AS NOTED
DISAPPROVED

SUBJECT TO THE REQUIREMENTS OF
CONTRACT NO. N62470-81-C-1644
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 [signature] DATE APR 02 1986

FOR OFFICER IN CHARGE OF CONSTRUCTION

I hereby certified that the (material) (equipment) shown and in this submittal, shop drawings, catalog cut(s), etc., are approved/proposed to be incorporated into Contract Number N62470-81-C-1644 is in compliance with the Contract Drawings and Specifications and can be installed in the allocated space, and is:

____ Approved for use.

X Submitted for Government approval.

____ Approved for use subject to Government approval of specific deviation.

Authorized Reviewer _____ DATE _____

Signature CQC Rep. [signature] DATE 3-18-86

Two Hour Recovery
Well # 1

3-13-86

ITEM # 2

11:00AM	26'1"
11:01	22'9"
11:02	20'6"
11:03	18'3"
11:04	16'9"
11:05	14'1"
11:06	13'11"
11:07	13'9"
11:08	13"6"
11:09	"
11:10	"
11:15	"
11:20	"
11:25	"
11:30	"
11:35	"
11:40	"
11:45	"
11:50	"
11:55	"
12:00PM	"
1:00	"
2:00	"

X/KAK
1/22

APM

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO	TRANSMITTAL NO	DATE

FROM CONTRACTOR: [illegible] Associates, Inc.

TO: [illegible] Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION: [illegible]

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

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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
	[illegible]	POTABLE [illegible]			
1		Step Test		RA	JB 1/21/86

CONTRACTOR'S COMMENTS

Well # 1 was drilled an additional 25 feet and an additional 20 feet of screen was added. See Transmittal # [illegible], dated 9 [illegible].

A/E Please advise Date to Pump for 24 hours test.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC: ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Phil [illegible]

DATE RECEIVED BY REVIEWER: 1/20/86

FROM (Reviewer): KENNY VON OESEN & ASSOC

TO: LANT DIV, ROICC

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REVIEWER'S COMMENTS

SEE MY LETTER 1/21/86 TO PF KRUG WITH INFO ON PREVIOUS WELLS DRILLED FOR BLDG 670.
SUGGEST TESTING THIS WELL AT 200 GPM, WHICH IS A PUMPING LEVEL OF ABOUT 60 FT.

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

DATE: 1/21/86

SIGNATURE: JB

☆ U.S. GPO:1984-537-003/11170 Region 3-11

NL
drilling fluid product
QUIK-GEL®
Viscosifier

Item # 10
Page 2.1.7

QUIK-GEL® viscosifier is a finely ground, premium-grade western sodium bentonite, specially processed to promote ease of mixing and superior mud-making qualities in fresh water.

Recommended Uses

In Fresh Water or In Freshwater-based Drilling Fluids

Increasing hole-cleaning capabilities.

Forming on permeable sections of the well bore a thin filter cake that can be removed easily by backflushing.

Promoting hole stability in poorly consolidated and caving formations.

Reducing water seepage in permeable formations.

Avoiding or overcoming loss of circulation.

In Fresh Water

Making an economical, single-sack, low-solids drilling fluid.

Making gel-foam for air drilling.

Major Advantages

Effectiveness. QUIK-GEL® viscosifier makes more than twice as much mud of the same viscosity as an equal weight of API-standard bentonite.

Fast yield. QUIK-GEL reaches high viscosity quickly.

Easy mixing. QUIK-GEL viscosifier saves time and effort in making mud.

Convenience. The 50-pound (22.7 kg) bag is easy to handle.

Enviornmental acceptability. QUIK-GEL is not toxic and does not ferment.

Recommended Treatment

See table.

Approximate Amounts of QUIK-GEL® Viscosifier Added to Fresh Water or to Freshwater Drilling Fluids

	lb/100 gal	lb/bbl	kg/m³
Added to Fresh Water			
Under normal drilling conditions.	15-25	6-11	15-30
In gravel or other poorly consolidated formations.	25-40	12-18	35-50
To stop loss of circulation.	35-45	15-20	40-55
Added to Freshwater Mud			
To improve performance: for better hole cleaning, thinner filter cake, and increased hole stability.	5-10	2-5	6-14

Method of addition. Preferably, mix by adding slowly through a jet mixer or high-speed stirrer. If such mixing equipment is not available, sift QUIK-GEL slowly into the liquid close to the pump suction while circulating.

Packaging

QUIK-GEL® is packaged in multiwall, water-resistant paper bags containing 50 pounds (22.7 kg).

4 Ply - Paper - 1 ply plastic (Polyethylene)

Availability

QUIK-GEL® viscosifier may be purchased through any NL Baroid Service Center or from the Houston plant.

DMD 34 7/80 5M GPC

Printed in U.S.A.

NL Baroid/NL Industries, Inc.
P.O. Box 1675 Houston

demonstration of test reliability. This demonstrates that their test precision and accuracy are equivalent to the norm established by major laboratories in the industry who routinely run these tests.

e. The values furnished for each property do not represent absolute value, but rather the values that should be obtained when precisely following the test procedures in API Spec 13A, Section 2. The test calibration barite should be run alongside any sample in dispute using the same equipment and technician.

SECTION 3
BENTONITE

3.1 Physical and Chemical Requirements. Bentonite furnished to this specification shall conform to the physical and chemical requirements of Table 3.1.

3.2 Testing Procedures. The requirements given in Table 3.1 shall be determined by the following testing procedures.

3.3 Apparatus.

a. Laboratory Balance—Sensitivity 0.01 g.

b. Mixer—11,000 ±300 rpm under load, with single corrugated impeller approximately 1 in. (2.5 cm) in diameter (e.g., Multimixer Model 9B with 9B29 impeller).

c. Container—7 in. (18 cm) deep, 3⅛ in. (9.7 cm) ID top, 2¾ in. (7.0 cm) ID bottom (e.g., Hamilton Beach mixer cup No. M110-D).

d. Direct-Indicating Viscometer — as described in API RP 13B.

e. Filter Press—as described in API RP 13B.

f. Oven—220 ±5 F (105 ±3 C).

g. Sieve—U. S. Standard No. 200.

TABLE 3.1
BENTONITE PHYSICAL AND CHEMICAL REQUIREMENTS*

See Par. 3.2 through 3.6, Std 13A and Par. 2.7 through 2.10, RP 13B for testing procedures

1	2
Requirements	Numerical Values
Suspension Properties*	
Viscometer Dial Reading at 600 rpm	30, minimum**
Yield Point, lb. per 100 ft.²	3 × Plastic Viscosity, maximum
Filtrate	15.0 cm³, maximum
Wet Screen Analysis Residue on U. S. Sieve No. 200†	4.0 per cent maximum
Moisture, as shipped from point of manufacture	10 per cent maximum

*Viscometer reading, yield point, and filtrate are measured on a suspension of 22.5 g bentonite in 350 cm³ of distilled water (22.5 lb./bbl. or 64.2 kg per m³). Filtrate measurement and viscometer reading shall be taken at a temperature of 75±5F (24±3C).

**The requirements of Table 3.1 result in a minimum yield of approximately 91 bbl. of 15 cp mud per ton of bentonite.

†Sieve designation as per ASTME11: *Sieves for Testing Purposes*, available from American Society for Testing Materials, 1916 Race St., Philadelphia, Pa. 19103.

3.4 Suspension Properties.

a. Prepare a suspension of the bentonite sample using 22.5 g of clay (as received) per 350 cm³ of distilled water. Sift the clay into the water while stirring on the mixer. Stir for 20 minutes. If the moisture content of the clay as received exceeds 10 per cent by weight, take such weight of clay as is equivalent to 22.5 g of clay containing 10 per cent moisture.

b. Store the suspension approximately 16 hours (overnight) in a sealed container at room temperature.

c. Stir the suspension for 5 minutes in the apparatus defined in Par. 3.3. On the direct-indicating viscometer note the dial readings at 300 and 600 rpm and at a temperature of 75±5F (24±3C). Calculate the plastic viscosity and yield point.

d. Determine filtrate of the suspension at 75±5F (24±3C) as described in API RP 13B.

3.5 Wet Screen Analysis.

a. Weigh approximately 10 g of bentonite to ±0.01 g. Add the weighed sample to 350 cm³ of water containing 0.2 g of neutral phosphate, such as sodium tetraphosphate. Stir on the mixer for 30 minutes. Age a minimum of 2 hours. Stir 5 minutes on the mixer.

b. Transfer the sample to a U.S. Standard No. 200 sieve having a diameter of 3 inches (7.6 cm) and a depth of 2.5 inches (6.3 cm) from the top of the frame to the wire cloth. Wash the material on the screen with water at 10 psig (0.70 kgf per cm²) from a spray nozzle (e.g., Spraying Systems Company No. TG 6.5 tip with ¼ TT body) for 2 minutes. While washing, allow the elbow bend of the nozzle to rest on the rim of the sieve and move the spray of water repeatedly over the surface of the screen. Transfer the residue from the screen to a tared evaporating dish.

c. Dry the residue in the oven and weigh to ±0.01 g.

$$\text{Per cent Residue} = \frac{\text{Weight Residue}}{\text{Weight Sample}} \times 100$$

3.6 Moisture.

a. Weigh approximately 10 g of bentonite to ±0.01 g.

b. Dry to a constant weight at a temperature of 220 ±5 F (105 ±3 C).

c. Cool the sample in a desiccator and weigh.

$$\text{Per cent Moisture} = \frac{\text{Weight Original Sample} - \text{Weight Dry Sample}}{\text{Weight Original Sample}} \times 100$$

John's Copy

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

CONTRACT NO	TRANSMITTAL NO	DATE
81-C-1644	94	9-20-85

FROM CONTRACTOR
Harry Pepper & Associates, Inc.

TO
Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION
Holcomb Blvd Water Treatment Plant
Cp Lejeune, North Carolina

CONTRACTOR USE ONLY

*List only one specification division per form

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REVIEWER USE ONLY

**ACTION CODES
A-Approved
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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
	02734	ROTARY-DRILLED WATER WELLS ----Well # 1			
1	2.2	Driller's Log	7	A	JMB 10/3/85
2	2.2.3	Electric Log	7	A	JMB 10/3/85
3	2.2	Gamma Log	7	A	JMB 10/3/85
4	2.2.2	Water Analysis and Sieve Analysis	7	A	JMB 10/3/85
5	2.2.4	Recommendation and Data Submittal	7	A	JMB 10/3/85

CONTRACTOR'S COMMENTS
10-6-85 -
Advised Contractor not to proceed until he complies with Para 1.2.1 + 1.2.3.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC
ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature)
Phil Reese

DATE RECEIVED BY REVIEWER
9/24/85

FROM (Reviewer)
HENRY VON OESEN & Assoc

TO
HARRY PEPPER & Assoc

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☐ 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

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

DATE
10/3/85

SIGNATURE
JM Bennett

☆ U.S. GPO:1984-537-003/11170 Region 3-11

DRILLERS LOG CAMP LEJEUNE WELL #1

DEPTH OF SAMPLE	
0 - 5 FT.	TOPSOIL AND BROWN SAND
5 - 35 FT.	WHITE CLAY AND FINE STRATA SAND
35 - 60 FT.	WHITE FINE SAND AND FINE STRATA SAND
60 - 85 FT.	GREEN CLAY. PUPLUKN SAND AND FINE SAND
85 - 120 FT.	LIMESTONE
120 - 250 FT.	GREEN CLAY AND FINE SAND

It is hereby certified that the (material) (equipment) shown and marked in this submittal, shop drawings, catalog cut(s), etc., and approved/proposed to be incorporated into Contract Number N62470-81-C-1644 is in compliance with the Contract Drawings and Specifications and can be installed in the allocated space, and is:

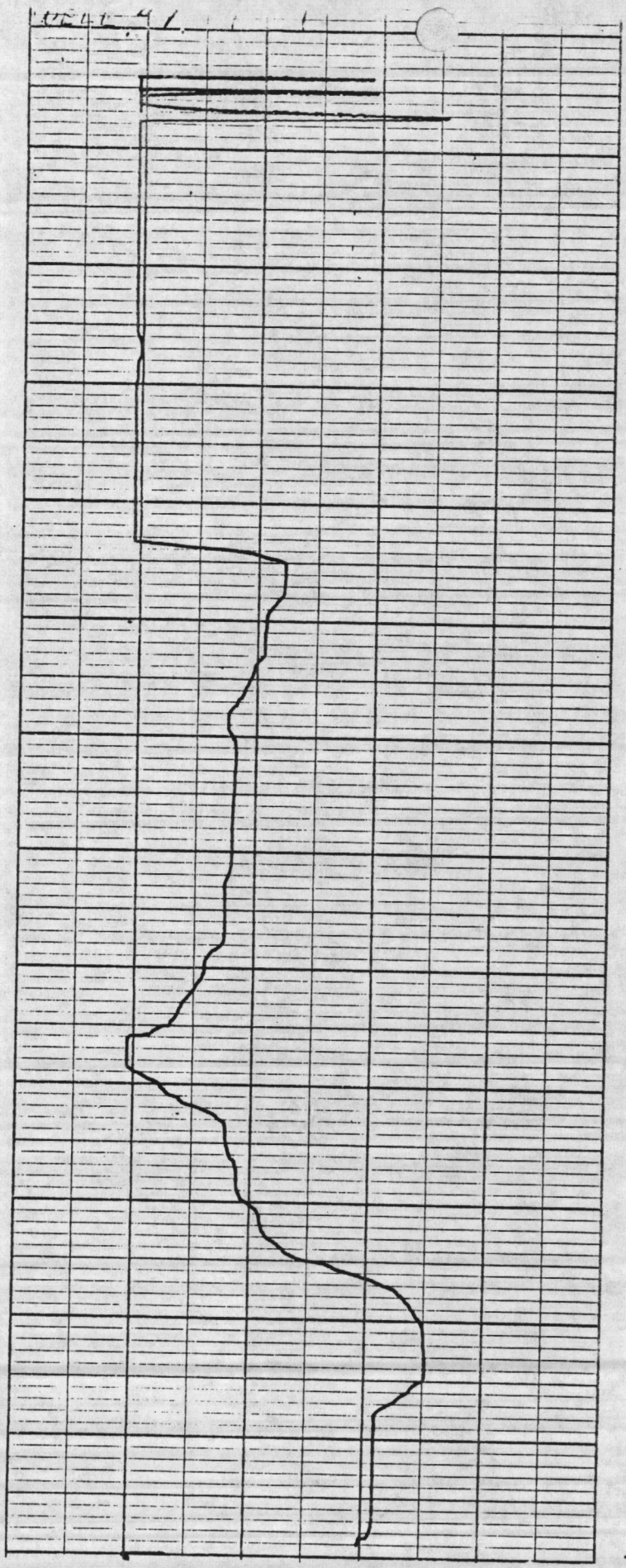
_____ Approved for use.

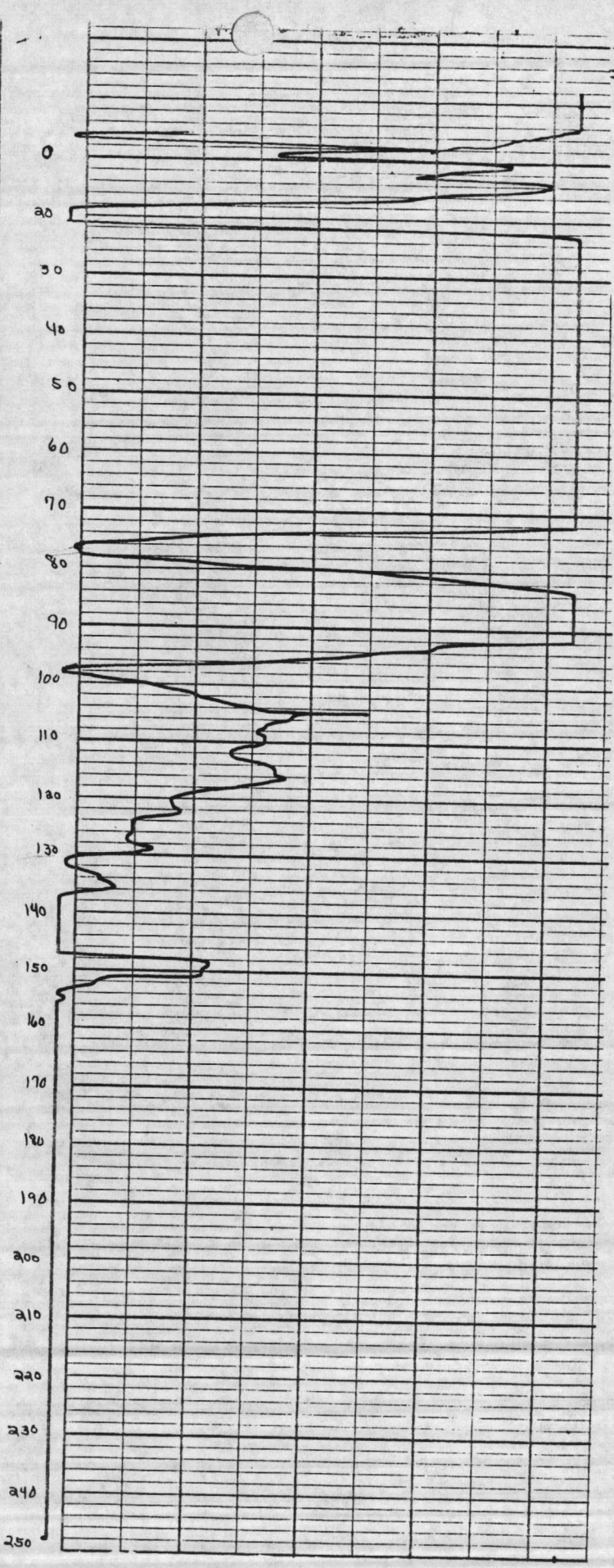
_X_ Submitted for Government approval.

_____ Approved for use subject to Government approval of specific deviation.

Authorized Reviewer _____ DATE _____

Signature CQC Rep Phil Pearce DATE 9-30-85

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190
200
210
220
230
240
250

LAW & COMPANY
Consulting and Analytical Chemists
ESTABLISHED 1903

Main Office
1711 Castle Street
P.O. Box 629
Wilmington, N.C. 28402

RICHARD SPIVEY, President
919-762-7082 919-762-8956
TWX 510-937-0280

MAJETTE WELL & PUMP CO
P. O. BOX 908
SMITHFIELD, VA 23430
ATTN: BUD KELLOG

DATE COLLECTED: 8-9-85
DATE RECEIVED: 8-9-85
COLLECTED BY: CUSTOMER
LAB ID# EW8755

SAMPLE DESCRIPTION: WELL #1

TESTS/UNITS		RESULTS
DISSOLVED OXYGEN	(MG/L)	5
TEMPERATURE	(^{O}F)	63
pH		8.0
CARBON DIOXIDE	(PPM)	0
SULFIDES	(PPM)	<.1
CHLORINE DEMAND	(PPM)	1.5
COLOR	(APHA)	50
TURBIDITY	(NTU)	190
TOTAL ALKALINITY	(PPM)	266.4
HYDROXIDE	(PPM)	0
BICARBONATE	(PPM)	247.2
CARBONATE	(PPM)	19.2
TOTAL HARDNESS	(PPM)	106
NON-CARBONATE	(PPM)	0
CARBONATE	(PPM)	106
TOTAL DISSOLVED SOLIDS	(PPM)	275

CONTINUED.....

LAW & COMPANY
Consulting and Analytical Chemists
ESTABLISHED 1903

Main Office
1711 Castle Street
P.O. Box 629
Wilmington, N.C. 28402

RICHARD SPIVEY, President
919-762-7082 919-762-8956
TWX 510-937-0280

TESTS/UNITS		RESULTS
SPECIFIC CONDUCTANCE	(UMHOS)	285
SULFATES	(PPM)	3
CALCIUM	(PPM)	54
MAGNESIUM	(PPM)	1.5
SODIUM	(PPM)	20
POTASSIUM	(PPM)	2.4
CHLORIDE	(PPM)	13
NITRATE NITROGEN	(PPM)	<.2
IRON	(PPM)	2.13
MANGANESE	(PPM)	.03
SILICON	(PPM)	5.25
FLOURIDE	(PPM)	.36

CHEMIST Dolly Bidwell

TOTAL CHARGES $180.00

HSSC
HOWARD SMITH SCREEN COMPANY
A Halliburton Company
1201 SAWYER ST. ◆ P.O. BOX 666 ◆ (713) 869-5771 ◆ TELEX: 77-4667 ◆ HOUSTON, TEXAS 77001

QUOTATION

STANCLIFF RIBBED WIRE WRAPPED SCREENS
FOR OIL AND WATER WELLS

SIEVE ANALYSIS

NAME MAGETTE WELL PUMP DEPTH 80-90 MATERIAL

LOCATION WELL NO. 1

SIEVE OPENINGS	RETAINED WTS.		TOTAL %		REMARKS
INCHES	GRAMS	%	CUMULATIVE RETENTION	PASSED	
025	.1	6.66	6.66		
020	.1	6.66	13.32		
016	.1	6.66	19.98		
014	.1	6.66	26.64		
012	.1	6.66	33.30		
010	.1	6.66	39.96		
008	.2	13.33	53.29		
006	.3	20.00	73.29		
004	.2	13.33	86.62		
003	.1	6.66	93.28		
PAN	.1	6.72	100.00		
TOTALS	1.5	100.00			

BY JIM JACKSON

DATE

HSSC
HOWARD SMITH SCREEN COMPANY
A Halliburton Company
1201 SAWYER ST. • P.O. BOX 666 • (713) 869-5771 • TELEX: 77-4667 • HOUSTON, TEXAS 77001

QUOTATION

STANCLIFF RIBBED WIRE WRAPPED SCREENS
FOR OIL AND WATER WELLS

SIEVE ANALYSIS

NAME MAGETTE WELL PUMP DEPTH 90-100 MATERIAL

LOCATION WELL NO. 1

SIEVE OPENINGS	RETAINED WTS.		TOTAL %		REMARKS
INCHES	GRAMS	%	CUMULATIVE RETENTION	PASSED	
025	2.4	19.04	19.04		
020	1.1	8.73	27.77		
016	1.1	8.73	36.50		
014	1.2	9.52	46.02		
012	1.0	7.93	53.95		
010	1.0	7.93	61.88		
008	.9	7.14	69.02		
006	2.5	19.84	88.86		
004	.8	6.34	95.20		
003	.4	3.17	98.37		
PAN	.2	1.63	100.00		
TOTALS	12.6	100.00			

BY JIM JACKSON

DATE

Item #5

HARRY PEPPER & ASSOCIATES, INC.

ENGINEERING CONTRACTORS

September 20, 1985

Henry Von Oesen
611 Princess St.
Wilmington, NC 28402

RE: N62470-81-C-1644
Expansion of Holcomb Blvd.
Water Treatment Plant
Camp Lejeune, NC 28542
Well #1

Gentlemen:

We are enclosing six (6) copies of the Driller's Log, Electric Log, Gamma Log, Water Analysis and Sieve Analysis for your review. The test well was drilled at 250'. Water samples were taken at the 90' level.

We recommend a line of .30-slot stainless steel screen set at the 78' to 98' level for a total of 20 VF of screen. The gravel pack recommended is 8-12. It is our best estimate that this well may yeild 260 GPM.

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

Very truly yours,
HARRY PEPPER & ASSOCIATES, INC.

Phil Reese
CQC Officer

Enclosures

119 WEST EIGHTH STREET • P.O. BOX 3007 • JACKSONVILLE, FL. 32206 904/356-3954

CAMP LEJEUNE NO. 1 WELL
to press .43 press to Head 2.31

DEMING PUMP CO.

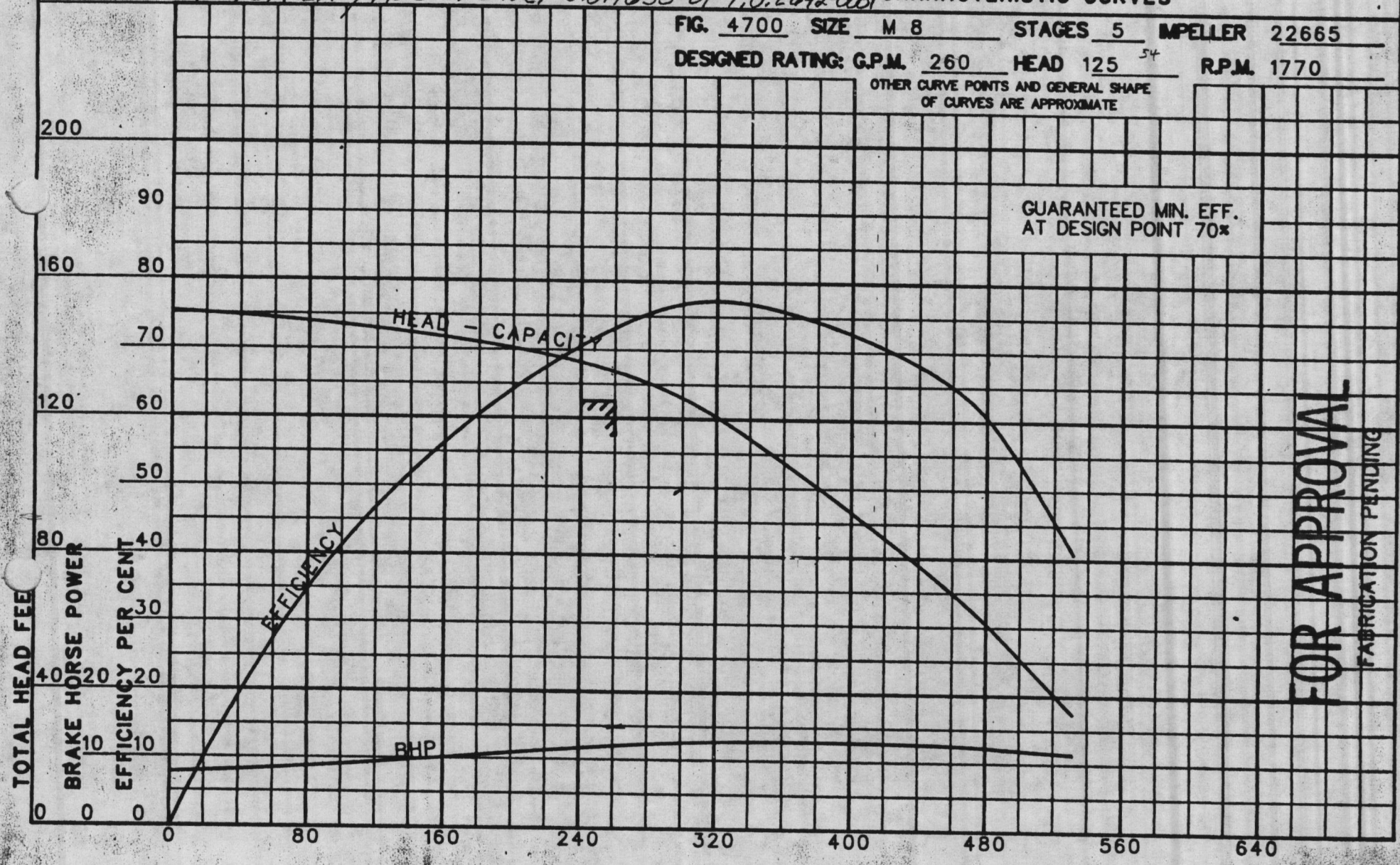
SALEM, OHIO, U.S.A.

240 HARRY PEPPER & ASSOC. INC. S.O. 1635-01 P.O. C642-0001 CHARACTERISTIC CURVES

FIG. 4700 SIZE M 8 STAGES 5 IMPELLER 22665

DESIGNED RATING: G.P.M. 260 HEAD 125 54 R.P.M. 1770

OTHER CURVE POINTS AND GENERAL SHAPE OF CURVES ARE APPROXIMATE



SERIAL NO. ****

IMP. DIA. 5 13/16"

DATE 2-20-85

NO. Q23650

Hunt

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO	TRANSMITTAL NO	DATE
81-C-1644	107	10-16-85

FROM CONTRACTOR: Harry Pepper & Associates, Inc.

TO: Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION: Holcomb Blvd Water Treatment Plant, Cp Lejeune, North Carolina

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
	02734	ROTARY DRILLED WATER WELLS---- Well # 1			
1	1.2.1	Shop Drawings	7	AN	10/21/85

CONTRACTOR'S COMMENTS

This Transmittal forms a part of Transmittal # 94, dated 9-20-85.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC: ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Phil Pepper

DATE RECEIVED BY REVIEWER: 10/17/85

FROM (Reviewer): HENRY VON OESEN & ASSOC

TO: HARRY PEPPER & ASSOC

☒ 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

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

DATE: 10/21/85

SIGNATURE: [signature]

☆ U.S. GPO:1984-537-003/11170 Region 3-11

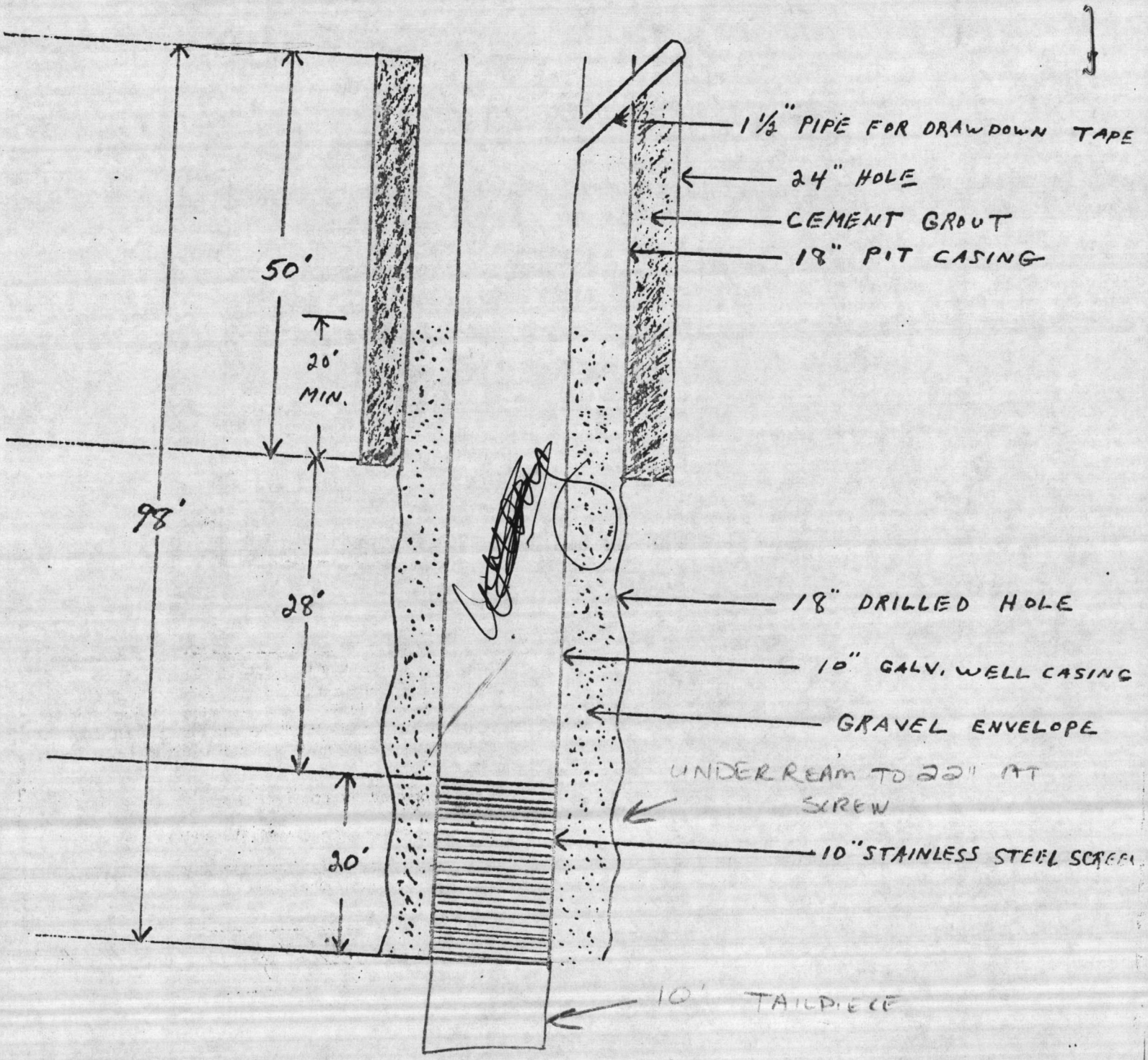
FCR

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

WELL #1



ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED _____
APPROVED AS NOTED ✓
DISAPPROVED _____

SUBJECT TO THE REQUIREMENTS OF

CONTRACT NO. N62470-81-C-1644

APPROVAL OF [illegible] DOES NOT INCLUDE APPROVAL OF ANY [illegible]ATION 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 _____ DATE OCT 21 1985

FOR OFFICER IN CHARGE OF CONSTRUCTION

"It is hereby certified that the (material) (equipment) shown and marked in this submittal, shop drawings, catalog cut (s), etc., and approved/proposed to be incorporated into Contract Number N62470-81-C-1644 is in compliance with the Contract Drawings and Specifications and can be installed in the allocated space, and is:

_____ Approved for use.

X Submitted for Government approval.

_____ Approved for use subject to Government approval of specific deviation.

Authorized Reviewer _____ DATE _____

Signature CQC Rep. Phil Pace DATE 10-16-85

Hunt

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

CONTRACT NO	TRANSMITTAL NO	DATE
81-C-1644	94	9-20-85

FROM CONTRACTOR
Harry Pepper & Associates, Inc.

TO
Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION
Holcomb Blvd Water Treatment Plant
Cp Lejeune, North Carolina

CONTRACTOR USE ONLY

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☐ Contractor Approved ☒ OICC Approval ☐ Deviation/Substitution For OICC Approval

REVIEWER USE ONLY

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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
	02734	ROTARY-DRILLED WATER WELLS ----Well # 1			
1	2.2	Driller's Log	7	A	JMB 10/3/85
2	2.2.3	Electric Log	7	A	JMB 10/3/85
3	2.2	Gamma Log	7	A	JMB 10/3/85
4	2.2.2	Water Analysis and Sieve Analysis	7	A	JMB 10/3/85
5	2.2.4	Recommendation and Data Submittal	7	A	JMB 10/3/85

CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC
ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature)
Phil Reese

DATE RECEIVED BY REVIEWER
9/24/85

FROM (Reviewer)
HENRY VON OESEN & Assoc

TO
HARRY PEPPER & Assoc

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☐ 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

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

DATE
10/3/85

SIGNATURE
JMBennett

☆ U.S. GPO:1984-537-003/11170 Region 3-11

Item # 1

Hunt

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO	TRANSMITTAL NO	DATE
81-C-1644	211	5-30-86

FROM CONTRACTOR: Harry Pepper & Associates, Inc.

TO: Henry Von Oesen & Associates, Inc.

PROJECT TITLE AND LOCATION: Holcomb Blvd Water Treatment Plant

MCB, Cp Lejeune, North Carolina

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
	02734	ROTARY DRILLED WATER WELLS WELL # 1			
1	1.2.1	Shop Drawing	7	A	JRB

CONTRACTOR'S COMMENTS

An additional twenty (20) feet of screen was added.

This Shop Drawing replaces Shop Drawing previous submitted. See Transmittal # 107, dated 10-16-85.

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC: ONE COPY TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Phil Reese Phil Reese

DATE RECEIVED BY REVIEWER: 6/3/86

FROM (Reviewer): HENRI VON OESEN AND ASSOC., INC.

TO

☐ 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

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

DATE: 6/13/86

SIGNATURE

☆ U.S. GOP: 1983 - 739-003/2122 Region 3-11

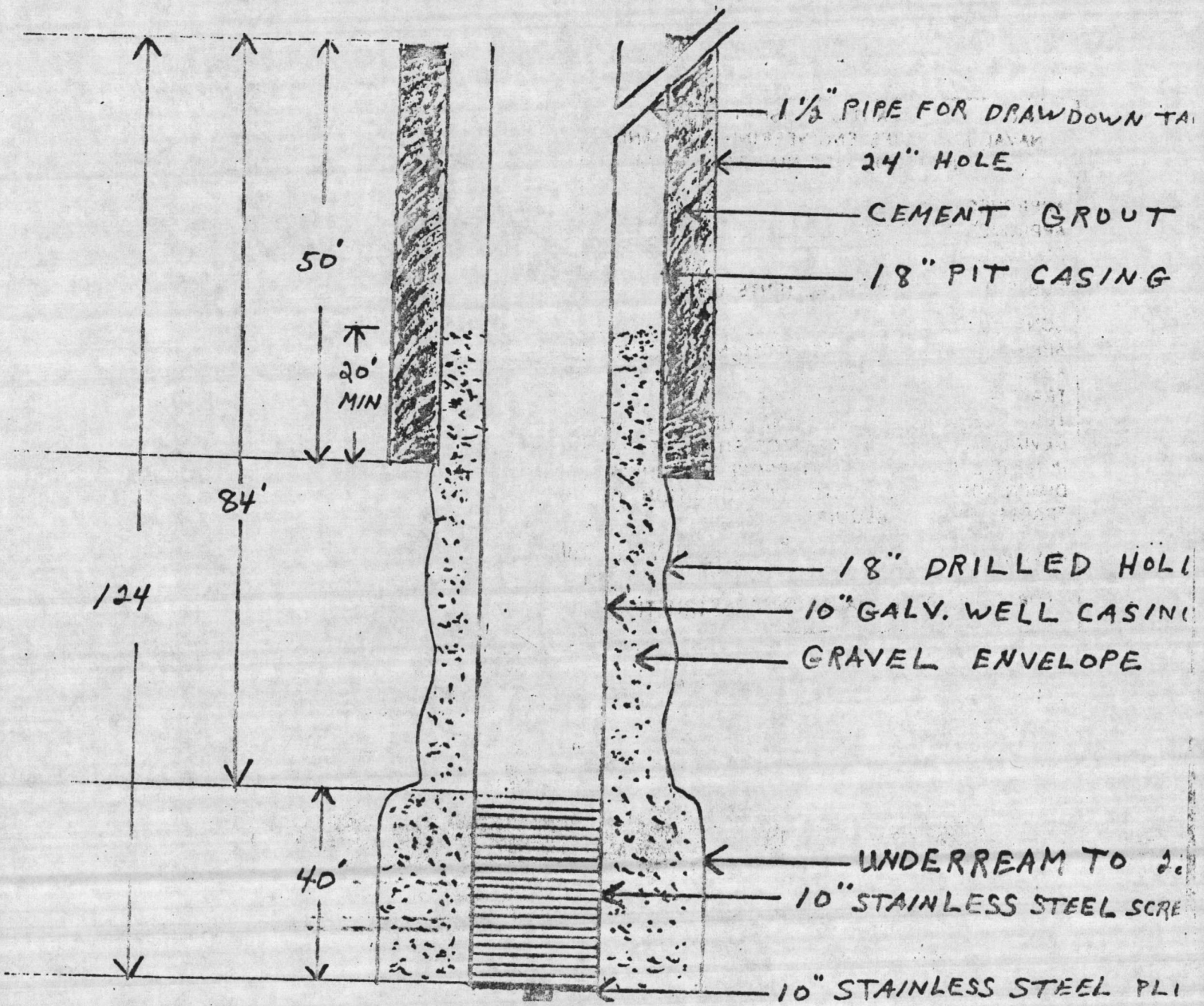
Item 1.

R. L. MAGETTE COMPANY

WATER SUPPLY CONTRACTORS
DOMESTIC : INDUSTRIAL : MUNICIPAL
Wells, Pumps and Community Water Systems
Serving Tidewater Virginia and Eastern North Carolina

P. O. Box 908 Phone - 804 - 357-4105
Smithfield, Virginia 23430

WELL #1



Item # 1.

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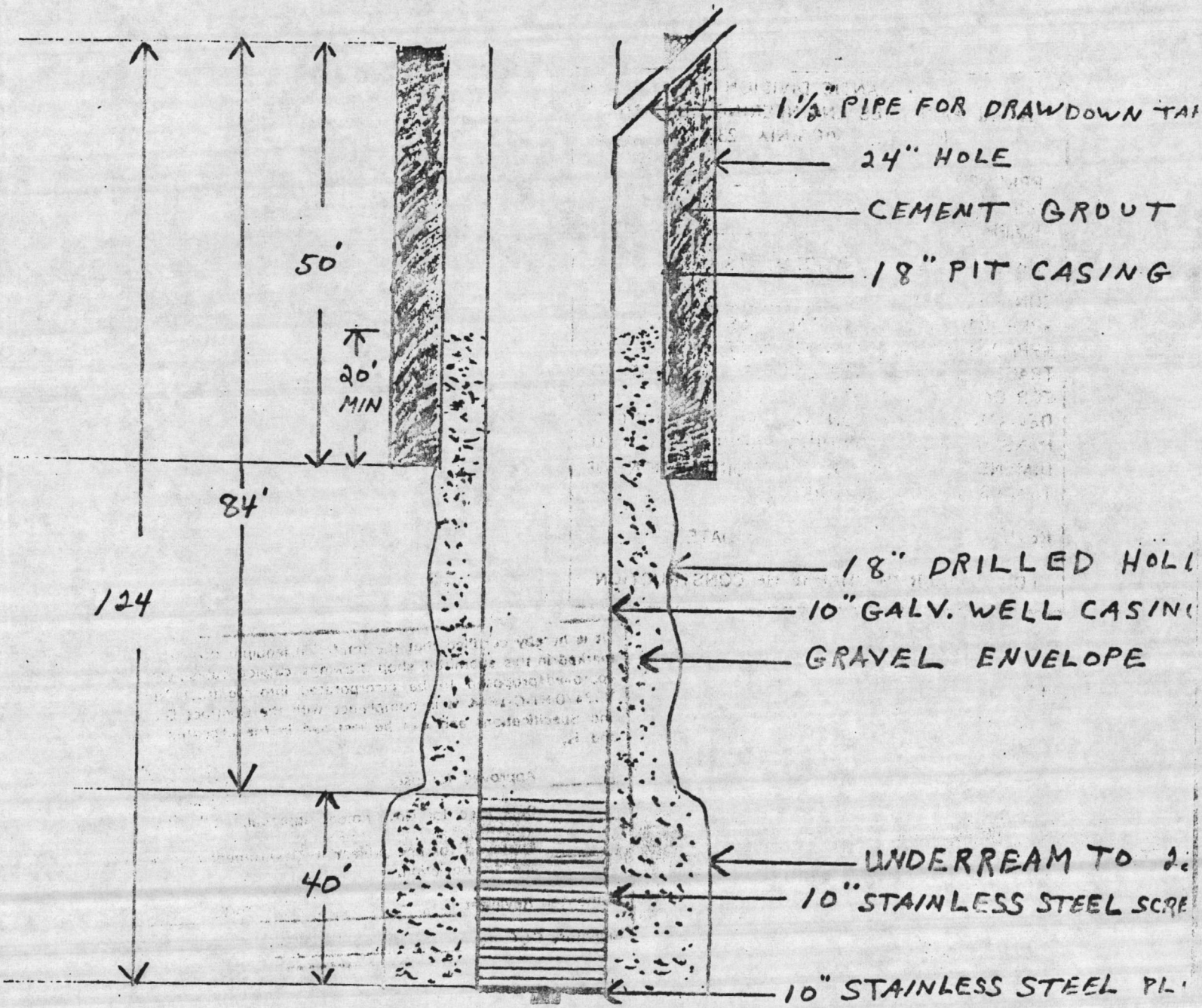
P. O. Box 908 Phone - 804 - 357-4103

Smithfield, Virginia 23430

WELL #1



LAW & COMPANY
Consulting and Analytical Chemists
ESTABLISHED 1903

Main Office
1711 Castle Street
P.O. Box 629
Wilmington, N.C. 28402

Well #698

RICHARD SPIVEY, President
919-762-7082 919-762-8956
TWX 510-937-0280

TESTS/UNITS		RESULTS
SPECIFIC CONDUCTANCE	(UMHOS)	285
SULFATES	(PPM)	3
CALCIUM	(PPM)	54
MAGNESIUM	(PPM)	1.5
SODIUM	(PPM)	20
POTASSIUM	(PPM)	2.4
CHLORIDE	(PPM)	13
NITRATE NITROGEN	(PPM)	<.2
IRON	(PPM)	2.13
MANGANESE	(PPM)	.03
SILICON	(PPM)	5.25
FLOURIDE	(PPM)	.36

CHEMIST Debby Bridwell

TOTAL CHARGES $180.00

Item 4

LAW & COMPANY

Consulting and Analytical Chemists

ESTABLISHED 1903

Main Office
1711 Castle Street
P.O. Box 629
Wilmington, N.C. 28402

Well #698

RICHARD SPIVEY, President
919-762-7082 919-762-8956
TWX 510-937-0280

MAJETTE WELL & PUMP CO
P. O. BOX 908
SMITHFIELD, VA 23430
ATTN: BUD KELLOG

DATE COLLECTED: 8-9-85
DATE RECEIVED: 8-9-85
COLLECTED BY: CUSTOMER
LAB ID# EW8755

SAMPLE DESCRIPTION: WELL #1

TESTS/UNITS		RESULTS
DISSOLVED OXYGEN	(MG/L)	5
TEMPERATURE	(^{O}F)	63
pH		8.0
CARBON DIOXIDE	(PPM)	0
SULFIDES	(PPM)	<.1
CHLORINE DEMAND	(PPM)	1.5
COLOR	(APHA)	50
TURBIDITY	(NTU)	190
TOTAL ALKALINITY	(PPM)	266.4
HYDROXIDE	(PPM)	0
BICARBONATE	(PPM)	247.2
CARBONATE	(PPM)	19.2
TOTAL HARDNESS	(PPM)	106
NON-CARBONATE	(PPM)	0
CARBONATE	(PPM)	106
TOTAL DISSOLVED SOLIDS	(PPM)	275

CONTINUED.....

Item #5

HARRY PEPPER & ASSOCIATES, INC.

ENGINEERING CONTRACTORS

September 20, 1985

Henry Von Oesen
611 Princess St.
Wilmington, NC 28402

RE: N62470-81-C-1644
Expansion of Holcomb Blvd.
Water Treatment Plant
Camp Lejeune, NC 28542
Well #1

Gentlemen:

We are enclosing six (6) copies of the Driller's Log, Electric Log, Gamma Log, Water Analysis and Sieve Analysis for your review. The test well was drilled at 250'. Water samples were taken at the 90' level.

We recommend a line of .30-slot stainless steel screen set at the 78' to 98' level for a total of 20 VF of screen. The gravel pack recommended is 8-12. It is our best estimate that this well may yeild 260 GPM.

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

Very truly yours,
HARRY PEPPER & ASSOCIATES, INC.

Phil Reese
CQC Officer

Enclosures

119 WEST EIGHTH STREET • P.O. BOX 3007 • JACKSONVILLE, FL. 32206 904/356-3954

Item #1

DRILLERS LOG CAMP LEJEUNE WELL #1

DEPTH OF SAMPLE	
0 - 5 FT.	TOPSOIL AND BROWN SAND
5 - 35 FT.	WHITE CLAY AND FINE STRATA SAND
35 - 60 FT.	WHITE FINE SAND AND FINE STRATA SAND
60 - 85 FT.	GREEN CLAY. POPCORN SAND AND FINE SAND
85 - 120 FT.	LIMESTONE
120 - 250 FT.	GREEN CLAY AND FINE SAND

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED ✓
APPROVED AS NOTED _____
DISAPPROVED _____

SUBJECT TO THE REQUIREMENTS OF

CONTRACT NO. N62470-81-C-1644

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REVIEWER M Brusso DATE OCT 03 1985

FOR OFFICER IN CHARGE OF CONSTRUCTION

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_____ Approved for use.

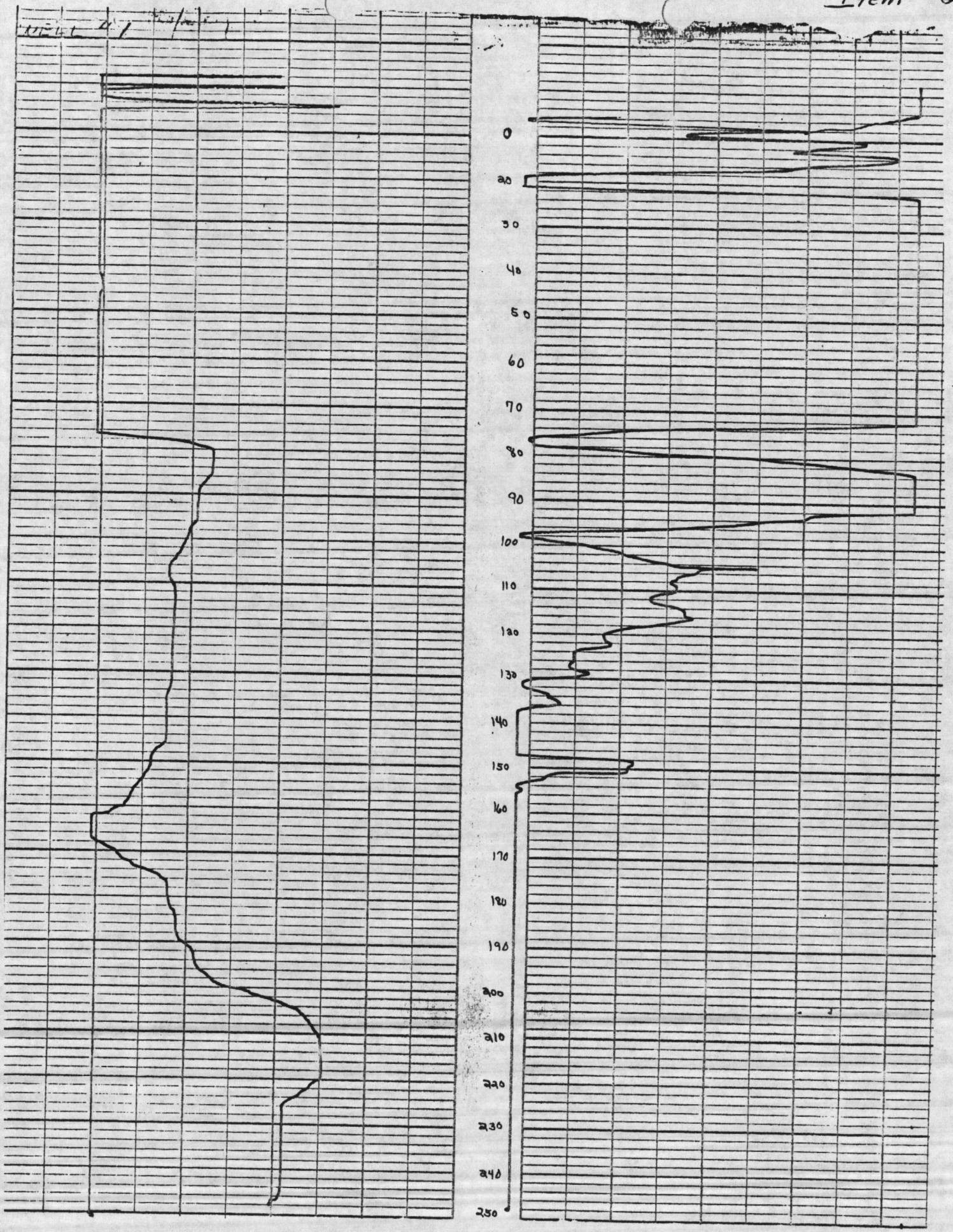
X Submitted for Government approval.

_____ Approved for use subject to Government approval of specific deviation.

Authorized Reviewer _____ DATE _____

Signature E&S Rep. Phil Rose DATE 9-30-85

Item # 2+3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