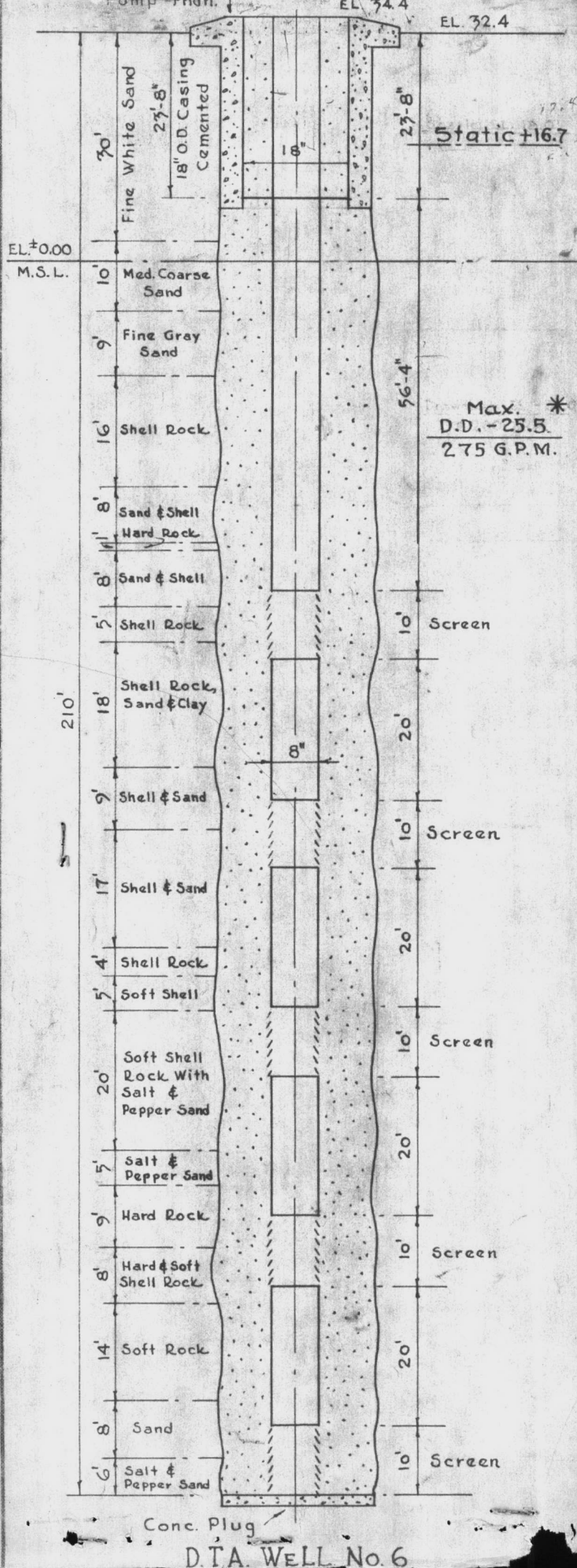
200 G.P.M. - SINGLE DRIVE - 7½ H.P.
224 " " " actual. D.D. -13.4



D.T.A. WELL No. 6

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

SOURCE INFORMATION
GROUND WATER

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

PWSID: 0662041

Owner Assigned Source Code: 606

Well Name (If purchase, name of system): HADNOT POINT 606

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

If Purchase, seller ID#:

Source Begin Date (M M Y Y):

Source exempt—SWTR? Y N

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

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

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

Latitude (N) Deg. Min. Sec.: 34 39 49

Longitude (W) Deg. Min. Sec.: 077 19 10

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

GPS Data: Q# or DOP #

No. of Sats. Locked on:

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

Vulnerable (VOCs)? Y N

Assessment Date (M M D D Y Y):

ENTRY POINT INFORMATION

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

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

Owner Assigned Entry Point Code: 1C0

Entry Point Name: ~~HP606~~ 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: 50' to Road

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: NONE

Well: Diameter: 8" Type: GRAVEL PACK Yield (gpm): ~~220~~ 345 Properly sealed? Y (Y,N)

Properly vented? N (Y,N) Casing depth: 80 ft. (If unknown, put 'UNK') Well depth: 210' Meter available? N (Y,N)

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

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

Pumps: Capacity: GPM: ~~345~~ 220 HP: 7.5 Pump intake depth: 80 Auxiliary Power? N (Y,N)

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 22" /

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 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 No Meter
③ Pump switch s/s for heavier use

DATE 7-25-00

PWSID 04-67-041

WELL # HP-606

WELL NAME HADNOT POINT HP-20

BLDG. HP 606

CODE 6.

AVAILABILITY P.

LOCATION SNEADS FERRY ROAD

LATITUDE 34.6645

LONGITUDE 77.32002

WELL DIAMETER 8"

WELL DEPTH 210'

SCREEN INTERVAL ---

YIELD 197

STATIC LEVEL 20

PUMPING LEVEL 46

PUMP TYPE VERTICAL TURBINE

MOTOR HP 7.5

INTAKE DEPTH 80'

DESIGN CAPACITY 345

ACTUAL GPM 226

SIZE OF CONCRETE SLAB 10X12

HEIGHT OF CASING 22"

WELL NUMBER 606 | BY Stevenson & Peterson | DATE 7-16-57

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	20	33	13	35	100	
		37	17	25	137	
		40	20	20	170	
		43	23	15	183	
		46	26	10	197	

REMARKS

D/H 54 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 606 | BY Stevenson & Brown | DATE 10-12-94

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	20	50	30	45	100	
		55	35	35	133	
		60	40	25	175	
		63	43	15	210	
		65	45	10	226	

REMARKS

D/H 58

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 606		BY Thomas-Brown			DATE 3-26-90	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	20	30	10	50	100.	05
		35	15	45	119	15
		40	20	35	157	25
		46	26	25	192	35
		50	30	15	230	45
		58	38	8	267	55

REMARKS

dead head @ 60 PSI

set @ 8 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

Dead Head 60 PSI

WELL NUMBER 606 | BY Thomas/Sardina | DATE 3-27-89

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	19	27	8	57	104	15
		33	14	52	143	25
		36	17	46	178	35
		39	20	41	192	45
		42	23	36	216	55
		46	27	27	239	05
		56	31	20	272	15
		54	35	15	290	25
		58	39	10	311	35
		60	41	7	317	45

REMARKS Dead Head 60 PSI

3-21-89 NEW PUMP

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE
GOULDS	6	MST89037 MODEL 8RJLO		6 ST.

WELL NUMBER COG | BY Thomas/Sedinas | DATE 2-13-89

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	21	24	3	10	100	45
		26	5	5	128	55

Dead Head 21

REMARKS

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 606		BY THOMAS/SARDINAS			DATE 1-5-88	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	18	20	2	14	100	0715
		21	3	11	115	0925
		25	6	8	137	1000
						0945

REMARKS dead head press. 25 psi
0935 stoped pumping test adj. impellers gained 2" on scale
left set at 8 psi 137 G.P.M.

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	606	BY	THOMAS / BROWN	DATE	10-26-84	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	16	22	6	27	104	1150
		24	8	24	111	1200
		27	11	21	125	1230
		29	13	18	140	1240
		33	17	15	154	1250
		34	18	12	172	1300
		38	22	9	183	1310

REMARKS kept set at 9 PSI 183 GPM

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL #606

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
1-11-79			40'		23 set		115
			37'		21		133
			31'		17		204
			30'		14		212
REMARKS:							
EPTH OF ELL:							
IRLINE LEVATION:	+	-					
ATE NSTALLED:							

606

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL GPM
					Start	Time	1030
9-29-82	80'	31'	40	9	29	100	1045
			43	12	26	111	1100
			45	14	22	130	1115
			49	18	19	154	1130
			51	20	16	167	1145
			53	22	13	187	1155

REMARKS: used direct reading gage

Last set at 13 PSI 187 GPM

PHYSICAL AND CHEMICAL ANALYSIS OF WATER

SAMPLE NO. NH9-5

DATE 9-17-58

FROM: (Station or unit)
U.S. Marine Corps Air Facility, New River, Jacksonville, N. C.

TO: (Name and location of laboratory)
Sanitation Laboratory, DPWO, 5ND, Naval Base, Norfolk, Virginia

SAMPLE FROM (Location of sampling point)
Well #6

COLLECTED BY	DATE	HOUR	SOURCE (Designate ground, surface, raw, treated)
Activity Personnel	9-8-58	-	Ground

REASON FOR EXAMINATION
To test for chloride content

EXAMINATION REQUESTED BY
Mr. R. L. Cox

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

I. Laboratory ~~FIELD~~ ANALYSIS

1. pH

TEMPERATURE: °F ; °C 22

ITEM	PPM
2. CARBON DIOXIDE (CO_2)	
3. DISSOLVED OXYGEN (O_2)	
4. HYDROGEN SULFIDE (H_2S)	
5. CHLORINE DEMAND (CI_2)	

FIELD ANALYSIS BY

DATE OF ANALYSIS

II. SPECIAL LABORATORY ANALYSES

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

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

III. ROUTINE LABORATORY ANALYSIS

(CHECK ONE)

[X] REQUESTED [ ] NOT REQUESTED

ITEM	PPM
1. COLOR	
2. TURBIDITY	
3. ALKALINITY ($CaCO_3$)	
P: 2. ; MO: 356.	
4. TOTAL HARDNESS ($CaCO_3$)	
5. NON-CARBONATE HARDNESS ($CaCO_3$) (By Computation)	
6. CARBONATE HARDNESS ($CaCO_3$) (By Computation)	
7. TOTAL DISSOLVED SOLIDS	
8. SPECIFIC CONDUCTANCE (Micromhos)	
9. CALCIUM (Ca)	
10. MAGNESIUM (Mg)	
11. SODIUM (Na) AND POTASSIUM (K)	
12. HYDROXIDE (OH)*	
13. BICARBONATE (HCO_3)*	
14. CARBONATE (CO_3)*	
15. SULFATE (SO_4)	
16. CHLORIDE (Cl)	120.
17. NITRATE (NO_3)	
18. IRON (Fe) TOTAL	
19. MAGANESE (Mn)	
20. SILICA (SiO_2)	
21. FLUORIDE (F)	

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

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

Note: Very faint odor of hydrogen sulfide in this sample.
Pump in service for 2½ hours prior to the time sample was collected.
Three (3) wells in service at time of sample collection.

LABORATORY ANALYSIS BY
George I. Earnest, Jr.

DATE OF ANALYSIS
9-19-58

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

GPO 912375

HP-606

CHECKED BOX APPLIES			PAGE 1 OF
	[X] ORDER FOR SUPPLIES OR SERVICES	[ ] REQUEST FOR QUOTATIONS NO. RETURN COPY(IES) OF THIS QUOTE BY (THIS IS NOT AN ORDER. See DD Form 1155r)	2

1. CONTRACT/PURCH ORDER NO.	2. DELIVERY ORDER NO.	3. DATE OF ORDER	4. REQUISITION/PURCH REQUEST NO.	5. CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1
M67001-77-M-4440		77 MAY 06	M93058-7117-W054	DO C9(2Q)76

6. ISSUED BY: CODE M67001
Mr. Harris/919-451-2164
Purchasing & Contracting Office
Bldg 1211, Marine Corps Base
Camp Lejeune, N. Carolina 28542

7. ADMINISTERED BY: (If other than 6) CODE

22 July WRP
Received 8/25/77

8. DELIVERY FOB
[ ] DESTINATION
[XX] OTHER
(See Schedule if other)

9. CONTRACTOR/QUOTER CODE FACILITY CODE

NAME AND ADDRESS
AURORA PUMP COMPANY
3048 MILLER ROAD
LITHONIA, GA 30058

10. DELIVER TO FOB POINT BY:
77 JUN 15

11. CHECK IF SMALL BUSINESS [ ] MBE

12. DISCOUNT TERMS
NET 30

13. MAIL INVOICES TO: (In sextuplicate)
SAME AS BLOCK #14

14. SHIP TO: CODE
Freight Traffic Branch
Bldg 1011, Camp Lejeune, N. Carolina 28542
M67001-77-M-4440

15. PAYMENT WILL BE MADE BY CODE M67001
Base Disbursing Officer
MCB, Camp Lejeune, North Carolina 28542

MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. TYPE OF ORDER
DELIVERY [ ]
PURCHASE [XX]

This delivery order is subject to instructions contained on this side of form only and is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.

Reference your TELEQUOTE 77 MAY 06, furnish the following on terms specified herein, including; for U. S. purchases, General Provisions of Purchase Order on DD Form 1155r (Except CLAUSE NO. 13 APPLIES ONLY IF THIS BOX [ ] IS CHECKED, and NO. 15 IF THIS BOX [ ] IS CHECKED); special provisions and delivery as indicated. This purchase is negotiated under authority of 10 USC 2304(a)(3) or as specified in the schedule if within the U. S., its possessions or Puerto Rico, if otherwise, under 2304(a)(6).

[ ] If checked, Additional General Provisions apply; Supplier shall sign "Acceptance" on DD Form 1155r and return copies.

17. ACCOUNTING AND APPROPRIATION DATA – ACCOUNTING CLASSIFICATION (REV. 7-65)

ITEM NO.	APPROPRIATION SYMBOL AND SUBHEAD	OBJECT CLASS	BUREAU CONT. NO.	SUB-ALLOT.	AUTH'N ACCT'G ACT'Y	TRANS. TYPE	PROPERTY ACCT'G ACT'Y	COUNTRY	COST CODE	AMOUNT
ALL	1771106.2720	000	67001	0	067001	2D	000000		AA72343552383T	PLUS TRANS $2748.00

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/SERVICES	20. QUANTITY ORDERED/ ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	PRIORITY 14				
0001 606	MML999 4320-00-C99-2993 Pump, layne vertical turbine deep well, water lubricated, complete with electric motor 220/240 volts, 7-1/2H.P., 3 phase, 1800 RPM., setting 80 ft., size 5", 4 stage, 200 GPM, 86 TDH, suction-pipe 5" X 10'	1	ea	2748.00	2748.00
	F.O.B. ATLANTA, GA. TRANSPORTATION CHARGES ESTIMATED NOT TO EXCEED $500.00. ALL TRANSPORTATION CHARGES PREPAID AND LISTED ON DEALER'S INVOICE AS A SEPARATE ITEM.				

* If quantity accepted by the Government is same as quantity ordered, indicate by √ mark. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA
BY J.C. CRUMLEY Purchasing ~~CONTRACTING~~/ORDERING OFFICER

25. TOTAL $2748.00
29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN:
[ ] RECEIVED [ ] INSPECTED [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

Date (Signature of authorized Government representative)

27. SHIP. NO. 28. D.O. VOUCHER NO. 30. INITIALS

[ ] FINAL [ ] PARTIAL

31. PAYMENT
[ ] COMPLETE [ ] PARTIAL [ ] FINAL

32. PAID BY
67001-
SYM # 5190
MCB CLNC

33. AMOUNT VERIFIED CORRECT FOR

34. CHECK NUMBER

35. BILL OF LADING NO.

36. I CERTIFY that this account is correct and proper for payment
(Signature and title of Certifying Officer)

37. RECEIVED AT	38. RECEIVED BY	39. DATE RECEIVED	40. TOTAL CONTAINERS	41. S/R ACCOUNT NUMBER	42. S/R VOUCHER NO.

DD FORM 1 AUG 66 1155 (NAVY) (Overprint 1/70)

Form Approved by Comptroller General, U. S., 27 May 66
Exception to SF 18 under $2,500 Approved by Budget Bureau Oct 66

THIS PARAGRAPH APPLIES ONLY TO QUOTATIONS SUBMITTED:

Supplies are of domestic origin unless otherwise indicated by quoter. The Government reserves the right to consider quotations or modifications thereof received after the date indicated should such action be in the interest of the Government. This is a request for information and quotations furnished are not offers. When quoting, complete blocks 11, 12, 22, 23, 25. If you are unable to quote, please advise. This request does not commit the Government to pay any cost incurred in preparation or the submission of this quotation or to procure or contract for supplies or services.

GENERAL PROVISIONS

1. INSPECTION AND ACCEPTANCE - Inspection and acceptance will be at destination, unless otherwise provided. Until delivery and acceptance, and after any rejections, risk of loss will be on the Contractor unless loss results from negligence of the United States Government. Notwithstanding the requirements for any Government inspection and test contained in specifications applicable to this contract, except where specialized inspections or tests are specified for performance solely by the Government, the Contractor shall perform or have performed the inspections and tests required to substantiate that the supplies and services provided under the contract conform to the drawings, specifications and contract requirements listed herein, including if applicable the technical requirements for the manufacturers' part numbers specified herein.

2. VARIATION IN QUANTITY - No variation in the quantity of any item called for by this contract will be accepted unless such variation has been caused by conditions of loading, shipping, or packing, or allowances in manufacturing processes, and then only to the extent, if any, specified elsewhere in this contract.

3. PAYMENTS - Invoices shall be submitted in quadruplicate *(one copy shall be marked "Original")* unless otherwise specified, and shall contain the following information: Contract or Order number, Item number, contract description of supplies or services, sizes, quantities, unit prices and extended totals. Bill of lading number and weight of shipment will be shown for shipments on Government Bills of Lading. Unless otherwise specified, payment will be made on partial deliveries accepted by the Government when the amount due on such deliveries so warrants.

4. DISCOUNTS - In connection with any discount offered, time will be computed from date of delivery of the supplies to carrier when acceptance is at the point of origin, or from date of delivery at destination or port of embarkation when delivery and acceptance are at either of these points, or from the date the correct invoice or voucher is received in the office specified by the Government, if the latter is later than date of delivery. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the Government check.

5. DISPUTES - (a) Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall mail or otherwise furnish a copy thereof to the Contractor. This decision shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Contractor mails or otherwise furnishes to the Contracting Officer a written appeal addressed to the Secretary. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. The Contractor shall be afforded an opportunity to be heard and to offer evidence in support of his appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision. (b) This "Disputes" clause does not preclude consideration of law questions in connection with decisions provided for in (a) above, provided, that nothing in this contract shall be construed as making final the decision of any administrative official, representative, or board on a question of law.

6. FOREIGN SUPPLIES - This contract is subject to the Buy American Act *(41 U.S.C. 10a-d)* as implemented by Executive Order 10582 of December 17, 1954, and any restrictions in appropriation acts on the procurement of foreign supplies.

7. CONVICT LABOR - The Contractor agrees not to employ for work under this contract any person undergoing sentence of imprisonment at hard labor.

8. OFFICIALS NOT TO BENEFIT - No member of or Delegate to Congress or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

9. COVENANT AGAINST CONTINGENT FEES - The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

10. GRATUITIES - (a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found after notice and hearing, by the Secretary or his duly authorized representative, that gratuities *(in the form of entertainment, gifts or otherwise)* were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such contract, provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court. (b) In the event this contract is terminated as provided in paragraph (a) hereof the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor and (ii) as a penalty in addition to any other damages to which it may be entitled by law to exemplary damages in an amount *(as determined by the Secretary or his duly authorized representative)* which shall be not less than three nor more than ten times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee. (c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

11. RENEGOTIATION - This contract, and any subcontract hereunder, is subject to the Renegotiation Act of 1951, as amended *(50 U.S.C. App. 1211 et seq.)* and shall be deemed to contain all the provisions required by Section 104 thereof, and is subject to any subsequent act of Congress providing for the renegotiation of contracts.

12. CONDITION FOR ASSIGNMENT - This Purchase Order may not be assigned pursuant to the Assignment of Claims Act of 1940, as amended *(31 U.S.C. 203, 41 U.S.C. 15)*, unless or until the supplier has been requested and has accepted this order by executing the Acceptance hereon.

13. COMMERCIAL WARRANTY - The Contractor agrees that the supplies or services furnished under this contract shall be covered by the most favorable commercial warranties the Contractor gives to any customer for such supplies or services and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the Government by any other clause of this contract.

14. PRIORITIES, ALLOCATIONS AND ALLOTMENTS DEFENSE MATERIALS SYSTEM - When the amount of the order is $500 or more the Contractor shall follow the provisions of DMS Reg. 1 and all other applicable regulations and orders of the Business and Defense Services Administration in obtaining controlled materials and other products and materials needed to fill this order.

15. FAST PAYMENT PROCEDURE --

(a) General. This is a fast payment order. Invoices will be paid on the basis of the Contractor's delivery to a post office, common carrier, or, in shipment by other means, to the point of first receipt by the Government.

(b) Responsibility for Supplies. Title to the supplies shall vest in the Government upon delivery to a post office or common carrier for shipment to the specified destination. If shipment is by means other than post office or common carrier, title to the supplies shall vest in the Government upon delivery to the point of first receipt by the Government. Notwithstanding any other provision of the purchase order, the Contractor shall assume all responsibility and risk of loss for supplies (i) not received at destination, (ii) damaged in transit, or (iii) not conforming to purchase requirements. The Contractor shall either replace, repair, or correct such supplies promptly at his expense, *provided* instructions to do so are furnished by the Contracting Officer within ninety (90) days from the date title to the supplies vests in the Government.

(c) Preparation of Invoice.

(1) Upon delivery of supplies to a post office, common carrier, or in shipments by other means, the point of first receipt by the Government, the Contractor shall prepare an invoice in accordance with Clause 3 of the General Provisions of Purchase Order, except that invoices under a blanket purchase agreement shall be prepared in accordance with the provisions of the agreement. In shipments by either post office or common carrier, the Contractor shall either (A) cite on his invoice the date of shipment, name and address of carrier, bill of lading number or other shipment document number, or (B) attach copies of such documents to his invoice as evidence of shipment. In addition the invoice shall be prominently marked "Fast Pay." In case of delivery by other than post office or common carrier, a receipted copy of the Contractor's delivery document shall be attached to the invoice as evidence of delivery.

(2) If the purchase price excludes the cost of transportation, the Contractor shall enter the prepaid shipping cost on the invoice as a separate item. The cost of parcel post insurance will not be paid by the Government. If transportation charges are separately stated on the invoice, the Contractor agrees to retain related paid freight bills or other transportation billings paid separately for a period of three years and to furnish such bills to the Government when requested for audit purposes.

(d) Certification of Invoice. The Contractor agrees that the submission of an invoice to the Government for payment is a certification that the supplies for which the Government is being billed have been shipped or delivered in accordance with shipping instructions issued by the ordering officer, in the quantities shown on the invoice, and that such supplies are in the quantity and of the quality designated by the cited purchase order.

OUTER SHIPPING CONTAINERS SHALL BE MARKED "FAST PAY"

16. *(This clause applies if this contract is for services and is not exempted by applicable regulations of the Department of Labor.)*

SERVICE CONTRACT ACT OF 1965 - Except to the extent that an exemption, variation, or tolerance would apply pursuant to 29 CFR 4.6 if this were a contract in excess of $2,500, the Contractor and any subcontractor hereunder shall pay all of his employees engaged in performing work on the contract not less than the minimum wage specified under section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended ($1.60 per hour). However, in cases where section 6(c)(2) of the Fair Labor Standards Act of 1938 is applicable, the rates specified therein will apply. All regulations and interpretations of the Service Contract Act of 1965 expressed in 29 CFR Part 4 are hereby incorporated by reference in this contract.

ADDITIONAL GENERAL PROVISIONS

17. CHANGES - The Contracting Officer may at any time, by a written order, and without notice to the sureties, make changes, within the general scope of this contract, in (i) drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the Government in accordance therewith; (ii) method of shipment or packing; and (iii) place of delivery. If any such change causes an increase or decrease in the cost of, or the time required for performance of this contract, whether changed or not changed by any such order, an equitable adjustment shall be made by written modification of this contract. Any claim by the Contractor for adjustment under this clause must be asserted within 30 days from the date of receipt by the Contractor of the notification of change provided that the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim if asserted prior to final payment, under this contract. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes." However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

18. TERMINATION FOR DEFAULT - The Contracting Officer, by written notice, may terminate this contract, in whole or in part, for failure of the Contractor to perform any of the provisions hereof. In such event, the Contractor shall be liable for damages, including the excess cost of reprocuring similar supplies or services; provided that, if (i) it is determined for any reason that the Contractor was not in default or (ii) the Contractor's failure to perform is without his and his subcontractor's control, fault or negligence, the termination shall be deemed to be a termination for convenience under paragraph 19. As used in this provision the term "subcontractor" and "subcontractors" means subcontractors at any tier.

19. TERMINATION FOR CONVENIENCE - The Contracting Officer, by written notice, may terminate this contract, in whole or in part, when it is in the best interest of the Government. If this contract is for supplies and is so terminated, the Contractor shall be compensated in accordance with Section VIII of the Armed Services Procurement Regulation, in effect on this contract's date. To the extent that this contract is for services and is so terminated, the Government shall be liable only for payment in accordance with the payment provisions of this contract for services rendered prior to the effective date of termination.

20. ASSIGNMENT OF CLAIMS - Claims for monies due or to become due under this contract shall be assigned only pursuant to the Assignment of Claims Act of 1940, as amended *(31 U.S.C. 203, 41 U.S.C. 15)*. However, payments to an assignee of monies under this contract shall not, to the extent provided in said Act, as amended, be subject to reduction or set-off. *(See Clause 12.)*

ACCEPTANCE

The Contractor hereby accepts the offer represented by this numbered purchase order as it may previously have been or is now modified, subject to all of the terms and conditions set forth, and agrees to perform the same.

NAME OF CONTRACTOR	
SIGNATURE	
TYPED NAME AND TITLE	DATE SIGNED

REMARKS

WATER ANALYSIS

By N. H. Kellam

Date 12-17-41

Sample from Well No. 6 Per Area

210 ft Deep 2nd Sample

24 hrs Pumping

Total Solids	268 PPM	Volatile Soilds	62 PPM
Suspended Solids	32 "	Disolved Soilds	236 "
Phenophthalein Alkalinity	0 "	Silica	24 "
Total Alkalinity	200 "	Ferrous Iron	0 "
Chlorides	16 "	Total Iron	1.2 "
Sulphates	15 "	Aluminum	1.7 "
Carbonates	0 "	Calcium	72.8 "
Bicarbonates	200 "	Magnesium	5.8 "
		Sodium	0.9 "

pH 7.3 Soap Hardness as $CaCo_3$ 210 "

Mineral Hardness as $CaCo_3$ "

Odor Very Slight

Turbidity 10

REMARKS Nitrites - 0

PHYSICAL AND CHEMICAL ANALYSIS OF WATER

SAMPLE NO.

FROM: *(Station or unit)* Well 6

DATE 8-1-57

TO: *(Name and location of laboratory)*

SAMPLE FROM *(Location of sampling point)*

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

REASON FOR EXAMINATION

EXAMINATION REQUESTED BY

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

I. FIELD ANALYSIS

1. pH	TEMPERATURE °F	TEMPERATURE °C

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

FIELD ANALYSIS BY

DATE OF ANALYSIS

II. SPECIAL LABORATORY ANALYSES

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

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

III. ROUTINE LABORATORY ANALYSIS

(CHECK ONE)

	REQUESTED		NOT REQUESTED

ITEM		PPM
1. COLOR		
2. TURBIDITY		
3. ALKALINITY ($CaCO_3$)	P: 0	MO: 154
4. TOTAL HARDNESS ($CaCO_3$)		158
5. NON-CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*		
6. CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*		
7. TOTAL DISSOLVED SOLIDS		
8. SPECIFIC CONDUCTANCE *(Micromhos)*		
9. CALCIUM (Ca)		
10. MAGNESIUM (Mg)		
11. SODIUM (Na) AND POTASSIUM (K)		
12. HYDROXIDE (~~OH~~)* $CaCO_3$		0
13. BICARBONATE (~~HCO_3~~)* $CaCO_3$		154
14. CARBONATE (~~CO_3~~)* $CaCO_3$		0
15. SULFATE (SO_4)		
16. CHLORIDE (Cl)		10
17. NITRATE (NO_3)		
18. IRON (Fe) TOTAL		1.0
19. MAGANESE (Mn)		
20. SILICA (SiO_2)		
21. FLUORIDE (F)		

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

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

LABORATORY ANALYSIS BY Justice

DATE OF ANALYSIS 8-1-57

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

GPO 912375

PHYSICAL AND CHEMICAL ANALYSIS OF WATER

SAMPLE NO. WW 2-9

FROM: (Station or unit) U. S. Marine Corps Base, Camp Lejeune, North Carolina

DATE 1 March 1960

TO: (Name and location of laboratory) DPWO Sanitary Engineering Laboratory, Bldg. L-29, Naval Base, Norfolk 11, Virginia

SAMPLE FROM (Location of sampling point) Hadnot Point Area Well No. 6, Bldg. No. 606

COLLECTED BY	DATE	HOUR	SOURCE (Designate ground, surface, raw, treated)
Mr. R. L. Cox	3 Feb. 1960	—	Ground

REASON FOR EXAMINATION: E.S.R. DPWO PROJECT NO. 09-2455

EXAMINATION REQUESTED BY: Mr. R. L. Cox

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

I. Laboratory ~~FIELD~~ ANALYSIS

1. pH	TEMPERATURE °F	TEMPERATURE °C
7.3		24.

ITEM	PPM
2. CARBON DIOXIDE (CO_2)	
3. DISSOLVED OXYGEN (O_2)	
4. HYDROGEN SULFIDE (H_2S)	
5. CHLORINE DEMAND (CI_2)	

~~FIELD ANALYSIS BY~~

The temperature of the water at time of collection was 18°C.

DATE OF ANALYSIS

II. SPECIAL LABORATORY ANALYSES

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

(X)	ITEM	PPM
	1. As	
	2. Se	
	3. Pb	
	4. B	
	5. Cu	
	6. Zn	
	7. Cr (Hexavalent)	
X	8. PO_4	0.0
	9. Cd	
	10. CN	
	11. Phenolic Compounds (PPB)	
	12. Others (Specify)	
X	13. Aluminum (Al)	0.0
	14.	
	15.	
	16.	

III. ROUTINE LABORATORY ANALYSIS

(CHECK ONE)

X	REQUESTED		NOT REQUESTED

ITEM		
1. COLOR	Apparent	20.
	True	5.
2. TURBIDITY	Settled	1.6
	Shaken	3.0
3. ALKALINITY ($CaCO_3$)	P	0.0
	MO	170.
4. TOTAL HARDNESS ($CaCO_3$)		172.
(Ca+Mg) Hardness		171.
5. NON-CARBONATE HARDNESS ($CaCO_3$) (By Computation)		2.
6. CARBONATE HARDNESS ($CaCO_3$) (By Computation)		170.
7. TOTAL DISSOLVED SOLIDS		—
8. SPECIFIC CONDUCTANCE (Micromhos)		300.

ITEM	PPM
9. CALCIUM (Ca)	63.
10. MAGNESIUM (Mg)	3.33
11. SODIUM (Na) AND POTASSIUM (K) **	6.6
12. HYDROXIDE (OH)* (as $CaCO_3$)	0.0
13. BICARBONATE (HCO_3)* (as $CaCO_3$)	170.
14. CARBONATE (CO_3)* (as $CaCO_3$)	0.0
15. SULFATE (SO_4)	1.6
16. CHLORIDE (Cl)	10.
17. NITRATE (NO_3)	—
18. IRON (Fe) TOTAL	.40
19. MAGANESE (Mn)	0.0
20. SILICA (SiO_2)	10.
21. FLUORIDE (F)	0.0

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

REMARKS (Such as unusual appearance, taste, odor, etc.) * Computed from P and MO alkalinity

** Computed

Note: At the time of analysis, there was a small quantity of sediment in the bottom of the sample bottle.
The well was in service at the time the sample was collected (discharge pressure = 22.5 psig).

LABORATORY ANALYSIS BY: George I. Earnest, Jr., Chemist

DATE OF ANALYSIS: 29 Feb. 1960

DD FORM 1 APR 53 710 REPLACES WD AGO FORM 8-125, 1 APR 45, WHICH MAY BE USED. Analysis No. 4 GPO 912375

FORM A-4
(JUNE '66)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF WATER DATA COORDINATION
INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

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

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
MC	Q	° ' " N: 34 39 49	° ' " W: 77 19 10	

6. AGENCY STATION NO.	7. STATION NAME
606	HP20-606

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

12. PERIOD OF RECORD
Began: 1942
Discontinued:
Y ☐ Continuous
Interruption Exceeds 1 Year

13.

14.

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

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

17. TYPES OF DATA AVAILABLE

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

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

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

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

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

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

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

20. OFFICE AT WHICH DATA AVAILABLE

Office: BASE MAINTENANCE DEPARTMENT, UTILITIES DIVISION

Street No.: MARINE CORPS BASE

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

City Code: 0735

21. OFFICE COMPLETING FORM

BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME

F. E. TEAL, JR.

23. DATE
Month: SEPT.
Year: 19 66

#6 WELL

+34.4

AIR LINE 70'

35.6

STATIC	GAGE PUMPED	D. D.	DIS. PRES.	G.P.M.	SEA LEVEL
42			13	est. 50 gal	
			11	108	
			9	108	
			7	122	

AIR LINE No GOOD

SHUT OFF HEAD 18#

LINE PRESSURE 6#

RUNNING AT. 9#

Well #6

Date	Line Pt.	G.P.M.	D.D. El.	Static El.	Shut Off Head	D.D. Ft.
2-11-54	53		Stage Ft.			
10-14-54	55		23			
11-21-66	air 70'	232	24	42	38	18
8-3-69		108	AIR LINE	BAD	SEE WELL TEST.	

17 FT TO WATER. 9-10-53:

as of 3/1/67 well 6: has peerless pump

Air Line

Marine Barracks
New River, N. C.

WELLS-PERMANENT WATER SUPPLY-REGIMENTAL AREA
By Layne Atlantic Company

Project P-108-4

WELL NO. 6 (6th Layne Well)
As on M. B. Drawing #251

Location: Approximately 5000' S.S.E. of intersection of Main Access Road and Oak Street (Supply & Ind. Area).

Date Drilled: December 1941

Drilling Equipment: Rotary Rig and Rotary Bit

Status of Well: An 18" diameter pit casing was set in a 23" diameter hole and a depth of 23'-8", and the annular space filled with Portland Cement Grout.

A 17" diameter hole was drilled below the casing to a depth of 220 feet, and hydraulically underreamed the portion of the hole below the 18" casing. After underreaming, the hole was cleaned out with the 17½" rotary bit. An 8" diameter casing with silicon bronze shutter screens at various points (see Log of Casing) to a depth of 210 feet below the surface. The space between the 8" casing and the limits of the underreaming in the sand strata was filled with about 35 yds. of Cape May Gravel, by the circulation method.

Status Water Level: 14'-6" below ground level.

Tests: Ran pump 31 hours getting constant discharge of 350 G.P.M. with a 60' D.D. - after shutting down for for 24 hours, pumping was resumed and showed an average of 345 G.P.M. with a draw down of 59'-6".

Water analysis dated December 4, 1941, December 15, 1941, and December 17, 1941, were made.

Marine Surveys
New River, N. C.

WELL-DRILLING WORK AS PERFORMED BY
The Layne Atlantic Company

Project T-108-L

WELL NO. 9 (Old Layne Well)
Ice Co. U. S. Drawing #591

Location: Approximately 3000' N.E.E. of intersection of Main Access Road and Gas Street (Supply & Ind. Area).

Date Drilled: December 1941.

Drilling Equipment: Rotary rig and hydraulic.

Status of Well: An 18" diameter pilot opening was cut to a 25" diameter hole and a length of 23½-ft., and the annular space filled with Portland Cement Grout.

A 17½" diameter hole was drilled below the casing to a depth of 280' (net), and hydraulically underreamed the portion of the hole below the 18" casing. After underreaming, the hole was cleaned out with the 17½" rotary bit. An 8" diameter casing with silicon bronze slotted screens at various points (new log of Casing) to a depth of 210 feet below the surface. The space between the 8" casing and the limits of the underreaming in the sand strata was filled with clean, dry Yds. of Dune Sand gravel, by the circulation method.

Static Water Level: 14'-6" below ground level.

Tests: Man pump 24 hours yielding sustained discharge of 340 G.P.M. with a 50' D.D. - After shutting down for 24 hours, pumping was resumed and showed an average of 345 G.P.M. with a draw down of 50'-0".

Water analysis dated December 4, 1941, December 17, 1941, and December 27, 1941, were made.

W E L L D A T A

Well No. 6

SPECIFICATIONS

Pump Base Elevation	34.40
Ground Elevation	32.4
Static Elevation	19.4
Maximum allowed Drawdown	-22

TEST

300 G.P.M.	10# Pressure	Drawdown	-12.6
285 G.P.M.	12# Pressure	Drawdown	-10.6
275 G.P.M.	15# Pressure	Drawdown	- 8.6
260 G.P.M.	18# Pressure	Drawdown	- 6.6
250 G.P.M.	20# Pressure	Drawdown	- 5.6
210 G.P.M.	25# Pressure	Drawdown	- 2.4

Recovers to static in three (3) minutes.

Air line Figured 70'

Log of Formations:

0' - 30'	Fine white sand packed hard
30' - 40'	Medium coarse sand
40' - 49'	Fine grey sand
49' - 65'	Shell rock
65' - 73'	Sand and shell
73' - 74'	Hard rock
74' - 82'	Layers sand and shell
82' - 87'	Hard and soft layers shell rock
87' - 105'	Shell rock with sand and clay mixed
105' - 114'	Soft shell with same sand
114' - 131'	Shell and sand
131' - 135'	Hard shell rock
135' - 140'	Solf Shell
140' - 160'	Soft shell rock with soft and pepper sand
160' - 165'	Soft and pepper sand
165' - 174'	Hard rock (Rough drilling)
174' - 182'	Hard and soft layers of shell rock
182' - 196'	Soft Rock
196' - 204'	Medium tight sand
204' - 220'	Hard packed soft and pepper sand

Log of Casing:

0 - 80	Blank pipe
80 - 90	Silicon bronze screen
90 - 110	Blank pipe
110 - 120	Silicon bronze screen
120 - 140	Blank pipe
140 - 150	Silicon bronze screen
150 - 170	Blank pipe
170 - 180	Silicon bronze screen
180 - 200	Blank pipe
200 - 210	Silicon bronze screen
210 - 220	Cement plug

John E. Womeldurf

Log of Formations:

0' - 20'	Fine white sand packed hard
20' - 40'	Medium coarse sand
40' - 45'	Fine gray sand
45' - 65'	Shell rock
65' - 75'	Sand and shell
75' - 90'	Hard rock
90' - 85'	Layers sand and shell
85' - 95'	Hard and soft layers shell rock
95' - 105'	Shell rock with sand and clay mixed
105' - 112'	Soft shell with some sand
112' - 121'	Shell and sand
121' - 135'	Hard shell rock
135' - 140'	Soft Shell
140' - 165'	Soft shell rock with soft red pepper sand
165' - 169'	Soft red pepper sand
169' - 175'	Hard rock (Sorta drilling)
175' - 185'	Hard and soft layers of shell rock
185' - 196'	Soft Rock
196' - 204'	Medium light sand
204' - 240'	Hard packed dirt and pepper sand

Log of Casing:

0 - 80	Blank pipe
80 - 90	Million Dollar screen
90 - 110	Blank pipe
110 - 130	Million Dollar screen
130 - 140	Blank pipe
140 - 150	Million Dollar screen
150 - 170	Blank pipe
170 - 180	Million Dollar screen
180 - 200	Blank pipe
200 - 210	Million Dollar screen
210 - 230	Blank pipe

Well HP 606 Typed 4/27/77

PUMP, LAYNE VERTICAL TURBINE
DEEP WELL, WATER LUBRICATED
COMPLETE WITH ELECTRIC MOTOR
VOLTS, 220/440 H.P 7½ PHASE 3
RPM 1800
SETTING 80'
~~SIZE~~ 5"
STAGE 4
GPM 200
TDH 86'
SUCTION PIPE ~~5'~~ 5' X 10'
~~STRAINER~~
EA. 1 @ $3,000.00

Received
8/25/77
WRP

SS: AURORA PUMP CO.
3048 MILLER ROAD
LITHONIA GA. 30058

WORK REQUEST

Replace Deep well pump in Bldg HP-606

No labor cost 3000.00

Utilities to Roy and maint to install

H.P. Weil 606

North Carolina Department of Environment, Health, and ... Division of Environmental Health, Public Water Supply ...on

SOURCE INFORMATION GROUND WATER

Date Form Completed: M M D D Y Y = 01/24/95

PWSID: 1310190

Owner Assigned Source Code: 607

Well Name (If purchase, name of system): HADNOT POINT 607

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

If Purchase, seller ID#:

Source Begin Date (M M Y Y):

Source exempt—SWTR? (Y/N):

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

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

Location of well within the system (If purchase, location of master meter): MARYLAND AVE BERKELEY MANOR

Latitude (N) Deg. Min. Sec.: 34 42 42

Longitude (W) Deg. Min. Sec.: 077 20 43.7

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

GPS Data: Q# or DOP #: 92

No. of Sats. Locked on: 4

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

Vulnerable (VOCs) (Y/N):

Assessment Date (M M D D Y Y):

ENTRY POINT INFORMATION

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

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

Owner Assigned Entry Point Code: 100

Entry Point Name: ~~HP607~~ 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: San Swr line @ 50' (RV ~~dump~~ cleanout)

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: 8" Type: GRAVEL Pack Yield (gpm): 393 Properly sealed? (Y,N)

Properly vented? N (Y,N) Casing depth: 50 ft. (If unknown, put 'UNK') Well depth: 210 Meter available? Yes (Y,N)

Concrete slab adequate? Y (Y,N) If no, explain: Size: 12x12

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

Pumps: Capacity: GPM: 200 HP: 15 Pump intake depth: 80 Auxiliary Power? Yes (Y,N)

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 15" /

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? HP20 PLANT

If purchase, retreat? (Y/N) If yes, complete back of form. ① No well casing vent ② Sewer clean station s/s removed

DATE 7-25-00

PWSID 04-67-041

WELL # HP 607

WELL NAME HADNOT POINT HP20

BLDG. HP 607

CODE S.

AVAILABILITY D.

LOCATION MARYLAND AVENUE BERKLEY MANOR.

LATITUDE 34.70716

LONGITUDE 77.34622

WELL DIAMETER 8"

WELL DEPTH 210'

SCREEN INTERVAL

YIELD 289

STATIC LEVEL 30'

PUMPING LEVEL 82'

PUMP TYPE VERTICAL TURBINE

MOTOR HP 15

INTAKE DEPTH 105

DESIGN CAPACITY 200

ACTUAL GPM 289

SIZE OF CONCRETE SLAB 12X12

HEIGHT OF CASING 15"

WELL NUMBER 607 BY Stevenson & Peterson DATE 2-14-57

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
90	35	48	13	70	100	28
		55	20	60	133	35
		65	30	50	192	45
		73	38	40	240	55
		78	43	30	278	05
		82	47	25	289	15

REMARKS

D/H 80 PST

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 607 BY Brown Stevenson DATE 7-14-94

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
90	30	45	15	70	100	
		52	22	60	146	
		61	31	50	205	
		70	40	40	248	
		75	45	30	280	
		79	49	25	293	passed test

REMARKS Dead Head @ 86 PSI
replaced shaft (1") Brg & Column (5")
tail pcs & Strainer - cleaned & assy
old pump. ran G.P.M. @ above

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 607 BY Brown – Stevenson DATE 10-6-93

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
90'	30'	40	10	41	100	0900
		44	14	35	115	0915
		46	16	30	128	0930
		48	18	25	143	0945
		50	20	20	157	1000

REMARKS Dead Head 60

New Column + Shaft Complete 7-11-94

MANUFACTURER

SIZE

New Column
+ Shaft
Complete 7-11-94

WELL NUMBER 607 | BY Brown - Stevenson | DATE 10-6-93

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
90'	30'	40	10	41	100	0900
		44	14	35	115	0915
		46	16	30	128	0930
		48	18	25	143	0945
		50	20	20	157	1000

REMARKS Dead Head 60

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	607	B[redacted] Thomas - Brown			DATE 3-24-90	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
90	30	48	18	70	104	05
		54	24	60	122	15
		58	28	50	183	25
		65	35	40	197	35
		70	40	30	221	45
		72	42	25	232	55
		76	46	20	246	65

REMARKS

dead head @ 88 PSI

set @

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	607	BY	Thomas Sartin			DATE	10-17-88
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE		GPM	START TIME
90	30	46	16	73		108	10
	44	48	18	67		122	20
		54	24	60		151	30
		58	28	55		170	40
		63	33	50		195	50
		66	36	45		210	00
		69	39	40		224	10
		73	43	35		244	20
		75	45	30		259	30
	→	80	50	25		266	40

REMARKS

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

Well 607 4-22-86

A-L	S-L	P-L	D-D	PSI	GPM	Time
						0830
105	27	38	11	74	120	15
		40	13	71	145	15
		42	15	68	160	15
		44	17	64	170	15
		47	20	60	190	15
		55	28	50	200	15
		60	33	40	220	15
		67	40	30	240	15
		72	45	20	260	15
		75	48	12	270	15

NORTH CAROLINA DEPARTMENT OF NATURAL AND ECONOMIC RESOURCES
OFFICE OF WATER AND AIR RESOURCES
GROUND WATER DIVISION
P. O. BOX 27687 – RALEIGH, N. C. 27611

WELL RECORD

DRILLING CONTRACTOR Carolina Well & Pump Co., Inc REG. NO. 136 WELL CONSTRUCTION PERMIT NO.

1. WELL LOCATION: (Show a sketch of the location on back of form)
   Nearest Town: Maryland Ave. (Road, Community or Subdivision and Lot No.)
   County: Onslow OLD New
   Quadrangle No. Well 612 607
2. OWNER: Camp Lejeune
3. ADDRESS:
4. TOPOGRAPHY: draw, valley, slope, hilltop, flat
5. USE OF WELL: for Base DATE: 8-21-84
6. DOES THIS WELL REPLACE AN EXISTING WELL? yes
7. TOTAL DEPTH: 210 RIG TYPE OR METHOD: rotary
8. FORMATION SAMPLES COLLECTED: [x] YES No. of Bags
9. CASING:

	Depth From	to	ft.	Inside Diam.	Wall thick. or weight/ft.	Type
	0	50		10"	3/8	steel
	0	115		8"	3/8	galv.
	135	163		8"	3/8	galv.
	175	190		8"	3/8	galv.

10. GROUT:

Depth From	to	ft	Material	Method
0	50		cement	pumped

11. SCREEN:

Depth From	to	ft.	Diam.	Type and Opening
115	135		8"	s.s 20 slot
163	175		8"	s.s 20 slot
190	200		8"	s.s 20 slot

12. GRAVEL:

Depth From	to	ft.	Size	Material
0	210		course sand	

13. WATER ZONES (depth): as shown
14. STATIC WATER LEVEL: 24'3" ft. above / below top of casing.
    Casing is 1 ft. above land surface. ELEV.
    DATE MEASURED: 8-21-84
15. YIELD (gpm): 275 METHOD OF TESTING: pumped
16. PUMPING WATER LEVEL: 75'1" ft. after 24 hours
    at 275 gpm.
17. CHLORINATION: Type H.t.H. Amount 3 lbs
18. WATER QUALITY: TEMPERATURE(°F)
19. PERMANENT PUMP: (Show a sketch of well head on back of form)
    Date installed Type Make
    Capacity (gpm) HP
    Intake Depth Airline Depth 90'
20. HAVE YOU INFORMED THE WELL OWNER OF THE DEPARTMENTS REQUIREMENTS AND RECOMMENDATIONS?
21. REMARKS:

I do hereby certify that this well record is true and exact.

Ronald R. Ellis
SIGNATURE OF CONTRACTOR OR AGENT DATE

DRILLING LOG

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	1	Top soil
1	8	Sandy clay
8	18	Yellow clay
18	44	Sand
44	60	Sand & clay
60	84	Clay
84	105	Shell rock, soft
105	143	Shell rock, hard
143	158	Clay
158	175	Shell rock, hard
175	186	Clay
186	200	Sand

Form GW-1

White Copy - Office of Water and Air Resources; Blue - Drillers Copy; Green - Owners Copy

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO.	TRANSMITTAL NO.	DATE
N62470-82-C-2511	Nine (9)	6-22-84

FROM CONTRACTOR: Onslow Utilities Inc.

TO: ROICC

PROJECT TITLE AND LOCATION: Replace Water Wells 612 & 626 Camp Lejeune NC. (Well No 612)

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

RECEIVED 2 JUL 1984 LANTDIV OIC-05

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	Driller's Log	6	A	CCS for 7-10-84
	"	Electric Log	6	↓	↓
	"	Water Analysis	6		
	"	Recommendation and Data Submittal	6		

CONTRACTOR'S COMMENTS: Submittal for well No 612

COPY TO: FIELD
DATE: 8-10-84

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Ronald K. Ellen

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. L. Hartle

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. 85 110
(Well No. ~~612~~ 607)

Gentlemen:

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 127 to 132, 165 to 170 and 193 to 198 levels.

We recommend a line of .20 slot screens set at the 115 to 135, 163 to 175, and 190 to 200 levels for a total of 42 VF of screens. The gravel pack recommended is a course sand. It is our best estimate that this well may yield 200-250 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

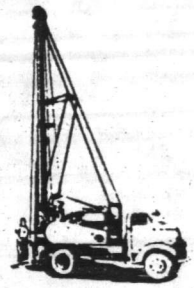
Ronald R. Ellen, Pres.

RRE/ck
Enclosures

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED ✓
APPROVED AS NOTED
DISAPPROVED
SUBJECT TO THE REQUIREMENTS OF
CONTRACT NO. 05-82-2541
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 CCS DATE 10 JUL 1984
FOR OFFICER IN CHARGE OF CONSTRUCTION

...OLINA 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 612
Location Camp LeJeune, N.C.

0 - 1	top soil
1 - 8	sandy clay
8 - 18	yellow clay
18 - 44	sand
44 - 60	sand & clay
60 - 84	clay
84 - 105	shell rock soft
105 - 143	shell rock hard
143 - 158	clay
158 - 175	shell rock hard
175 - 186	clay
186 - 200	sand

WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA
29512

(803) 479-4639

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

Well # 612

DATE: May 10, 1984

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

Date Analyzed: 5/10/84

Sample Number: 127-132

Analysis Results--Parts Per Million

Determination		Determination	
pH	6.9	Carbon Dioxide (CO_2)	5
Iron (Fe)	.05	Total Acidity ($CaCO_3$)	8
Nitrate (NO_3)	0.1	Calcium Hardness ($CaCO_3$)	172
Fluoride (F)	.5	Magnesium Hardness ($CaCO_3$))	22
Manganese (Mn)	Trace	Carbonate Hardness ($CaCO_3$)	104
Total Hardness ($CaCO_3$)	194	Noncarbonate Hardness ($CaCO_3$)	0
Chlorides (Cl)	14	Alkalinity (Phenolphthalein) ($CaCO_3$)	0
Sulfate (SO_4)	8.7	Carbonate Alkalinity ($CaCO_3$)	0
Phosphate (PO_4)	0	Bicarbonate Alkalinity ($CaCO_3$)	220
Magnesium (Mg)	5.3	Total Alkalinity ($CaCO_3$)	220
Calcium (Ca)	69	Total Dissolved Solids	238
Carbonate (CO_3)	0	Specific Conductance (micromhos at 25°)	340
Bicarbonate (HCO_3)	268	Appearance When Analyzed	Clear
Hydroxide (OH)	0	Odor When Analyzed	Not Objectionable

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.

WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA
29512

(803) 479-4639

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

612

DATE: May 10, 1984

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

Date Analyzed: 5/10/84

Sample Number: 165-170

Analysis Results--Parts Per Million

Determination		Determination	
pH	6.9	Carbon Dioxide (CO_2)	4
Iron (Fe)	.05	Total Acidity ($CaCO_3$)	6
Nitrate (NO_3)	0.1	Calcium Hardness ($CaCO_3$)	152
Fluoride (F)	.5	Magnesium Hardness ($CaCO_3$)	27
Manganese (Mn)	.05	Carbonate Hardness ($CaCO_3$)	160
Total Hardness ($CaCO_3$)	180	Noncarbonate Hardness ($CaCO_3$)	29
Chlorides (Cl)	11	Alkalinity (Phenolphthalein) ($CaCO_3$)	0
Sulfate (SO_4)	11.3	Carbonate Alkalinity ($CaCO_3$)	0
Phosphate (PO_4)	0	Bicarbonate Alkalinity ($CaCO_3$)	160
Magnesium (Mg)	6.5	Total Alkalinity ($CaCO_3$)	160
Calcium (Ca)	64.4	Total Dissolved Solids	196
Carbonate (CO_3)	0	Specific Conductance (micromhos at 25°)	280
Bicarbonate (HCO_3)	195	Appearance When Analyzed	Clear
Hydroxide (OH)	0	Odor When Analyzed	Not Objectionable

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.

WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA
29512

(803) 479-4639

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

612

DATE: May 10, 1984

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

Date Analyzed: 5/10/84
Sample Number: 193-198

Analysis Results--Parts Per Million

Determination		Determination	
pH	6.7	Carbon Dioxide (CO_2)	10
Iron (Fe)	.1	Total Acidity ($CaCO_3$)	13
Nitrate (NO_3)	Trace	Calcium Hardness ($CaCO_3$)	124
Fluoride (F)	.7	Magnesium Hardness ($CaCO_3$)	29
Manganese (Mn)	.05	Carbonate Hardness ($CaCO_3$)	125
Total Hardness ($CaCO_3$)	153	Noncarbonate Hardness ($CaCO_3$)	28
Chlorides (Cl)	17	Alkalinity (Phenolphthalein) ($CaCO_3$)	0
Sulfate (SO_4)	32.9	Carbonate Alkalinity ($CaCO_3$)	0
Phosphate (PO_4)	0	Bicarbonate Alkalinity ($CaCO_3$)	125
Magnesium (Mg)	6.9	Total Alkalinity ($CaCO_3$)	125
Calcium (Ca)	49.6	Total Dissolved Solids	283
Carbonate (CO_3)	0	Specific Conductance (micromhos at 25°)	410
Bicarbonate (HCO_3)	153	Appearance When Analyzed	Clear
Hydroxide (OH)	0	Odor When Analyzed	Not objectionable

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.

file 6.01/02

CONTRACTOR'S SUBMITTAL TRANSMITTAL

SND LANTDIV 4-4355/3 (Rev. 6/76)

CONTRACT NO.	TRANSMITTAL NO.	DATE
82-R-254	16	8-28-84

FROM CONTRACTOR: ONSLOW UTILITIES, INC

TO ATLANTIC DIVISION, NAVAL FAC ENGR CMD (NAVAL STATION, NORFOLK VA 23511

PROJECT TITLE AND LOCATION: REPLACE WATER WELLS 6124626 MCB, CLNC

RECEIVED 31 AUG 1984 LANTDIV CODE 05

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 ☐ 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	02734.3.1.6	PUMPING TEST	7	A	9/10/84

CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): C. A. Mallette

DATE RECEIVED BY REVIEWER: 31 AUG 84

FROM (Reviewer): LANTDIV

TO: ONSLOW UTILITIES/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

APPROVED

COPY TO: FILE

DATE: 10-15-84

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

DATE: 11 SEP 84

SIGNATURE: J. Hasta

PUMPING TEST DATA

Carolina Well & Pump Co. R. Patterson & W. Pickard

Well Owner: Camp Lejeune Address:

Pumped Well No: 612 Location: County: Onslow

Observation Well Locations:

Airline Lengths: Pumped Well Observation Wells

Remarks:

Pumping Rate Measured With: 4x6 Orfice 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
9-21-84							
1:00	0	15				24' 3"	
1:05	5	"				66' 9"	
1:10	10	"	"			67'10"	
1:15	15	"	"			68' 6"	
1:20	20	"	"			69' 8"	
1:25	25	"	"			70'	
1:30	30	"	"			70' 3"	
1:35	35	"	"			70' 7"	
1:40	40	"	"			70' 7"	
1:45	45	"	"			70' 7"	
1:50	50	"	"			70' 9"	
1:55	55	"	"			71' 2"	
2:00	60	"	"			71' 1"	
2:05	65	"	"			71' 1½"	
2:10	70	"	"			70'10½"	
2:15	75	"	"			71' 4"	
2:20	80	"	"			71' 2"	
2:25	85	"	"			71' 1"	
2:30	90	"	"			71' 2"	
2:35	95	"	"			71' 2"	
2:40	100	"	"			71' 1"	
2:45	105	"	"			71' 1"	
2:50	110	"	"			71' 2½"	
2:55	115	"	"			71' 4"	
3:00	120	"	"			70'10"	
4:00	180	"	"			72' 3"	
5:00	240	"	"			72' 3"	
6:00	300	"	"			72'11"	
7:00	360	"	"			72' 8"	
8:00	420	"	"			73' 6"	
9:00	480	"	"			74' 3"	
10:00	540	"	"			74' 5"	
11:00	600	"	"			74' 6"	
12:00	660	"	"			74' 6"	
1:00	720	"	"			74' 5"	
2:00	780	"	"			74' 5"	
3:00	840	"	"			74' 5"	
4:00	900	"	"			74' 5"	
5:00	960	"	"			74' 8"	
6:00	1020	"	"			74'11"	
7:00	1080	"	"			75' 2"	

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED ✓
APPROVED AS NOTED
DISAPPROVED
SUBJECT TO THE REQUIREMENTS OF
CONTRACT NO. 05-82-2541
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE
APPROVAL OF ANY DEVIATION FROM THE CO
TRACT REQUIREMENTS UNLESS THE CONTR
TOR CALLS ATTENTION TO AND SUPPORTS
DEVIATION" THE CONTRACTOR SHALL
RESPONSIBLE FOR PROVIDING PRO
PHYSICAL DIMENSIONS & WEIGHTS
TION
REVI
10 SEP 1984

Form No. 16524A

PUMPING TEST DATA

Test by: Carolina Well & Pump Co. R. Patterson & W. Pickard

Owner: Camp Lejeune Address:

Pumped Well No: 612 Location: County: Onslow

Observation Well Locations:

Airline Lengths: Pumped Well Observation Wells

Remarks:

Pumping Rate Measured With: 4x6 orfice 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
8:00	1140	"	"			75' 2"	
9:00	1200	"	"			75' 2"	
10:00	1260	"	"			75' 2½"	
11:00	1320	"	"			75' 1"	
12:00	1380	"	"			75' 2"	
1:00	1440	"	"				
			Recovery				
1:05	5					32' 9"	
1:10	10					30' 7"	
1:15	15					29' 6"	
1:20	20					28'10"	
1:25	25					28' 4"	
1:30	30					27'11"	
1:35	35					27' 6"	
1:40	40					27' 3"	
1:45	45					27'	
1:50	50					26'10"	
1:55	55					26' 8"	
2:00	60					26' 6"	

Form No. 16824A

CONTRACTOR'S SUBMITTAL TRANSMITTAL

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

CONTRACT NO.	TRANSMITTAL NO.	DATE
N62470-82-C-2541	None (9)	6-22-84

FROM CONTRACTOR: Onslow Utilities Inc.

TO: ROICC

PROJECT TITLE AND LOCATION: Replace Water Wells 612 & 626 Camp Lejeune NC. (Well No 612)

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

RECEIVED 2 JUL 1984 LANTDIV 02-03

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	Driller's Log	6	A	CCS 4 of 7-10-84
	"	Electric Log	6	↓	↓
	"	Water Analysis	6		
	"	Recommendation and Data submittal	6		

CONTRACTOR'S COMMENTS: Submittal for well No 612

COPY TO: FIELD
DATE: 8-10-84

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Ronald R. Ellen

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. L. Hanks

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. 85 110
(Well No. ~~612~~ 607)

Gentlemen:

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 127 to 132, 165 to 170 and 193 to 198 levels.

We recommend a line of .20 slot screens set at the 115 to 135, 163 to 175, and 190 to 200 levels for a total of 42 VF of screens. The gravel pack recommended is a course sand. It is our best estimate that this well may yield 200-250 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

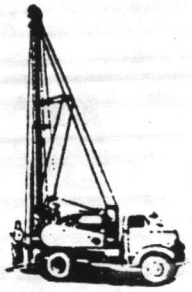
Ronald R. Ellen, Pres.

RRE/ck
Enclosures

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

APPROVED ✓
APPROVED AS NOTED
DISAPPROVED
SUBJECT TO THE REQUIREMENTS OF
CONTRACT NO. 05-82-2541
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 CCS DATE 10 JUL 1984
FOR OFFICER IN CHARGE OF CONSTRUCTION

...OLINA 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 612
Location Camp LeJeune, N.C.

0 - 1	top soil
1 - 8	sandy clay
8 - 18	yellow clay
18 - 44	sand
44 - 60	sand & clay
60 - 84	clay
84 - 105	shell rock soft
105 - 143	shell rock hard
143 - 158	clay
158 - 175	shell rock hard
175 - 186	clay
186 - 200	sand

WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA
29512
(803) 479-4639

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

Well # 612

DATE: May 10, 1984

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

Date Analyzed: 5/10/84

Sample Number: 127-132

Analysis Results--Parts Per Million

Determination		Determination	
pH	6.9	Carbon Dioxide (CO_2)	5
Iron (Fe)	.05	Total Acidity ($CaCO_3$)	8
Nitrate (NO_3)	0.1	Calcium Hardness ($CaCO_3$)	172
Fluoride (F)	.5	Magnesium Hardness ($CaCO_3$)	22
Manganese (Mn)	Trace	Carbonate Hardness ($CaCO_3$)	194
Total Hardness ($CaCO_3$)	194	Noncarbonate Hardness ($CaCO_3$)	0
Chlorides (Cl)	24	Alkalinity (Phenolphthalein) ($CaCO_3$)	0
Sulfate (SO_4)	8.7	Carbonate Alkalinity ($CaCO_3$)	0
Phosphate (PO_4)	0	Bicarbonate Alkalinity ($CaCO_3$)	220
Magnesium (Mg)	5.3	Total Alkalinity ($CaCO_3$)	220
Calcium (Ca)	69	Total Dissolved Solids	238
Carbonate (CO_3)	0	Specific Conductance (micromhos at 25°)	340
Bicarbonate (HCO_3)	268	Appearance When Analyzed	Clear
Hydroxide (OH)	0	Odor When Analyzed	Not Objectionable

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.

WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA
29512

(803) 479-4639

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

612

DATE: May 10, 1984

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

Date Analyzed: 5/10/84

Sample Number: 165-170

Analysis Results--Parts Per Million

Determination		Determination	
pH	6.9	Carbon Dioxide (CO_2)	4
Iron (Fe)	.05	Total Acidity ($CaCO_3$)	6
Nitrate (NO_3)	0.7	Calcium Hardness ($CaCO_3$)	152
Fluoride (F)	.5	Magnesium Hardness ($CaCO_3$))	27
Manganese (Mn)	.05	Carbonate Hardness ($CaCO_3$)	160
Total Hardness ($CaCO_3$)	180	Noncarbonate Hardness ($CaCO_3$)	29
Chlorides (Cl)	11	Alkalinity (Phenolphthalein) ($CaCO_3$)	0
Sulfate (SO_4)	11.3	Carbonate Alkalinity ($CaCO_3$)	0
Phosphate (PO_4)	0	Bicarbonate Alkalinity ($CaCO_3$)	160
Magnesium (Mg)	6.5	Total Alkalinity ($CaCO_3$)	160
Calcium (Ca)	64.4	Total Dissolved Solids	196
Carbonate (CO_3)	0	Specific Conductance (micromhos at 25°)	280
Bicarbonate (HCO_3)	195	Appearance When Analyzed	Clear
Hydroxide (OH)	0	Odor When Analyzed	Not Objectionable

SIGNED _____
LABORATORY DIRECTOR

ANALYTICAL METHODS REFERENCES: 'STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER.' 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.

WATER ANALYSIS LABORATORY
802 HAMLET HIGHWAY
BENNETTSVILLE, SOUTH CAROLINA
29512

(803) 479-4639

CONSULTANTS FOR:
INDUSTRY
MUNICIPALITIES
HOME OWNERS
DEVELOPERS
IRRIGATION
OTHERS

6/2

DATE: May 10, 1984

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

Date Analyzed: 5/10/84

Sample Number: 193-198

Analysis Results--Parts Per Million

Determination	
pH	6.7
Iron (Fe)	.1
Nitrate (NO_3)	Trace
Fluoride (F)	.7
Manganese (Mn)	.05
Total Hardness ($CaCO_3$)	153
Chlorides (Cl)	17
Sulfate (SO_4)	32.9
Phosphate (PO_4)	0
Magnesium (Mg)	6.9
Calcium (Ca)	49.6
Carbonate (CO_3)	0
Bicarbonate (HCO_3)	153
Hydroxide (OH)	0

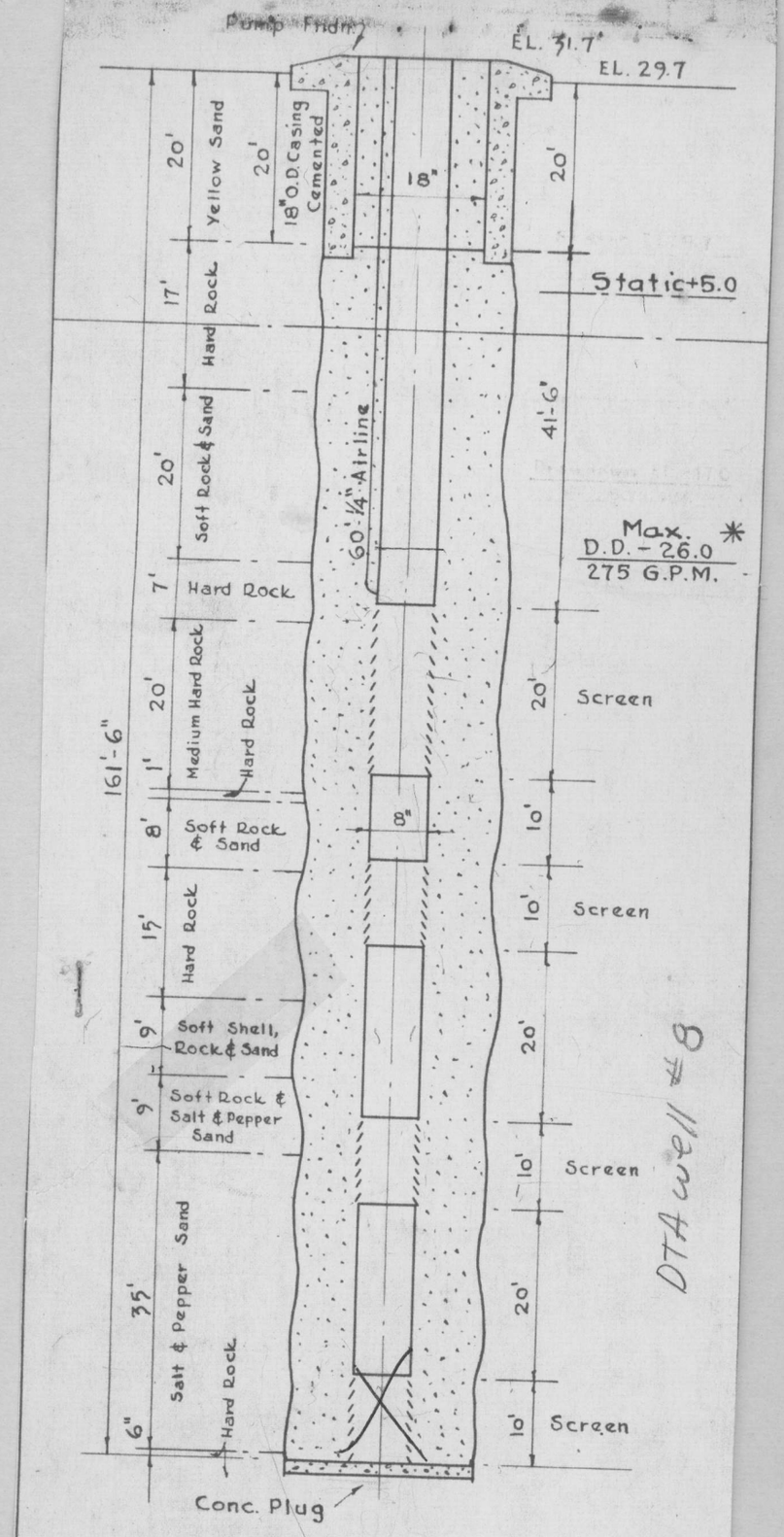
Determination	
Carbon Dioxide (CO_2)	10
Total Acidity ($CaCO_3$)	13
Calcium Hardness ($CaCO_3$)	124
Magnesium Hardness ($CaCO_3$)	29
Carbonate Hardness ($CaCO_3$)	125
Noncarbonate Hardness ($CaCO_3$)	28
Alkalinity (Phenolphthalein) ($CaCO_3$)	0
Carbonate Alkalinity ($CaCO_3$)	0
Bicarbonate Alkalinity ($CaCO_3$)	125
Total Alkalinity ($CaCO_3$)	125
Total Dissolved Solids	283
Specific Conductance (micromhos at 25°)	410
Appearance When Analyzed	Clear
Odor When Analyzed	Not objectionable

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.

HP 607

250 G.P.M. – DUAL DRIVE – 7½ H.P.
250 " " " actual. D.D.-22.0



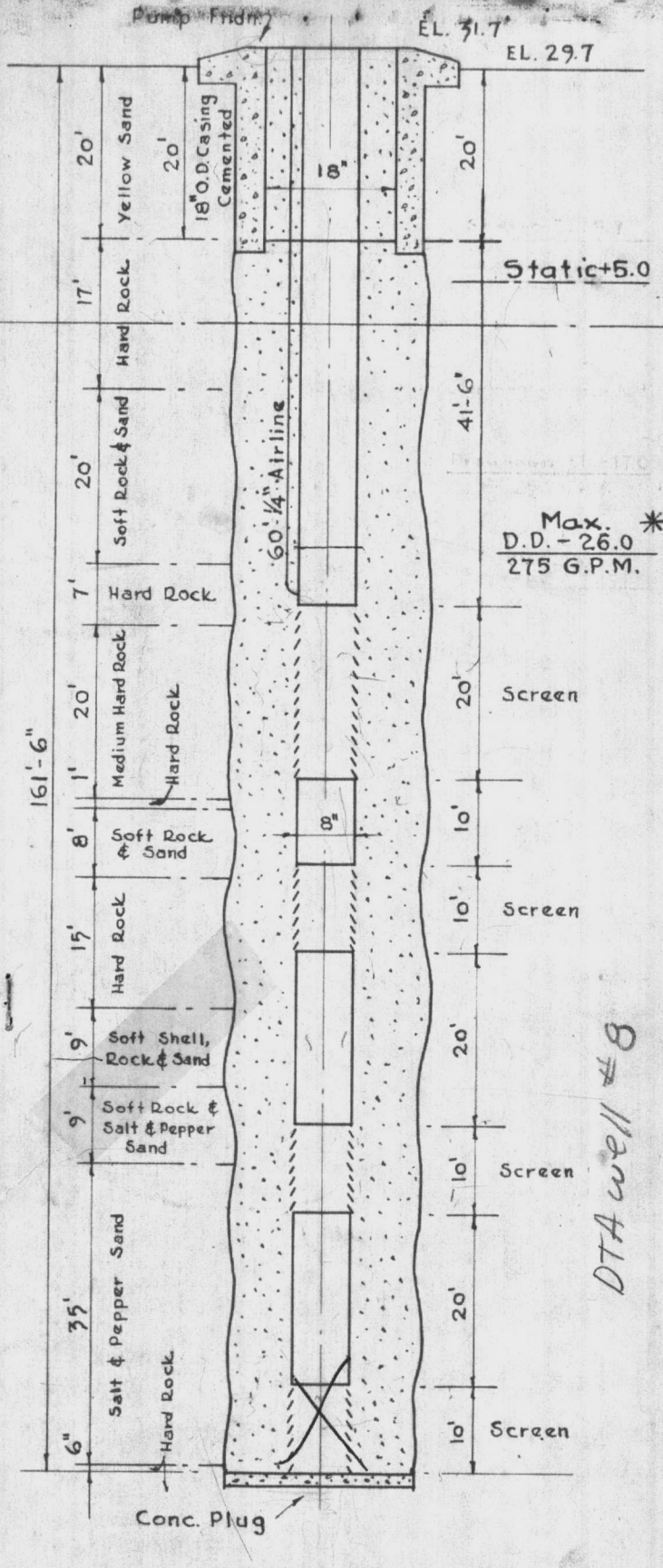
Solid Concrete at 132' 4-5-82 M

DTA well #8

D.T.A. WELL No. 8

Solid
Concrete
at 132'
4-5-82

250 G.P.M. – DUAL DRIVE – 7½ H.P.
250 " " " actual D.D.-22.0



D.T.A. WELL No. 8

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

SOURCE INFORMATION
GROUND WATER

Date Form Completed: M M D D Y Y = 01 25 95

PWSID: 1170670

Owner Assigned Source Code: 608

Well Name (If purchase, name of system): HAD NOT POINT 608

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

If Purchase, seller ID#:

Source Begin Date (M M Y Y):

Source exempt—SWTR? ☐ Y ☐ N

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

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

T/B Abandoned

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

Latitude (N) Deg. Min. Sec.: 34 39 53.

Longitude (W) Deg. Min. Sec.: 077 20 19.

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

GPS Data: Q# or DOP #

No. of Sats. Locked on

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

Vulnerable (VOCs)? ☐ Y ☐ N

Assessment Date (M M D D Y Y):

ENTRY POINT INFORMATION

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

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

Owner Assigned Entry Point Code: 100

Entry Point Name: HP 608

Location: _____

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

Sources of pollution/distance: _____

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

Adequate slope? ____ (Y,N) Flooding? ____ (Y,N) Maintenance: _____

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

Condition of house: _____ Type of freeze protection: _____

Well: Diameter: 8" Type: GRAVE PACK Yield (gpm): 208 Properly sealed? ____ (Y,N

Properly vented? ____ (Y,N) Casing depth 61 ft. (If unknown, put 'UNK') Well depth: 132' Meter available? N (Y,N

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

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

Pumps: Capacity: GPM: 200 HP: REMOVED Pump intake depth: 132 Auxiliary Power? Y (Y,N

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 30" /

Storage at well site: Elev: Hydro: Ground:

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

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

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

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

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

PUMP & MOTOR REMOVE
ALL ENGINE DOWN-

WELL NUMBER 608		BY Thomas/Brown/Ward			DATE 11-15-84	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 0840
60'	27	35'	8	48	104	0850
		36	9	44	108	0900
		37	10	40	119	0910
		40	13	37	130	0920
		41	14	34	143	0930
		43	16	31	162	0940
		44	17	28	172	0950
		45	18	25	185	1000
		46	19	22	192	1010
		47	20	19	201	1020
REMARKS last set at →		48	21	17	207	1030

well Demo 10-95

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	608	BY THOMAS / BROWN			DATE 3-21-84	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1000
60'	27'	33	6	50	108	1010
		35	8	45	122	1020
		36	9	42	133	1033
		37	10	38	146	1045
		39	12	35	162	1055
		40	13	30	178	1105
		41	14	25	197	1116
		43	16	20	210	1126
		44	17	16	276	1145

REMARKS Pump set at 60' with 60' air line

last set at 16 PSI 276 GPM

pulled pump cleaned well acid cleaned water jetted clean, added C-319 clean, cleaned, install pump

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE
	7			

WELL NUMBER HP 608 BY THOMAS / KELLUM DATE 11-2-83

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
	30	35	5	21	100	1050 1100
		36	6	14	108	1110
		38	8	10	115	1124

REMARKS

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL #

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
6-19-79	Well Pulled +						
	Repaired this DATE						
	IN Service						
	Static 19'						
	Well Depth 132'						
	Air Line 63'						
	INStalled Direct Reading Gauge						
REMARKS:							
2-13-80			54'		19		154
			58'		15		199
			53'		20'		146
					25		75
INSTALLED	GOULD - 7 STAGE			5-3-82			
	AIR LINE 60'						

DEPTH OF WELL:

AIRLINE ELEVATION: +

DATE INSTALLED:

MAINTENANCE TROUBLE/SERVICE TICKET 608 NO. 125778

SHOP 83 BLDG. [redacted] DATE 9-12-79

EMERGENCY ☐ JOB ORDER NO. AA9-23, 3036-2383

☐ REPAIR	☐ COMMODE	☐ LIGHT/FIXTURE	FLOOR NO.	B 1 2 3
☐ REPLACE	☐ URINAL	☐ SWITCH	HEAD NO.	1 2 3 4
☐ UNSTOP	☐ SINK	☐ OUTLET	SQUAD BAY	1 2 3 4
☐ LEAKING	☐ DRAIN	☐ HEAT/AIR CONDITION	SIDE	N E S W
☐ RUNNING	☐ FAUCET	☐ DOOR/DOOR LOCK	ROOM NO.	
☐ INSUFF.	☐ HOT WATER	☐ WINDOW/WINDOW GLASS		

OTHER

Check G.P.M. on well

#8 214 gal at 15 PSI

STATIC 42

PUMP LEVEL 55

FOR INFORMATION CALL | PHONE NO. | AUTHORIZED BY

JOB STARTED (DATE & TIME) | JOB COMPLETED (DATE & TIME) 9/12/79

TOTAL MAN HOURS USED | SIGNATURE (SHOP SUPERVISOR)

REMARKS

JOHN STANLEY BUS. FORMS-JACKSONVILLE, N.C. 329904-3

WATER ANALYSIS

By N. H Kellam

Date 3-24-42

Sample from Well No. 8 Rey area

40 hrs Pumping

Total Solids	240 PPM	Dissolved Solids	205 PPM
Suspended Solids	35 PPM	Volatile Solids	PPM

Phenol. Alk. as $CaCo_3$	0 PPM	Silica as Sio_2	28 PPM
Total Alk. " "	150 "	Ferrous Iron as Fe	0 "
Carbonates " "	0 "	Total Iron as Fe	0.6 "
Bicarbonates " "	150 "	Aluminum as Al.	2.8 "
Chlorides as Cl.	12 "	Calcium as Ca.	60.9 "
Sulphates as SO_4	20 "	Magnesium as Mg.	6.2 "
Nitrites as No_2	0 "	Sodium as Na.	1.3 "
Carbon Dioxide as CO_2	0 "		

pH 7.6 Soap Hardness as $CaCO_3$ 180 PPM

Odor slight Turbidity 30

REMARKS

FORM 9-4
(JUNE '66)

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF WATER DATA COORDINATION
INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

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

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
MC	Q	34 ° 39 ' 52 " N	77 ° 20 ' 20 " W	

6. AGENCY STATION NO.	7. STATION NAME
608	HP20-608

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

12. PERIOD OF RECORD — Began: 1942 — Discontinued: — Y ☐ Continuous Interruption Exceeds 1 Year

13.

14.

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

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

17. TYPES OF DATA AVAILABLE

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

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

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

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

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

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

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

20. OFFICE AT WHICH DATA AVAILABLE

Office — BASE MAINTENANCE DEPARTMENT, UTILITIES DIVISION

Street No. — MARINE CORPS BASE

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

City Code: 0735

21. OFFICE COMPLETING FORM

BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME

F. E. [illegible], JR.

23. DATE — Month: SEPT. — Year: 19 66

Well 608
Static water level measured from
pump base 27 ft.
depth of well 126 ft.
air line 60'
3 stage Impeller unit
setting 76 ft to bottom of suction pipe

Date	Head.	Static (GAGE READING)	D.D. level	Feet of D.D.	G.P.M.	
1/6/59	New pump put in operation			Layne. Pump Setting _____		Air Line _____
1/6/59	15 LB.	34 Ft.	9 Ft.	25 Ft	270	
"	18 "	"	11 "	23 "	242	
"	20 "	"	13 "	21 "	230	OPERATING HERE.
"	25 "	"	19 "	15 "	180	
11-23-66	35	29'	20'	9'	201	SE WELL TEST.
8/3/69	P	29 STATIC	20' Pumping LEVEL	9	162	
9-4-69	19#	-4.3	-24.3	20'	162	

Well # 8

Date	Line Ft.	G.P.M.	D.D. El. Gage FT	Static El. Gage FT	Shut Off Head	D.D. Ft. new Pump
7-22-54	46	178	53	32		21
"	48	170	52	-	-	20
"	44	180	54	-	"	22
"	40	192	55		"	23
"	34	201	59,5 ← Operating Head. →			24.5 — Line —
"	39	195	56.5			25.5
"	—	—	60	32		28

In operation 2 weeks - very noisy. Cut off, Put back in operation - 7-19-55. Operation time guide.

7-19-55 — — 49 — 30ft. — 19 —

old pump discarded. 1-6-59.

as of 3/1/67 Well 8 has a Layne pump new Head Shaft - by Thomas 7-5-55

Air Line } 64 ft.? Figured 65 FT. (64)

Well 608 3/2/77

DEPTH 114' 114'
CASEING 8"
STATIC 23'8" MEASURED
AIR LINE 60'

PUMP LAYNE
SIZE 5"
SETTING 60' 1/4"
TAIL 6"x10'

BOWL ASSEMBLY
STAGE 3
SIZE 8
TYPE PRHC
SERIAL 65263

HARTSFIELD WATER COMPANY, INC.
Kinston, N. C.
Phone JA 3-6007

FINAL TEST RECORD

WELL NO. 8

WELL FOR Tarawa Terrace

DESIRED FLOW 100

ADDRESS Camp Lejeune, N. C.

TEST 100

DATE	TIME	G.P.M.	DRAWDOWN	PUMPING LEVEL	REMARKS
11/1/61	7:00	100			Static level 7½' from G.L.
	8:00	100	19' 6"	27'	
	9:00	100	20' 6"	28	
	10:00	100	20' 6"	28	
	11:00	100	20' 6"	28	
	12:00	100	28' 6"	~~28~~ 29	
	1:00	100	21' 6"	29	
	2:00	100	21' 6"	29	
	3:00	100	21' 6"	29	
	4:00	100	21' 6"	29	
	5:00	100	21' 6"	29	
	6:00	100	21' 6"	29	
	7:00	150		38	
	8:00	150	30' 6"	38	
	9:00	150	30' 6"	38	
	10:00	150	30' 6"	38	
	11:00	175	37' 6"	45	
	12:00	175	37' 6"	45	
	1:00	175	37' 6"	45	
	2:00	175	37' 6"	45	
	3:00	195	44' 6"	52	
	4:00	195	44' 6"	52	
	5:00	195	45' 6"	53	
	6:00	195	45' 6"	53	
	7:00	195	45' 6"	53	

W E L L D A T A

Well No. 8

SPECIFICATIONS

Pump Base Elevation	31.7
Ground Elevation	29.7
Static Elevation	9.7
Maximum allowed Drawdown	-17
Total Discharge	250 G.P.M.
Total Head	73 Feet

TEST

300 G.P.M.	Pressure	Drawdown	-28.3	
250 G.P.M. 13#	Pressure	Drawdown	-19.0	4.25
240 G.P.M. 15#	Pressure	Drawdown	-18.3	5.0
230 G.P.M.	Pressure	Drawdown	-17.0	
210 G.P.M. 18#	Pressure	Drawdown	-15.9	6.25
190 G.P.M. 21#	Pressure	Drawdown	-11.9	

Recovers to elevation 24.0

Air line 61'

Marine Barracks
New River, N. C.
April 13, 1942

Wells: Permanent Water Supply, Regimental Area

By Layne Atlantic Company

Report on Well No. 8

Location: 500 ft. South of the intersection of cypress St. and Pine St. in industrial area as shown on M.B. drawing No. 521.

Date Drilled: March, 1942

Drilling Equipment: Rotary rig, bits, and other equipment.

Status: Ground elevation 29.7

A 17½" hole drilled to 21 feet. This was reamed to 23" in diameter. 20 feet of 18" I.D. Steel casing, was set and the anular space around this was filled with cement grout. A 17½" hole was drilled to a total depth of 170 feet.

Log of Formation:

0 to 1'5"	Black top soil
1'5" to 20'	Fine yellow sand
20' to 37'	Hard rock
37' to 57'	Streaks of soft rock and sand
57' to 64'	Hard rock
64' to 84'	Medium hard rock
84' to 85'	Hard rock (rough drilling)
85' to 93'	Soft rock and sand
93' to 108'	Hard rock
108' to 117'	Soft rock and sand
117' to 126'	Soft rock with fine sand
126' to 161'	Fine sand
161' to 166'	Hard rock
166' to 170'	Fine gray sand

Remarks: Due to the presence of fine sand, it was necessary to construct a gravel wall well.

Gravel Wall Construction: 111'6" of 8" steel pipe and 50' of silician bronze shutter screen was lowered into the well and the anular space was pumped full of a special ¼" cape gravel.

Log of screen setting:	0' to 61'6"	8" Blank pipe
	61'6" to 81'6"	8" Bronze screen
	81'6" to 91'6"	8" Blank pipe
	91'6" to 101'6"	8" Bronze screen
	101'6" to 121'6"	8" Blank pipe
	121'6" to 131'6"	8" Bronze screen
	131'6" to 151'6"	8" Blank pipe
	151'6" to 161'6"	8" Bronze screen

The bottom of the screen was filled with a cement plug and then capped with a steel plate.

Static water level: 20 feet below surface

Pumping: Well was pumped for forty-two hours to clear off fine sand. Showed a constant flow of 205 gallons per minute with a 22 foot drawdown. This was approximately 9.3 gallons per foot drawdown.

See separate report for chemical analysis.

Report will be made of pump installations.

N. H. Kellam
Asst. Chem. Engineer

3 found
13 lost

H.P. Well 608

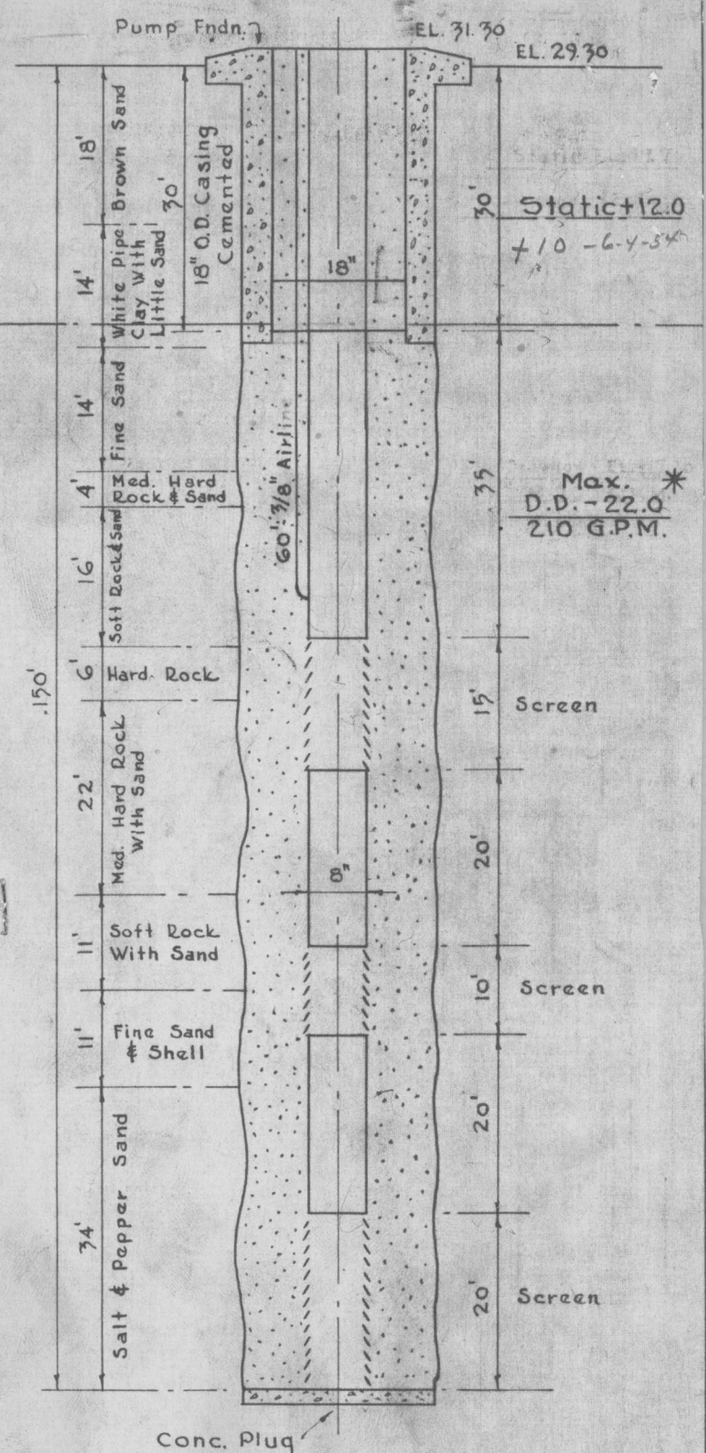
3 found
13 lost

H.P. Well 608

609 was replaced by 585

200 G.P.M. – SINGLE DRIVE – 7½ H.P.

~~200~~ " " " actual. D.D. – 19.7



D.T.A. WELL No. 9

153.3

883

650
175
220
85

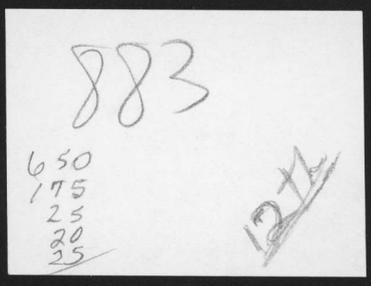
609 was replaced by 585

883

650
175
25
20
25

12th

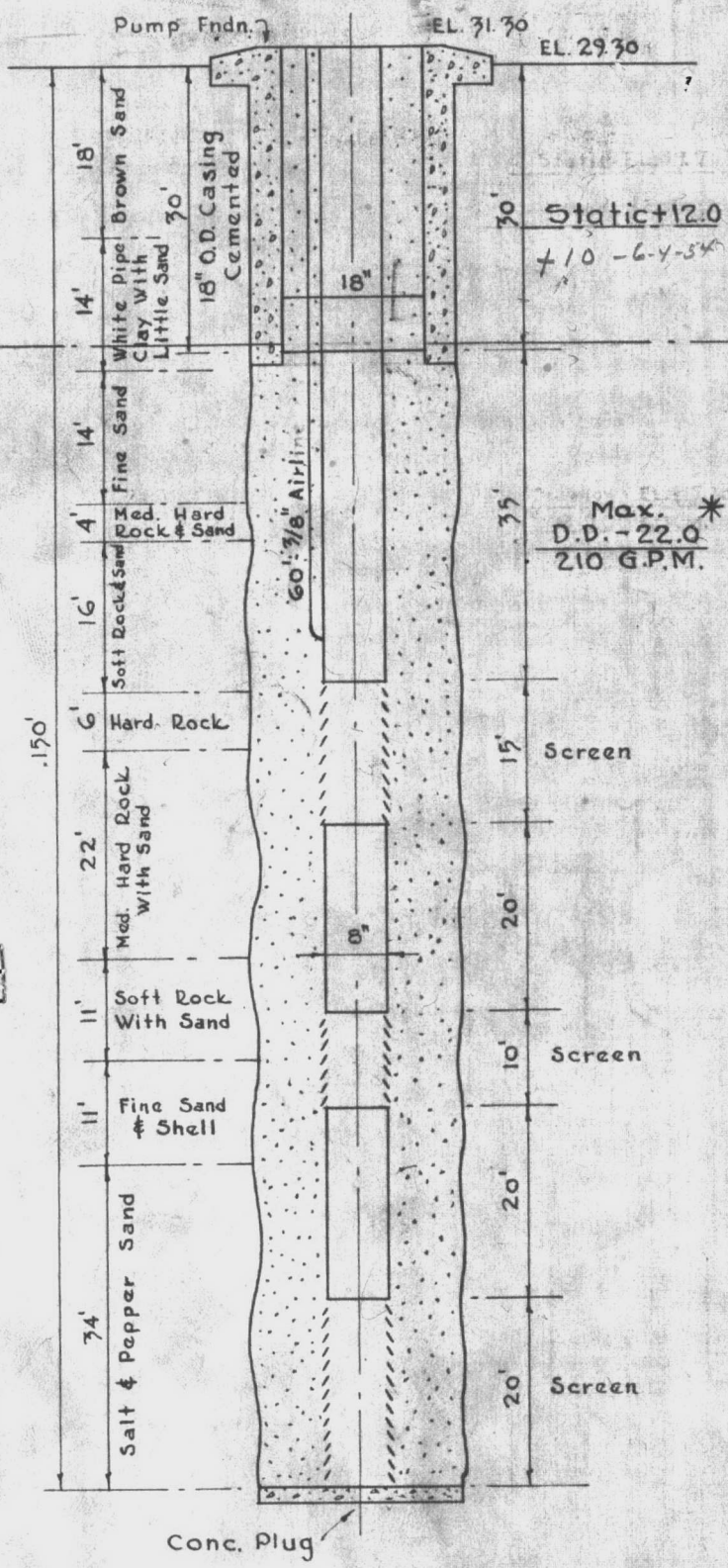
1 60
53.3


883
650
175
25
20
35

609 was replaced by 585

200 G.P.M. – SINGLE DRIVE – 7½ H.P.

200 " " " actual. D.D. – 19.7



D.T.A. WELL No. 9

Sent To Wiggins 3-20-97

REQUISITION DATA -MAINTENANCE
MCBCL 11014/2 REV 01-93

DATE: 2-24-97

STOCK NUMBER	PART NUMBER	MANUFACTURER	U/I	U/P	QTY	PRI
	6CHC-4	GOULD	EA	5571.00	1	07

FIP: M67001 - 23 - 83 - - - - - -

DESCRIPTION:
4 STAGE VERTICAL PUMP, HEAD 200 FT
250 GPM, 20 HP 3600 RPM 3 PH 230/460
VOLTS 4 INCH COLUMN AT 70 FT

JUSTIFICATION:
REPLACE WELL PUMP 609
WORN OUT IN SERVICE

TICKET NUMBER:

SUGGESTED SOURCE:
COMPANY NAME TENCARVA MACH. CO POC
ADDRESS PO BOX 3407 TEL 910-799-8800
CITY, STATE, & ZIP WILMINGTON NC 28406-0407

SIGNATURE
Sly L Miller

REQUISITION DATA -MAINTENANCE
MCBCL 11014/2 REV 01-93

DATE 2-24-97

STOCK NUMBER	PART NUMBER	MANUFACTURER	U/I	UNIT COST	QTY	PRI
	6 CHC-4	GOULD	EA	5571	1	07

FIP: M67001 - 23 -83 - - - - - - -

DESCRIPTION:
4 STAGE VERTICAL PUMP, HEAD 200 FT
250 GPM, 20 HP 3600 RPM 3 PH 230/460
VOLTS 4 INCH COLUMN AT 70 FT

JUSTIFICATION:
REPLACE WELL PUMP 609
WORN OUT IN SERVICE

TICKET NUMBER:

SUGGESTED SOURCE:
COMPANY NAME TENCARVA MACH. CO POC
ADDRESS PO BOX 3407 TEL 910-799-8800
CITY, STATE, & ZIP W. ILMINGTON NC 28406-0407

SIGNATURE Sty L Miller

NAT W1666

Tencarva Machinery Co.

FAX Transmission

From: SCOTT HUDSON
To: STANLEY MILLER
Company: CAMP LEJEUNE

Date: February 19, 1997
Time: 4:09 PM
FAX #: 910-451-3544

Message: WELL HOUSE 609

Mr. Miller,

I am pleased to offer the following for the subject pump:

Rating: 250 GPM @ 200 Ft

1-Goulds 6CHC 4 stage vertical turbine pump, setting at 70 feet, 4 inch column, cone strainer, driven by a 20 HP 3600 RPM 3/60/230/460 volt WP1 VHS motor with non-reverse ratcheting.....**$5571.00**

Terms-net 30 days or credit card
freight allowed
shipment 5 to 6 weeks

Thank you and please call with questions.

Scott Hudson

VOICE: 910 799 8800 FAX: 910 799 8801

P.O. Box 3407, 108 N. Kerr Ave, Suite K-3, Wilmington, N.C. 28406-0407

North [redacted]olina Department of Environment, Health, and [redacted]
Division of Environmental Health, Public Water Supply S[redacted]

SOURCE INFORMATION
GROUND WATER

Date Form Completed: M M D D Y Y = 01 25 95

PWSID: 0461040

Owner Assigned Source Code: 609

Well Name (If purchase, name of system): HADNOT POINT 609

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

If Purchase, seller ID#:

Source Begin Date (M M Y Y):

Source exempt—SWTR? N

Direct Influence Date (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): SNEADS FERRY ROAD

Latitude (N) Deg. Min. Sec.: 34 39 26.

Longitude (W) Deg. Min. Sec.: 077 18 54.

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

GPS Data Q # or DOP #:

No. of Sats. Locked on:

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

Vulnerable (VOCs)? N

Assessment Date (M M D D Y Y):

ENTRY POINT INFORMATION

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

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

Owner Assigned Entry Point Code: 100

Entry Point Name: ~~HP609~~ 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: 50' to Road

Surface water within 200'? 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: None

Well: Diameter: 8" Type: GRAVE Pack Yield (gpm): 162 Properly sealed? Y (Y,N

Properly vented? (Y,N) Casing depth: 65 ft. (If unknown, put 'UNK') Well depth: 145' Meter available? N (Y,N

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

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

Pumps: Capacity: GPM: 140 HP: 7.5 Pump intake depth: 145 Auxiliary Power? N (Y,N

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 16" /

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 If yes, complete back of form.

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

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

① NO meter
② NO Vent

WELL NUMBER 609 BY Stevenson & Petersen DATE 8-24-97

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
20	18	60	42	90	183	45

REMARKS

D/H 100+

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	609	BY	BROWN-STEVENSON	DATE	10-5-94	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
70	20	60	40	50	162	

REMARKS D-H 80

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

4- 12'

6" -

4" 5- 8'

2- 8' of 6"

WELL NUMBER 609 THOMAS DATE 8-10-90

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
70	18	32	14	72	108.	
		42	24	67	130	
		52	34	60	159	
		60	44	50	199	pressure set

REMARKS

installed pump from 608' set at 70' - with 5" column 1" shaft
Dead head @ 84 PSI
WELL DEPTH 145

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 609		BY Marks - Brown			DATE 3-26-90	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
60	15					05

REMARKS

dead head @ 55 PSI

set @

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 609		BY THOMAS/SARDINAS			DATE 9-22-58	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
60	16	38	22	8	100	13:30
						13:45

DH 55

REMARKS

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL 609

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
10-8-81	60'	30'	50	20	40	3½"	
			56	26	37	100	
			58	28	34	119	
			60	30	31	133	

REMARKS: left set at 37 PSI

[illegible] OF
[illegible]
[illegible]
[illegible]

HP

609

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
9-24-81	60	29	35'	6'	22		
			36'	7	16	1"	
			37'	8	10	1⅛"	
			38'	9	0	1¼"	

REMARKS:

WELL NUMBER 609		BY Thomas / BROWN			DATE 10-26-84	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1030
60	16	38	22	20	105	1040
		39	23	17	108	1056
		42	26	14	111	1106
		44	28	10	119	1116
		46	30	7	122	1126

REMARKS Last set at 10 PSI 119 GPM

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER	609	BY	THOMAS / RAYNOR	DATE	9-23-83	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
60	26	49	23	29	104	1350 / 1302

10-7-81

REMARKS

LAYNE PUMP 38890
SIZE 8"
TYPE ORHC

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL #609

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
1-11-79			23'		(25)		104
			20'		20		115
			19'		15		119
			17'		10		122
2-13-80	60'		47'		14		90
			48'		10		95
			46'		18		80

REMARKS:

DEPTH OF WELL:

AIRLINE ELEVATION: + -

DATE INSTALLED:

DATE - 4-26-63

WELL #	STATIC	PUMPING LEVEL GAGE.	DD -	DISCHARGE PRESS	GPM	AIRLINE LIFT
9	47 FT	4 FT			212	NEW LAYNE - INSTALLED 4-25-63
		5½ FT			203	BY HENDERSON
		7 FT			195	
		9 FT			187	
9			18½	14½		3/22/66
						as of 3/1/67 Layne pump in well 9
12/12/66	36.5'		48'	21	190	
3/13/68	45'		40'	0	30	PULLED AND CLEANED.
8/11/69	44	11	33	12	133	SE WELL TEST
	STATIC	Pump Level				
9-4-69	+12'	-21'	33'	12	133	11-25-69 - Pulled & Cleaned

#18
32

Well # 9

52 FT.

Date	Line Ft.	G.P.M.	D.D. El.	Static El.	Shut Off head	D.D. Ft.	
11-10-52	54	?	-8	+17	115	25	OLD PUMP
9-16-53	—	—	-13	+18	—	31	
5-28-54	71	151	43?	22			NEW PUMP.
"	55	170	50?	22			
"	60	170	50?	22			
6-4-54	50	177	55	22		33	105
6-4-54	68	156	50	22		28	110

16'6" to water Level from Base —
149' feet Deep before Pumped.

	M.O. ALK	CHLORIDES	IRON	HARDNESS	PH. ALK.
1-13-55	99	9	0.4	96	0

Air Line 60 FT. LOWER EL. -26

WELL # 609

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
9/15/81	60	29'					

REMARKS: pump not pumping

DEPTH OF WELL:

AIRLINE ELEVATION: +

SIZE INSTALLED:

PHYSICAL AND CHEMICAL ANALYSIS OF WATER

SAMPLE NO.

FROM: *(Station or unit)* Well 9 Bldg 609

DATE 8-8-57

TO: *(Name and location of laboratory)*

SAMPLE FROM *(Location of sampling point)*

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

REASON FOR EXAMINATION

EXAMINATION REQUESTED BY

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

I. FIELD ANALYSIS

1. pH	TEMPERATURE °F	TEMPERATURE °C

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

FIELD ANALYSIS BY

DATE OF ANALYSIS

II. SPECIAL LABORATORY ANALYSES

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

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

III. ROUTINE LABORATORY ANALYSIS

(CHECK ONE)

	REQUESTED		NOT REQUESTED

ITEM	PPM
1. COLOR	
2. TURBIDITY	
3. ALKALINITY ($CaCO_3$)	
P: 0	MO: 88
4. TOTAL HARDNESS ($CaCO_3$)	92
5. NON-CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*	
6. CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*	
7. TOTAL DISSOLVED SOLIDS	
8. SPECIFIC CONDUCTANCE *(Micromhos)*	
9. CALCIUM (Ca)	34.4
10. MAGNESIUM (Mg)	1.2
11. SODIUM (Na) AND POTASSIUM (K)	
12. HYDROXIDE (OH)* $CaCO_3$	0.0
13. BICARBONATE (HCO_3)* $CaCO_3$	88.0
14. CARBONATE (CO_3)* $CaCO_3$	0.0
15. SULFATE (SO_4)	
16. CHLORIDE (Cl)	8.0
17. NITRATE (NO_3)	
18. IRON (Fe) TOTAL	0.5
19. MAGANESE (Mn)	
20. SILICA (SiO_2)	
21. FLUORIDE (F)	

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

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

LABORATORY ANALYSIS BY Justice

DATE OF ANALYSIS 8-8-57

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

GPO 912375

FORM A-4
(JUNE '66)

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

INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

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

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
MC	Q	34 ° 39 ' 22 " N	77 ° 18 ' 53 " W	

6. AGENCY STATION NO.: 609

7. STATION NAME: HP20-609

8. DRAINAGE BASIN CODE: No. 06 Letter N

9. STATE CODE: 37

10. COUNTY CODE: 133

11. COUNTY NAME: ONSLOW

12. PERIOD OF RECORD: Began 1942 Discontinued | Y ☐ Continuous Interruption Exceeds 1 Year

13. | 14.

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

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

17. TYPES OF DATA AVAILABLE

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

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

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

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

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

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

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

20. OFFICE AT WHICH DATA AVAILABLE

Office: BASE MAINTENANCE DEPARTMENT, UTILITIES DIVISION

Street No.: MARINE CORPS BASE | City Code:

City, State, Zip: CAMP LEJEUNE, N. C. 28542 | 0735

21. OFFICE COMPLETING FORM: BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME: F. E. TEW, JR.

23. DATE: Month SEPT. Year 19 66

WATER ANALYSIS

By N.H Kellam

Date 3-27-42

Sample from Supply Well Per area at Well Site No. 9

Total Solids	PPM	Dissolved Solids	PPM
Suspended Solids	PPM	Volatile Solids	PPM

Phenol. Alk. as $CaCo_3$	0 PPM	Silica as Sio_2	PPM
Total Alk. " "	54 "	Ferrous Iron as Fe	"
Carbonates " "	0 "	Total Iron as Fe	"
Bicarbonates " "	50 "	Aluminum as Al.	"
Chlorides as Cl.	10 "	Calcium as Ca.	"
Sulphates as SO_4	"	Magnesium as Mg.	"
Nitrites as No_2	"	Sodium as Na.	"
Carbon Dioxide as CO_2	5 "		

pH 7.6 Soap Hardness as $CaCO_3$ PPM

Odor Slight Turbidity

REMARKS

WATER ANALYSIS

By N. H Kellam

Date 3-31-42

Sample from Supply Well at Well Site No. 9

Total Solids	PPM	Dissolved Solids	PPM
Suspended Solids	PPM	Volatile Solids	PPM

Phenol. Alk. as $CaCo_3$	0 PPM	Silica as Sio_2	PPM
Total Alk. " "	106 "	Ferrous Iron as Fe	"
Carbonates " "	0 "	Total Iron as Fe	"
Bicarbonates " "	106 "	Aluminum as Al.	"
Chlorides as Cl.	8 "	Calcium as Ca.	"
Sulphates as SO_4	"	Magnesium as Mg.	"
Nitrites as No_2	"	Sodium as Na.	"
Carbon Dioxide as CO_2	0 "		

pH 7.8 Soap Hardness as $CaCO_3$ PPM

Odor Slight Turbidity 15

REMARKS

Marine Barracks
New River, N. C.
April 14, 1942

Wells: Permanent Water Supply

By Layne Atlantic Company

Report on Well No. 9

Location: On the west side of road to Hurst Beach 2500' south east of well No. 6 as shown on M.B. Drawing No. 521.

Date Drilled: April, 1942

Drilling Equipment: Roatary rig, bits, and other equipment.

Status: Ground elevation 29.3

A 17½" hole drilled to a depth of 32'. This was reamed to 23" in diameter to a depth of 31'. 30' of 18" I.D. steel casing was set and the anular space was filled with cement grout. A 17½" hole was then drilled to a total depth of 156 feet.

Log of Formation:

0' to 18'	Brown sand
18' to 32'	White clay with litle sand
32' to 46'	Fine sand
46' to 50'	Medium hard rock and sand
50' to 66'	Soft rock and sand
66' to 72'	Hard rock
72' to 94'	Medium hard rock and sand
94' to 105'	Soft rock and sand
105' to 116'	Fine sand and shells
116' to 151'	Very fine sand
151' to 156'	Very hard rock

Remarks: Well finished at 150', due to the fine sand in the hole, it was necessary to construct a gravel wall well.

Gravel Wall Construction: 105 feet of 8" steel pipe and 45 feet of silician bronze shutter screen was placed in the well and the anular space was pumped full of a special ¼" cape may gravel.

Log of Screen Setting:	0' to 65'	8" Blank pipe
	65' to 80'	8" Bronze screen
	80' to 100'	8" Blank pipe
	100' to 110'	8" Bronze screen
	110' to 130'	8" Blank pipe
	130' to 150'	8" Bronze screen

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

Static Level: 11'6" below surface

Pumping: Well pumps 165 gallons per minute with a 28'6" drawdown. This is approximately 6 gallons per foot of drawdown. Well was pumped for 48 hours to clear off sand and mud.

Report will be made later of pump installation.

See separate report for chemical analysis.

N. H. Kellam
Asst. Chemical Engineer

W E L L D A T A

Well No. 9

SPECIFICATIONS

Pump Base Elevation	31.3
Ground Elevation	29.3
Static Elevation	12.7
Maximum allowed Drawdown	-17
Total Discharge	200 G.P.M.
Total Head	85 Feet

TEST

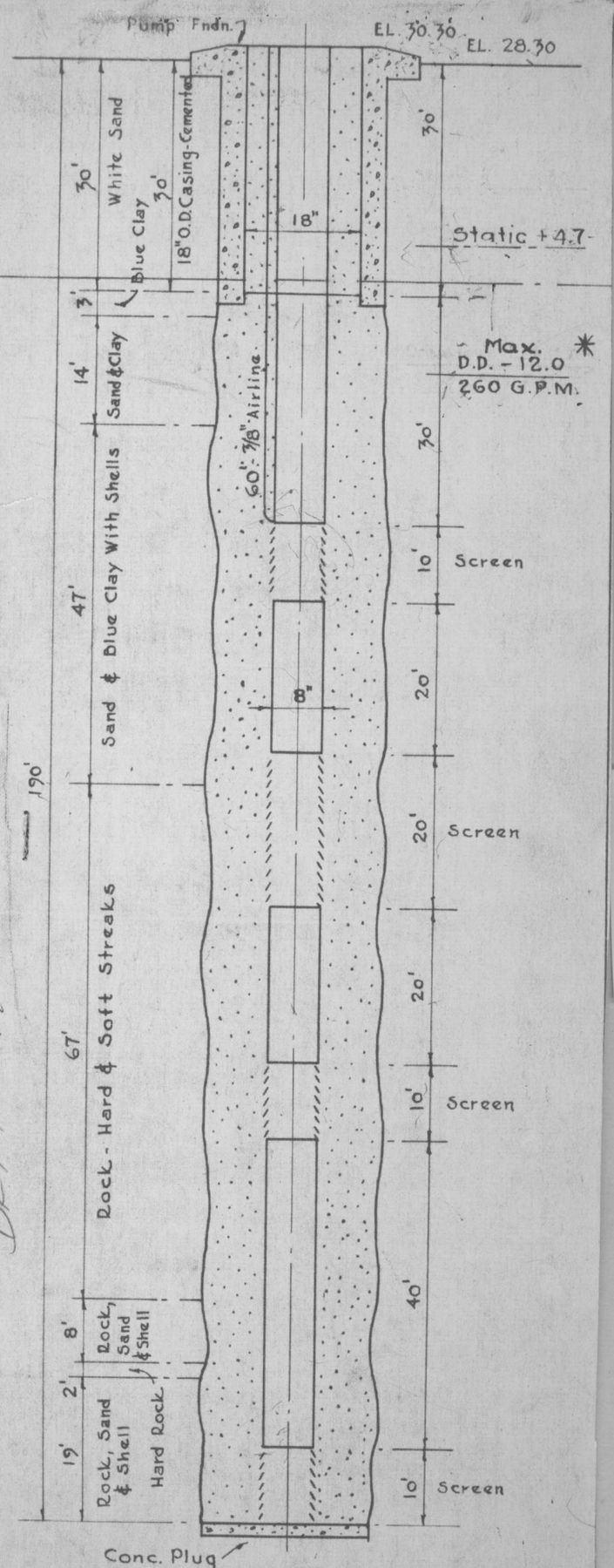
205 G.P.M.	20# Pressure	Drawdown	- 15.5
185 G.P.M.	24# Pressure	Drawdown	- 16.1
165 G.P.M.	28# Pressure	Drawdown	- 14.4
145 G.P.M.	32# Pressure	Drawdown	- 6.5
135 G.P.M.	36# Pressure	Drawdown	- 2.5

4"

Air line 62.5'

H.P. Well 609

~~250~~ G.P.M. – DUAL DRIVE – ~~7½ H.P.~~
260 actual D.D.-11.6



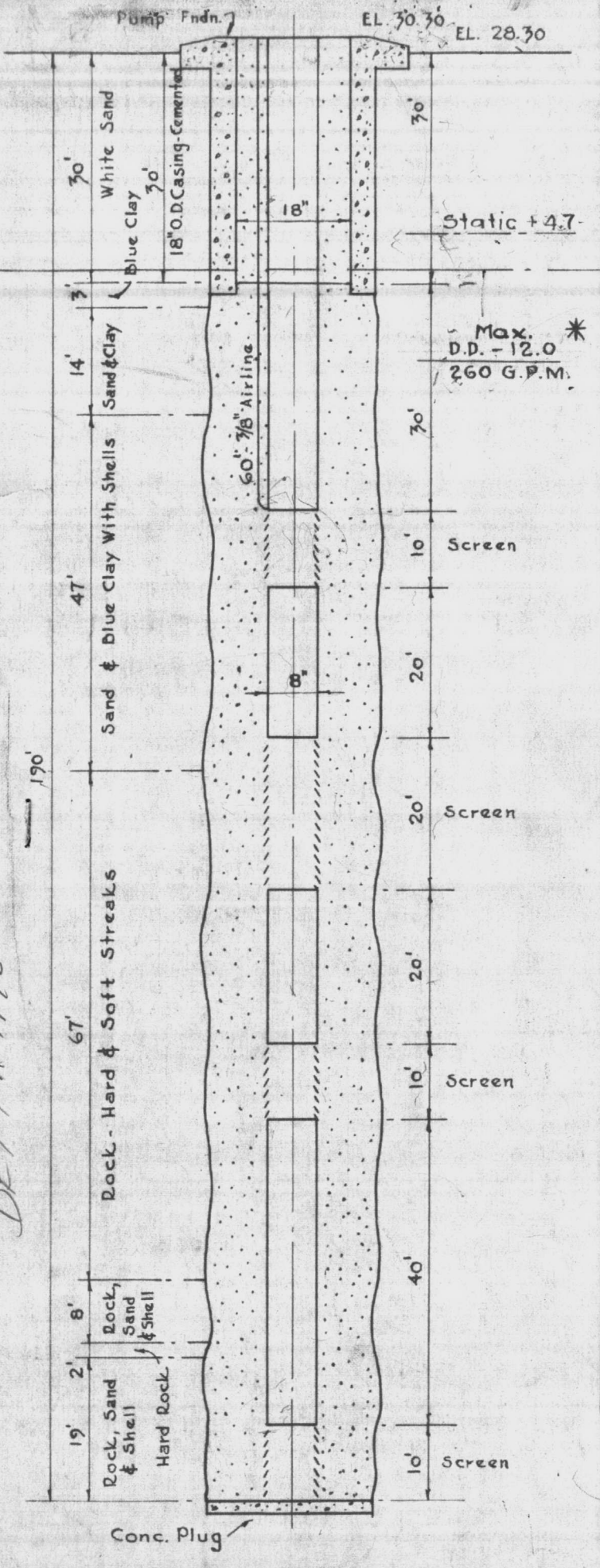
DEPTH. 178'

610
12-18-92
TCE 37

D.T.A. WELL No. 10

610
12-18-92
TCE 37

250 G.P.M. – DUAL DRIVE – 7½ H.P.
260 actual. D.D.-11.6



DEPTH 178'

D.T.A. WELL No. 10

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

SOURCE INFORMATION
GROUND WATER

Date Form Completed: M M D D Y Y = 01 24 95

PWSID: 67041

Owner Assigned Source Code: 010

Well Name (If purchase, name of system): HADNOT POINT 610

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

If Purchase, seller ID#:

Source Begin Date (M M Y Y):

Source exempt—SWTR? Y N

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

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

T/B ABANDONED

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

Latitude (N) Deg. Min. Sec.: 34 41 12

Longitude (W) Deg. Min. Sec.: 077 19 54

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

GPS Data: Q# or DOP #

No. of Sats. Locked on:

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

Vulnerable (VOCs)? Y N

Assessment Date (M M D D Y Y):

ENTRY POINT INFORMATION

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

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

Owner Assigned Entry Point Code: 100

Entry Point Name: HP 610

Location:

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

Sources of pollution/distance:

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

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

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

Condition of house: Type of freeze protection:

Well: Diameter: 8" Type: GRAVEL PACK Yield (gpm): 214 Properly sealed? ____ (Y,N

Properly vented? ____ (Y,N) Casing depth 60 ft. (If unknown, put 'UNK') Well depth: 60' Meter available? N (Y,N

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

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

Pumps: Capacity: GPM: 200 HP: 10 Pump intake depth: 190 Auxiliary Power? Y (Y,N

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 26.5" /

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? HP-20 PLANT

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

DEHNR 3803 (Revised 12/93)
Public Water Supply Section (Review 12/96)

- CONTAMINATED -

WELL NUMBER 610 BY [redacted] Thomas / Brown DATE 4-3-90

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
70'	32'	36	4	43	105	05
		38	6	34	140	15
		40	8	23	172	25
		42	10	18	183	35
		43	11	12	199	45
		46	14	5	214	55

REMARKS

Added head @ 42 PSI

Set @ 5 PSI

well Demo

10-95

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 610		BY Sardinas			DATE 9-20-88	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
70'	30'	32'	2'	40	104	13:15
		33'	3'	35	125	13:30
		34	4'	30	146	13:45
		42	12'	25	164	14:00
		44	14'	20	185	14:15
		46	16'	15	195	14:30
		47	17'	10	210	14:45
		48	18'	5	222	15:00
						15:15

DH 62 psi

REMARKS

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 610		BY Thomas Brown			DATE 9-10-85	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
70'	30	32	2	38	100	15
		33	3	35	120	15
		34	4	32	130	15
		35	5	29	140	15
		36	6	25	150	15
		40	10	20	165	15
		46	14	10	200	15

REMARKS
used direct readig gage
Need new gage or air line

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

2-27-85

610 Well House

Air Line 70 Feet

Top Screen 61' To 73'
88' To 109'
129' To 141'

Re-Screened By East Coast Co.

WELL NUMBER	610	BY	THOMAS - BROWN	DATE	3-29-85	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1300
70	25	35	10	40	105	1315
		37	12	37	120	1330
		40	15	33	135	1345
		41	16	30	150	1400
		43	18	25	165	1415
		45	20	21	175	1430
		45	20	18	185	1445
		46	21	14	195	1500
				10	205	1515

REMARKS left set at 14 PSI 195 GPM.

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

Well 610 June 4, 1981

air line 50'

static	pumping level	drawdown	pressure	GPM
21'	36'	15'	21	111
	40'	19'	18	128
	43'	22	15	140
	46'	24'	12	151

Set on 18 LBS pressure

installed ashcroft liquid pressure gauge.

Well HP 610

T.V. inspection 10-27-82

Showed worn screens with possible collapsed lower screen

Screen

Well HP 610

T.V. inspection 10-27-82

showed worn screens with possible collapsed lower screen

Screen

Well 610 June 4, 1981

air line 50'

Set on 18 LBS pressure

installed ashcroft liquid pressure gauge.

static	pumping level	drawdown	pressure	GPM
21'	36'	15'	21	111
	40'	19'	18	128
	43'	22	15	140
	46'	24'	12	151

Well # 10

Date	Line Ft.	G.P.M.	D.D. El. FT	Static El. FT	Shut Off head FT	D.D. Ft.	
			AIR LINE BAD. UNABLE TO TAKE.				
6-4-53	45.5	185			76	—	OLD PUMP
"	40	200	Stage FT	—	—	—	"
9-9-53	62	180	?. -22.7	?. -1.3 X	92	?. 21.4	NEW PUMP
"	46	225"	?. -24.7	—	—	?. 23.4	"
"	57	200	?. -23.7	—	—	?. 22.4	"
9-14-53	76	?	?. -16.7	—	—	?. 15.4	"
1-28-54	78	?	Stage FT. 10	Stage 27		17 FT.	
"	62	?	5	27		22	
8/13/58	New		Pump	Installed			
11/1/66	AIR LINE 50'	199	1	37'	36'	SE WELL TEST	
8/11/69	50'	130		37	35	SE WELL TEST.	
9-4-69		130	-14.7	+17.3		32.0'	

As of 3/1/67 well 10 has a Pomona pump on Layne Base

19 FT. FROM PUMP BASE TO WATER BY MEASURE 9.10.53.

AIR LINE EL- LOWER END- — 26.7

Air Line 58 46" NEW LINE. 9-10-53. (OLD LINE 60 FT.)

CONSOLIDATED PUMP & EQUIPMENT, INC.

DISTRIBUTORS AND MANUFACTURER REPRESENTATIVES • WATER & WASTE WATER TREATMENT

POST OFFICE BOX 3188 • ROCK HILL, SOUTH CAROLINA 29731 • 803/328-1891

October 6, 1983

Contractor: East Coast Const. Co.

Project: Repair Water Wells
Bldgs 610, M628
Camp Lejeune, N. C.

Material Submitted:

Bldg 610

1 - Crane Deming Model XH6 9 Stage Vertical Turbine Pump, 10 HP, 1800 RPM, 240 Volt, 3 Phase, Combination Right Angle Gear Drive. COS 200 GPM @ 117' TDH

Bldg M628

1 - Crane Deming Model M6 9 Stage Vertical Turbine Pump, 7.5 HP, 1800 RPM, 208 Volt, 3 Phase.

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

APPROVED

SUBJECT TO CONTRACT REQUIREMENTS

CONTRACT N62470-83-C-5842

DATE 10/19/83

R. E. CARLSON
CDR, CEC, USN
Officer in Charge
of Construction

Bldg. 610

1 - Crane Deming Model XH6 Vertical Turbine Pump.

10 HP 1800 RPM, 240 Volt, 3 Phase US Motor, VHS, WP1

Model SD54-10 Discharge Head with Packing type seal, 6" companion flange discharge.

160' - 5" pump column with 1" drive shaft, water lubricated bearings, galvanized column.

10' - 5" suction pipe, galvanized.

5" bronze suction strainer.

3/4" steel foundation plate, 17" square.

Conditions of Service: 200 GPM @ 117' TDH

83% Eff. at design point, 7.12 BHP

CURVE PAGE 76 | TS CATALOG - SECTION C - 1750 RPM | CRANE-DEMING PUMPS
SIZE XH6 P.C. 3186 | VERTICAL TURBINE PUMP CURVES | CRANE CO.
SUPERSEDES P.C. 2622 | **PERFORMANCE PER STAGE** | SALEM, OHIO, U.S.A.

SIZE XH6 — SINGLE STAGE PERFORMANCE — 1770 R.P.M.

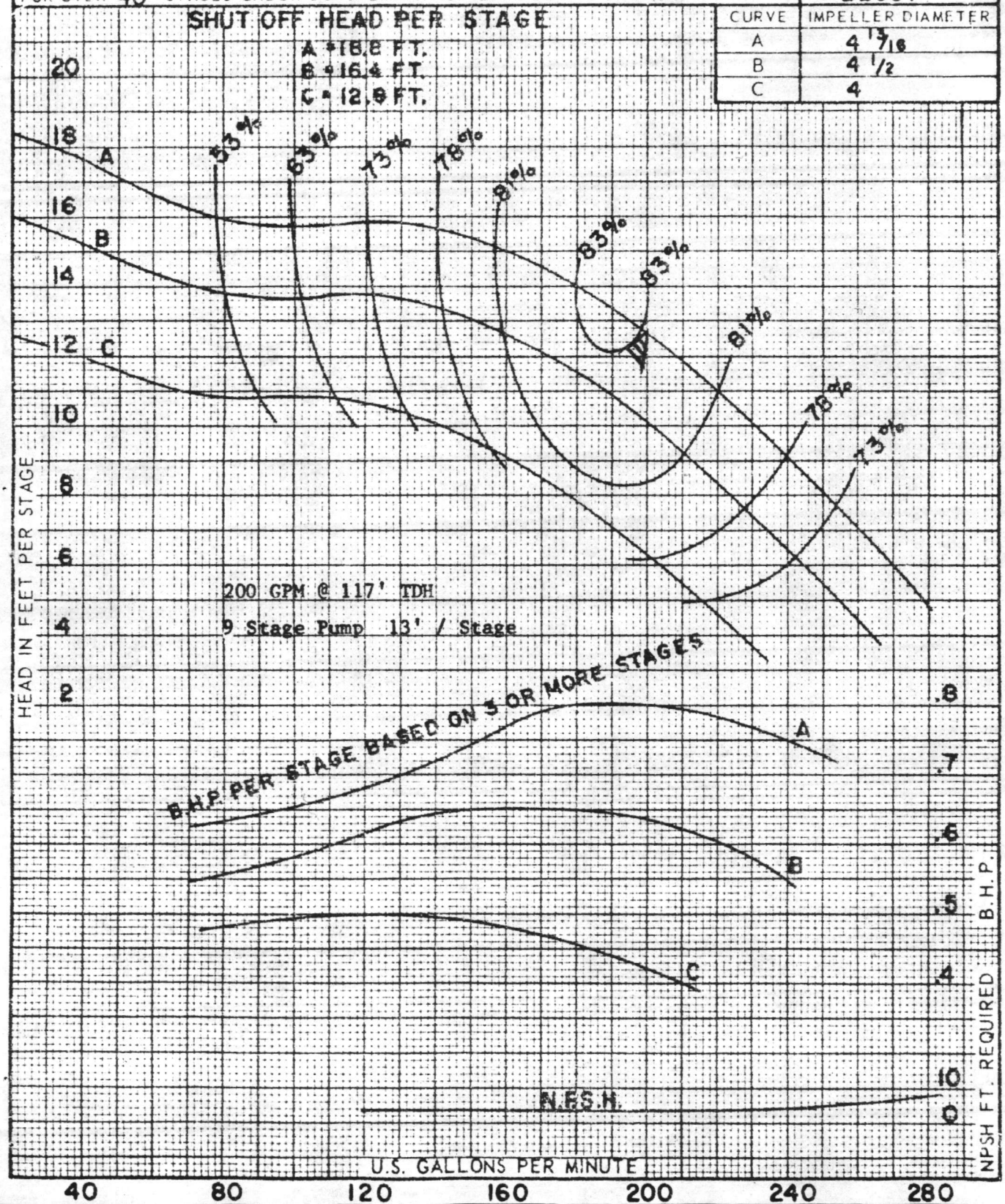
EFFICIENCY CHANGE:

___ STAGE DEDUCT	___ POINTS		
3 STAGE DEDUCT	0 POINTS		
2 STAGE DEDUCT	2 POINTS		
1 STAGE DEDUCT	4 POINTS		
ENAMELED BOWLS			

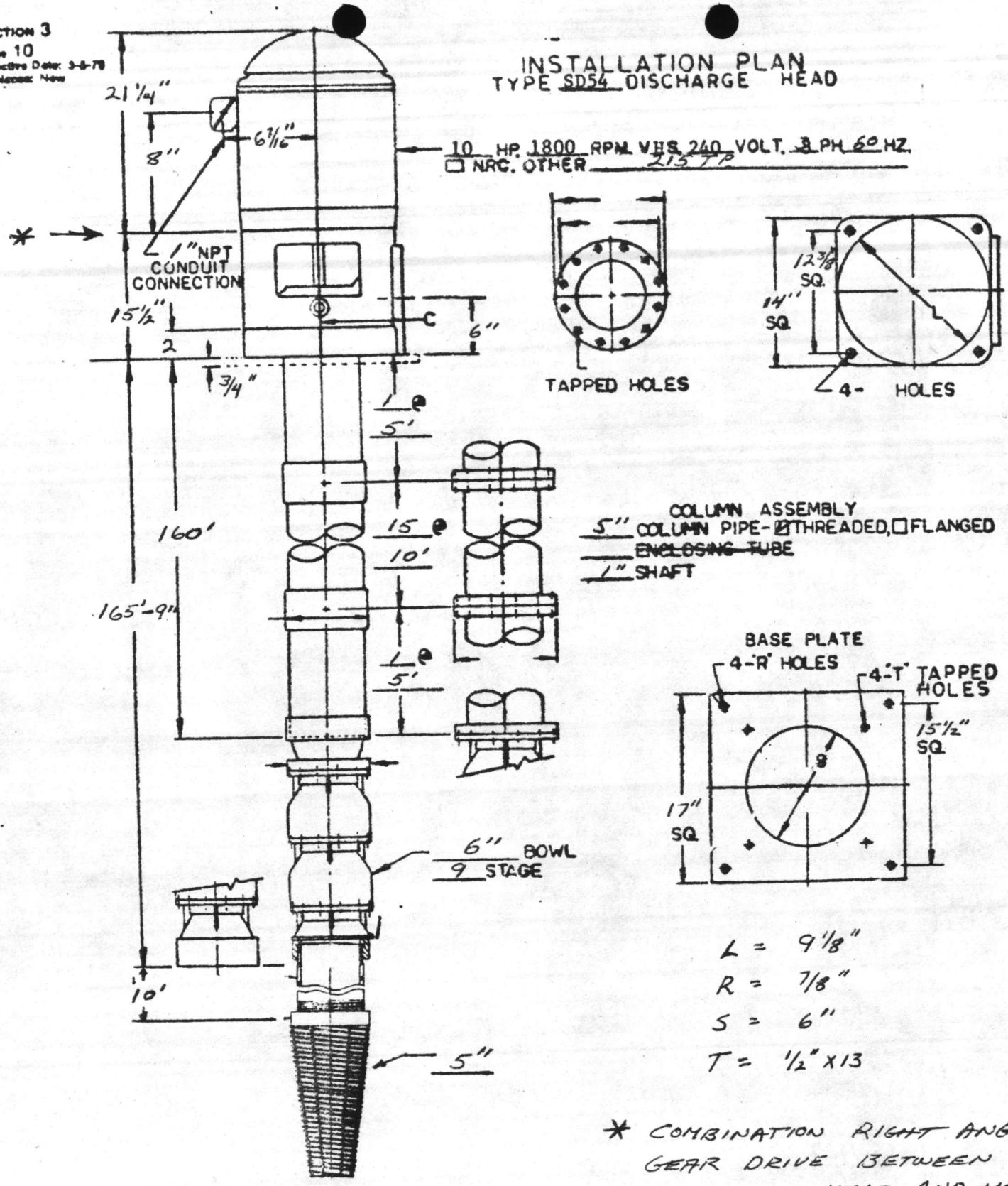
DIMENSIONS	FIG. 4700	FIG. 4750
BOWL DIAMETER	5 3/4	5 3/4
IMPELLER SHAFT DIA.	1	1
LENGTH FIRST STAGE	17 1/8	20 1/8
ADDITIONAL STAGE	6 1/8	6 1/8
THRUST FACTOR =	3.9	3.9

SUCTION - I.D. PIPE SIZE 4" SIZE COLUMN ADAPTER 4" " OR 5" SEMI-ENC. IMPELLER
FOR OVER 40 STAGES CHECK BOWL LIMITATION ENGINEERING SECTION NO. 22957

CURVE	IMPELLER DIAMETER
A	4 13/16
B	4 1/2
C	4



INSTALLATION PLAN
TYPE SD54 DISCHARGE HEAD



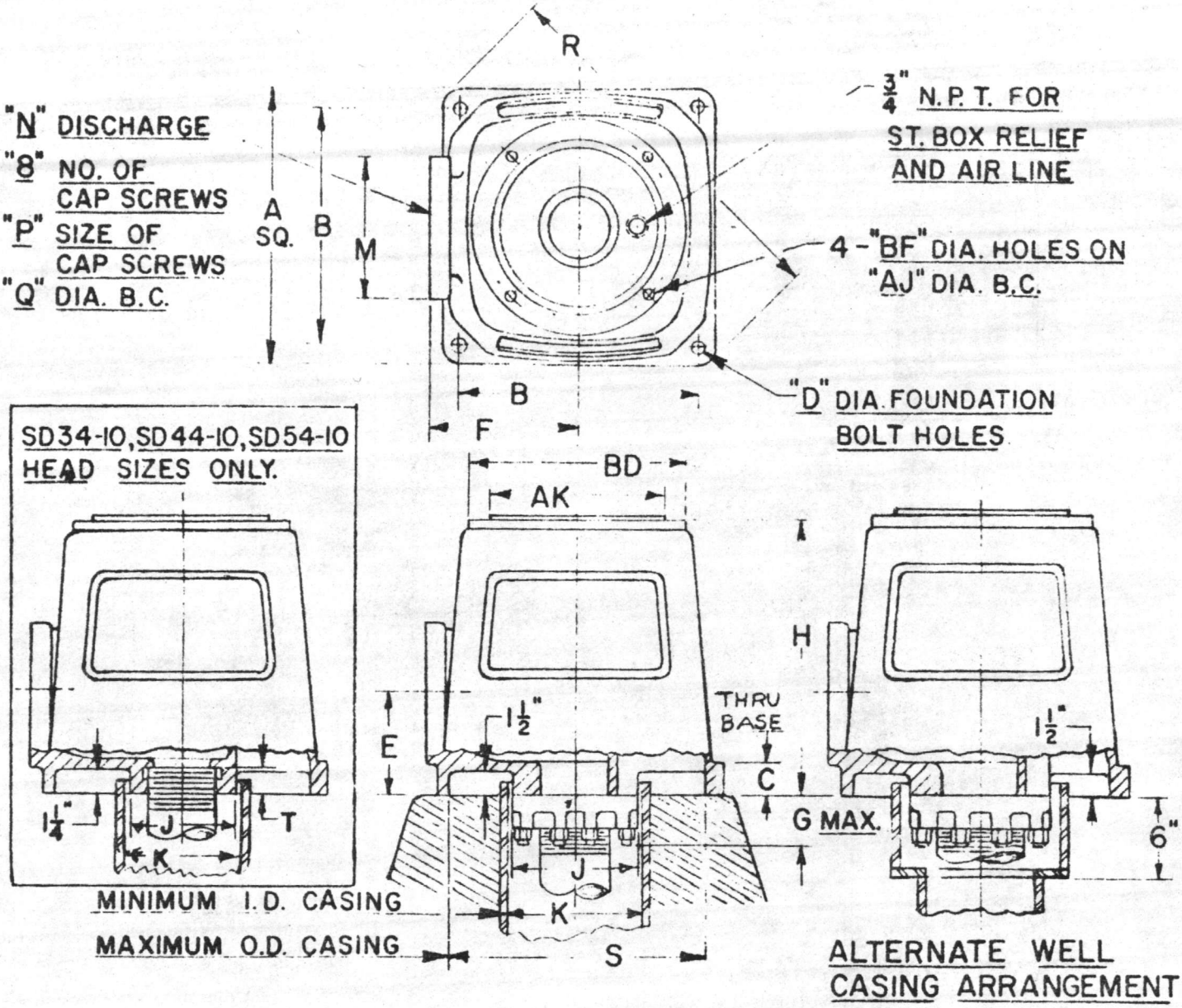
L = 9 1/8"
R = 7/8"
S = 6"
T = 1/2" X 13

* COMBINATION RIGHT ANGLE GEAR DRIVE BETWEEN DISCHARGE HEAD AND MOTOR

DIMENSIONS ARE APPROXIMATE USE ONLY WHEN CERTIFIED

CUSTOMER East Coast Construction Co.		ITEM NO. Bldg. 610	G.P.M. 200
LOCATION Camp Lejuene, N. C.		QUOTE NO.	T.D.H. 117'
	SPEC NO.	PUMP NO. XH6	R.P.M. 1800
FOR APPROVAL X	CERTIFIED	DATE 9/28/83	B.H.P. 10

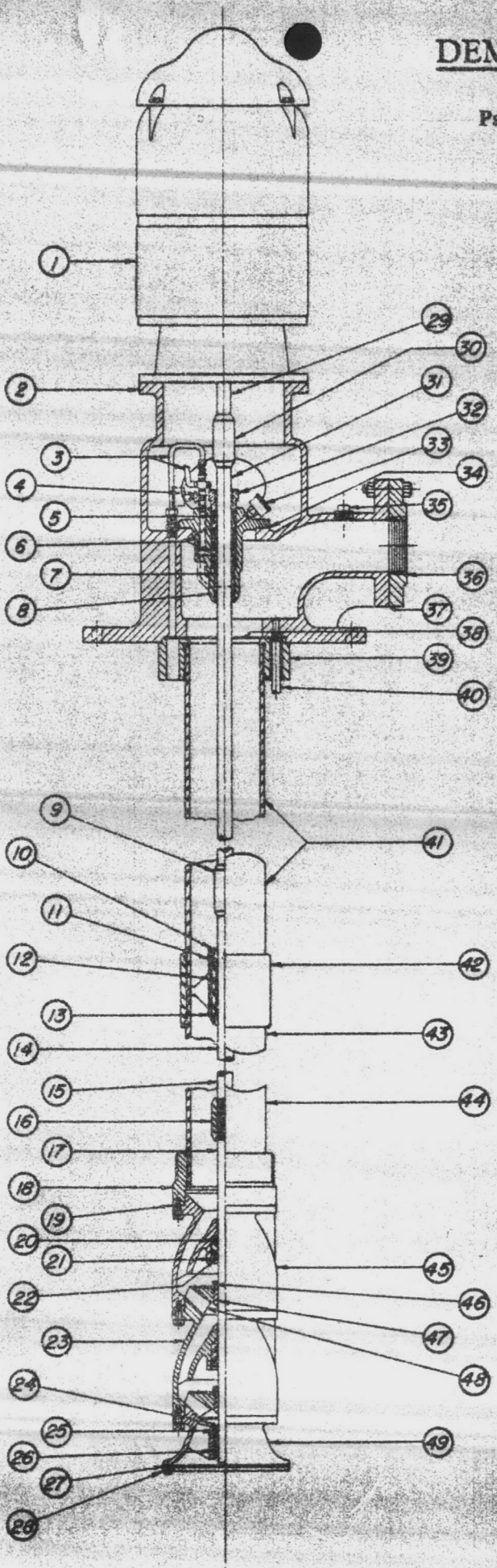
DIMENSIONS OF TYPE SD DISCHARGE HEADS



HEAD SIZE	SYMBOL	A	B	C	D	E	F	G	H	J	K	M	N	P	Q	R	S	BF	AJ	AK	BD	T
SD34-10	34027	14	12 3/8	2	5/8	6	7 1/2	0	15 1/2	5 5/8	6	9	4	5/8	7 1/2	19 1/8	12 3/4	7/16	9 1/8	8 1/4	10	1 3/4
SD44-10	34028									5 5/8	6											1 3/4
SD54-10	34029									6 1/2	7											1 5/8
SD66-12	33715	17	14 1/2	2	7/8	6 1/2	9	3 3/4	15 1/2	9 7/8	10	11	6	3/4	9 1/2	23	15	7/16	9 1/8	8 1/4	12	
SD88-12	33716	17	14 1/2	2 1/8	7/8	7 3/4	9	4 1/4	16 1/2	12 3/4	13 1/4	13 1/2	8	3/4	11 3/4	23	15	7/16	9 1/8	8 1/4	12	
SD88-16 1/2	33717	20	17 11/16	2 1/8	7/8	7 3/4	10 1/2	4 1/4	16 1/2	12 3/4	13 1/4	13 1/2	8	3/4	11 3/4	27 3/8	18	11/16	14 3/4	13 1/2	16 1/2	

DEMING VERTICAL TURBINE PUMPS

Parts List No. 57G - Fig. 4700G Pumps With Stuffing Box



Item No.	Name of Part
1.	Vertical Hollowshaft Motor
2.	Discharge Head
3.	Stuffing Box Relief Assembly
4.	Grease Cup (To St. Box Bearing)
5.	Stuffing Box Packing
6.	Lantern Rings
7.	Stuffing Box Bearing
8.	Stuffing Box
9.	Shaft Coupling
10.	Bearing Retaining Cup
11.	Rivets
12.	Column Bearing
13.	Bearing Housing
14.	Intermediate Shaft
15.	Bottom Shaft
16.	Impeller Shaft Coupling
17.	Impeller Shaft
18.	Column Adapter
19.	Bowl Gaskets
20.	Bowl Bearing
21.	Snap Ring
22.	Cover Plate
23.	Intermediate Bowl
24.	Suction Bowl Cover Plate
25.	Suction Bowl Snap Ring
26.	Suction Bowl Bearing
27.	Wire Mesh Strainer
28.	Strainer Clamping Ring
29.	Motor Shaft
30.	Motor Shaft Coupling
31.	Stuffing Box Shaft
32.	Stuffing Box Gland (Split)
33.	Grease Cup (To Upper Lantern Ring)
34.	Stuffing Box Gasket
35.	Pipe Plug
36.	Discharge Flange
37.	Discharge Flange Gasket
38.	Top Column Flange Gasket
39.	Top Column Flange
40.	By-Pass Nipple With Orifice
41.	Top Column
42.	Column Coupling
43.	Intermediate Column
44.	Bottom Column
45.	Top Bowl
46.	Impeller Nut
47.	Impeller Sleeve
48.	Impeller
49.	Suction Bowl

NOTE - Specify pump serial number when ordering parts. This number will be found on the nameplate attached to the discharge head.

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 (STARTING) PERCENT OF FULL LOAD	PULL OUT (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	22.6	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.

CUSTOMER NAME	
CUST. ORD. NO.	
U.S. ORD. NO.	
MARK:	
QTY. HP FRAME PHASE	
HERTZ R.P.M. VOLTS	

Vertical Motors

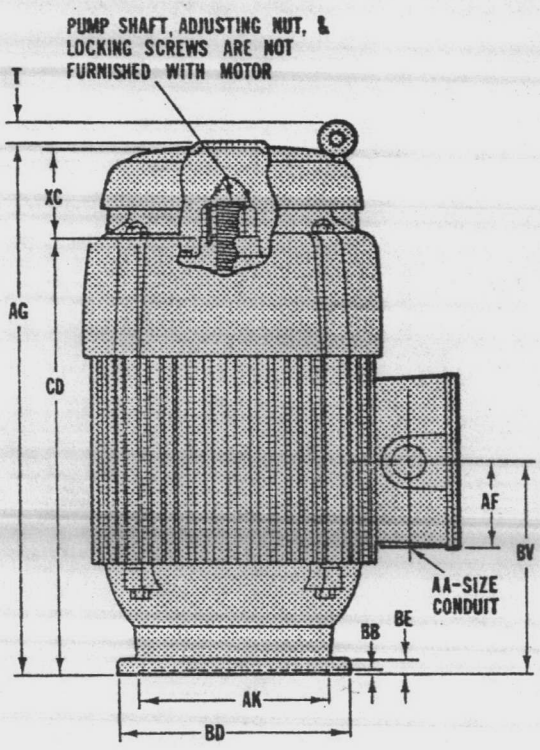
Section 505
Page 1

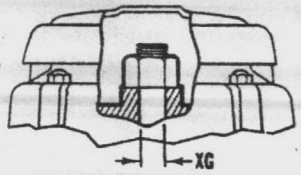
WPI-TYPE AU
FRAMES 182 THRU 256TPA

HIGH THRUST VERTICAL HOLLOSHAFT
NEMA P BASE

DIMENSIONS

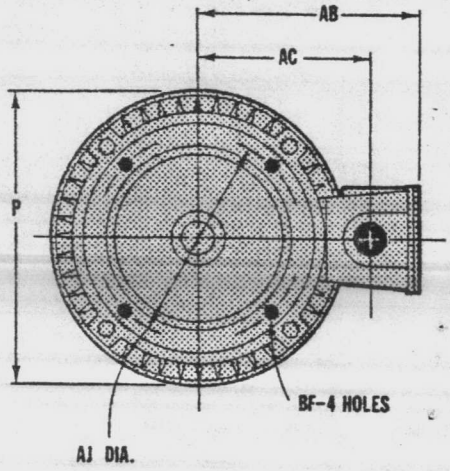
FEATURES:





HOLLOW SHAFT BORE

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
PRINTED IN U.S.A.

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

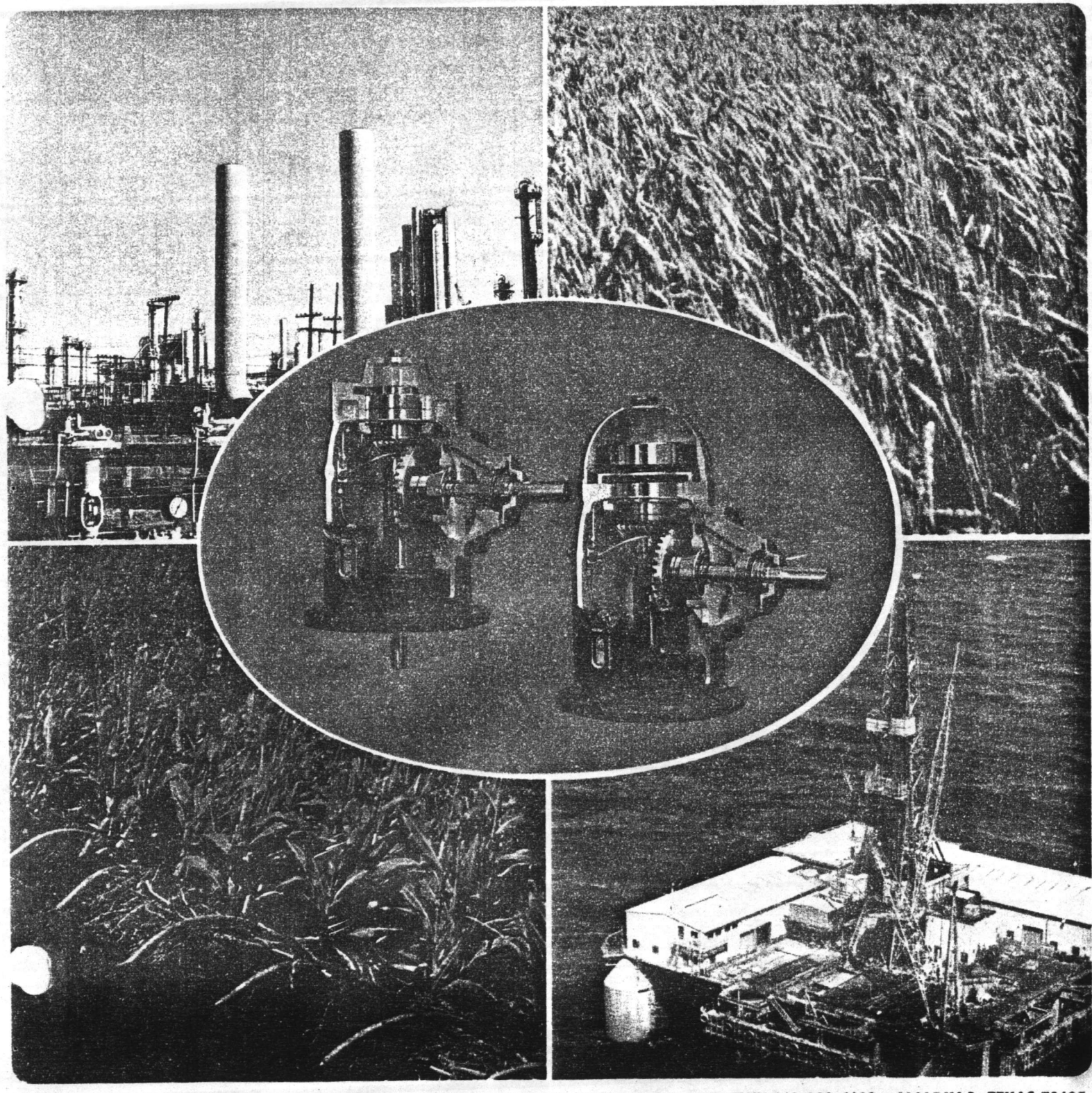
If properly endorsed this print is correct for frame & assembly positions indicated.
By _____ Date _____

MARMON

amarillo

RIGHT ANGLE GEAR DRIVES

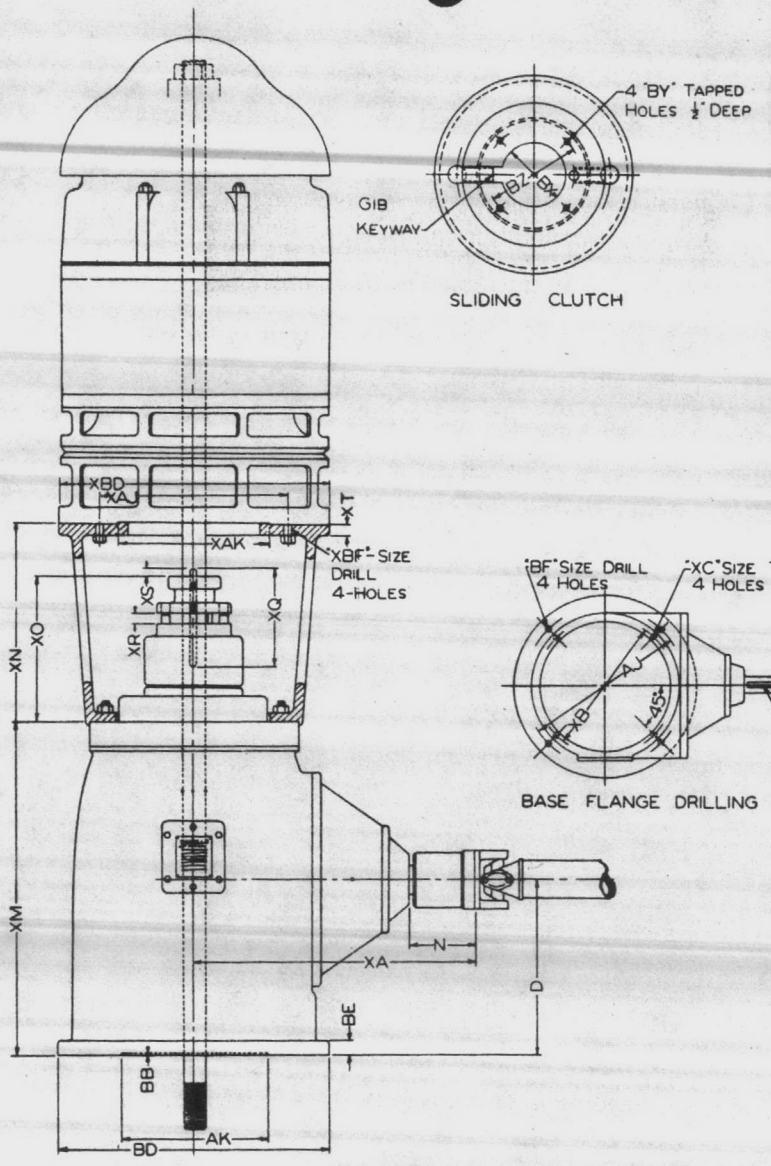
CATALOG NUMBER 30 • MARCH 1971

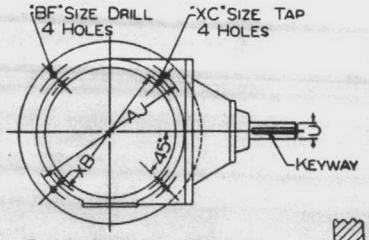


AMARILLO GEAR COMPANY - P.O. BOX 1789 - 2401 SUNDOWN LANE - A/C 806 622-1273, TWX 910-898-4128 - AMARILLO, TEXAS 79105

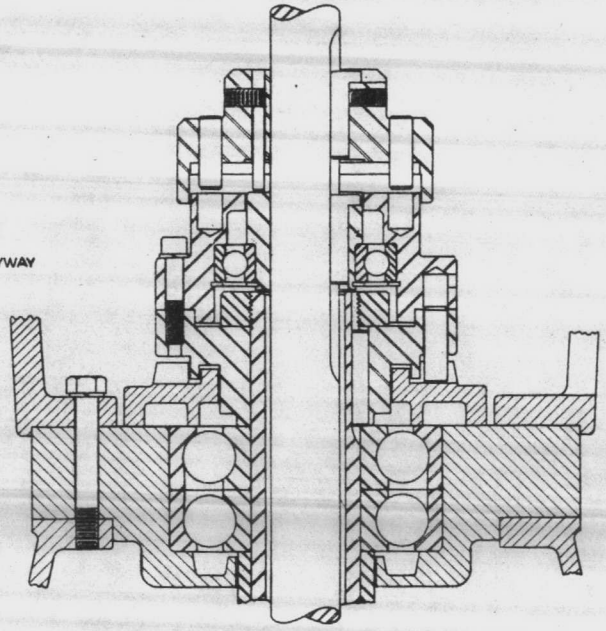
COMBINATION DRIVE

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.





BASE FLANGE DRILLING



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 Maximum
			Nominal	Actual	Keyway																						
C20	6¾	2⅜	1¼	1.249	5/16 x 5/32	9⅛	8.250	3/16	10	5/8	7/16	10⅞			9/32	12¼	12½	5½	5¼	½	1½	7/16					1*
C40A	8½	4⅜	1½	1.499	⅜ x 3/16	9⅛	8.250	¼	12	11/16	7/16	15⅝			9/32	16¾	16	6½	7	⅝	2	⅜					1¼
C40B	8½	4⅜	1½	1.499	⅜ x 3/16	14¾	13.500	¼	16½	11/16	11/16	15⅝			9/32	16¾	16	6½	7	⅝	2	⅜					1¼
C60	11½	4¼	1½	1.499	⅜ x 3/16	14¾	13.500	¼	16½	¾	11/16	16¾			9/32	20¼	18	7 13/16	7¾	¾	2¼	¾					1½
C80	11½	4¼	1⅛	1.874	⅜ x 3/16	14¾	13.500	¼	16½	¾	11/16	16¾			9/32	20⅜	18	7 13/16	7¾	¾	2¼	¾					1½
C100	11½	4¼	1⅛	1.874	⅜ x 3/16	14¾	13.500	¼	16½	¾	11/16	16¾			9/32	20⅜	18	7 13/16	7¾	¾	2¼	¾					1½
C125	11½	4½	2 1/16	2.436	⅜ x 3/16	14¾	13.500	¼	16½	¾	11/16	18¾			9/32	21⅛	18	7½	9	¾	2¼	¾					1 11/16
C150	13¾	5¼	2 1/16	2.436	⅜ x 3/16	18¼	13.500	¼	20	1⅛	11/16	20⅞	14¾	⅝-11-NC	9/32	25⅝	20	9	10	⅞	2¾	⅞					2*
C200	13¾	5¼	2 1/16	2.436	⅜ x 3/16	18¼	13.500	¼	20	1⅛	11/16	20⅞	14¾	⅝-11-NC	9/32	25⅝	20	9	10	⅞	2¾	⅞					2
C275	16	6	2 15/16	2.936	¾ x ⅜	23	13.500	¼	24½	1⅛	13/16	†25½	14¾	⅝-11-NC	9/32	32⅝	27	12	11½	1⅛	3½	1					2 7/16
C375	16	6	2 15/16	2.936	¾ x ⅜	23	13.500	¼	24½	1⅛	13/16	†25½	14¾	⅝-11-NC	9/32	32⅝	27	12	11½	1⅛	3½	1					2 7/16
C450	16	6	3¾	3.749	⅞ x 7/16	23	13.500	¼	24½	1⅛	13/16	†25½	14¾	⅝-11-NC	9/32	32⅝	27	12	11½	1⅛	3½	1					2 7/16
C600	18	6	3¾	3.749	⅞ x 7/16	23	13.500	¼	24½	1⅛	13/16	†26¾	14¾	⅝-11-NC	9/32	34¼	27	12¼	11½	1⅛	3½	1⅛					2 7/16
C750	21	8	4	3.998	1 x ½	28¾	22.000	¼	30½	1¼	13/16	36⅞	26	¾-10-NC	7/16	42	30	16¼	15	1 3/16	4	1¼					2 15/16
C1000G	21	8	4	3.998	1 x ½	28¾	22.000	¼	30½	1¼	13/16	36⅞	26	¾-10-NC	7/16	42	30	16¼	15	1 3/16	4	1¼					2 15/16

* Model C20, ratio 1:3, maximum clutch bore ⅞"; 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.

† "XA" dimensions shown apply to ratios in Table 4 only. Consult factory for dimensions of all others.

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

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
	1760	125	0	4100	2250	5900	2250	9200	0	4100	0	5900			0	5900
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	150	0	5000	2700	6800	2700	10550	0	5000	0	6800	0	10550	0	6800
200	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
	1760	200	0	5000	2700	6800	2700	10550	0	5000	0	6800	0	10550	0	6800
275	720	147	0	8100	3920	13973	3920	25650	0	8100	0	13973	3920	25650	CONSULT FACTORY	
	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		
375	580	172	0	8700	4871	27550	4871	36250	0	8700	0	15008	4871	27550	CONSULT FACTORY	
	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		
	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		
450	580	207	0	8700	5583	27550	5583	36250	0	8700	0	15008	5583	27550	CONSULT FACTORY	
	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		
	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		
600	580	275	0	11600	6259	36250	6259	44645	0	11600	0	15008	6259	36250	CONSULT FACTORY	
	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		
	1760	600	0	8000	4500	25000	4500	32000	0	8000	0	10350	4500	25000		
750	580	344	0	11310	6959	36250	6959	44645	0	11310	0	15008	6259	36250	CONSULT FACTORY	
	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		
	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		
1000G	580	460	0	11310	9306	36250	9306	46738	0	11310	CONSULT FACTORY		CONSULT FACTORY		CONSULT FACTORY	
	720	535	0	10530	8719	33750	8719	43802	0	10530						
	870	611	0	9828	8241	31500	8241	41385	0	9828						
	960	654	0	9516	7994	30500	7994	40181	0	9516						
	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.

CONTRACTOR'S SUBMITTAL TRANSMITTAL

5ND LANTDIV 4-355/3 (Rev. 6/76)

☐ Copy to Fred Conn 22 02

CONTRACT NO.	TRANSMITTAL NO.	DATE
83-C-5842	5	2/2/84

FROM CONTRACTOR: East Coast Construction Co. Inc.

TO: Officer in Charge of Construction

PROJECT TITLE AND LOCATION: Repair Water Wells Bldgs 610 & M-628 MCB CAMP LEJEUNE NC. Well No 610

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	15201-3.5	24 hour Pumping Test Well No 610 Holcomb Blvd	6		

CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC

CONTRACTOR REPRESENTATIVE (Signature): Ronald K. Eller

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

RECEIVED FEB 3 1 PM '84 ROICC CAMP LEJEUNE

RECEIVED MAR 1 1984

COPIES TO: ROICC (2) LANTDIV (1) A-E (1)	DATE	SIGNATURE
		[illegible] CONSTRUCTION CO., INC.

PUMPING TEST DATA

Test conducted by: Carolina Well & Pump Co. R. Thomas - R. Patterson
Well Owner: U. S. Marine Corp. Address:
Pumped Well No.: 610 Location: Holcomb County: Onslow
Observation Well Locations:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 4 x 6 orfice Water levels measured with: electric 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
1/24/84							
9:30 AM		15	250			17'11"	
9:35	5 min.	"	"			18' 2"	
9:40	10	"	"			18' 5"	
9:45	15	"	"			18' 7"	
9:50	20	"	"			18' 9"	
9:55	25	"	"			18'11"	
10:00	30	"	"			19' 5"	
10:05	35	"	"			22' 8"	
10:10	40	"	"			24'10"	
10:15	45	"	"			24'10"	
10:20	50	"	"			25' 0"	
10:25	55	"	"			25' 4"	
10:30	60	"	"			25' 4"	
10:35	65	"	"			25' 4"	
10:40	70	"	"			25' 4"	
10:45	75	"	"			25' 4"	
10:50	80	"	"			25' 4"	
10:55	85	"	"			25' 7"	
11:00	90	"	"			25' 7"	
11:05	95	"	"			25' 7"	
11:10	100	"	"			25' 7"	
11:15	105	"	"			25' 7"	
11:20	110	"	"			25' 7"	
11:25	115	"	"			25' 7"	
11:30	120	"	"			25' 7"	
11:45	135	"	"			25' 7"	
12:00	150	"	"			25' 9"	
12:15	165	"	"			25' 9"	
12:30	180	"	"			26' 3"	
1:30	240	"	"			26' 3"	
2:30	300	"	"			26' 3"	
3:30	360	"	"			26' 3"	
4:30	420	"	"			26'10"	
5:30	480	"	"			26'10"	
6:30	540	"	"			26'10"	
7:30	600	"	"			26'10"	
8:30	660	"	"			27'10"	
9:30	720	"	"			27'10"	
10:30	780	"	"			27'10"	
11:30	840	"	"			27'10"	
12:30	900	"	"			27'10"	
1:30	960	"	"			27'10"	
2:30	1020	"	"			27'10"	
3:30	1080	"	"			27'10"	

PUMPING TEST DATA

Test conducted by: Carolina Well & Pump Co. R. Thomas - R. Patterson
Well Owner: U. S. Marine Corp. Address:
Pumped Well No.: 610 Location: Holcomb County: Onslow
Observation Well Locations:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 4 x 6 orfice Water levels measured with: electric 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
1/25/84							
4:30 AM	1140	15	250			27'10"	
5:30	1200	"	"			27'10"	
6:30	1260	"	"			27'10"	
7:30	1320	"	"			27'10"	
8:30	1380	"	"			27'10"	
9:30	1440	"	"			27'10"	
		Recovery					
9:35						25'11"	
9:40	5 min.					24' 4"	
9:45	10					23' 5"	
9:50	15					22'10"	
9:55	20					22' 5"	
10:00	25					21' 4"	
10:05	30					21' 4"	
10:10	35					21' 3"	
10:15	40					21' 0"	
10:20	45					21' 0"	
10:25	50					21' 0"	
10:30	55					20' 8"	
10:35	60					20' 3"	
10:40	65					20' 1"	
10:45	70					20' 0"	
10:50	75					20' 0"	
10:55	80					18'11"	
11:00	85					18' 9"	
11:05	90					17'11"	
11:10	95					17'11"	
11:15	100					17'11"	

PHYSICAL AND CHEMICAL ANALYSIS OF WATER

SAMPLE NO.

FROM: *(Station or unit)* Well 10 Bldg 610 HP

DATE 8-12-57

TO: *(Name and location of laboratory)*

SAMPLE FROM *(Location of sampling point)*

COLLECTED BY	DATE	HOUR	SOURCE *(Designate ground, surface, raw, treated)*
Shackelford	8-12-57		Raw

REASON FOR EXAMINATION

EXAMINATION REQUESTED BY

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

I. FIELD ANALYSIS

1. pH	TEMPERATURE °F	TEMPERATURE °C

ITEM	PPM
2. CARBON DIOXIDE (CO_2)	
3. DISSOLVED OXYGEN (O_2)	
4. HYDROGEN SULFIDE (H_2S)	
5. CHLORINE DEMAND (CI_2)	

FIELD ANALYSIS BY

DATE OF ANALYSIS

II. SPECIAL LABORATORY ANALYSES

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

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

III. ROUTINE LABORATORY ANALYSIS

(CHECK ONE)

	REQUESTED		NOT REQUESTED

ITEM	PPM
1. COLOR	
2. TURBIDITY	
3. ALKALINITY ($CaCO_3$) P	0
ALKALINITY ($CaCO_3$) MO	127
4. TOTAL HARDNESS ($CaCO_3$)	126
5. NON-CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*	
6. CARBONATE HARDNESS ($CaCO_3$) *(By Computation)*	
7. TOTAL DISSOLVED SOLIDS	
8. SPECIFIC CONDUCTANCE *(Micromhos)*	
9. CALCIUM (Ca)	48.0
10. MAGNESIUM (Mg)	1.2
11. SODIUM (Na) AND POTASSIUM (K)	
12. HYDROXIDE ~~(OH)~~* $CaCO_3$	0.0
13. BICARBONATE ~~(HCO_3)~~* $CaCO_3$	127.0
14. CARBONATE ~~(CO_3)~~* $CaCO_3$	0.0
15. SULFATE (SO_4)	
16. CHLORIDE (Cl)	8.0
17. NITRATE (NO_3)	
18. IRON (Fe) TOTAL	1.5
19. MAGANESE (Mn)	
20. SILICA (SiO_2)	
21. FLUORIDE (F)	

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

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

LABORATORY ANALYSIS BY

DATE OF ANALYSIS

FORM A-4
JUNE '66)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF WATER DATA COORDINATION
INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

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

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
M61	Q	° ' " N: 34 41 13	° ' " W: 77 19 53	

6. AGENCY STATION NO.	7. STATION NAME
610	HP20-610

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

12. PERIOD OF RECORD Began	Discontinued	Y Continuous Interruption Exceeds 1 Year	13.	14.
1942				

15. SITE

- ☐ 101 Stream
- ☐ 102 Canal
- ☐ 103 Lake
- ☐ 104 Reservoir
- ☐ 105 Estuary
- ☐ 106 Spring
- ☒ 107 Well
- ☐ 110 Other

16. FREQUENCY OF MEASUREMENT

- ☐ 201 Continuous Recorder
- ☐ 202 Telemetered
- ☐ 203 Daily
- ☐ 204 Weekly
- ☐ 205 Monthly
- ☐ 206 Quarterly
- ☐ 207 Seasonal
- ☐ 208 Annual
- ☐ 209 Other Periodic
- ☒ 210 Occasional

17. TYPES OF DATA AVAILABLE

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

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

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

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

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

18. SUPPLEMENTARY DATA FOR SITE

- ☐ 421 Surface Water Station
- ☐ 422 Ground Water Station
- ☐ 423 Water Stage or Level
- ☒ 424 Water discharge
- ☐ 425 Time of Travel
- ☐ 426 Drainage Area

19. STORAGE OF DATA

- ☐ 501 Periodic Report
- ☐ 502 Areal Report
- ☒ 503 Not Published
- ☐ 504 Data on Punchcard
- ☐ 505 Data on Magnetic Tape
- ☐ 506 Other

20. OFFICE AT WHICH DATA AVAILABLE

Office: BASE MAINTENANCE DEPARTMENT, UTILITIES DIVISION

Street No.: MARINE CORPS BASE

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

City Code: 0735

21. OFFICE COMPLETING FORM

BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME

F. E. TEW, JR.

23. DATE Month: SEPT Year: 19 66

Marine Barricks
New River, N. C.
April 20, 1942

WELLS-PERMANENT WATER SUPPLY-REGIMENTAL AREA
By Layne Atlantic Company

Report on Well No. 10

Location: West side of main access Road, 3000' South of Wallace Creek Bridge. As shown on M. B. Drwg. No. 521.

Date Drilled: April 1942

Status: A 23" hole cased with 18" I. D. steel caseing to a depth of 30' below surface. The anular space around this was filled with cement grout. A 17½" hole drilled to a total depth of 198'.

Log of formation:

0 to 30'	White Sand
30' to 33'	Blue Clay
33' to 47'	Sand and clay (tight)
47' to 94'	Sand and Blue Clay with Shells
94' to 161'	Rock hard and soft layers
161' to 169'	Rock, Sand and Shells
169' to 171'	Hard Rock
171' to 198'	Rock, Sand and Shells

Remarks: Because of the presence of Sand in the Rock formation it was necessary to construct a gravel wall well.

Gravel Wall Constructions: An 8" steel pipe with sections of Silican Bronze Shatter screen was lowered into the 17½" hole to a dept of 190'. The anular space around this was filled with a special ¼" Cap May gravel.

Log of screen Setting:

0	to 60'	8" Steel pipe
60'	to 70'	8" Bronze screen
70'	to 90'	8" Steel pipe
90'	to 110'	8" Bronze screen
110'	to 130'	8" Steel pipe
130'	to 140'	8" Bronze screen
140'	to 180'	8" Steel pipe
180'	to 190'	8" Bronze screen

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

Static Level: 16' below surface.

Pumping: After 25 hours pumping well gave a constant flow of 250 gallons per minute with a 24 foot draw down from static level. Pumps 390' gallons per minute with a draw down of 40' from static level.

Marine Geronimo
New Mayes, N. M.
April 20, 1942

PUBLIC-MANAGEMENT WATER SUPPLY-HYDROLOGICAL AREA
By Ground Utilities Division

Record on Well No. 10

Location: Near side of main canyon Road, 3000' South of Mallace Creek Bridge. As shown on M. S. Surv. No. 527.

Date Drilled: April 1942

Casing: 8 5/8" hole cased with 10" I. P. steel casing to a depth of 30' below surface. The outer space around this was filled with cement grout. A 17½" hole drilled to a total depth of 198'.

Log of Formations:

0 to 20'	Main Sand
20' to 23'	Blue Clay
23' to 47'	Sand and clay (tight)
47' to 94'	Sand and Blue Clay with Shells
94' to 161'	Rock hard and soft layers
161' to 169'	Rock, Sand and Shells
169' to 171'	Hard Rock
171' to 198'	Rock, Sand and Shells

Remarks: Because of the presence of Sand in the Rock formation it was necessary to construct a gravel wall well.

Gravel Wall Construction: An 8" steel pipe with sections of Milliken Bronze Shutter screen was lowered into the 17½" hole to a depth of 190'. The annular space around this was filled with a special 4" Cap Clay gravel.

Log of screen Setting:

	to 60'	8" Steel pipe
60'	to 70'	8" Bronze screen
70'	to 90'	8" Steel pipe
90'	to 110'	8" Bronze screen
110'	to 130'	8" Steel pipe
130'	to 140'	8" Bronze screen
140'	to 180'	8" Steel pipe
180'	to 190'	8" Bronze screen

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

Static Level: 101' below surface.

Pumping: After 25 hours pumping well gave a constant flow of 250 gallons per minute with a 24 foot draw down from static level. Pumps 200' below surface with a 40' draw down from static level.

WATER ANALYSIS

By N. H Kellam

Date April 10 42

Sample from Supply Well at Well Site No. 10 Reg area

Total Solids	PPM	Dissolved Solids	PPM
Suspended Solids	PPM	Volatile Solids	PPM

Phenol. Alk. as $CaCo_3$	0 PPM	Silica as Sio_2	PPM
Total Alk. " "	130 "	Ferrous Iron as Fe	"
Carbonates " "	0 "	Total Iron as Fe	"
Bicarbonates " "	130 "	Aluminum as Al.	"
Chlorides as Cl.	25 "	Calcium as Ca.	"
Sulphates as SO_4	"	Magnesium as Mg.	"
Nitrites as No_2	"	Sodium as Na.	"
Carbon Dioxide as CO_2	"		

pH 6.8 Soap Hardness as $CaCO_3$ PPM

Odor Slight Turbidity

REMARKS

W E L L D A T A

Well No. 10

SPECIFICATIONS

Pump Base Elevation	46.0 30.3
Ground Elevation	44.0 28.3
Static Elevation	12.3
Maximum allowed Drawdown	-11.7
Total Discharge	250 G.P.M.
Total Head	81 Feet

TEST

305 G.P.M.	10#	Pressure	Drawdown	-14.2
290 G.P.M.	12.5#	Pressure	Drawdown	-13.2
275 G.P.M.	15#	Pressure	Drawdown	-11.4
250 G.P.M.	19#	Pressure	Drawdown	- 7.2
200 G.P.M.	29#	Pressure	Drawdown	-2.6
188 G.P.M.	30#	Pressure	Drawdown	- 1.5

Recovers to elevation + 10 in three (3) minutes.

This well should be discharged out side for 30 minutes before pumping into line, and should not be pumped over 200 G.P.M. as it will pump sand.

Air line 61.5'

W E L L D A T A

Well No. 1

SIDETRACKED AT 205

Turn Base Elevation	45.0
Ground Elevation	44.0
Static Elevation	12.5
Maximum Allowed Drawdown	-11.7
Total Discharge	250 G.P.M.
Total Head	41 Feet

TESTS

205 G.P.M.	10#	Pressure	Drawdown -1.2
250 G.P.M.	12.6#	Pressure	Drawdown -15.2
275 G.P.M.	14#	Pressure	Drawdown -17.4
280 G.P.M.	14#	Pressure	Drawdown - 7.2
300 G.P.M.	25#	Pressure	Drawdown -2.0
188 G.P.M.	30#	Pressure	Drawdown - 1.5

Recovers to elevation + 10 in three (3) minutes.

This well should be discharged out side for 30 mi nutes before pumping into line, and should not be pumped over 200 G.P.M. as it will pump sand.

W E L L D A T A

Well No. 10

SPECIFICATIONS

Pump Base Elevation	46.0
Ground Elevation	44.0
Static Elevation	12.3
Maximum allowed Drawdown	-11.7
Total Discharge	250 G.P.M.
Total Head	81 Feet

TEST

305 G.P.M.	10#	Pressure	Drawdown	-14.2
290 G.P.M.	12.5#	Pressure	Drawdown	-13.2
275 G.P.M.	15#	Pressure	Drawdown	-11.4
250 G.P.M.	19#	Pressure	Drawdown	- 7.2
200 G.P.M.	29#	Pressure	Drawdown	- 2.6
188 G.P.M.	30#	Pressure	Drawdown	- 1.5

Recovers to elevation + 10 in three (3) minutes.

This well should be discharged out side for 30 minutes before pumping into line, and should not be pumped over 200 G.P.M. as it will pump sand.

250 G.P.M. – SINGLE DRIVE – 10 H.P.
253 " " actual. – D.D. – 8.35
260 " " " " – D.D. – 8.90

Armco Iron Screen Used In This Well

D. T. A. Well No. 11

Onan

Power Source
for Living

HAYES & LUNSFORD ELECTRICAL CONTR'S INC.
P.O. BOX 754, ASHEVILLE, NC 28802

THIS SUBMITTAL AND/OR TECHNICAL DATA
REFERS TO SECTION 16216 PARAGRAPH 1.4
OF THE SPECIFICATIONS

Prepared for:

Hayes & Lunsford

Post Office Box 754

Asheville, NC 28802

Project: Building 610

Building BB 221

Building LCH 4007

Prepared by:

Owsley & Sons, Inc.

Drawer L

Fort Mill, SC 29715

OWSLEY & SONS
INCORPORATED

FORT MILL, S.C. 803 548-3636 | GREENSBORO, N.C. 919/668-2454 | WILMINGTON, N.C. 919/763-4666 | RICHMOND, VA. 804/275-2603

OWSLEY

SUMMARY OF ACCEPTANCE REQUIREMENTS

BLDG 610,BB221, LCH4007 Contract N62470-85-B6441

ENGINE GENERATOR

16216-1.4.1 Provide anchor bolt details for setting on foundation.

16216-1.4.2 Provide certified vibration stress reports for each diesel engine and prototype test reports for the generator.

16216-2.1.1 Generator set for Bldg LC 4007 required to supply 40 kW output. (Quotation form states 30 kW but Mfgr states 44 kW). Discrepancy is noted but generator with 44 kW is satisfactory.

16216-2.3.2.3 Provide voltage adjusting rheostat.

MUFFLER

16216-2.12 The muffler finish shall be zinc coated or phosphated and prime painted unless enclosed in the housing.

OWSLEY & SONS, INC.

Drawer L
Fort Mill, S.C. 29715
803/548-3636

P.O. Box 34508
Richmond, VA. 23234
804/275-2603

P.O. Box 8627
Greensboro, N.C. 27419
919/668-2454

P.O. Box 1058
Wilmington, N.C. 28402
919/763-4666

QUOTE # 197-96 DATE: November 18, 1986
PROJECT: Building 610
1 Model 40DL6 ONAN Housed, Water Cooled, Diesel Engine Driven Generator Rated 30 KW Continuous Standby at 120/240 VOLTS, 37.5 KVA, 3 PHASE, 4 WIRE, 60 HERTZ, per spec sheet A-869 attached with the following modifications & accessories:

FUEL SYSTEM
- Diesel
  - Flexible fuel lines
- Day tank 25 gallons
  - with electric fuel pump and accessories:
  - weather proof
- Fuel tank 275 gallons
  - aboveground
  - steel double wall
  - with internal fitting kit to include:
    - fill cap, vent
  - Levelometer/Fuel Gauge

COOLING SYSTEM
- Unit mounted radiator
- 3 gallons Anti-freeze
- Engine block heater 120 V.A.C. 1 phase.

CONTROLS, INSTRUMENTS AND SAFETIES
- Voltmeter-Ammeter Phase selector with
  - OFF position, frequency meter, running time meter.
- Governor: Electrical
- Main line circuit breaker 3 pole, 100 amps
  - mounted on generator
- Individual fault lamps for:
  - Low oil pressure shutdown
  - High engine temperature
  - Overspeed shutdown
  - Overcrank cutout
- Switch not in automatic
- Prealarm for low oil pressure, and high engine temperature.
- Remote annunciator panel
- Alarm howler
- Oil pressure gauge, water temperature gauge
  - battery charge ammeter.

ENCLOSURES AND EXHAUST COMPONENTS
- Muffler grade: residential
- Weather protective enclosure: Steel
- Exhaust system: mounted on generator enclosure
- Raincap

☐ ACCEPTED ☐ NOT ACCEPTED
☒ ACCEPTED AS CORRECTED (SEE SUMMARY)
☐ REVISE AND RESUBMIT

Checking is for compliance with the information given in the plans and/or specifications and for conformance with the design concept of the project only. Contractor is responsible for dimensions to be verified and correlated at the job and for the coordination of the work of all trades and subject to all Contract requirements.

BY MD DATE 12/1/86
ALLEN & HOSHALL, INC.

TRANSFER SWITCH AND ACCESSORIES

1 ONAN Automatic transfer switch model
OTBCD 100-*U/3401
*5D Building 610 & Building LCH4007
*4 Building BB221
rated 120/240 / 120/208 volts, 120 amp, 3 phase, 3 pole.
with the following characteristics and options
per spec sheet: A-878.
Undervoltage sensing
Under/Over frequency sensing
Time delay engine start
Time delay engine stop
Time delay on transfer
Time delay on retransfer
Simulated power failure switch
Lamps to indicate: load connection
Auxiliary contacts:
normal side
emergency side
Nema class 4 enclosure
Neutral bar
Manual transfer operator handle

MISCELLANEOUS MATERIALS AND TESTING

Starting battery: 12 VDC
Lead Acid
Battery: rack
SCR battery float charger 10 amp.
12 quarts engine lubrication oil
Vibration isolators
Standard between Eng/Gen & skid base
Operators manuals
1 Year Warranty
Initial startup and checkout not to exceed 4 hours.
Load bank test of 8 hours.

WE OFFER NO BID ON THE FOLLOWING: extended wiring or piping
(fuel or exhaust cooling)
exhaust insulation

OWSLEY & SONS, INC.

Drawer L
Fort Mill, S.C. 29715
803/548-3636

P.O. Box 34508
Richmond, VA. 23234
804/275-2603

P.O. Box 8627
Greensboro, N.C. 27419
919/668-2454

P.O. Box 1058
Wilmington, N.C. 28402
919/763-4666

QUOTE # 197-96 DATE: November 18, 1986

PROJECT: Building BB221

1 Model 40DL6 ONAN Housed, Water Cooled, Diesel Engine Driven Generator Rated 30 KW Continuous Standby at 120/208 VOLTS, 37.5 KVA, 3 PHASE, 4 WIRE, 60 HERTZ, per spec sheet A-869 attached with the following modifications & accessories:

FUEL SYSTEM
- Diesel
  - Flexible fuel lines
- Day tank 25 gallons
  - with electric fuel pump and accessories:
  - weather proof
- Fuel tank 275 gallons
  - aboveground
  - steel double wall
  - with internal fitting kit to include:
    - fill cap, vent
  - Levelometer/Fuel Gauge

COOLING SYSTEM
- Unit mounted radiator
- 3 gallons Anti-freeze
- Engine block heater 120 V.A.C. 1 phase.

CONTROLS, INSTRUMENTS AND SAFETIES
- Voltmeter-Ammeter Phase selector with
  - OFF position, frequency meter, running time meter.
- Governor: Electrical
- Main line circuit breaker 3 pole, 100 amps
  - mounted on generator
- Individual fault lamps for:
  - Low oil pressure shutdown
  - High engine temperature
  - Overspeed shutdown
  - Overcrank cutout
- Switch not in automatic
- Prealarm for low oil pressure, and high engine temperature.
- Remote annunciator panel
- Alarm howler
- Oil pressure gauge, water temperature gauge
  - battery charge ammeter.

ENCLOSURES AND EXHAUST COMPONENTS
- Muffler grade: residential
- Weather protective enclosure: Steel
- Exhaust system: mounted on generator enclosure
- Raincap

☐ ACCEPTED ☐ NOT ACCEPTED
☒ ACCEPTED AS CORRECTED (SEE SUMMARY)
☐ REVISE AND RESUBMIT

Checking is for compliance with the information given in the plans and/or specifications and for conformance with the design concept of the project only. Contractor is responsible for dimensions to be verified and correlated at the job and for the coordination of the work of all trades and subject to all Contract requirements.

BY MD DATE 12/1/86

ALLEN & HOSHALL, INC.

TRANSFER SWITCH AND ACCESSORIES

1 ONAN Automatic transfer switch model
OTBCD 100-*U/3401
*5D Building 610 & Building LCH4007
*4 Building BB221
rated 120/240 / 120/208 volts, 120 amp, 3 phase, 3 pole.
with the following characteristics and options
per spec sheet: A-878.
Undervoltage sensing
Under/Over frequency sensing
Time delay engine start
Time delay engine stop
Time delay on transfer
Time delay on retransfer
Simulated power failure switch
Lamps to indicate: load connection
Auxiliary contacts:
normal side
emergency side
Nema class 4 enclosure
Neutral bar
Manual transfer operator handle

MISCELLANEOUS MATERIALS AND TESTING

Starting battery: 12 VDC
Lead Acid
Battery: rack
SCR battery float charger 10 amp.
12 quarts engine lubrication oil
Vibration isolators
Standard between Eng/Gen & skid base
Operators manuals
1 Year Warranty
Initial startup and checkout not to exceed 4 hours.
Load bank test of 8 hours.

WE OFFER NO BID ON THE FOLLOWING: extended wiring or piping
(fuel or exhaust cooling)
exhaust insulation

OWSLEY & SONS, INC.

Drawer L
Fort Mill, S.C. 29715
803/548-3636

P.O. Box 34508
Richmond, VA. 23234
804/275-2603

P.O. Box 8627
Greensboro, N.C. 27419
919/668-2454

P.O. Box 1058
Wilmington, N.C. 28402
919/763-4666

QUOTE # 197-96 DATE: November 18, 1986
PROJECT: Building LCH 4007
1 Model 40DL6 ONAN Housed, Water Cooled, Diesel Engine Driven Generator Rated 30 KW 40 Continuous Standby at 120/240 VOLTS, 37.5 KVA, 3 PHASE, 4 WIRE, 60 HERTZ, per spec sheet A-869 attached with the following modifications & accessories:

FUEL SYSTEM
- Diesel
  - Flexible fuel lines
- Day tank 25 gallons
  - with electric fuel pump and accessories:
  - weather proof
- Fuel tank 275 gallons
  - aboveground
  - steel double wall
  - with internal fitting kit to include:
    - fill cap, vent
  - Levelometer/Fuel Gauge

COOLING SYSTEM
- Unit mounted radiator
- 3 gallons Anti-freeze
- Engine block heater 120 V.A.C. 1 phase.

CONTROLS, INSTRUMENTS AND SAFETIES
- Voltmeter-Ammeter Phase selector with
  - OFF position, frequency meter, running time meter.
- Governor: Electrical
- Main line circuit breaker 3 pole, 100 amps
  - mounted on generator
- Individual fault lamps for:
  - Low oil pressure shutdown
  - High engine temperature
  - Overspeed shutdown
  - Overcrank cutout
- Switch not in automatic
- Prealarm for low oil pressure, and high engine temperature.
- Remote annunciator panel
- Alarm howler
- Oil pressure gauge, water temperature gauge
  - battery charge ammeter.

ENCLOSURES AND EXHAUST COMPONENTS
- Muffler grade: residential
- Weather protective enclosure: Steel
- Exhaust system: mounted on generator enclosure
- Raincap

☐ ACCEPTED ☐ NOT ACCEPTED
☒ ACCEPTED AS CORRECTED (SEE SUMMARY)
☐ REVISE AND RESUBMIT

Checking is for compliance with the information given in the plans and/or specifications and for conformance with the design concept of the project only. Contractor is responsible for dimensions to be verified and correlated on the job and for the coordination of the work of all trades and subject to all Contract requirements.

BY MD DATE

ALLEN & HOSHALL, INC.

TRANSFER SWITCH AND ACCESSORIES

1 ONAN Automatic transfer switch model
OTBCD 100-*U/3401
*5D Building 610 & Building LCH4007
*4 Building BB221
rated 120/240 / 120/208 volts, 120 amp, 3 phase, 3 pole.
with the following characteristics and options
per spec sheet: A-878.
Undervoltage sensing
Under/Over frequency sensing
Time delay engine start
Time delay engine stop
Time delay on transfer
Time delay on retransfer
Simulated power failure switch
Lamps to indicate: load connection
Auxiliary contacts:
normal side
emergency side
Nema class 4 enclosure
Neutral bar
Manual transfer operator handle

MISCELLANEOUS MATERIALS AND TESTING

Starting battery: 12 VDC
Lead Acid
Battery: rack
SCR battery float charger 10 amp.
12 quarts engine lubrication oil
Vibration isolators
Standard between Eng/Gen & skid base
Operators manuals
1 Year Warranty
Initial startup and checkout not to exceed 4 hours.
Load bank test of 8 hours.

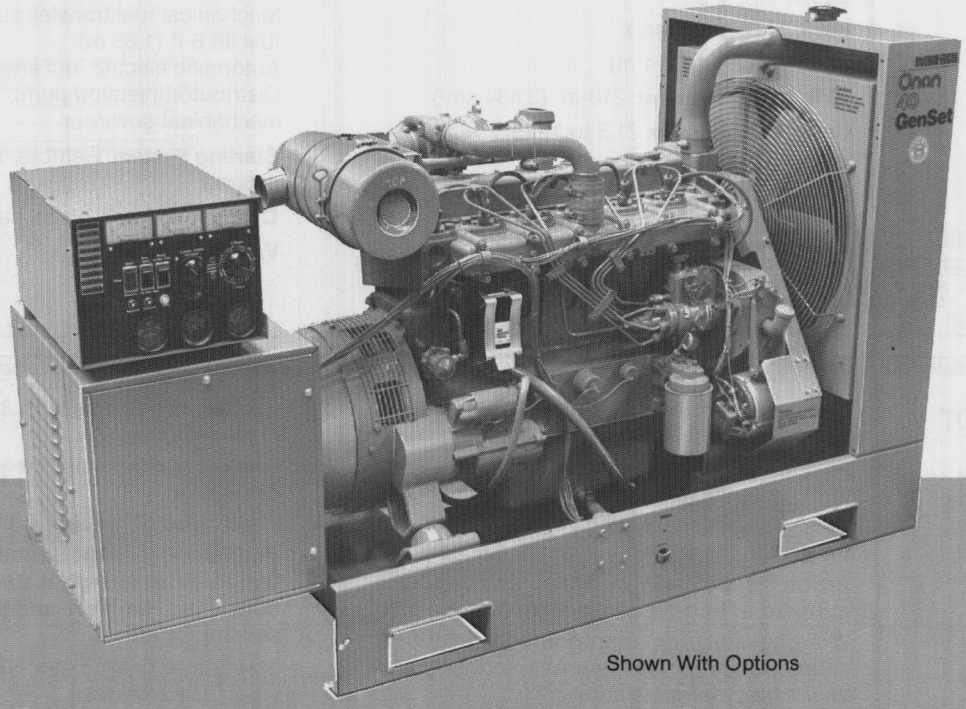
WE OFFER NO BID ON THE FOLLOWING: extended wiring or piping
(fuel or exhaust cooling)
exhaust insulation

Onan

40 DL6T GenSet

Diesel

Standby Power
Prime Power



Shown With Options

- **Prototype Test Supported (PTS)** to ensure reliability
- **Revolving Field, Brushless Alternators** 12-lead, broad range (reconnectible models)
- **Torque-Matched** voltage excitation system provides superior motor starting
- **Onan-Built L Series** Turbocharged diesel engine
- **50 or 60 hertz** models available
- Complete line of **Factory Options and Accessories**
- Backed by a **Worldwide Sales & Service** network

Specification Sheet *Specifications May Change Without Notice* Printed in U.S.A. 10/85 **A-904B**

GenSet Performance

One step load acceptance: 100% of nameplate kW rating. Meets requirements of NFPA 110 paragraph 5-13, 2.6

Voltage recovery after acceptance of 100% of rated load in one step: 2 **sec**

Voltage regulation under varying loads from 0 to 100% load ±3% **max.**

Random voltage variation: Will not exceed ±1% of its mean value for constant loads from no load to full load.

Frequency regulation under varying loads from 0 to 100% load: 5% **max**

Random frequency variation: Will not exceed ±0.5% of its mean value for constant loads from no load to full load

- **Electromagnetic Interference Attenuation** meets requirements of most industrial and commercial applications.
- **Total Harmonic Content** of the AC waveform is less than 5%
- **Telephone Influence Factor** (TIF) less than 40 per NEMA MG1-22.43.
- **Alternator Temperature Rise** at rated load is within NEMA MG1-22.40, BS 4999 part 32, and IEC 34-1.
- **Waveform Deviation Factor,** less than 0.06 line-to-line, reduces risk of overheating and of interference with sensitive communication equipment.

Continuous Standby Rating: The unit will operate at the stated rating for the duration of normal utility power interruptions.

Engine Detail

Model: Onan L634T

Design: Metric diesel

Cylinders: 6, in-line

Cycle: 4

Bore: 3.50-in (89 mm)

Stroke: 3.62-in (92 mm)

Piston Displacement: 210-in^3 (3,434 cm^3)

Compression Ratio: 21.5 to 1

Radiator Cooling:
Coolant capacity—18.5-qt (17.5 L) Rated at 50°C ambient against an external restriction of 0.5-in (12.7 mm) H_20

Aspiration: Turbocharged

Main Bearings: 7

Lube Oil Capacity: 12-qt (11.4 L)

Fuel System:
Fuel filter
Mechanical fuel transfer pump, fuel lift 6-ft (1.83 m)
Automatic electric fuel shutoff
Distributor injection pump with integral mechanical governor

Starting System: Remote, 12-volt, 2-wire, negative ground

Cylinder Block: 1-piece, cast iron

Valves: Overhead

Alternator Detail

Design: Onan revolving field, 4-pole, brushless, drip proof construction

Stator: Skewed for minimal field heating and voltage harmonics

Twice impregnated with high temperature polyester varnish

Rotor: Dynamically balanced and directly coupled to engine with a flexible drive disc.

Windings vacuum impregnated with 100% solid epoxy resin for improved cooling and environmental protection

Amortisseur (damper) windings minimize voltage deviation or unbalance

Exciter: Brushless, with 8-pole stator and 3-phase rotor

Rectifiers encapsulated for environmental protection

Field circuit breaker (manual reset)

Voltage Regulator: Solid state and temperature compensated, with silicon controlled rectifiers and phase controlled sensing circuit

Insulation: Class F per NEMA MG1-1.65 and BS 2757 definition

Insulating varnish conforms to MIL-I-24092, Grade CB, Class 155°C

Bearing: Double sealed, prelubricated ball bearing

Cooling: Direct drive centrifugal blower

Control Detail

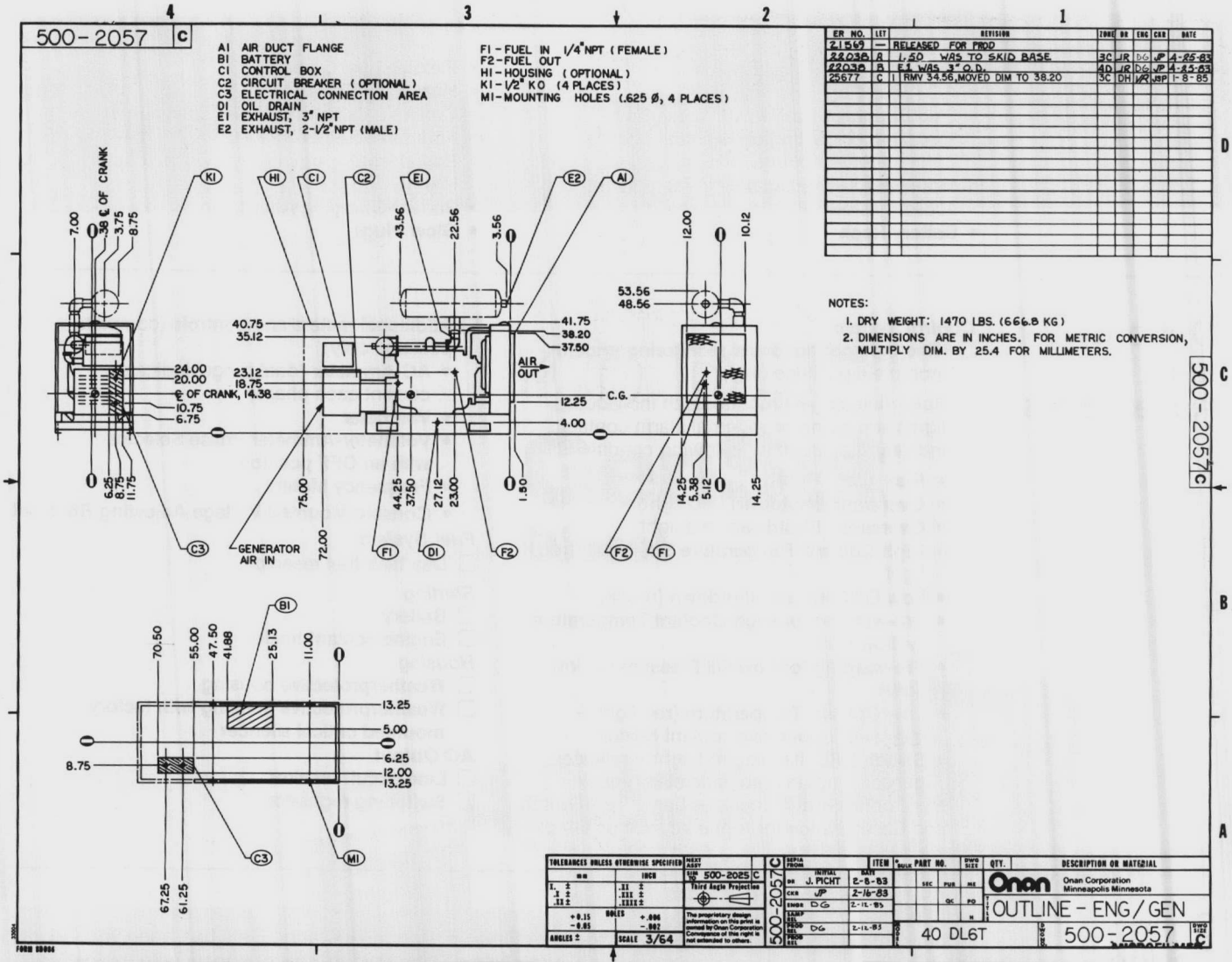
Unit Mounted Console with Panel Lighting

DC Engine Controls

Run-Stop-Remote switch
Remote start-stop terminals
Lighted oil pressure gauge
Lighted coolant temperature gauge
Lighted battery charge rate ammeter
Running time meter
Preheat switch (glow plugs)
Control circuit breaker, 7-amp
Remote circuit breaker, 7-amp

Two-Light GenSet Monitoring System
Run light (green)
Fault light (red) with alarm contact (manual reset) indicates engine shutdown for:

- Overcrank
- Overspeed
- High coolant temperature
- Low oil pressure



CAUTION: For construction details, all models, obtain installation outline from the factory.

Approximate net weight: 1470-lb (667 kg)

Operating Data 40 DL6T

Hertz	Engine Power Min. bhp (kW)	Piston Speed fpm (mm/s)	Radiator Cooling Air-cfm (m³/min)	Max. Heat Rejection (Engine to coolant) Btu/min (MJ/min)	Coolant Pumpage gpm (L/min)	Combustion Requirement Air-cfm (m³/min)	Generator Cooling Air-cfm (m³/min)	Heat Radiated to Room (Engine and Generator) Btu/min (MJ/min)	Average Fuel Consumption #2 Diesel, gph (L/h) at load- 0	1/4	2/4	3/4	4/4	Motor Starting Three-Phase kW	kVA
60 (1800 r/min)	65 (48.5)	1086 (5517)	5460 (155)	2900 (3.05)	41 (155)	140 (4.0)	240 (6.8)	1100 (1.16)	1.0 (3.8)	1.6 (6.0)	2.3 (8.7)	3.1 (11.6)	3.9 (14.9)	44	150
50 (1500 r/min)	53 (39.5)	905 (4597)	3100 (88)	2490 (2.62)	34 (129)	100 (2.9)	200 (5.6)		0.7 (2.8)	1.2 (4.7)	1.8 (6.8)	2.5 (9.3)	3.2 (12.1)		

Model Selection

60-Hz 1800 r/min

☐ **40 DL6T-15R**
3-phase, Reconnectible, Broad Range
120/208V 139A 127/220V 131A
139/240 120 120/240 120
240/416 69 254/440 66
277/480 60
Rated 40.0 kW Continuous Standby, 50.0 kVA at 0.8 PF

☐ **40 DL6T-7R**
3-phase, 4-wire
220/380V 76A
Rated 40.0 kW Continuous Standby, 50.0 kVA at 0.8 PF

☐ **40 DL6T-9XR**
3-phase, 4-wire
347/600V 48A
Rated 40.0 kW Continuous Standby, 50.0 kVA at 0.8 PF

☐ **40 DL6T-6DR**
240/480V 60A
Rated 40.0 kW Continuous Standby, 50.0 kVA at 0.8 PF

50-Hz 1500 r/min

☐ **32 DL6T-515R**
3-phase, Reconnectible, Broad Range
110/190V 122A
115/200 116
120/208 111
127/220 105
110/220 105
115/230V 101A
120/240 96
220/380 61
230/400 58
240/416 56
254/440 53
Rated 32 kW Continuous Standby, 40 kVA at 0.8 PF

CSA Certified
Ratings and performance data apply to altitudes up to 300 ft (91.4 m), standard cooling, 77°F (25°C) ambient, and No. 2 diesel fuel.
Single-phase power can be taken in capacities up to 2/3 of the rated 3-phase kVA. Broad range alternators have 12 leads brought out for user reconnect.
Continuous rating per BS 5514 and DIN 6270 is 36.4 kW for the 40 DL6T (60 Hz) and 29.1 kW for the 32 DL6T (50 Hz).

Standard Equipment

- **Turbocharged Diesel Engine**
- **AC Alternator**
- **Skid Support Chassis** with **Three-Point Mounting** and **Vibration Isolators** between Engine-Generator and Skid
- **Mounted Control Console** to face rear or accesory side
- **Battery Rack**
- **Flexible Fuel Lines**
- **Heavy Duty Air Cleaner**
- **Oil Drain Valve** with Hose Extension
- **Fork Lift Sockets**
- **Radiator** with Air Dischrge Duct Adapter Flange
- **Battery Charging Alternator**
- **Glow Plugs**

Options and Accessories

Control System

☐ **Nine-light generator set monitoring system** (complete package only)

Solid state engine monitor with individual lights and common external alarm contact indicating each of the following conditions:

- **Run** (green light)
- **Overcrank Shutdown** (red light)
- **Overspeed Shutdown** (red light)
- **High Coolant Temperature Shutdown** (red light)
- **Low Oil Pressure Shutdown** (red light)
- **Pre-warning for High Coolant Temperature** (yellow light)
- **Pre-warning for Low Oil Pressure** (yellow light)
- **Low Coolant Temperature** (red light—indicates inoperative coolant heater)
- **Switch OFF** (flashing red light - indicates genset is not in automatic start mode)

Monitoring System includes Lamp Test Switch and Reset Switch for tripped condition lamps

☐ **Additional meters and controls** (complete package only)

- **AC Ammeter** (dual range, indicates current each phase)
- **Voltmeter**
- **Voltmeter-Ammeter Phase Selector with an OFF position**
- **Frequency Meter**
- **Console Mounted Voltage Adjusting Rheostat**

Fuel System

☐ **Day tank fuel reservoir**

Starting

☐ **Battery**

☐ **Engine coolant heater**

Housing

☐ **Weatherprotective housing**

☐ **Weatherprotective housing with factory mounted critical silencer**

AC Output

☐ **Line circuit breaker**

☐ **Switching regulator**

Onan Design Integrity

This seal certifies that the **design integrity** of Onan Electric Generating Sets has been verified by comprehensive prototype testing. Prototypes are subjected to rigorous tests with typical and atypical loads and transients well above rated performance.

Prototype Testing Typically Includes:

• Reserve Capacity, Overload and Recovery • Failure Mode • Multiple Consecutive Short Circuits • Endurance, Resonance and Fatigue • Environmental Extremes • Alternator Temperature Rise by Multiple Embedded Temperature Sensors • Component Variance Analysis • Simulation of Actual In-Service Load Circuit Disturbances • Protective System Safety Margin

(Prototype tested units are never sold as new equipment.)

Production units earn the PTS seal only after individual testing at rated load and *power factor* in addition to demonstrating acceptable performance relative to criteria established by the Prototype Test Program.

Onan Builds Complete Power Systems of precisely matched components including all transfer switches, controls and monitors to assure smooth, continuous operation. Expertise and engineering services available from Onan will provide guidance in selecting the most reliable emergency electric power protection for your investment.

Parts and Service are available worldwide for all of Onan's generating sets, more than 1,000 models ranging from 1.75 kW to 4000 kW.

Manufacturers Limited Warranty to original users is one year. See your Onan distributor for information or complete documents on available **Manufacturers Two-Year and Five-Year Warranties.**

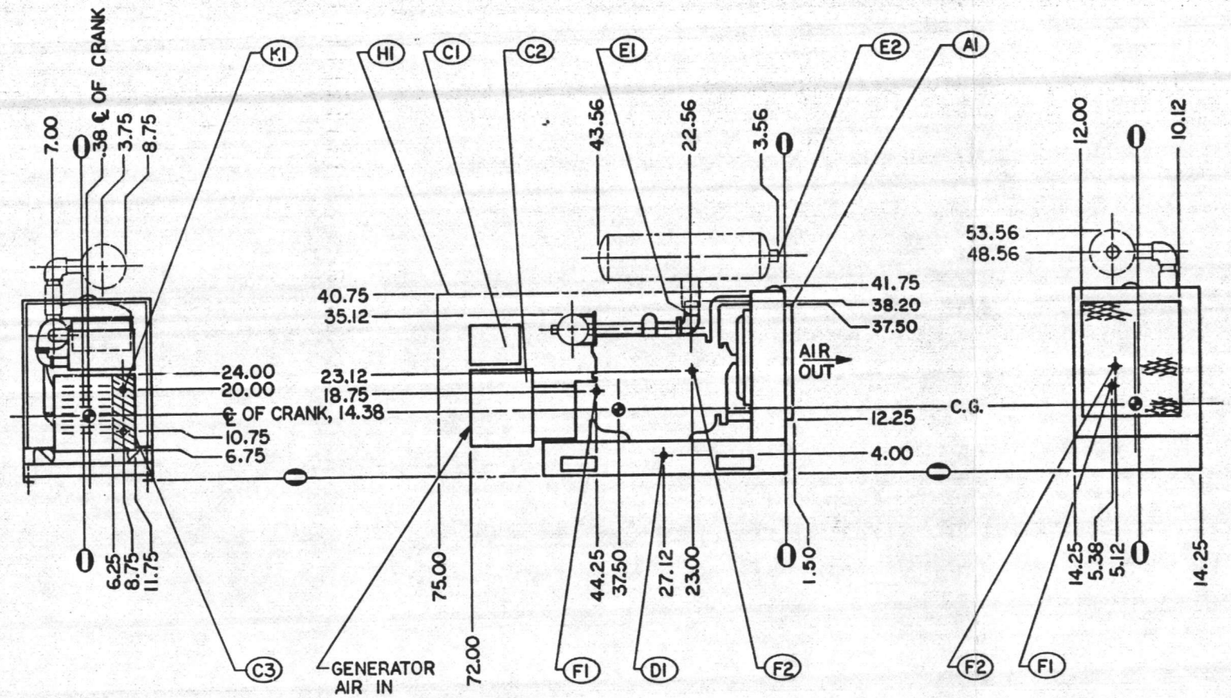
See Your Onan Distributor:

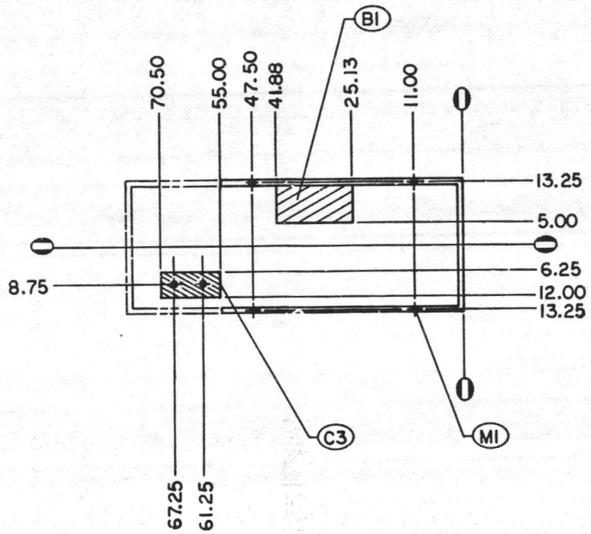
Onan Corporation 1400 73rd Avenue N.E. Minneapolis, MN 55432 Telephone 612 574-5000 Telex 29 0476 (U.S.) Telex 29 0856 (outside U.S.) TWX 910 576-2833 Cable ONAN

500-2057 C

A1 AIR DUCT FLANGE
B1 BATTERY
C1 CONTROL BOX
C2 CIRCUIT BREAKER (OPTIONAL)
C3 ELECTRICAL CONNECTION AREA
D1 OIL DRAIN
E1 EXHAUST, 3" NPT
E2 EXHAUST, 2-1/2" NPT (MALE)

F1 - FUEL IN 1/4" NPT (FEMALE)
F2 - FUEL OUT
H1 - HOUSING (OPTIONAL)
K1 - 1/2" KO (4 PLACES)
M1 - MOUNTING HOLES (.625 Ø, 4 PLACES)





ER NO.	LET	REVISION	ZONE	DR	ENG	CKR	DATE
21569	—	RELEASED FOR PROD					
22038	A	4D WAS TO SKID BASE	3C	JR	DG	JP	4-25-83
22038	B	WAS 3" O.D.	4D	JR	DG	JP	4-25-83
25677	C	4V 34.56, MOVED DIM TO 38.20	3C	DH	JR	JP	1-8-85

NOTES:

1. DRY WEIGHT: 1470 LBS. (666.8 KG)
2. DIMENSIONS ARE IN INCHES. FOR METRIC CONVERSION, MULTIPLY DIM. BY 25.4 FOR MILLIMETERS.

500-2057 C

TOLERANCES UNLESS OTHERWISE SPECIFIED		NEXT ASSY	
mm	INCH	SIM TO 500-2025	C
X. ±	.XX ±	Third Angle Projection	
.X ±	.XXX ±		
.XX ±	.XXXX ±		
+0.15 −0.05	HOLES +.006 −.002	The proprietary design information on this print is owned by Onan Corporation. Conveyance of this right is not extended to others.	
ANGLES ±	SCALE 3/64		

500-2057 C	SEPIA FROM	ITEM
	INITIAL / DATE	
DR	J. PICHT / 2-8-83	
CKR	JP / 2-16-83	
ENGR	DG / 2-12-83	
SAMP REL		
PROD REL	DG / 2-12-83	
PROD REL		

*BULK	PART NO.			DWG SIZE
	SEC	PUR	MT	
		QC	PO	
			H	
40 DL6T				

QTY.	DESCRIPTION OR MATERIAL
	Onan Corporation, Minneapolis Minnesota
	OUTLINE - ENG/GEN
	500-2057 C

FORM 80086

612-6020 SIZE D

BACK OF CONTROL BOX

START-RUN ALARM FOR CUSTOMER USE CONTACT RATING: 10 AMP, 28 VDC/120 VAC

K12

K11

MOUNT ON BOTTOM OF BOX

TB1-10 } TO AC
TB1-9 } DIAGRAM

BOTTOM OF CONTROL BOX

TB1

SHUT DOWN
GND
FAULT
RUN
OC SHUTDOWN
NO CONNECTION
REMOTE START
REMOTE B+

CUSTOMER CONNECTIONS

A11

J3

J1

GND

TACHOMETER INSTALLATION

W10

W11

M5

CALIBRATION POT

DS13

M1

DS10

M2

DS11

M3

DS12

M4

CB1

CB2

SOLDER TACH LEAD TO THIS PIN

ALT

REG

BAT

TERM 26

START
STOP
REMOTE

PRE HEAT

RESET LAMP TEST

S10

S11

S12

DS2 FAULT

DS1 RUN

REAR VIEW OF CONTROL PANEL TOP EDGE

P2

P1

S6

K2

HR1 HR2 HR3 HR4 HR5 HR6

K1

BT1

B1

E2

E1

S3

S1

S7

K3

TB 26

(TACH ONLY)

SEE NOTE 7

(OIL TEMP ONLY)

E3

C1

NOTES:

1. OPTIONS ARE SHOWN CONNECTED IN DASHED LINES
2. UNLESS OTHERWISE NOTED, ALL COMPONENTS ARE SHOWN IN DE-ENERGIZE POSITION
3. INSTALL S11 & S12 WITH ACTUATOR PROTRUSION UP
4. WHEN USING 2 FLANGED SPADE CONNECTORS ON THE SAME SCREW TERMINAL, INSTALL THE LOWER CONN WITH FLANGES TOWARD TERMINAL BLOCK & UPPER CONN WITH FLANGES AWAY FROM TERMINAL BLOCK
5. STD METERING INCLUDES 3 DC GAUGES & 1 TIME METER, DOES NOT INCLUDE ANY AC METERING
6. OPTIONAL METERING INCLUDES ONE ADDITIONAL GAUGE (M5) EITHER OIL TEMP OR TACH
7. SOLDER LEAD TO ANODE OF ALTERNATOR RECTIFYING DIODE LOCATED BETWEEN THE REGULATOR AND THE GROUND TERMINAL FOR TACH INPUT
8. TEST ROOM TACH CALIBRATION. START SET AND ADJUST FREQUENCY TO 60 Hz (50Hz) THEN TURN CALIBRATION POT ON THE REAR OF THE TACH UNTIL THE TACH READS 1800 (1500) RPM OR 3600 (3000) RPM
9. CUT LEADS OF TACH LAMP AS REQUIRED THEN TERMINATE WITH A #10 RING CONNECTOR (ONAN Nº 332-0147)

ENG PARTS LIST (REF)

REF DES	PART NO	DWG SIZE	QTY	DESCRIPTION
B1			1	STARTER & SOLENOID
BT1			1	BATTERY - 12V
E1			1	SENDER-OIL PRESSURE
E2			1	SENDER-WATER TEMP
E3			1	SENDER-OIL TEMP (-02,-04)
G1			1	ALTERNATOR
HR1,2,3,4			4	GLOW PLUG (DL4, DL6)
HR5,6			2	GLOW PLUG (DL6)
K1			1	SOLENOID & LEAD - STARTER
K2			1	SOLENOID - HEATER
K3			1	SOLENOID - FUEL
S1			1	SWITCH - HET
S3			1	SWITCH - LOP
S6			1	SWITCH - OVERSPEED
(A)* S7			1	SWITCH - LWL
TB26			1	BRACKET ASSY - TERMINAL

CONTROL PARTS LIST

A11	300-2510	D	1	ENG MONITOR
CB1	320-1110	C	1	CIRCUIT BREAKER (REMOTE, 7A)
CB2	320-1110	C	1	CIRCUIT BREAKER (CONTROL, 7A)
DS1	322-0138	P	1	LIGHT-IND (RUN)
DS2	322-0128	A	1	LIGHT-IND (FAULT)
	322-0141	-	7	BEZEL ASSY
DS10-12	322-0308	P	3	LAMP-PILOT
	322-0210	P	3	SOCKET-BAYONET
K11	307-1061	B	1	RELAY-STARTER PILOT
	323-0765	A	(REF)	SOCKET-RELAY
	307-1157	P	1	SPRING-RELAY HOLDDOWN
K12	307-1058	B	1	RELAY-RUN (-03,-04,-06)
	323-0804	A	1	SOCKET-RELAY (K12)(-03-04,-06)
M1	302-1402	B	1	AMMETER-CHARGE
M2	193-0320	B	1	GAUGE-OIL PRESSURE
M3	193-0319	B	1	GUAGE-WATER TEMP
M4	302-0895	B	1	METER-RUN TIME
S10	308-0531	P	1	SWITCH (3PDT)
(F1) S12	308-0532	P	1	SWITCH (3PDT)
(F2) S11	308-0533	P	1	SWITCH (3PST)
M5	193-0330	B	1	GAUGE-OIL TEMP (-02,-04)
M5	302-1715	B	1	TACHOMETER (-03,-06)
W10	336-6388	A	1	LEAD (M3-3, M5-3) (-05,-06)
W11	336-6389	A	1	LEAD (M2-1, M5-1)(-02,-04,-05,-06)
	338-1643-01	C	1	WIRE HARNESS-DC (METER)
	338-1644	C	1	WIRE HARNESS-DC (SWITCH)
	338-1646	B	1	WIRE HARNESS-DC (2 LITE)
	341-6230	D	1	CONTROL BOX ASSY
	517-0132	P	1	PLUG-HOLE
(D3)	337-6049	A	1	STRAP-BAND
	508-0444	P	1	GROMMET
(D3) DS13	322-0004	P	1	LAMP-PILOT (-02,-04,-05,-06)
	322-0210	P	1	SOCKET-BAYONET

* WHEN USED

25670	G	1	SEE ER	1/4	JR	12-20-84
		2	S11 WAS 308-0532,	1/4	JR	10-5-84
25197	F	1	S12 WAS 308-0533	1/4	JR	10-5-84
24431	E	1	REVERSED M1 CONNECTIONS	1/4	JR	5 23 84
	D	3	ADD 402-0527(301-8955	WO	WS	4 18 84
	D	2	SEE SHEET 2	WO	WS	4 18 84
24182	D	1	SEE SHEET 2	WO	WS	4 18 84
23568	C	1	ADD-07 & -08	WO	WT	1-11-84
21010	B		SEE ER (SHEET 1&2)	1/4	JR	11-5-82
20677	A		ADDED S7 WHEN USED	-	-	10-14-82
20544			SUPSD DWG SAME Nº DATED 2-10-82 W/CHG.			
-	LET	REVISION		ENGR	CKD	DATE

Onan DIVISION OF ONAN CORPORATION Minneapolis, Minnesota

DRAFTING REL	A DG INTRO	DASH NO.	MODEL NO. DL4/C DL6/C
ENGR REL	4 OCT 82		
PARTS		PO	

DATE 9-18-82 DR JC ENGR ADG CHK ES

CONTROL-GEN SET DC (2 LITE) (WIRING DIAGRAM)

SEPIA FROM 612-5914 SIZE D SHT 1 OF 2 DWG SIZE D

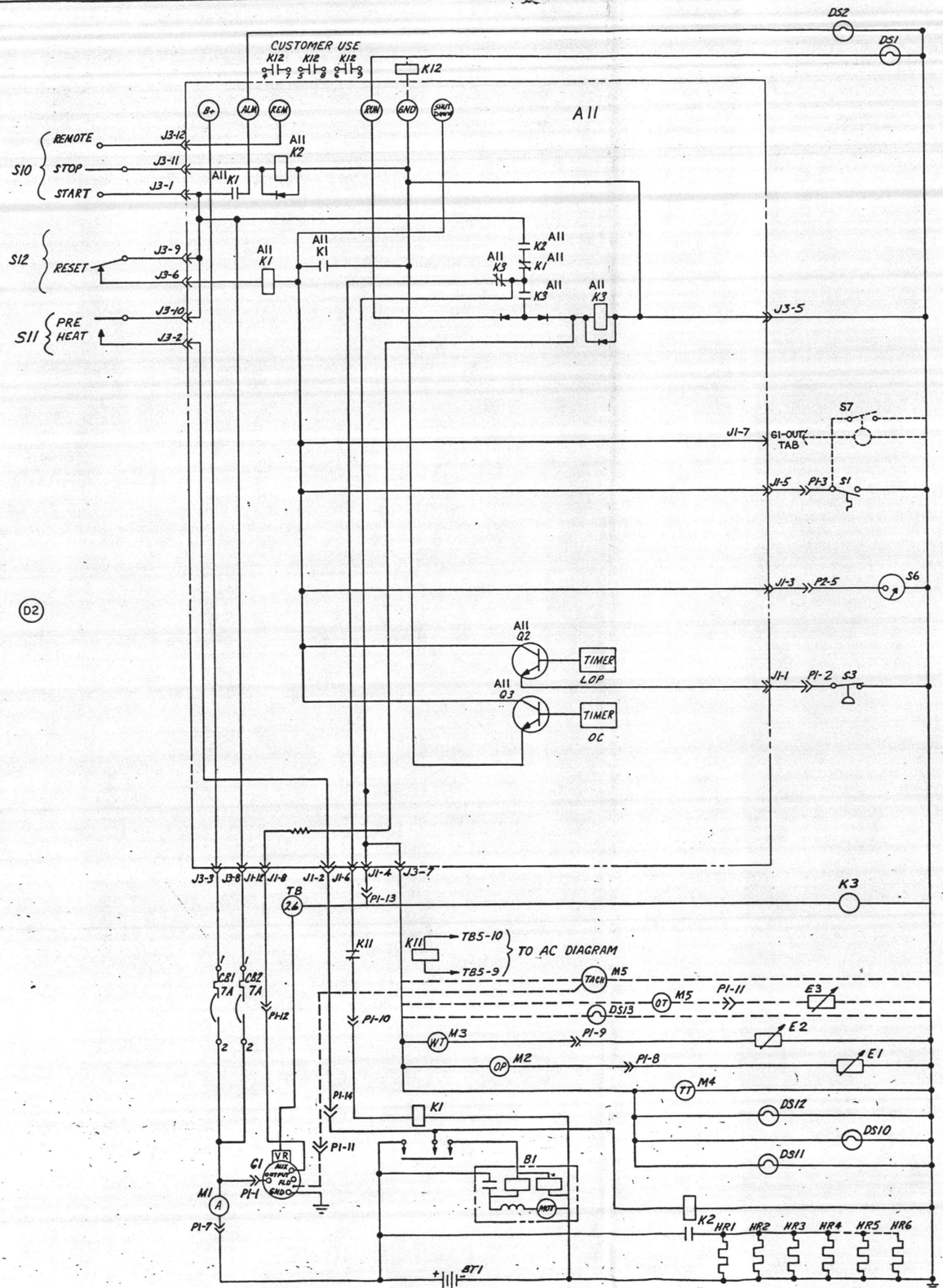
612-6020

0209-219

612-6020

MICROFILMED

612-6020 DWG SIZE D



NOTE:

1. OPTIONS ARE SHOWN CONNECTED IN DASHED LINES.

12V MODEL	DASH NO.	NOTES	STD	OIL TEMP	RUN RELAY	TACH
DL4 DL6 DL4B DL6B DL6TB	-01	1-3/5	X			
	-02	1-3/5,6	X	X		
	-03	1-3/5	X		X	
	-04	1-3/5,6	X	X	X	
	-05	1-3/5-9	X			X
	-06	1-3/5-9	X		X	X

PARTS LIST

REF DES	PART NO	SIZE	QTY	DESCRIPTION

	D	3	SEE SHEET 1	VR/JC	4 18 84
	D	2	REVISE TABLE	VR/JC	4 18 84
24182	D	1	ADD DASH NO.(-09 thru -12)	VR/JC	4-18-84
23568	C		SEE SHEET 1	VR	11 1 84
21010	B		SEE ER	AP. JK	11-5-82
20544			SUPSDS DWG SAME NO DATED 2-18-82 W/CHNG		
ER	LTT		REVISION	ENGR	CHCK	DATE

DIVISION OF ONAN CORPORATION
Minneapolis, Minnesota

DATE 9-18-82 BY JC CHKD ADG APP'D EE

A D GUNTHER 4 OCT 82

DL4/C DL6/C

CONTROL-GEN SET DC(2 LITE) (SCHEMATIC)

APPLICATION 612-5914 DRAWING 612-6020 SHT 2 OF 2 REV D

612-6020

Onan

SCR Battery Float Chargers

Fully Automatic
Constant Voltage
Current Limiting
Equalize Charge Timer

12-Volt, 10-Amp **24-Volt, 6-Amp** **12-volt, 2-amp, 50 or 60-hertz input**

Construction Details

Cabinet: The sturdy, compact sheet steel cabinet is a hinged two-piece (cover and chassis) enclosure, equipped with rubber feet for table mounting and brackets for wall mounting. The louvered top and expanded-metal-mesh bottom provide good convection cooling.

Cabinet Cover: one-piece—includes the sides, louvered top and a front panel that holds the DC VOLTMETER (3% accuracy); DC AMMETER (5% accuracy); ON-OFF SWITCH—opens and closes the AC and DC circuits simultaneously; FUSE—protects the power transformer and the full-wave silicon bridge rectifier against excessive overloads; EQUALIZE-CHARGE TIMER—manually set for equalize charge, up to 12 hours, automatically switches back to float voltage.

Cabinet Chassis: one-piece (bottom and back) holds the Current Limiting POWER TRANSFORMER—factory wired for 120-volt, 60-hertz input and taps for 208- and 240-volt input, user reconnect); FULL-WAVE SILICON BRIDGE RECTIFIER—converts the AC input to a pulsing DC charging Output: SURGE-SUPPRESSOR—non-polarized rectifier prevents transient voltage surge damage to SCR and Silicon Bridge Rectifier; VOLTAGE REGULATOR—an All Electronic Package that controls the battery voltage by firing the SCR when the battery voltage is above the charger's minimum operating voltage and below the preset voltage. The regulator turns-on the SCR only as often as is necessary to maintain the preset voltage; SCR—blocks the DC circuit in both directions when not being fired (turned-on) by the voltage regulator; TERMINAL BLOCK—plainly marked, provides convenient connection for the user supplied input and output leads.

Performance

Onan, Fully Automatic, Battery Float Chargers—with SCR (silicon controlled rectifier) are constant voltage, current limiting chargers. Designed for float charging Lead-Acid or Nickel-Cadmium starting batteries, these transistorized units, complete with built-in Equalize Charge Timer, are an ideal package for stationary or portable starting battery charging service.

Stationary Service: As stationary chargers, the permanently connected battery continuously floats at a constant voltage. As the battery approaches full-charge preset voltage, the charging current automatically tapers to zero amperes or to the steady-state load on the battery. ONAN automatic float chargers keep starting batteries fully charged—NO gassing, NO overcharging.

Portable and Equalize-Charge Service: For faster charging in Portable Service or to Equalize-Charge the floating, lead-acid battery, manually set the equalize-charge timer for any time period up to 12 hours (most lead-acid battery manufacturers recommended 24 hours of equalize charging every month). Setting the Timer raises the charger's output voltage and maintains the higher charging voltage for the time selected. At the end of the timed interval, the Timer automatically switches back to float voltage. For faster battery charging, parallel two or more chargers.

CSA Certified

Self-Protecting: Inherently self-protected against shorted or reversed battery connections and overload currents.

Battery Float Charger—Fully Automatic

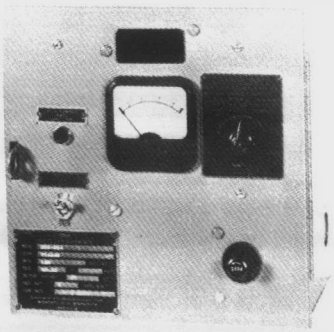
Constant Voltage—Current Limiting—Solid State

PERFORMANCE and PHYSICAL CHARACTERISTICS		Model 305-0347	Model 305-0346
OUTPUT:	Nominal Voltage	12 V	24 V
	Adjustable Float Voltage	12.8 V to 14.5 V	25.6 V to 29 V
	Adjustable Equalize-Voltage	Float V to 14.5 V	Float V to 29.0 V
	Recommended Float Voltage (Lead-Acid Batteries)	13.2 V	26.4 V
	Recommended Float Voltage (Nickel-Cadmium Batteries)	14.0 V (10 cell)	28.0 V (20 cell)
	Recommended Equalize Voltage (Lead-Acid Batteries)	14.4 V	28.8 V
	Voltage Regulation with ±5%, 60-hertz frequency and ±10%, line voltage	±2%	±2%
	Ampere-Maximum and Taper (Minimum)	10-amp to 0-amp	6-amp to 0-amp
	Equalize Charger Time (Manually Set)	0- to 12-hr	0- to 12-hr
INPUT:	Voltage, 60-hertz (Optional Adder 480-v input)	120, 208, 240 V	120, 208, 240 V
Approximate Net Weights:		23-lb (10.4 kg)	27-lb (12.2 kg)
Approximate Dimensions: Height x Width x Depth - inches (mm)		8 x 10 x 8 (203 x 254 x 203)	8 x 10 x 8 (203 x 254 x 203)
Ambient Temperature operation: from		—40F to 140F (-40C to 60C)	—40F to 140F (-40C to 60C)

PERFORMANCE and PHYSICAL CHARACTERISTICS		MODEL 305-0513*
OUTPUT:	Nominal Voltage (Battery cables, 6-ft (1.8 m) with insulated clips furnished)	12 V
	Adjustable Float Voltage	12.6 to 15.0 V
	Recommended Float Voltage (Lead-Acid Batteries)	13.3 V
	Recommended Float Voltage (Nickel-Cadmium Batteries, 10 cell)	14.0 to 14.5 V
	Voltage Regulation with ±5%, line frequency and ±10%, line voltage	±2%
	Ampere-Maximum and Taper (Minimum)	2-amp to 0-amp
INPUT:	Voltage, 50- or 60-hertz (molded, 3-wire, cord assembly furnished)	120 V*
Approximate Net Weight:		9-lb (4.1 kg)
Approximate Dimensions: Height x Width x Depth—inches (mm)		6.06 x 8.68 x 5.5 (154 x 220 x 140)
Ambient Temperature operation: from		—40F to 140F (—40 C to 60 C)

*Available also for 220-volt operation (Model 305-0598).

Rectifier Battery Chargers



ONAN Model 305-0325, Battery Charger, 12-volt

ONAN Model 305-0224, Battery Charger, 24-volt

These battery chargers charge batteries from a 120-volt, 50 or 60-hertz input line. They charge at a high rate of 2 amperes or switch to an adjustable, low trickle charge rate of 0.100 to 0.500-amperes. The meter reads the low trickle charge rate, only. The pilot light indicates the high charge rate.

ONAN Model 305-0175, 12-volt Trickle Charger

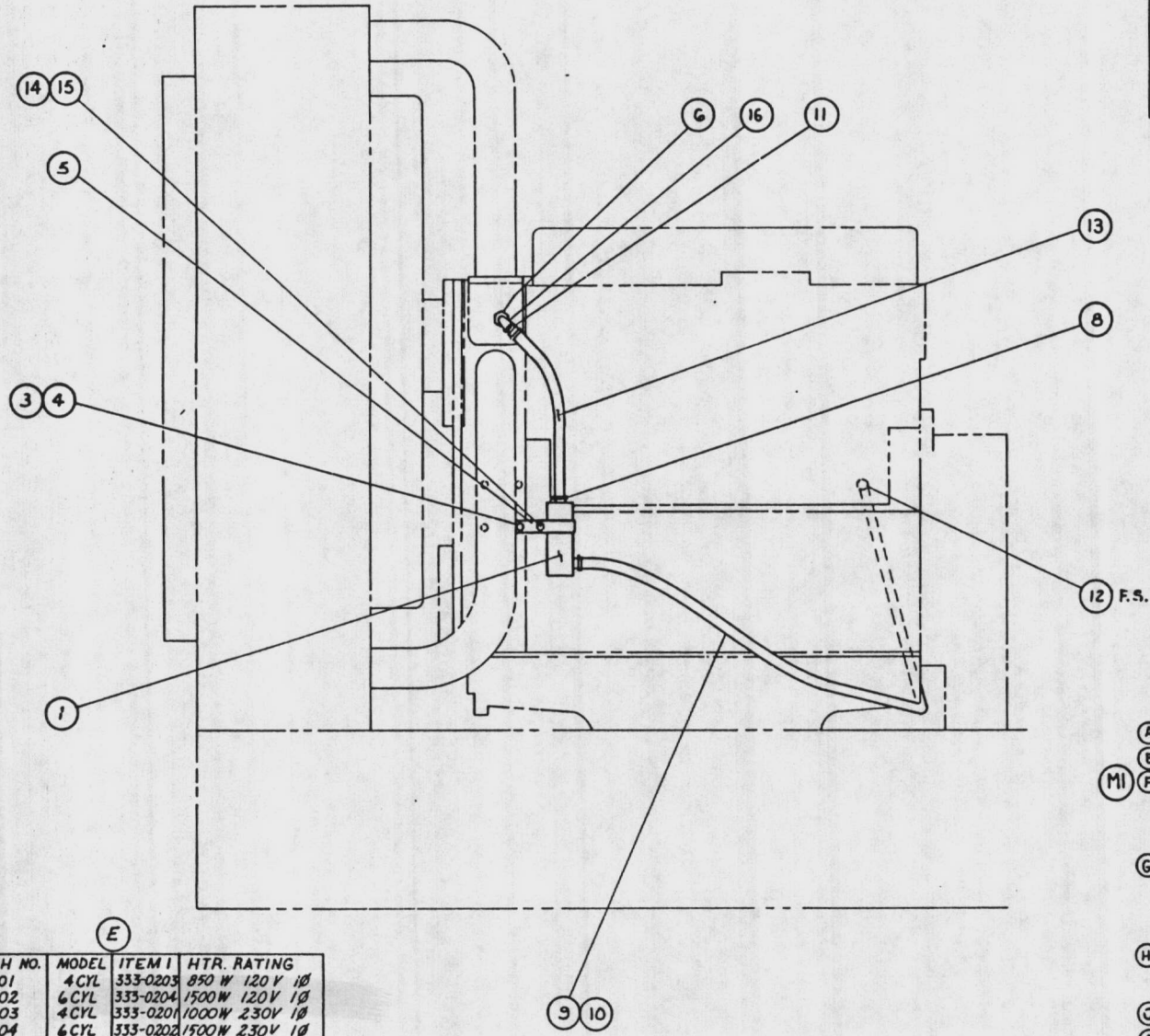
This 12-volt Trickle Charger operates from a 120-volt, 50 or 60-hertz input line. Leave permanently connected to battery. The charge rate is approximately 0.050 to 0.300 amperes. Milliammeter and rheostat are included.

See Your Onan Distributor:

Onan Corporation 1400 73rd Avenue N.E. Minneapolis, MN 55432 Telephone 612 574-5000 Telex 29 0476 (U.S.) Telex 29 0856 (outside U.S.) TWX 910 576-2833 Cable ONAN

179-2206 C

ER	LET	REVISION	ZONE	DR	ENG	CHK	DATE
9250	-	RLSE FOR PROD					
9262	A	ADDED ITEM 14 821-0016	2B	JR	CM	JR	5-18-82
9262	B	ADDED ITEM 15 870-0257	2B	JR	CM	JR	5-18-82
9270	C	DELETED ITEM 2 (333-0204)	A2	JWP	CM	JR	6-21-82
9270	D	ITEM 1 WAS 333-0203	A2	JWP	CM	JR	6-21-82
9270	E	REVISED TABULATION	A4	JWP	CM	JR	6-21-82
20748	F	DELETED ITEM 13 (502-0613)	B2	JR	CM	JP	10-8-82
21062	F	ADDED ITEM 13, 503-1225	2B	JSP	DG	JR	11-11-82
21062	G	ITEM 5: ADDED DASH Nº -05,-06	2A	JSP	DG	JR	11-11-82
21062	H	ITEM 5: ADDED DASH Nº -01,-02,-03,-04	2A	JSP	DG	JR	11-11-82
21062	J	ADDED -05 TO TAB	4A	JSP	DG	JR	11-11-82
21062	K	ADDED -06 TO TAB	4A	JSP	DG	JR	11-11-82
21294	L	SEE ER	-	JSP	DG	JR	12-17-82
22038	H	ADD ITEM 5 (130-0755)	2A	JR	DG	JP	5-2-83
22038	B	ADDED ITEM 14 (821-0016)	2B	JR	DG	JP	5-2-83
22038	A	ADDED ITEM 15 (870-0257)	2B	JR	DG	JP	5-2-83
24002	M	1 ITEM 13 WAS (6.5")	2B	DH	DG	JR	2-29-84



DASH NO.	MODEL	ITEM 1	HTR. RATING
-01	4 CYL	333-0203	850 W 120 V 1Ø
-02	6 CYL	333-0204	1500 W 120 V 1Ø
-03	4 CYL	333-0201	1000 W 230 V 1Ø
-04	6 CYL	333-0202	1500 W 230 V 1Ø

	DASH NO.	ITEM	QTY.	DESCRIPTION OR MATERIAL
		16	1	ELBOW - STREET (90° - 3/8)
A		15	1	WASHER - LK H (5/16 - 18)
B		14	1	SCREW - LK H (5/16 - 18 X 3/4)
M1 F		13	1	HOSE, FLEX (8")
		12	1	ELBOW - STREET (45° X 1/4)
		11	1	NIPPLE - HALF (3/8 X 1-1/2)
	-01,-03	10	1	HOSE (42.0")
G	-02,-04	9	1	HOSE (50")
		8	4	CLAMP - HOSE
		7		
		6	1	REDUCER (3/4 x 3/8)
H		5	1	BRACKET - WATER HEATER MTG
		4	1	SCREW - HHC (M8 X 1.25 X 20)
C		3	1	WASHER - LK (M8)
D		2		
		1	1	HEATER - ENGINE

TOLERANCES UNLESS OTHERWISE SPECIFIED
MM: X ± / .X ± / .XX ±
INCH: .XX ± / .XXX ± / .XXXX ±
HOLES: +.15 -.05 / +.006 -.007
ANGLES ±
SCALE 1/4
NEXT ASSY
SHP TO
Third Angle Projection
The proprietary design information on this print is owned by Onan Corporation. Conveyance of this right is not extended to others

179-2206 C

	INITIAL	DATE
DR	JPR	3-12-82
CHK	BWW	3-23-82
ENGR	C MELTON	3-29-82
SAMP REL PROD REL	C MELTON	3-29-82

Onan Corporation
Minneapolis Minnesota

INSTL - COOLANT HTR

L/C 4,6 (CYL) 179-2206 C

FORM 8B086

MICROFILMED

625-1027

(D)

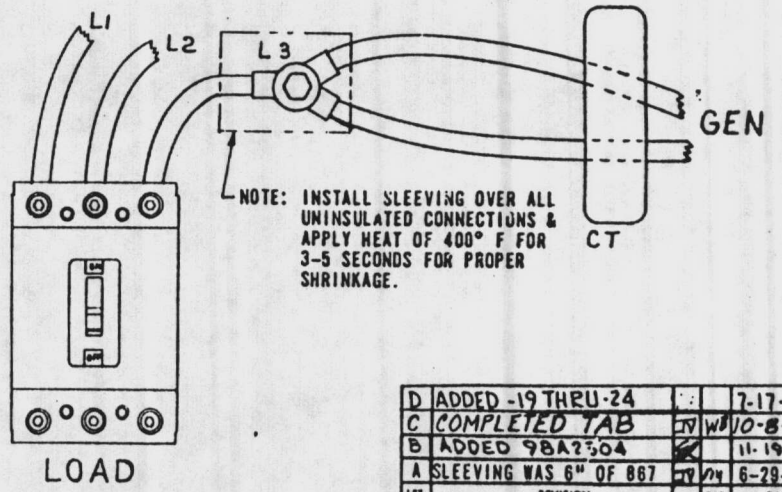
KW	VOLTAGE & PH	DASH NO.	BREAKER NO.	AMP	LEAD ASSY (QTY)
25-30	120/240V, 1 PH	-01	320P344	175	226A892 (2)
	120 208V, 3 PH	-02	320P412	100	226A891 (3)
	120/240V, 3 PH	-03	320P411	90	
	220/380V, 3 PH	-04	320P384	60	
	277/480V, 3 PH	-05	320P413	50	
	347/600V, 3 PH	-06	320P415	40	
	200/346V, 3 PH	-19	320P384	60	
35-45	120/240V, 1 PH	-07	320P359	225	226A892 (2)
	120/208V, 3 PH	-08	320P346	150	226A892 (3)
	120/240V, 3 PH	-08	320P346	150	226A892 (3)
	220/380V, 3 PH	-09	320P379	90	226A891 (3)
	277/480V, 3 PH	-10	320P414	70	
	347/600V, 3 PH	-11	320P416	60	
	200/346V, 3 PH	-20	320P379	90	
50	120/208V, 3 PH	-12	320P347	175	226A892 (3)
	120/240V, 3 PH	-08	320P346	150	226A892 (3)
	220/380V, 3 PH	-13	320P380	100	226A891 (3)
	277/480V, 3 PH	-09	320P379	90	226A891 (3)
	347/600V, 3 PH	-11	320P416	60	226A891 (3)
	200/346V, 3 PH	-21	320P380	100	226A891 (3)
55	120/208V, 3 PH	-14	320P348	200	226A892 (3)
	120/240V, 3 PH	-12	320P347	175	226A892 (3)
	220/380V, 3 PH	-13	320P380	100	226A891 (3)
	277/480V, 3 PH	-09	320P379	90	226A891 (3)
	347/600V, 3 PH	-15	320P417	70	226A891 (3)
	200/346V, 3 PH	-22	320P419	125	226A892 (3)
60	120/208V, 3 PH	-16	320P349	225	226A892 (3)
	120/240V, 3 PH	-14	320P348	200	226A892 (3)
	220/380V, 3 PH	-17	320P419	125	226A892 (3)
	277/480V, 3 PH	-09	320P379	90	226A891 (3)
	347/600V, 3 PH	-15	320P417	70	226A891 (3)
	200/346V, 3 PH	-23	320P419	125	226A892 (3)
65	120/208V, 3 PH	-16	320P349	225	226A892 (3)
	120/240V, 3 PH	-14	320P348	200	226A892 (3)
	220/380V, 3 PH	-17	320P419	125	226A892 (3)
	277/480V, 3 PH	-13	320P380	100	226A891 (3)
	347/600V, 3 PH	-18	320P418	90	226A891 (3)
	200/346V, 3 PH	-24	320P425	150	226A893 (3)

NOTES: 1. THIS LINE BREAKER MOUNTS INSIDE OF STANDARD OUTPUT BOX.

PARTS LIST

REF. DES.	PART NO.	QTY	DESCRIPTION
	30183192	1	COVER-JUNCTION BOX
	30183197	1	BRACKET-CKT BRKR MTG
	800-3	2	SCREW-HHC 1/4-20 1/2 LG
	850-40	2	WASHER-LK
	812-84	4	SCREW-RHM 8-32 3-5/8 LG
	850-25	4	WASHER-LK
	800-28	5	SCREW-HHC 5/16-18 1 LG
	526-22	10	WASHER-FLAT
	850-45	5	WASHER-LK
	862-15	5	NUT-HEX
	898-869	4"	SLEEVING-INSULATION
(A)	898-867	4"	SLEEVING-INSULATION
	898-865	4"	SLEEVING-INSULATION
	898-863	4"	SLEEVING-INSULATION
(B)	98A2304	1	SILKSCREEN-CKT BRKR (WARNING)

(C)



NOTE: INSTALL SLEEVING OVER ALL UNINSULATED CONNECTIONS & APPLY HEAT OF 400° F FOR 3-5 SECONDS FOR PROPER SHRINKAGE.

LET.	REVISION		CKD	DATE
D	ADDED -19 THRU -24			7-17-79
C	COMPLETED TAB	JN	WB	10-8-71
B	ADDED 98A2304			11-19-70
A	SLEEVING WAS 6" OF 867	JN	JN	6-29-70

Onan DIVISION OF STUDEBAKER CORPORATION Minneapolis, Minnesota

MODEL NO: 25-45KW, 1PH; 25-65KW, 3PH; UR-SERIES

DATE: 1-30-70 | BY: CIP | CKD: Jim Vint | W.B.

NAME: WIRING DIAGRAM CIRCUIT BREAKER

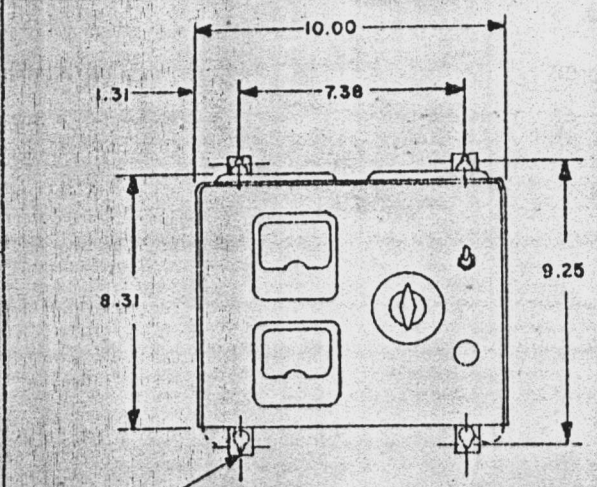
DWG. NO. 625-1027 | DWG. SIZE B

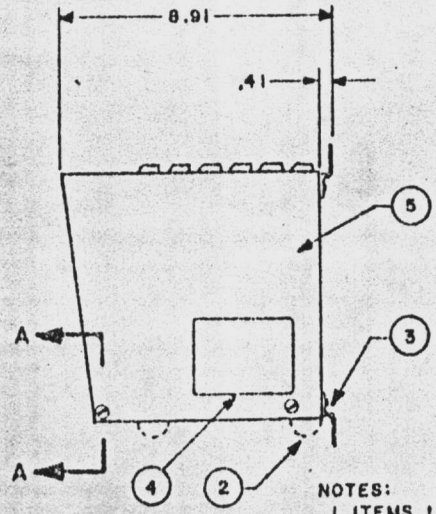
625-1027

FORM 8A090

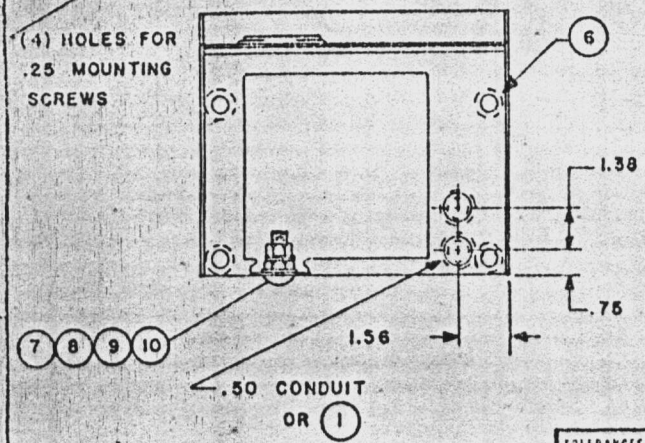
305-0347 B

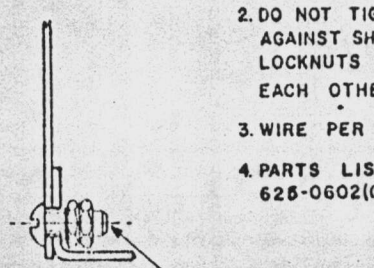
ER	LTR	DIVISION	ZONE	BY	ENG	CHK	PROJ
0471		PROD RELEASE					
1839	A	ADDED ITEMS 7 THRU 10	2-D	JC			2-11
2807	B	A1 WAS 305-0344	2-D	MRD			5-13





(4) HOLES FOR .25 MOUNTING SCREWS





SECTION A-A
SCALE 1/1

NOTES:
1. ITEMS 1, 2 & 3 SHIPPED LOOSE
2. DO NOT TIGHTEN AGAINST SHEET METAL, LOCKNUTS AGAINST EACH OTHER
3. WIRE PER 625-0602(C)
4. PARTS LIST FROM 625-0602(C)

ITEM	PART NO.	DWG SIZE	QTY.	DESCRIPTION OR MATERIAL
10	854-0014	-	1	WASHER-IT 1/4
9	871-0016	-	2	NUT-BRASS (1/4-20)
8	856-0006	-	2	WASHER-EIT (1/4)
7	810-0153	-	1	SCREW-RHOM (1/4-20 X 1)
A1	305-0345	B	1	REGULATOR ASSY
	332-0886	A	1	STRIP-MARKER
CR1	305-0348	B	1	RECTIFER-BRIDGE
CR2	305-0349	A	1	RECTIFER-SURGE SUPPRESSOR
CR3	305-0385	A	1	SCR ASSY
F1	321-0127	-	1	FUSE-15 AMP
	321-0104	P	1	HOLDER-FUSE
M1	302-0561	P	1	AMMETER-DC 0-10 AMP
M2	302-0562	P	1	VOLTMETER-DC 0-20V
S1	308-0211	P	(REF)	SWITCH, ON-OFF
S2	308-0213	A	1	SWITCH (EQUALIZE CHARGE TIMER 0-
T1	315-0175	C	1	TRANSFORMER-POWER
TB1	332-0537	A	(REF)	TERMINAL BOARD
	99-1169	A	1	PLATE-FUSE
	98-2060	A	1	SILKSCREEN-LEADS
W1	338-0641	D	1	WIRING HARNESS
W2	336-2134	A	1	LEAD ASSY
W3	336-2135	A	1	LEAD ASSY
	332-1179	A	2	SPACER-FIBER
	870-0129	-	2	NUT-NYLON
6	301-2457	D	1	CHASSIS
5	301-2459	C	1	COVER ASSY
4	99-0949	A	1	NAMEPLATE
3	301-2456	A	4	BRACKET-MTG (SEE NOTE 1)
2	402-0331	P	4	RUBBER FOOT (SEE NOTE 1)
1	508-0071	P	2	GROMMET (SEE NOTE 1)

TOLERANCES UNLESS OTHERWISE SPECIFIED

mm	INCH
X ±	.XX ± .03
.X ±	.XXX ±
.XX ±	.XXXX ±
NOLES	
+0.15 −0.05	+.006 −.002
ANGLES ±	SCALE 1/4

NEXT ASSY: SIM TO 305-0346 B

Third Angle Projection

305-0347 B

	INITIAL	DATE
DR	RK	8-20-79
ENG	CJP CJP	7-21-79
ENGR	L Smith	9/21/79
SAMP REL		
PROD REL	L Smith	9/21/79
PROD REL		

SEPIA FROM

SEC	PUR	MT
	QC	PO
		H

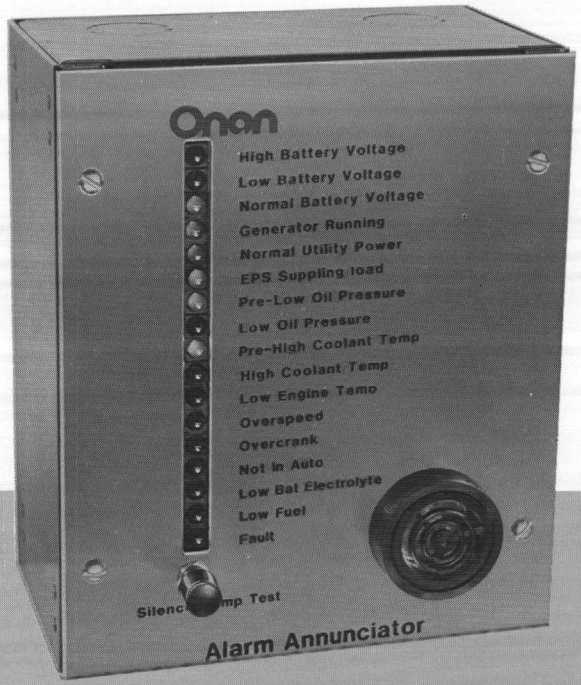
A DIVISION OF ONAN CORPORATION
Minneapolis, Minnesota

CHARGER-BATTERY (12V

DWG NO. 305-0347

FORM 8C071

Onan



Remote Alarm

Annunciator

Audible & Visual Alarm for Engine-Generator Malfunction

For Use with "DV" and "L" Series GenSets ONLY

300-2751
300-2752

Series ANN 12 or 24-volt Negative (ground) Signal

Series ANP 12 or 24-volt Positive Signal

Code Requirements for Alarm Annunciators

National Fire Protection Association (NFPA) standards for Essential Electrical Systems for Health Care Facilities and Emergency and Standby Electric Power Systems, as well as the National Electric Code (NEC) require that alternate electric power sources such as emergency generator sets be equipped with both audible and visual signal devices to monitor and warn of malfunction or alarm conditions. These codes further specify that the signal device be battery powered and installed outside the standby generating room in a location readily observable by operating personnel at regular work stations. These regulations are also included in other codes and specifications.

CAUTION: Do NOT run annunciator control wiring through power cable conduit or raceway.

Special Features

- **Alarm Silence button on annunciator resets circuit for any subsequent fault condition whether or not initial fault has been cleared**
- **Inputs for either 12 or 24-volt DC**
- **Contacts for common remote alarm**
- **Voltage Normal light on battery monitor**
- **Stainless steel front panel; desk-top or wall-mounting**
- **Knockouts for wire installation from top**
- **Solid state with LED lamps for high reliability and low power consumption**
- **Lamp test switch**
- **Replaces and is interchangeable with all previous Onan annunciators for piston-driven equipment**

Annunciators and Associated GenSet Series

ANP 12-volt Onan 300-2752*	DL4	DL6B
	DL6	DL6TB
	DL6T	ES
	DL4B	
ANN 24-Volt Onan 300-2751*	TechStar (Gas)	DV (All)

*Optional adapter ring for flush wall mount available, Onan 301-3091

Signal Level Requirements

Positive: At least 9 volts DC but not more than 30 volts DC.

Negative: Less than 1 volt DC.

Battery Voltage

Functional Range of audible and visual alarms: 6 volts to 50 volts.

Low Battery Voltage Setting: 11 volts for 12-volt systems; 22 volts for 24-volt systems.

High Battery Voltage Setting: 15 volts for 12-volt systems; 30 volts for 24-volt systems.

Temperature Range

Operating: 0°C (32°F) to 70°C (158°F)

Storage: -55°C (-67°F) to 100°C (212°F)

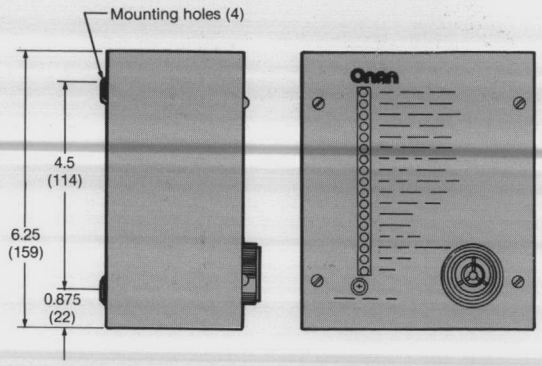
Power Requirement

Maximum Consumption: 5 Watts

Standby Consumption: 1/4 Watt

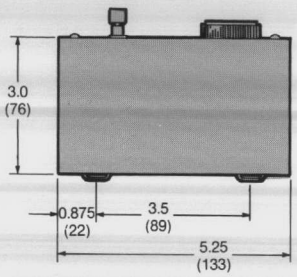
Stability

Voltage Sensor Drift: ±2% maximum



Approx. Weight
3.75 lb (1.75 kg)

Dimensions in ( )
are mm



Annunciator Lamps*

Lamp Legend	Generator Set Condition Indicated	Light	Audible Alarm
High Battery Voltage	Battery charger malfunction	Red	No
Low Battery Voltage	Battery voltage below low voltage setting	Red	No
Normal Battery Voltage	Battery voltage ok	Green	No
Generator Running	Generator has output voltage	Green	No
Normal Utility Power	Utility power supplying the load	Green	No
EPS Supplying Load	Genset supplying the load	Green	No
Pre-Low Oil Pressure	Oil pressure approaching preset minimum	Yellow	Yes
Low Oil Pressure	Genset has shut down due to low oil pressure	Red	Yes
Pre-High Coolant Temp	Temperature of cooling medium approaching preset maximum	Yellow	Yes
High Coolant Temp	Genset has shut down due to high coolant temp	Red	Yes
Low Engine Temp	Engine heater has malfunctioned	Red	Yes
Overspeed	Engine has shut down due to overspeed	Red	Yes
Overcrank	Cranking fails to start engine within 45-75 sec	Red	Yes
Not in Auto	Switch on control not in AUTO position; Genset will not start automatically	Flashing Red	Yes
Low Bat Electrolyte	Low battery electrolyte level	Red	No
Low Fuel	Fuel level below preset minimum	Red	Yes
Fault	Customer preselected condition	Red	Yes

See Your Onan Distributor:

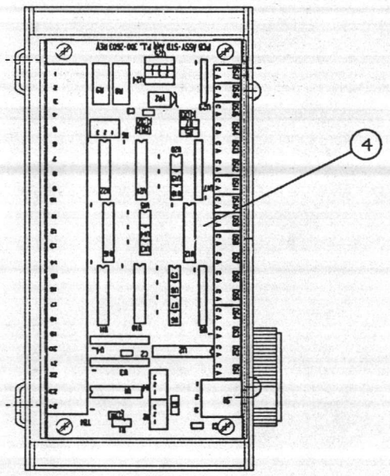
OWSLEY & SONS, INC.
DRAWER L
I-77 & S. C. EXIT 72
FORT MILL, S. C. 29715
PHONE (803) 548-3636

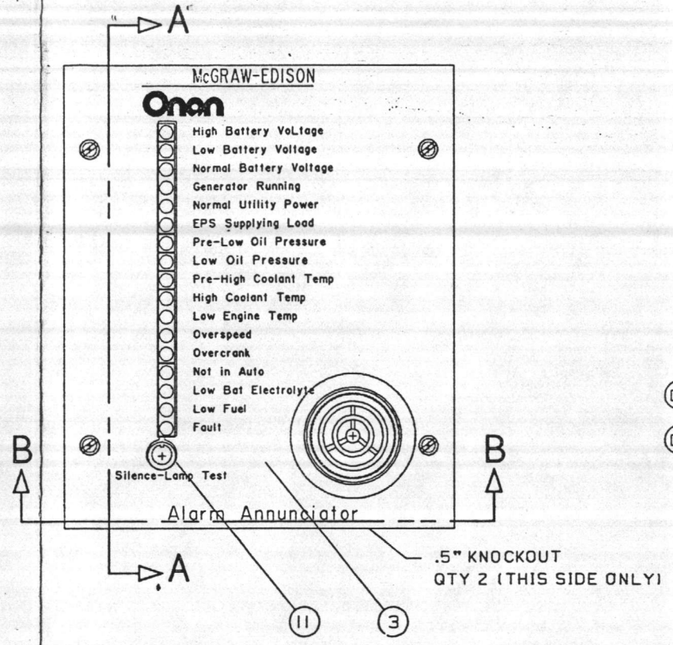
Onan Corporation 1400 73rd Avenue N.E. Minneapolis, MN 55432 Telephone 612 574-5000 Telex 29 0476 (U.S.) Telex 29 0856 (outside U.S.) TWX 910 576-2833 Cable ONAN

300-2752 D

ER NO.	LTR	NO.	REVISION	ZONE	DR	CHKR	APPROVED	DATE
21,325	-		SAMPLE RELEASE	-	MM			12-30-82
21,442	-		PRODUCTION RELEASE, NO CHANGE	-	MM	LN	SH	1-21-83
22,577	A		UPDATE FRONT VIEW OF PCB PER ER	-	MM	LN	SLS	9-6-83
22,473	B		REV REF DES OF IC'S ON SILK ANG SCHEMATIC	-	MM	LN	SLS	9-6-83
23,058	C		UPDATE SCH PCB PER ER CHANGE	-	LN	MM	SH	12-13-83
24,148	D	1	CAL PROCEDURE R4 WAS R3	2-C	MD			4-9-84
		2	CAL PROCEDURE R6 WAS R5	2-C	MD			4-9-84

VIEW A-A





CALIBRATION PROCEDURE

1. WITH 30 VDC INPUT AT PINS 1-3, ADJUST R2 UNTIL LED DS17 SWITCHES ON FROM OFF.

(D1) 2. WITH 22VDC INPUT AT PIN 1-3, ADJUST R4 UNTIL LED DS16 SWITCHES ON FROM OFF.

(D2) 3. WITH 11VDC INPUT AT PINS 2-3, ADJUST R6 UNTIL LED DS16 SWITCHES FROM OFF TO ON. CHECK THE OVERVOLTAGE SETTING DS17, IT SHOULD BE 15.1 VDC AT PINS 2-3.

TEST PROCEDURE

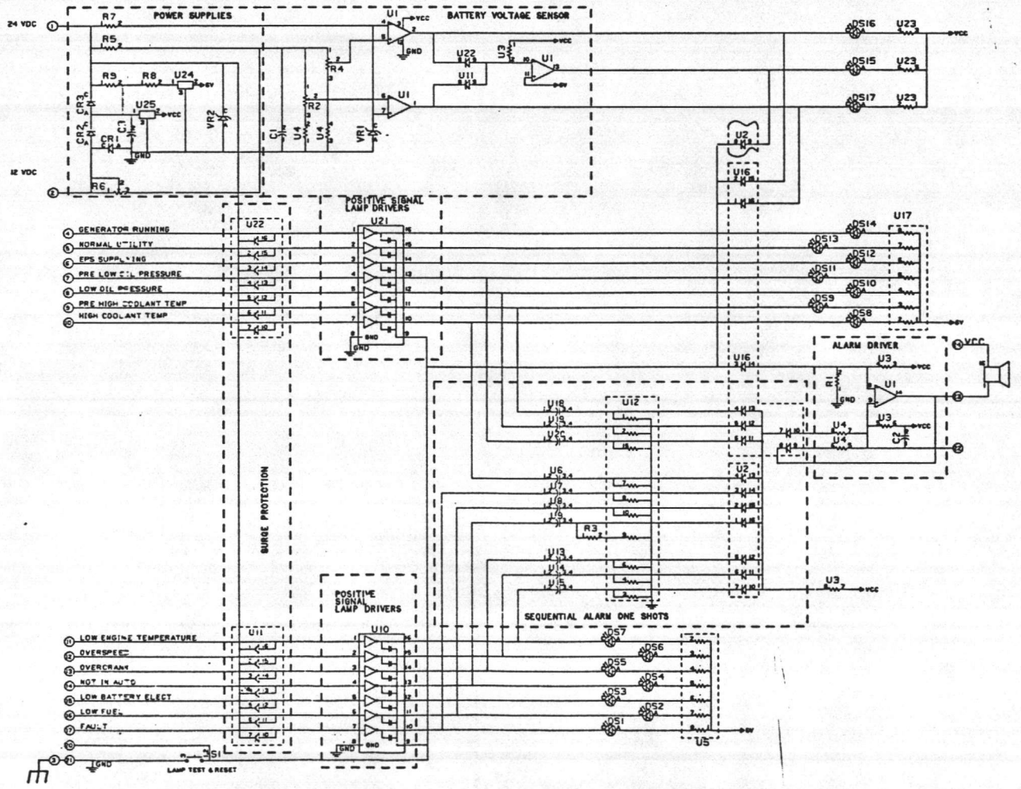
1. APPLY 12 VDC TO PIN 2.

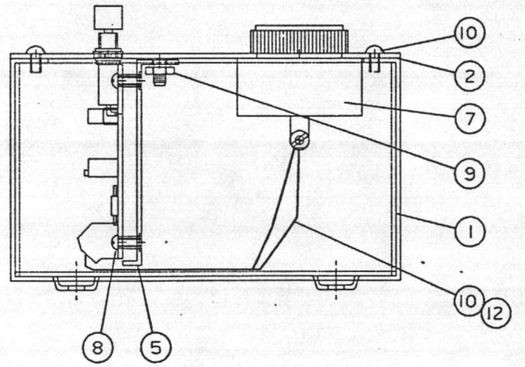
2. APPLY 12 VDC SEQUENTIALLY TO PINS 4 THROUGH 17 (RETAINING INPUTS).

3. RESET AFTER EACH ALARM. (GREEN LEDS AND LOW BATTERY ELECT EXCLUDED).

4. VERIFY LAMP TEST (ALL LEDS).

SCHEMATIC DIAGRAM





VIEW B-B

SPECIFICATIONS

1. GENERAL
   - 1.1 POWER SUPPLY VOLTAGE
     - VDC PIN 1 . . . . . 24V ± 6V
     - VDC PIN 2 . . . . . 12V ± 3V
     - HIGH VOLTAGE . . . . . 30V ± 2V; 15V ± 1
     - LOW VOLTAGE . . . . . 22V ± 2V; 11 ± 1
   - 1.2 MAX POWER CONSUMPTION . . . . . 5 WATTS AT 30V IN
     STAND-BY POWER CONSUMPTION . . . 400 MWATTS AT 12V
     1 WATT AT 24V
   - 1.3 OPERATION TEMPERATURE RANGE . . . 0° C TO 50° C
   - 1.4 STORAGE TEMPERATURE RANGE . . . . -55° C TO 100° C
   - 1.5 VOLTAGE SENSOR DRIFT . . . . . ± 2%
   - 1.6 SOUND LEVEL . . . . . 68-80 DB

CADD SYSTEM DWG

REF DES	ITEM	PART NO. *BULK	DWG SIZE	QTY	DESCRIPTION OR MATERIAL
	15				
	14				
	13				
	12	226-0845	A	2	LEAD (TB21-23,24 ITEM #7)
	11	518-0440	P	1	RING-LOCKING
	10	812-0059	-	6	SCREW RHM #6-32 X 1/4 LG
	9	870-0221	-	2	NUT-HEX HD W/ET (8-32)
	8	812-0028	-	4	SCREW-RHM (#4-40 X 5/16 LG)
	7	333-0133	A	1	SIGNAL-AUDIBLE
	6	630-1198	B	1	WD-INTERCONNECTION (POS ANN)
	5	301-7620	B	1	BRACKET-PC BOARD MTG
	4	300-2603	D	1	PCB ASSY-STD ANN P.L.
	3	98-4876	B	1	SILKSCREEN (ALARM ANNUNCIATOR)
	2	301-7619	C	1	PANEL-ANNUNCIATOR
	1	301-3090	C	1	CONTROL BOX

TOLERANCES UNLESS OTHERWISE SPECIFIED
MM: X. ± .1, .XX ± .05
INCH: X.X ± .1, .XX ± .05, .XXX ± .010
MACHINED HOLES: ±0.15 / .006, ±0.05 / .002
ANGLES ±
SCALE 1 TO 1
SIM TO NEXT ASSY
THIRD ANGLE PROJECTION
THE PROPRIETARY DESIGN INFORMATION ON THIS PRINT IS OWNED BY ONAN CORPORATION. CONVEYANCE OF THIS RIGHT IS NOT EXTENDED TO OTHERS
FOR INTERPRETATION OF DIMENSIONING AND TOLERANCING, SEE ANSI Y14.5-1973

	INITIAL	DATE
DR	MCM	12-22-82
CHKR	LLN	1-4-83
ENGR	SH	
SAMP REL	SH	12-30-82
PROD REL	SH	1-21-83

ONAN CORPORATION MINNEAPOLIS MINNESOTA

TITLE: ANNUNCIATOR ASSY-PL

MODEL: ANP

DWG NO. 300-2752

DWG SIZE D

300-2752 D

333 - 0011 | DWG SIZE P

1. Name HORN, VIBRATING

2. Mfrd. by EDWARDS CO. INC.
   Address NORWALK, CONN.

3. Manufacturer's No.:
   [X] Mfr. standard no. 343A which describes it fully. It is a standard commercial item.
   [ ] Mfr. style no. _____ which is an incomplete description. Also necessary to specify _____

4. Government Spec: The part described
   [ ] is not required to meet a Gov't Spec.
   [ ] must meet Gov't Specs as follows:

5. Or Equal
   [ ] Only the brand detailed above is acceptable.
   [X] An equal in another brand is acceptable.

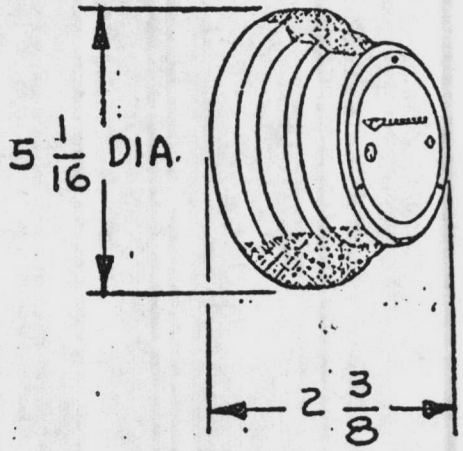
6. Same as Onan No. _____ except _____

7. After Receipt by Onan:
   [X] Used as is
   [ ] Modified becomes Onan No. _____

8. First Used on Model _____

9. Data Furnished by T. AASEN

Ref.-V.A. FOR TEST, VA ± 20%
12 VOLT, DC, (SPECIAL)
V.A., AMPS DC OHMS (REF)
62 DECIBELS AT 10 FT. GRAY.
MOUNTS ON SURFACE OR ELECTRICAL BOX



WT. - 1-1/4 LB.

LET	REVISION	ENG	CKR	DATE
	REDRAWN W/CHGS-OLD DWG-	da	tad	10-25-62

DR MLK SC QC
CKR CP
ENGR T.O. AASEN
DATE 4-19-73

DIVISION OF ONAN CORPORATION
Minneapolis, Minnesota

TITLE: HORN, VIBRATING

MODEL

DWG NO. 333 - 0011

DWG SIZE P

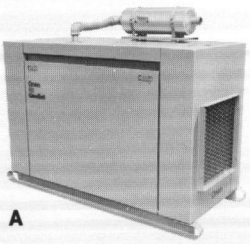
			6 X (2) PUR.	TP	COST	RELAY	X QC	X PO	SAMP REL / PROD REL T.O. AASEN

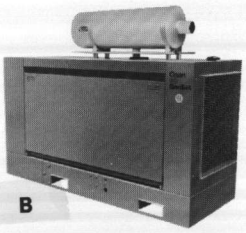
FORM 8C003

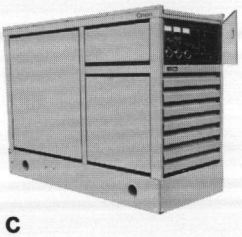
Onan

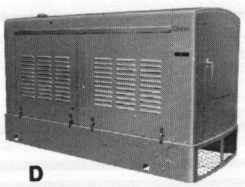
Protective **Housings**

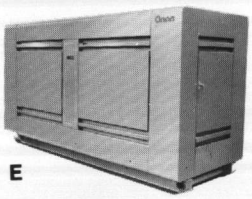
For GenSets 20 thru 500 kW, Radiator Cooled

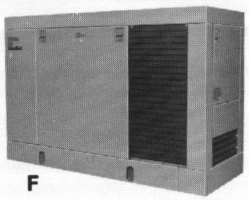

A

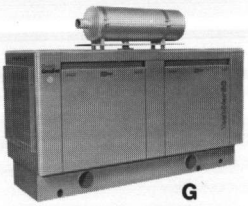

B

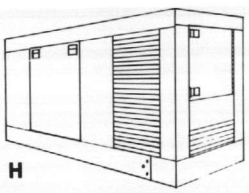

C

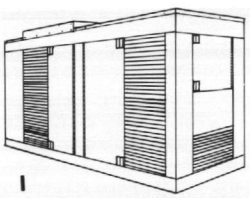

D

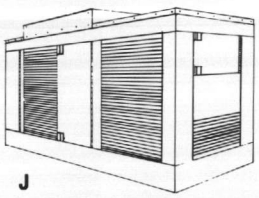

E

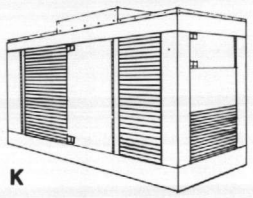

F


G


H


I


J


K

Mufflers not included with housings

Weather Protective Housing encloses the electric generating set, yet allows *ample airflow.* Factory-installed enclosure of heavy gauge, reinforced sheet steel, attaches to the generator set's standard mounting base and radiator cowling. *Easy access* to engine-generator provided by removable panels on each side. Rear hinged door opens to permit access to the instrument panel.

Protective Housing Selection

For GenSet-			Housing Overall Dimensions		
			Shown in inches, metric in parentheses (mm)		
Series	**Fuel**	**Figure**	**Length**	**Width**	**Height**
ES	Gasoline	A	58 (1473)	26 (660)	39.5 (1003)
DL4	Diesel	B	68.5 (1740)	28.5 (724)	41.5 (1054)
DL6	Diesel	B	75 (1905)	28.5 (724)	41.5 (1054)
DL6T	Diesel	B	75 (1905)	28.5 (724)	41.5 (1054)
SK	Gasoline	C	72.5 (1841)	29.3 (743)	51.3 (1302)
EK,EM	Gasoline	D	78 (1981)	33 (838)	45.6 (1157)
EN	Gasoline	D	85 (2159)	40.8 (1035)	52.5 (1334)
ENT	Natural Gas	D	93 (2362)	40.8 (1035)	52.5 (1334)
WA	Natural Gas	E	102 (2591)	40 (1016)	57 (1448)
DFP,DFM	Diesel	E	114 (2896)	44 (1118)	70 (1778)
DFS,DFN	Diesel	E	120 (3048)	55 (1397)	70 (1778)
DVA,DVB	Diesel	F	90 (2286)	33 (838)	59 (1497)
DVC,DVD,DVE	Diesel	H	106 (2692)	35 (889)	59 (1497)
DVF,DVG	Diesel	I	126 (3200)	44 (1118)	75 (1905)
DVH,DVJ	Diesel	J	138 (3505)	50 (1270)	75 (1905)
DVK,DVL	Diesel	K	162 (4115)	60 (1524)	91 (2311)
SJB	Gas/N. Gas/LPG	G	70.3 (1785)	31.5 (800)	47.6 (1210)
SKB	Gas/N. Gas/LPG	G	84.2 (2139)	31.5 (800)	47.6 (1210)
DL4B	Diesel	G	78.3 (1990)	31.5 (800)	47.6 (1210)
DL6B	Diesel	G	88.2 (2240)	36.8 (934)	55.2 (1402)
DL6TB	Diesel	G	92.7 (2354)	36.8 (934)	55.2 (1402)

Weatherproof **Shelters**

For Radiator Cooled GenSets

Weatherproof Outdoor Shelters completely enclose the factory-installed, electric generating set to give *year 'round protection* against adverse weather and environmental conditions. Housings also discourage tampering and act as a barrier to rodents, etc.

Ruggedly constructed of welded and bolted, reinforced sheet steel in both 16-gauge and 14-gauge thicknesses. The floor plate is 14-gauge steel. All metal parts are prime-coated and finish-painted. Each housing has *shuttered air openings* on front and sides, with mesh screens covering side shutters.

Four 22-volt AC motors on Modification 96 and 97 and six on Modification 98 open the shutters to permit air to enter when gensets operate. *Motors are spring-loaded to close shutters when gensets stop.*

Hinged, double doors on each side give *easy access* to the genset, and a rear door allows access to the control panel. All door handles are key-lock type. Skid and floor design includes a removable panel below the engine oil pan. All shelters come *ready for job-installation.* Exhaust silencer, mounting hardware, vibration isolators, battery racks, etc., are optional and must be ordered separately.

Weatherproof Shelter Selection

For GenSet

Shelter Overall Dimensions and Approximate Weights

Shown in inches, metric in parentheses (mm); weight-lb (kg)

Capacity	Fuel	Modification	Length	Width	Height	Weight
20-70 kW	Gasoline					
75 kW	Natural Gas	F96	150 (3810)	64 (1626)	79 (2007)	1400 (636)
85 kW	Gasoline					
300-100 kW	Diesel					
115 & 175 kW	Natural Gas	F97	150 (3810)	64 (1626)	79 (2007)	1400 (636)
125-250 kW	Diesel					
300-350 kW	Diesel	F98	180 (4572)	84 (2134)	97 (2464)	1600 (726)
400-500 kW	Diesel	F121	180 (4572)	86 (2184)	97 (2464)	1800 (816)

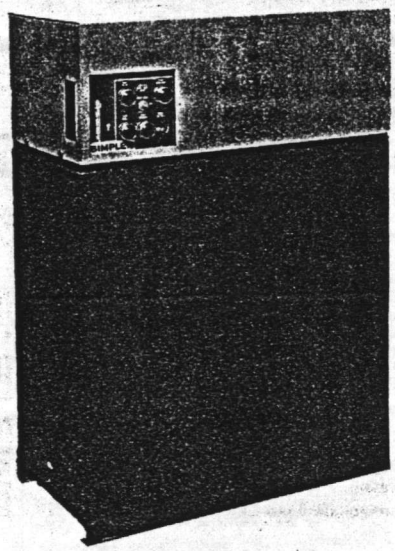
See Your Onan Distributor:

Onan Corporation 1400 73rd Avenue N.E. Minneapolis, MN 55432 Telephone 612 574-5000 Telex 29 0476 (U.S.) Telex 29 0856 (outside U.S.) TWX 910 576-2833 Cable ONAN

SIMPLX®

Packaged Day Tank Systems

Engineering Submittal

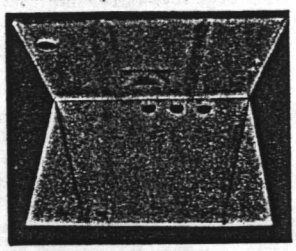


MODEL	CAPACITY (GALLONS)	DIMENSIONS (INCHES)		
		W	H	D
SFT3	3	36	22.25	12.25
SFT5	5	36	22.25	12.25
SFT7/10	7	36	22.25	12.25
SFT10A	10	24	23	12
SFT10S	10	24	24.5	5
SFT20S	20	24	24.5	8
SFT25A	25	24	34	12
SFT50A	50	24	43	18
SFT75A	75	24	56	18
SFT100A	100	24	56	24
SFT150A	150	27	59	36.25
SFT275A	275	27	58	66

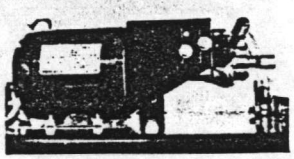
Standard Day Tank

Standard Day Tank consists of: heavy gauge steel tank, epoxy coated inside, rust-proofed and finished painted outside (tank in Brewster Green, lift-off top cover in customer colors); 1" NPT threaded pipe connections for vent, overflow, engine suction and two 1" NPT threaded pipe connections for engine fuel return: one located above max fuel level, one located at same head pressure level as engine suction; tank drain; 2 gpm bronze gear pump connected to 1/3HP, 120V AC motor; 1 HP float switch with adjustment to maintain large reserve; control panel with "Press-to-Test" button, fuel level gauge and space for control options; complete wiring and plumbing.

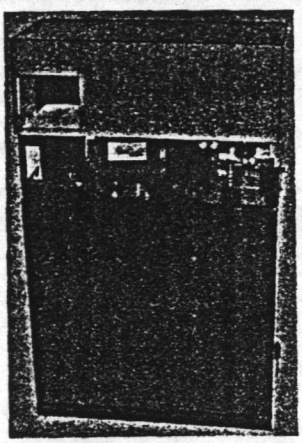
Control panel with standard press-to-test; gauge. Optional status lights; switch.



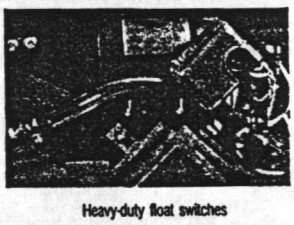
Each day tank supplied standard with complete inside epoxy coating. Standard upflow baffle (lower left) directs return fuel up and away from settled sediment.



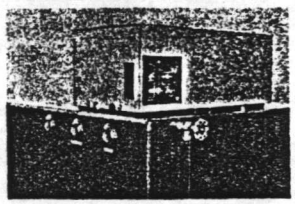
Oversize motors, bronze gear pumps

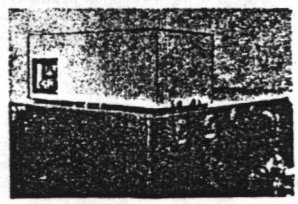


Standard lift-off top cover



Heavy-duty float switches





SFT275A standard dual connections

Standard pipe connections

SIMPLEX®

PACKAGED DAY TANK SYSTEMS FOR DIESEL AND FUEL OIL

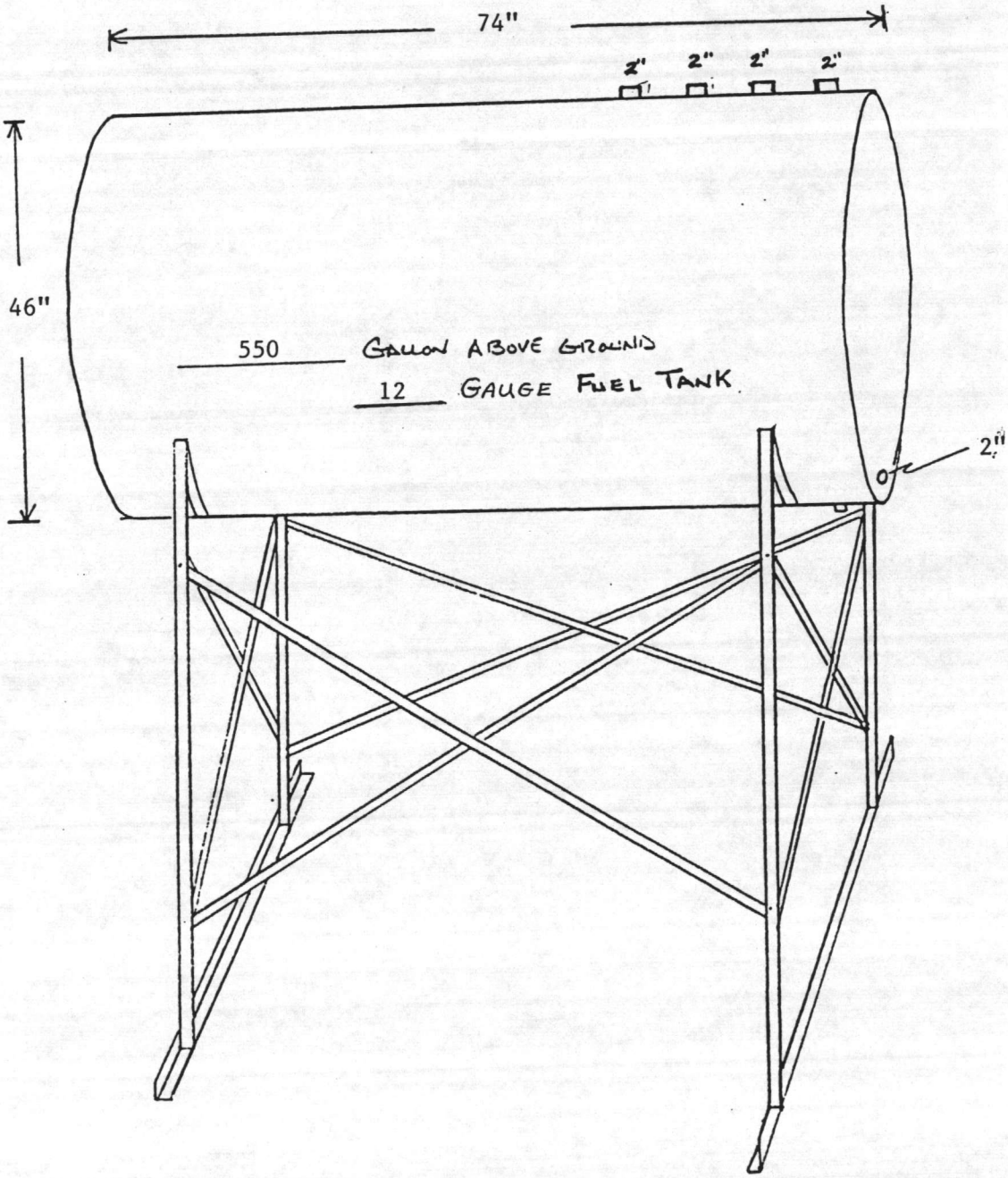
CUSTOMER _____ P.O. NO. _____ REFERENCE _____ EQUIPMENT _____

OPTIONS

Option	Description
Mechanical Options	
010	Auxiliary hand pump, piston type, 1 GPM capacity.
015	Auxiliary hand pump, piston type. 20 gallons per 100 strokes.
020	Manual fuel fill cap, 2" diameter.
030	6" square, gasketed inspection port in top of tank.
040	Wall-mounting brackets (available for 10 and 25 gallon units only).
050	Pipe stand adapter to raise tank above floor (pipe legs to be supplied by others).
060	Fuel strainer (shipped loose—mounts in Day Tank intake line).
063	Vent cap. Shipped loose for installation at outdoor vent termination. 1" NPT.
065	Drain hand valve in lieu of threaded plug in bottom of tank.
067	Manual quick-drain.
068	Emergency quick drain.
070	Check valve on pump intake to prevent loss of pump prime. For 2 GPM pump.
075	As above, for use with Option 400, 7 GPM pump.
080	Solenoid valve on pump intake to prevent loss of pump prime or tank flooding. For AC systems.
083	Solenoid valve, as above, for DC systems.
087	Manual fuel cut-off valve on day tank fuel inlet for gravity fed day tanks.
090	Foot valve to prevent loss of pump prime, 1" NPT (shipped loose).
093	High temperature fuel return.
095	Pressure relief valve.
110	Relocation of standard motor-pump to remote pumping unit.
120	Extra 1" NPT pipe connections on tank.
130	Oversize pipe connections, 1 1/4 to 2 1/2 NPT.
140	Special paint finishes.
150	Extra-heavy tank construction.
160	Stainless steel tank construction.
170	Tanks built and tested to withstand 50 PSI.
180	Weatherproof Modification.
185	2 or 3 complete day tanks mounted on common base, interconnected with isolation valves to provide system redundency.
190	Rupture basin.
191	Addition to Option 190: Float switch in rupture basin to sense day tank rupture and stop pump motor.
192	Addition to Option 191: Adds wiring and terminal block on day tank to privide remote signal of day tank rupture.
193	Addition to Option 190: Adds plumbing and hand valve to permit draining of rupture basin through manual quick-drain installed on day tank.
194	Addition to Option 190: In event of tank rupture, provides automatic gravity draining of rupture basin back to main tank.
198	Earthquake zone version of day tank.
Control Devices and Alarms	
261	"On-Off" Day Tank system circuit breaker with short circuit trips. Mounted on day tank.
262	Thermal overload protection built into pump motor.
270	Power available green pilot light connected to line side of float switch.
280	"Pump Run-Off-Automatic" operation mode selector switch (includes 270 and 340).
295	Remote low fuel level alarm dry signal contacts.
297	Remote high fuel level alarm dry signal contacts.
299	Auxiliary relay for use with option 295 or 297 above.
305	Low fuel level alarm light (red) on day tank control panel.
307	High fuel level alarm light (red) on day tank control panel.
311	Local/remote low fuel level alarm.
312	Local/remote high fuel level alarm.
325	High fuel level emergency pump-stop switch.
329	Low fuel level red light to indicate low fuel in the remote main storage tank.
333	Critical low fuel level alarm—engine shut down.
334	Alarm horn installed on day tank.
338	Explosion-proof float switch in lieu of NEMA1 float switch for high/low level options.
340	"Pump Running" amber light.
350	Duplex pump controller system-Provides motor-pump backup system.
360	Second standard motor-pump assembly: 1/3HP, 120V AC, 2GPM motor-pump complete with second float switch mounted and wired.
370	Explosion proof main float switch for motor-pump control in lieu of standard float switch.
380	Float valve for use in gravity fed systems.
390	Reversal of float switch and motor-pump to pump out on fuel level rise.
Gauges & Sight Glasses	
200	Sight glass (flexible plastic) with hand valve at lower end and guard.
210	Sight glass (glass) with 2 hand valves and guard.
220	Remote reading electric fuel level gauge for day tank.
230	Gauge to read fuel level of remote main storage tank (details required).
Pumps and Motors	
400	7 GPM highlight pump in lieu of 2 GPM basic unit pump. Requires a 1/2HP motor.
410	10 GPM highlift pump in lieu of 2 GPM basic unit pump. Requires a 3/4HP motor.
415	17GPM highlift pump in lieu of 2 GPM basic unit pump. Requires a 1HP motor.
510	Transformer, 480/120V AC, single phase, 60 Hz for use with standard & optional 1/3HP motors.
511	Transformer, 480/120V AC, single-phase, 60HZ, for use with optional 1/2HP motors.
605	1/3HP, 230V AC, single phase, 60 Hz motor.
610	1/3HP, 480V AC, single phase, 60 Hz motor c/w motor starter and control transformer.
615	1/3HP, 110V AC, single phase, 50 Hz motor.
616	1/3HP, 220V AC, single phase, 50 Hz motor.
620	1/3HP, 230V AC, 3 phase, 60 Hz motor.
625	1/3HP, 460V AC, 3 phase, 60 Hz motor c/w motor starter and control transformer.
630	1/3HP, 12V DC motor.
635	1/3HP, 24-28V DC motor.
638	1/3HP, 24-28V DC explosion-proof motor. Option 110 Required.
640	1/3HP, 32-36V DC motor.
645	1/3HP, 115V AC, single phase, 60 Hz motor, totally enclosed, fan cooled. #110 Req'd.
650	1/3HP, 230V AC, 3 phase, 60 Hz motor, totally enclosed, fan cooled. #110 Req'd.
655	1/3HP, 460V AC, 3 phase, 60 Hz motor, totally enclosed, fan cooled c/w motor starter and control transformer.
660	1/3HP, 115V AC, single phase, 60 Hz explosion-proof motor.
700	1/2HP, 115V AC, single phase, 60 Hz motor.
705	1/2HP, 230V AC, single phase, 60 Hz motor.
710	1/2HP, 480V AC, single phase, 60 Hz motor, c/w motor starter and control transformer.
715	1/2HP, 110V AC, single phase, 50 Hz motor.
716	1/2HP, 220V AC, single phase, 50 Hz motor.
720	1/2HP, 230V AC, 3 phase, 60 Hz motor.
725	1/2HP, 460V AC, 3 phase, 60 Hz motor c/w motor starter and control transformer.
730	1/2HP, 12V DC motor.
735	1/2HP, 24-28V DC motor.
738	1/2HP, 24-28V DC explosion proof motor.
740	1/2HP, 32-36V DC motor.
745	1/2HP, 115V AC, single phase, 60 Hz motor, totally enclosed, fan cooled.
750	1/2HP, 230V AC, 3 phase, 60 Hz motor, totally enclosed, fan cooled.
755	1/2HP, 460V AC, 3 phase, 60 Hz motor, totally enclosed, fan cooled, c/w motor starter and control transformer.
760	1/2HP, 120V AC, single phase, 60 Hz explosion-proof motor.
768	Single-phase magnetic motor starter with heater coil and control transformer.
770	3-phase magnetic motor starter with 3 heater coils and control transformer.

SIMPLEX INC
SPRINGFIELD, ILLINOIS 62702
PH217-525-6995 217-528-3130 (24hr.)
TELEX 406-415

Option List 8A 14022C
Printed in USA


74"
2"
2"
2"
2"
46"
550 GALLON ABOVE GROUND
12 GAUGE FUEL TANK
2"

Onan

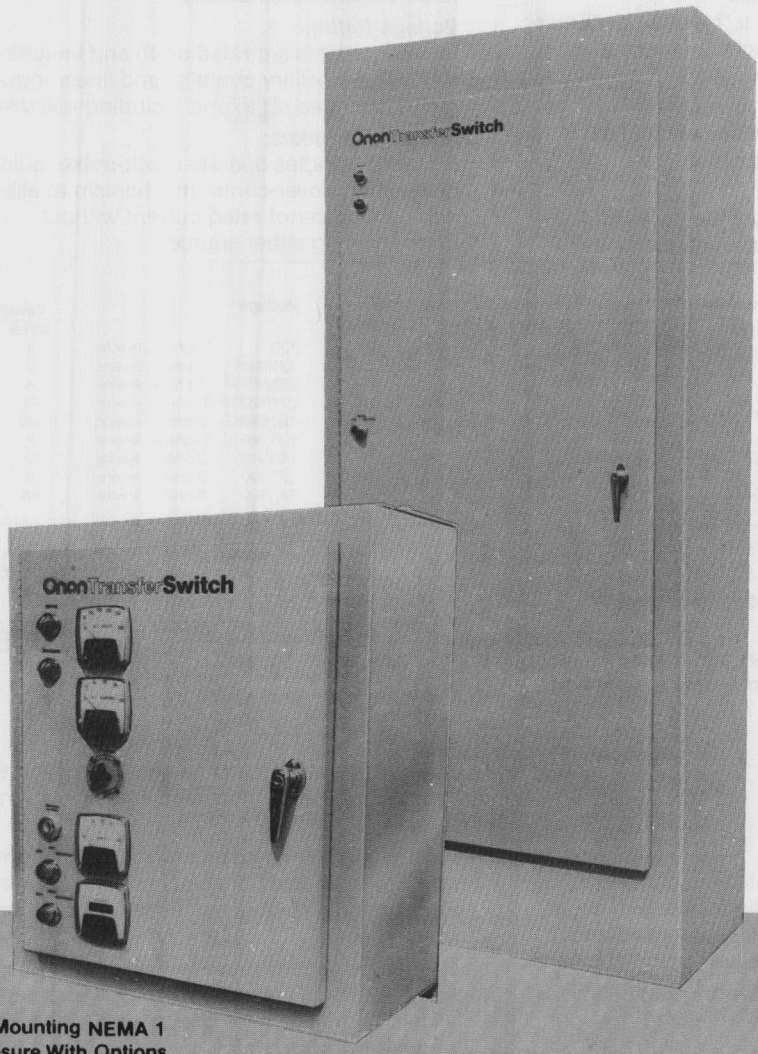
OT II

Automatic **Transfer Switches**

With Power Sentry® Control

40 through 1000 amperes
50/60 hertz

Two or three pole
UL listed (Standard 1008)
CSA Certified
Various NEMA cabinets or open construction



Wall Mounting NEMA 1 Enclosure With Options

Free Standing NEMA 1 Enclosure

The critical link between your load and the emergency power source is the Onan OT II automatic transfer switch. The transfer switch and an engine-generator make up a basic emergency power system to furnish power for your load when the normal power source is unsatisfactory.

Important Features Built Into OT II Transfer Switches With Power Sentry Control

- **High withstand rating**
- **Electronic control** with all-phase monitoring and four normally required time delays
- **Linear induction motor** operator
- **Programmed transition capability** for transfer of high inductive loads
- **Plug connector interface** with control simplifies maintenance and addition of features
- **Permanently mounted handles** for manual operation under load

Transfer Switch

Advanced Transfer Switch Design:
Bi-directional linear induction motors power all Onan OT II transfer switches. These motors provide virtually friction-free, constant force, straight-line switch action, with no gears or cams to break or wear.

Transfer Action:
Break-before-make action prevents the application of power to the load from both sources at the same time. A simple, mechanical interlocking beam ensures this action.

Mechanically Held Contacts:
Whether the switch is in the "Normal" or "Emergency" position, the contacts are mechanically held in that position.

Main Contacts:
Long-life, high pressure, silver cadmium oxide contacts resist burning and pitting.

Arc Interruption:
Multiple leaf arc chutes cool the gases and quench the arcs. Covers prevent interphase flashover.

Neutral:
Neutral bar with lugs is standard on OT II transfer switches supplied with cabinet.

Auxiliary Contacts:
An auxiliary switch on each side, operated by the transfer switch, is provided to operate peripheral equipment. These single-pole, double-throw switches, rated 10-amp, are wired to an easy access terminal block.

Current Rating:
All OT II transfer switches will carry their full rated current continuously.

Voltage Rating:
Power contacts are rated up to and including 600 VAC. The auxiliary contacts and linear induction motor are rated up to and including 480 VAC.

Manual Operators:
Insulated handles operate quick-make, quick-break spring over-center mechanism to allow manual transfer of rated current without disconnecting either source.

Withstand and Closing Ratings (Amperes) of Onan OT II Transfer Switches, per UL Standard 1008:

Transfer Switch Continuous Ampere Ratings	40,70,100	150,260	400, 600	800,1000
480-Volt Rating				
Circuit Breaker Protected				
Available RMS Symmetrical Fault Current, Amp	14,000	30,000	65,000	65,000
Protective Device Continuous Rating (max), Amp	125	400	1,200	2,000
600-Volt Rating				
Circuit Breaker Protected				
Available RMS Symmetrical Fault Current, Amp	5,000	10,000	14,000	25,000
Protective Device Continuous Rating (max), Amp	125	400	1,200	2,000
Fuse Protected				
Available Symmetrical Fault Current, Amp	200,000	200,000	200,000	200,000
Protective Device Continuous Rating (max), Amp	200	600	1,200	2,000
Fuse Class	J,RK1,RK5	J,RK1,RK5	L	L

Voltage		Voltage Code 60-Hz	Voltage Code 50-Hz
120	1-phase, 2-wire	1	51
120/240	1-phase, 3-wire	3	53
120/208	3-phase, 4-wire	4	54
277/480	3-phase, 4-wire	4X	54X
120/240	3-phase, 4-wire	5D	55D
220/380	3-phase, 4-wire	7	57
240/416	3-phase, 4-wire	7X	57X
127/220	3-phase, 4-wire	8	58
347/600	3-phase, 4-wire	9X	

Power Sentry® Electronic Control

- ***Adjustable Undervoltage Sensors With Dropout Time Delay***

These undervoltage sensors simultaneously monitor all phases of both normal and emergency sources.

Close Differential Adjustment Range

Pickup		Dropout		
Min.	Max.	Min.	Max.	Time Delay
85% ± 2.5% of nominal voltage	100% of nominal voltage	74% ± 3% of pickup setting	98% ± 0.3% of pickup setting	0.5 ± 0.25 seconds (fixed)

Adjustable range solid state voltage sensors let customer adjust for specific application needs. Protection can be field adjusted for brownout conditions to protect sensitive equipment, or adjusted to protect conventional equipment against gross voltage variations.

- ***Start Contacts***

Form-C (dry contacts, one normally open and one normally closed), for two-wire engine control, wired to an easy access terminal block.

- ***Control Mode Status Indicators***

- ***Adjustable Solid State Time Delays***

Time Delays enhance system performance and versatility.

Delay	Adjustment	Factory Setting
Start	0 to 6-sec	2-sec
Transfer	0 to 120-sec	2-sec
Retransfer	0 to 30-min	15-min
Stop	0 to 8-min	5-min

Start — Prevents nuisance genset starts in the event of momentary power system variation or loss.

Transfer — Allows genset to stabilize before application of load; prevents needless power interruption if normal source variation or loss is momentary.

Retransfer — Prevents needless power interruption if return of normal source is momentary; allows staggered retransfer of loads in multiple transfer switch systems.

Stop — Maintains availability of genset for immediate reconnection in the event that the normal source fails shortly after retransfer; allows gradual genset cool-down by running unloaded.

Enclosure

The transfer switch and Power Sentry control units are mounted in a single-door enclosure.

- Meters and indicator lamps readable from front of closed cabinet
- The key locking NEMA 1 cabinet utilizes 14-gauge welded steel construction
- Includes Normal/Emergency transfer switch position indicator lamps
- Includes key operated Test/Normal/Retransfer switch for system test and maintenance, and return to normal control, without opening the cabinet. Retransfer position provides immediate retransfer to normal, bypassing time delay.
- 40 through 100 amp switch cabinets wall mounting. Larger units free standing.
- **Wiring space complies with 1984 NEC Table 373-6 (b)**

Terminal Lug Capacity

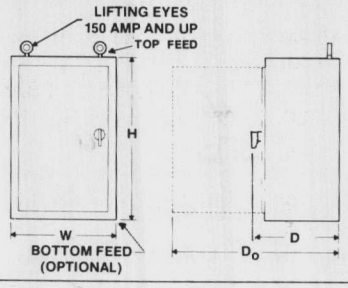
For Copper or Aluminum Conductors unless otherwise indicated (Lugs not supplied on rear-connect models)

Switch Amp Rating	Number of Conductors	Size Range of Conductors
40	1	#0 AWG to #14 AWG
70	1	#0 AWG to #14 AWG
100	1	#0 AWG to #14 AWG
150	1	#6 AWG to 350 MCM
260	1	#4 AWG to 500 MCM
400	1	#6 AWG to 250 MCM
	1	#2/0 AWG to 600 MCM
600	2	250 MCM to 350 MCM (copper)
	2	350 MCM to 500 MCM (aluminum)
800	4	#4 AWG to 600 MCM
1000	4	#4 AWG to 600 MCM

CAUTION: Do not run control wiring through power cable conduit or raceway.

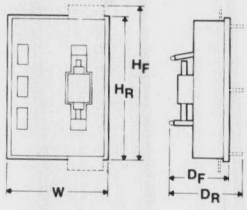
Approximate Physical Dimensions

NEMA 1 Cabinet and Transfer Switch



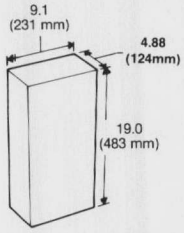
Switch Amp Rating	Height (H)	Width (W)	Depth W/Door — Closed (D)	Depth W/Door — Open (D_O)	Weight (Switch & Cabinet)
40. 70. 100	30.5 in (775mm)	23.0 in (584mm)	15.1 (384 mm)	32.75 in (832mm)	140 lb (64kg)
150. 260	63.0 in (1600mm)	30.0 in (762mm)	21.6 (549mm)	45.5 (1156 mm)	480 lb (218kg)
400 600	63.0 (1600 mm)	30.0 in (762mm)	21.6 (549 mm)	45.5 (1156 mm)	550 lb (249kg)
800. 1.000	84.0 in (2134mm)	36.0 in (914mm)	22.6 in (574mm)	51.7 in (1313mm)	650 lb (294kg)

Transfer Switch



Switch Amp Rating	Height — Front Connect (H_F)	Height — Rear Connect (H_R)	Width (W)	Depth — Front Connect (D_F)	Depth — Rear Connect (D_R)	Weight
40. 70. 100	18.75 in (476mm)	18.75 in (476mm)	13.0 in (330mm)	7.9 in (200mm)	9.4 in (238mm)	24.5 lb (11.1kg)
150. 260	32.4 (823 mm)	29.5 in (749mm)	16.25 in (413mm)	13.1 (333 mm)	13.6 in (345mm)	50 lb (23kg)
400 600	26.6 (676 mm)	26.8 (681 mm)	16.3 (414 mm)	13.6 (345 mm)	14.8 (376 mm)	76 lb (34.4 kg)
800. 1000	41.0 in (1041mm)	37.0 in (940mm)	18.0 in (457mm)	15.8 in (401mm)	15.2 in (386mm)	130 lb (60kg)

Power Sentry® Electronic Control



Approximate Weight
24-lb (11 kg)

Power Sentry Control unit for enclosed or open construction OT transfer switches.

Options and Accessories

Overvoltage and Frequency Sensing

☐ **Control Package** - Overvoltage Sensors and Frequency Sensors

Adjustable Overvoltage Sensors with Dropout Time Delay (all phases, both sides)

Close Differential Adjustment Range

Pickup		Dropout	Time Delay	
Min.	**Max.**	5% ± 1% of	**Time Delay**	
100% of nominal voltage	130% ±5% of nominal voltage	nominal voltage above pickup setting (fixed)	**Min.** 0.5-sec	**Max.** 2.2-min ±0.6-min

Adjustable Frequency Sensors with Dropout Time Delay (both sides)

Frequency Bandwidth Adjustment Range

Pickup		Dropout	Time Delay	
Min.	**Max.**	5% of	**Time Delay**	
±4% of nominal frequency	± 20% of nominal frequency	nominal wider than pickup frequency bandwidth	**Min.** 0.1-sec	**Max.** 15 sec

Meters

☐ **Voltmeter** — 3.5 in. (89 mm), 2% accuracy.
☐ **Ammeter** — 3.5 in. (89 mm), 2% accuracy.
☐ **Frequency Meter** — 3.5 in. (89 mm), pointer type.
☐ **Running Time Meter** records genset cumulative operating hours.

GenSet Exercise

☐ **Exerciser Clock** sets the day, time, and duration of the genset exercise period; includes With/Without Load selector switch.

Special Feature

☐ **Programmed Transition** extends the transition or disconnect period beyond the normal 6-cycle time to allow residual voltages generated by heavy inductive loads to decay to a safe level. Available for either factory or field installation.

☐ **Manual push to retransfer**

Battery Float Chargers *(includes charge rate ammeter)*

☐ **2-amp, 12 volt** ☐ **2-amp, 24-volt**
☐ **6-amp, 24-volt** ☐ **10-amp, 12-volt**

Two-To-Three-Wire Converter *(includes overcrank lamp)*

☐ **With diesel preheat time delay**
☐ **Without diesel preheat time delay**

Cabinet

☐ **NEMA 4** — Raintight
☐ **NEMA 3R** — Dustproof and rainproof
☐ **Open Construction** (no cabinet) model, for installation in customer's enclosure. Includes automatic transfer switch and all cabinet mountable devices and associated wiring — shipped loose.

Relay Control

☐ **Electromechanical Relay Control,** as an option to the Power Sentry electronic control, is an economical, reliable control for the automatic transfer switch functions where sophisticated controls are not required. Three control packages are offered:

- ☐ Single-phase, non-adjustable line-loss relay provides automatic standby set starting in response to normal source failure, and shutdown on return of normal power.
- ☐ All-phase, non-adjustable line-loss relay, plus time delays —
  - **Start,** adjustable 0.5 to 5.0 seconds.
  - **Retransfer,** adjustable 3.0 to 30 minutes.
- ☐ All-phase, line-loss relay and time delays start and retransfer, as above, plus time delays —
  - **Stop,** 5 minutes, non-adjustable.
  - **Transfer,** 0.5 seconds, non-adjustable.

Ordering

Note: Place the code (numbers or letters adjacent to boxes checked as selected features) in the model number block below. Additional options or accessories do not affect the model number.

OT	B	C	D	100 – 4/5D	U	/ 34	01

Series
- ☑ **OT** Automatic Transfer Switch

Pole
- ☐ **A** 2-pole
- ☑ **B** 3-pole

Basic Application
- ☑ **C** GenSet Standby to Utility

Enclosure
- ☐ **A** General Purpose (NEMA 1)
- ☐ **B** Dustproof & Rainproof (NEMA 3R)
- ☐ **C** Open Construction
- ☑ **D** Watertight (NEMA 4)

Continuous Ampere Rating
- ☐ **40**
- ☐ **70**
- ☑ **100**
- ☐ **150**
- ☐ **260**
- ☐ **400**
- ☐ **600**
- ☐ **800**
- ☐ **1000**

Voltage 60-Hz *50-Hz*
- ☐ **1** ☐ ***51*** 120-volt 1-phase, 2-wire
- ☐ **3** ☐ ***53*** 120/240 volt 1-phase, 3-wire
- ☑ **4** ☐ ***54*** 120-208-volt 3-phase, 4-wire
- ☐ **4X** ☐ ***54X*** 277/480-volt 3-phase, 4-wire
- ☑ **5D** ☐ ***55D*** 120/240-volt 3-phase, 4-wire
- ☐ **7** ☐ ***57*** 220/380-volt 3-phase, 4-wire
- ☐ **7X** ☐ ***57X*** 240/416-volt 3-phase, 4-wire
- ☐ **8** ☐ ***58*** 127/220-volt 3-phase, 4-wire
- ☐ **9X** 347/600-volt 3-phase, 4-wire

Agency Certification
- ☑ **U** Underwriters' Laboratories, Inc.
- ☐ **C** Canadian Standards Association
- ☐ **N** None

Control Group

Power Sentry Electronic Control
- ☐ **31** Normal side sensing: Undervoltage (all lines) Emergency side sensing: Undervoltage (all lines)
- ☐ **32** Normal side sensing: Undervoltage (all lines) Emergency side sensing: Undervoltage (all lines) Under/Over Frequency
- ☐ **33** Normal side sensing: Undervoltage (all lines) Emergency side sensing: Undervoltage (all lines) Overvoltage (all lines) Under/Over Frequency
- ☑ **34** Normal side sensing: Undervoltage (all lines) Overvoltage (all lines) Under/Over Frequency Emergency side sensing: Undervoltage (all lines) Overvoltage (all lines) Under/Over Frequency

Electromechanical Relay Control
- ☐ **56** Line Loss Relay
- ☐ **57** Line Loss Relay Time Delay Start Time Delay Retransfer
- ☐ **58** Line Loss Relay Time Delay Start Time Delay Transfer Time Delay Retransfer Time Delay Stop

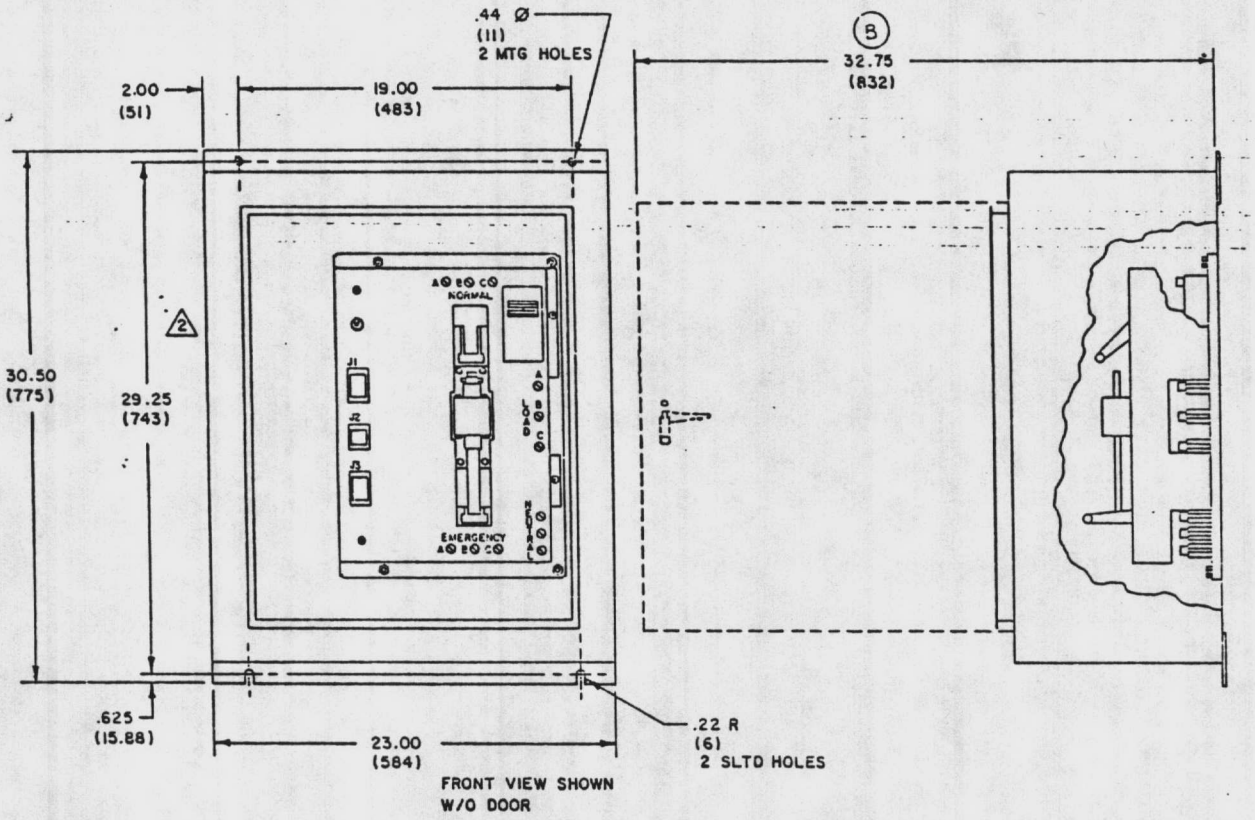
Meter Group
- ☑ **01** None
- ☐ **02** AC Voltmeter
- ☐ **03** AC Voltmeter AC Ammeter(s) Running Time Meter Frequency Meter
- ☐ **04** Running Time Meter
- ☐ **05** Running Time Meter Frequency Meter
- ☐ **06** AC Voltmeter AC Ammeter(s) Frequency Meter
- ☐ **11** AC Ammeter(s)

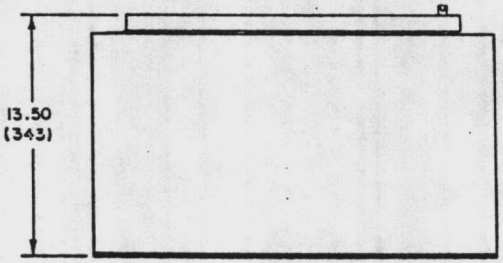
See Your Onan Distributor:

Onan Corporation 1400 73rd Avenue N.E. Minneapolis, MN 55432 Telephone 612 574-5000 Telex 29 0476 (U.S.) Telex 29 0856 (outside U.S.) TWX 910 576-2833 Cable ONAN

310-0226 C

ER	LET	REVISION	ZONE	DR	ENG	CHK	DATE
3505		PROD RLSE					
4331	A	WAS 01-14GA(1)	1C	RD			4-28-81
6141	B	DIM 32.75 WAS 32.50; 13.50 WAS 13.25	3D	RD			5-11-81





NOTE:
1. DIMENSIONS IN ( ) ARE IN MILLIMETERS.
2. CAUTION: NO SIDE ENTRANCE OF NORMAL, EMERGENCY OR LOAD CABLES DUE TO CONTROL BEING MOUNTED ON THIS SIDE.
3. WIRE SIZE & QTY: 0-14 GA (1) (A)

310-0226 C

ITEM	PART NO.	DWG SIZE	QTY.	DESCRIPTION OR MATERIAL
1	301-6086	D	REF	CONTROL BOX

TOLERANCES UNLESS OTHERWISE SPECIFIED
MFGT ASSY
SIM TO
Third Angle Projection
.x ±
.xx ±
.xxx ±
.xxxx ±
HOLES +.006 -.007
ANGLES ±
SCALE 6/9

The proprietary design information on this print is owned by Onan, a Division of Onan Corporation. Conveyance of this right in not extended to others.

SEPIA FROM 310-0226 C

	INITIAL	DATE
DR	MRD	9-2-80
CHK	JF COP	
ENGR	TM	
MFG APP.		
ENGR APP.		
PROD REL	TM	

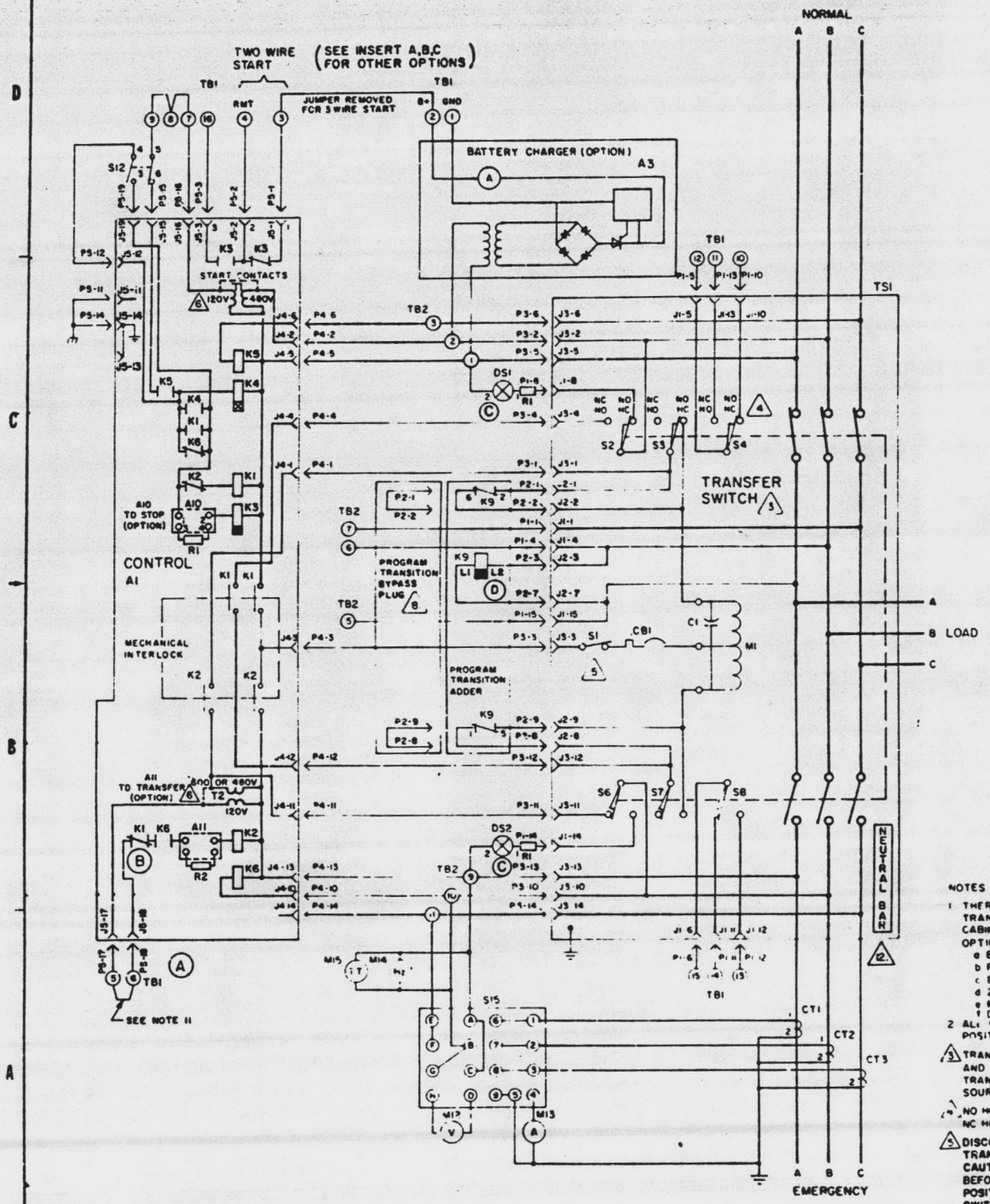
ONAN A DIVISION OF ONAN CORPORATION Minneapolis, Minnesota

OUTLINE - CONTROL BOX

OT, 40-100 A

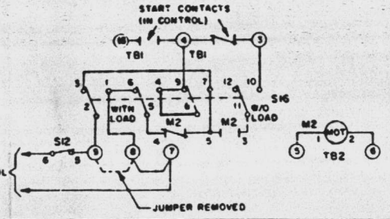
310-0226 C

626-1080 D



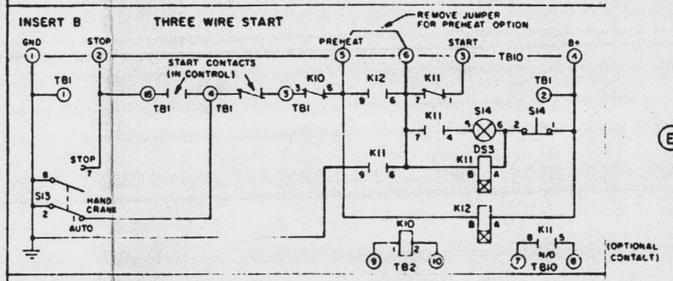
INSERT A

TWO WIRE START
EXERCISE WITH OR WITHOUT LOAD



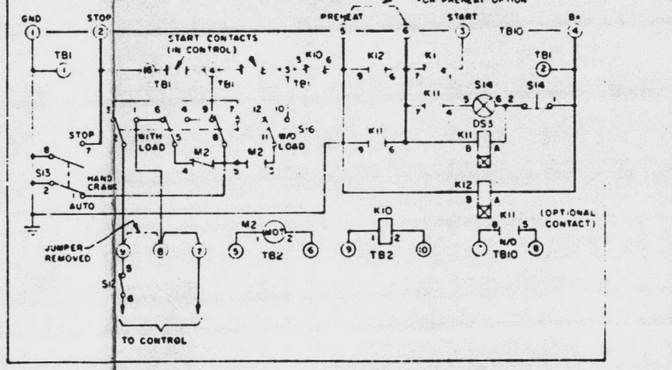
INSERT B

THREE WIRE START



INSERT C

THREE WIRE START
EXERCISE WITH OR WITHOUT LOAD



NOTES

1 THERE ARE OPTIONS SHOWN THAT ARE NOT ON EVERY TRANSFER SWITCH. SEE LABEL INSIDE TRANSFER SWITCH CABINET FOR SPECIFIC OPTIONS INSTALLED.
OPTIONS
a BATTERY CHARGER (A3)
b PROGRAM TRANSITION (K9)
c EXERCISER CLOCK (M2)(S16)
d 2 TO 3 WIRE CONVERTER (A2)(S13)(S14)
e METERS (MI2)(MI3)(MI4)(MI5)(S15)
f DIESEL PREHEAT (K12)

2 ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION UNLESS OTHERWISE STATED.

3 TRANSFER SWITCH IS MECHANICALLY HELD BOTH SIDES AND ELECTRICALLY OPERATED WITH MANUAL OPERATORS. TRANSFER SWITCH IS SHOWN CONNECTED TO THE NORMAL SOURCE.

4 NO MC DESIGNATES NORMALLY OPEN, HELD CLOSED
NC MO DESIGNATES NORMALLY CLOSED, HELD OPEN

5 DISCONNECT SWITCH: FOR MANUAL OPERATION OF TRANSFER SWITCH, THROW SWITCH TO "OFF". CAUTION: RETURN TRANSFER SWITCH TO ORIGINAL POSITION BEFORE SWITCHING TO "ON". SWITCH MUST BE LEFT IN "ON" POSITION EXCEPT FOR MANUAL OPERATION OF TRANSFER SWITCH.

6 SHOWN WIRED FOR 480 V OR 600V OPERATION. DASH LINE INDICATES CONNECTION FOR 208V OR 240V OPERATION.

7 UNLESS OTHERWISE NOTED ALL COMPONENTS ARE SHOWN IN THE DE-ENERGIZED POSITION.

8 TRANSFER SWITCH WITHOUT PROGRAM TRANSITION WILL HAVE A BYPASS PLUG IN J2

9 LIGHT
NORMALLY CLOSED CONTACT
NORMALLY OPEN CONTACT
RELAY COIL
RELAY COIL TO ON PICKUP
RELAY COIL TO ON DROPOUT

F VOLTAGE CODE:
4,54,50,550,4X,54X,S1B 3 POLE TRANSFER SWITCH

ER	LET	DESCRIPTION	MADE BY	CHK	CKD	DATE
4305		PROD RELEASE				
6182	A	REVISED PER ER	6-A	CJP	GP	8-6-81
7696	B	REVISED CONNECTION #3	6-B	CJP	CJP	10-5-81
8498	C	ADDED RESISTOR	5-C	RB	GP	12-14-81
8693	D	REVISED CONNECTION	5-C	RB	GP	12-14-81
8693	E	ADD NOTE	2-C	RB	CJP	2-26-81
9527	F	ADDED S1B VOLTAGE CODE	2-A	RB	[illegible]	4-21-82

11. TO ADD PARLLELING SWITCHBOARD TRANSFER SWITCH INHIBIT CIRCUIT, REMOVE JUMPER BETWEEN TBI-5 & 6

E 12 TRANSFER SWITCH SHOWN IS 40-100 AMP SIZE. ON THE 150-1000 AMP SWITCH THE LOAD IS LOCATED BELOW THE NORMAL CONNECTIONS ON THE SWITCH. THE NEUTRAL BAR ON THE 150-1000 AMP SWITCH IS MOUNTED ON THE BACK OF THE CABINET.

C

RI	RESISTOR-LAMP
A1	CONTROL ASSY
A2	CONVERTER-2 TO 3 WIRE (K10, K11, K12 TB10) (S13) (S14)
A3	BATTERY CHARGER
CI	CAPACITOR (TRANSFER SW)
CB1	CIRCUIT BREAKER (TRANSFER SWITCH
CT1,2,3	TRANSFORMER-CURRENT
DS1	LAMP-NORMAL
DS2	LAMP-EMERGENCY
DS3	LAMP-OVERCRANK (PART OF S14)
J1-J5	RECEPTACLES
K1,K2	RELAY-INTERPOSING (DUAL COIL)
K9	RELAY-PROGRAM TRANSITION
K10	RELAY-START DISCONNECT
K11	RELAY-OVERCRANK (TIMING)
K12	RELAY-PREHEAT (TIMING)
M1	LINEAR MOTOR
M2	EXERCISER CLOCK
MI2	VOLTMETER-AC
MI3	AMMETER-AC
MI4	METER-FREQUENCY
MI5	METER-TIME TOTALIZING
P1-P5	PLUGS
S1	SWITCH-DISCONNECT
S2,3 S6,7	SWITCHES-CONTROL (TRANSFER SW)
S4	CONTACT-AUXILARY (NORMAL SIDE)
S8	CONTACT-AUXILARY (EMERGENCY SIDE)
S12	SWITCH-SELECTOR (TEST, NORMAL, RETRANSFER)
S13	SWITCH-SELECTOR (STOP, AUTO, HAND CRANK)
S14	SWITCH-RESET (CVERCRANK)
S15	SWITCH-SELECTOR (VOLT & AMMETER)
S16	SWITCH-SELECTOR (W/WO LOAD)
TBI	TERMINAL BLOCK (CUSTOMER CONN 2 WIRE START)
TB2	TERMINAL BLOCK (INTERCONNECTION)
TBIO	TERMINAL BLOCK (CUSTOMER CONN 3 WIRE START)
TSI	TRANSFER SWITCH

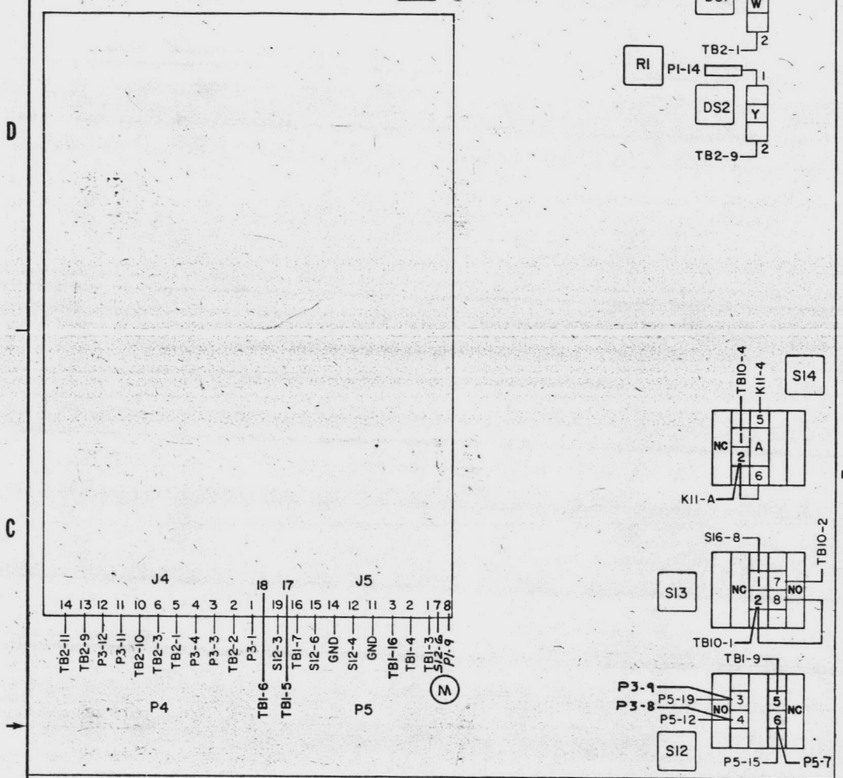
TOLERANCES UNLESS OTHERWISE SPECIFIED		D	SIZE 626-1047	ITEM	PART NO.	QTY	DESCRIPTION OR MATERIAL
.00 ±.03	.000 ±.010		MRD 12-5-80				A DIVISION OF ONAN CORPORATION
.0 ±.1	ANGLES ±.5°	626-1080	CJP 12-17-80				SCHEMATIC DIAGRAM-OT
Third Angle Projection			CHKD				
			ENGR				OT40-1000 SPEC E RELAY PANEL 57 & 58
			ITEM				SIZE D 626-1080 REV D

Onan Corp. Inc.

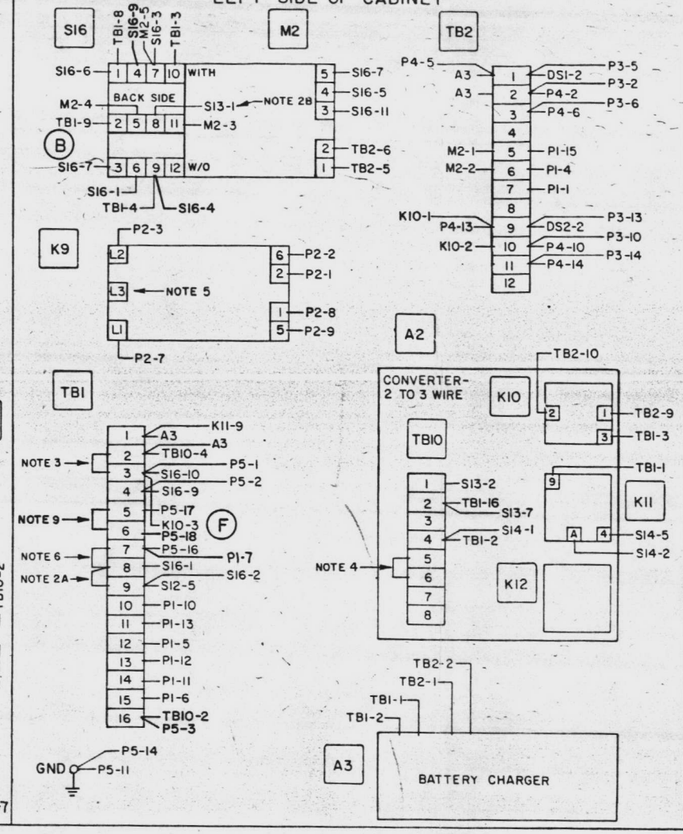
2 4 X

626-1042 D

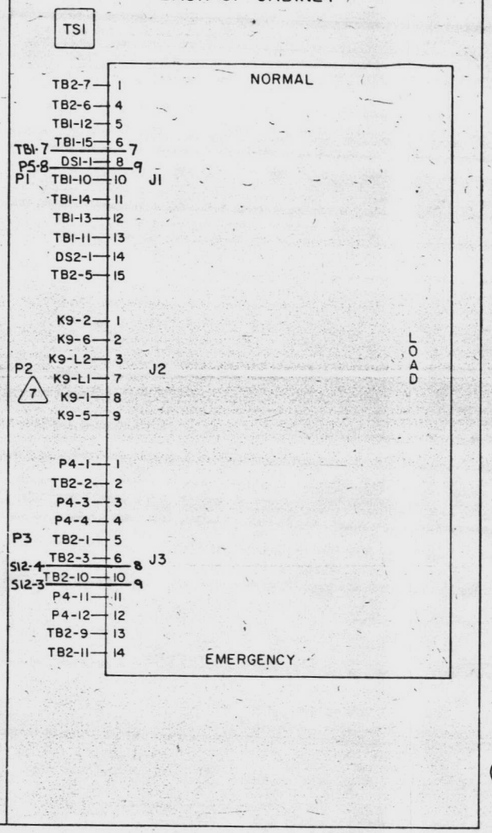
REAR VIEW OF DOOR



LEFT SIDE OF CABINET



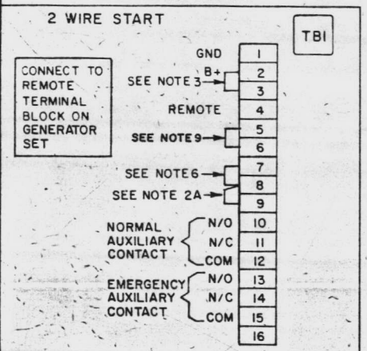
BACK OF CABINET



ER	LET		REVISION	ZONE	DR	ENG	CKR	DATE
3864			PROD RELEASE					
4146	A		REVISED NOTE 2C	5B	CIP		CIP	11-10-80
4146	B		REVISED SI6-4 & SI6-9, REM NOTE 2C	4D	CIP		CIP	11-10-80
4146	C		ADDED 406-0089 QTY 1	2C	CIP		CIP	11-10-80
4146	D		REMOVED 308-0566	2B	CIP		CIP	11-10-80
4146	E		ADDED 308-0579 & 308-0580	2C	CIP		CIP	11-10-80
6162	F		REVISED PER ER	4C	CIP	JM		4-27-81
8345	G		DSI WAS 322-0249, DS2 WAS 322-0248	2B	CIP	JM		12-4-81
8345	H		ADDED RI 350-1205 QTY 2	2B	CIP	JM		12-4-81
8345	J		ADDED 322-0316 QTY 2	2B	CIP	JM		12-4-81
22,423	K		ITEM A1 WAS 300-2107	1-C	RV			9-26-83
22,423	L		DELETED NOTE 8 & TI 301-0493	–	RV			9-26-83
22,423	M		ADDED RELATED WIRING TO A1, SI2, TBI, TSI	–	RV			9-26-83
25,220	N	1	ADDED P3-8 & P3-9	–	TF			10-8-84
		2	ADD 98-5380 & 98-5387	1-C	TF			10-26-84
26324	P	1	ADD NOTE #10	5-A	AH			5-9-85

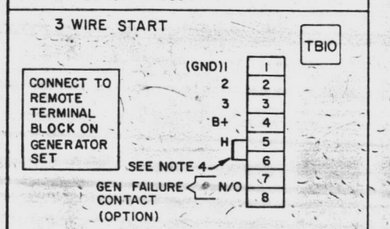
CUSTOMER CONNECTIONS

2 WIRE START



AUXILIARY CONTACTS RATED 10 AMP 480V

3 WIRE START



GEN FAILURE RATED 10 AMP 240V (OPTION)

NOTES:

1. THERE ARE OPTIONS SHOWN THAT ARE NOT ON EVERY TRANSFER SWITCH. SEE LABEL INSIDE TRANSFER SWITCH CABINET FOR SPECIFIC OPTIONS INSTALLED.
   OPTIONS
   a. BATTERY CHARGER (A3)
   b. PROGRAM TRANSITION (K9)
   c. EXERCISER CLOCK (M2) (SI6)
   d. CONVERTER-2 TO 3 WIRE (A2)(SI3)(SI4)
   e. DIESEL PREHEAT (KI2)
2. WHEN ADDING EXERCISER CLOCK:
   A. REMOVE JUMPER BETWEEN TBI-8 AND TBI-9.
   B. TO A TWO WIRE START REMOVE WIRE MARKED SI6-8, SI3-1.
   C. TO A THREE WIRE START REMOVE JUMPER BETWEEN SI6-8 AND SI6-4 (NOT SHOWN) REMOVE WIRE BETWEEN SI3-1 AND TBI-4 (NOT SHOWN)
   (A)
3. REMOVE JUMPER BETWEEN TBI-2 & TBI-3 WHEN ADDING 2 TO 3 WIRE CONVERTER DISCARD PLUGS 517-0150 AND INSTALL SI3 AND SI4.
4. REMOVE JUMPER BETWEEN TBI0-5 & TBI0-6 WHEN ADDING PRE-HEAT
5. FOR 208 V WIRE MARKED K9-LI, P2-7 IS CONNECTED TO K9-L3
   FOR 240 V WIRE MARKED K9-L2, P2-3 IS CONNECTED TO K9-L3.
6. TO ADD AREA PROTECT EQUIPMENT OR REMOTE TEST TRANSFER SWITCH, REMOVE JUMPER AND CONNECT BETWEEN TERMINALS 7 & 8.
7. PROGRAM TRANSITION NOTE:
   TRANSFER SWITCH WITHOUT PROGRAM TRANSITION WILL HAVE A BYPASS PLUG IN J2.
8. ~~TI TRANSFORMER ASSY (STPDN) ARE MOUNTED IN A1 CONTROL ASSY~~
9. TO ADD PARALLELING SWITCHBOARD TRANSFER SWITCH INHIBIT CIRCUIT, REMOVE JUMPER BETWEEN TBI-5 & 6
10. (P1) WIRES FROM P3-8 TO SI2-4 AND FROM P3-9 TO SI2-3 ARE INSTALLED IN TRANSFER SWITCHES DATED BETWEEN DEC 1984 AND MAY 1985. THESE WIRES SHOULD BE REMOVED IF A 300-3036 TIMING MODULE IS INSTALLED IN THE (A1) CONTROL ASSEMBLY.

	40 AMP	70 AMP	100 AMP
208V,240V 50,60Hz	-01	-02	-03

3 POLE NO METERS 01

VOLTAGE CODE: 4, 5D, 54, 55D

(E)	308-0580	C	1	CONTACT BLOCK (N.C.)
	308-0579	C	1	CONTACT BLOCK (N.O.)
(C)	406-0089	P	1	CATCH
	323-1226	A	1	PLUG-BYPASS
(K) A1	300-2774	D	1	CONTROL ASSY
A2	(REF)	-	1	CONVERTER-2 TO 3WIRE
A3	(REF)	-	1	BATTERY CHARGER
	99-1269	A	1	NAMEPLATE-LOAD XFR
(N2)	98-5387	B	1	LABEL-DANGER
	98-5380	A	1	TAG-CAUTION
(REF)	508-0231	P	3	BUMPER
(L) 8 TI	315-0493	C	2	TRANSFORMER ASSY (STPDN)
(G) DSI	322-0318	P	1	LAMP-HOUSING (WHITE)
DS2	322-0317	P	1	LAMP-HOUSING (YELLOW)
(J)	322-0316	A	2	LAMP-NEON
K9	(REF)	-	1	PROGRAM TRANSITION
M2	(REF)	-	1	EXERCISER CLOCK
(H) RI	350-1205	A	2	RESISTOR ASSY
SI2	308-0577	C	1	SWITCH-PUSH/ROTARY
(D) SI3	PART OF A2	-	1	SWITCH-SELECTOR (STOP, REMOTE, HAND CRANK)
SI4	PART OF A2	-	1	SWITCH-RESET (OVERCRANK)
SI6	PART OF M2	-	1	SWITCH-SELECTOR (W/WO LOAD)
	332-0052	P	2	CLIP-WIRE
	332-2420	P	4	MOUNT-CABLE TIE
TSI	306-2204	D	1	TRANSFER SW ASSY (-01)
	306-2222	D	1	TRANSFER SW ASSY (-02)
	306-2240	D	1	TRANSFER SW ASSY (-03)
	517-0150	A	2	PLUG-HOLE
	98-4339	B	1	LABEL-OPTIONS
	338-1436	D	1	WIRING HARNESS-CABINET
	301-6086	D	1	CONTROL BOX
	301-6087	D	1	MOUNTING PLATE
	332-1469	A	1	MARKER STRIP (USE ON TB2)
	332-2425	A	1	MARKER STRIP (USE ON TBI)
	301-6154	D	1	DOOR ASSY-CONT BOX
	406-0522	P	1	HANDLE

THIS DOCUMENT SUBJECT TO FOLLOWING STANDARDS/CODES: ☒ UL ☐ CSA ☐ ____ ☐ ____
TO MAINTAIN THIS COMPLIANCE, NO CHANGES OR DEVIATIONS TO BE MADE W/O APPROVAL OF:
CODES & STDS ENGR. ☒ USPP ☒ IPP ☐ RD&D
Dave Long P. Johnson 6-16-81
SIGNED DATE

TOLERANCES UNLESS OTHERWISE SPECIFIED: mm ± .1 ± .25 ± .5; INCH ± .X ± .XX ± .XXX ± .XXXX; HOLES +.15 -.05 / +.006 -.002; ANGLES ±; SCALE

NEXT ASSY | SIM TO | Third Angle Projection

The proprietary design information on this print is owned by Onan a Division of Onan Corporation. Consumption of this right is not extended to others.

626-1042 D

SEPIA FROM MASTER | INITIAL | DATE
DR CIP 9-23-80
CKR CIP CDR 10-6-80
ENGR 10-7-80
SAMP REL
PROD REL 10-7-80
PROD REL

ITEM | BULK PART NO. | DWG SIZE | QTY | DESCRIPTION OR MATERIAL

A DIVISION OF ONAN CORPORATION
Minneapolis, Minnesota

WIRING DIAGRAM-OT

OT40-100 Spec E | 626-1042 | D

FORM 5A131

626-1059 | A

ER	LEI	REVISION	DR	ENG	CHK	DATE
3952		PROD RELEASE				
20,425	A	ITEM 1 WAS 300-2111 QTY 1	CIP		CIP	8-12-82
20,425	B	REM ITEM 2 (300-2113) QTY 1	CIP		CIP	8-12-82
20,425	C	REV NOTE 1, REM NOTE 2	CIP		CIP	8-12-82
20,425	D	WAS GROUP 14	CIP		CIP	8-12-82
21,319	E	P/N WAS 300-2548	RD			12-22-82
23357	F	1 ADD-01 TO ITEM 1	TM	AF		1-14-85
		2 ADD -02, 50 HZ	TM	AF		1-14-85

NOTES:

1. INSTALL ITEM 1 INTO SLOT J1 & J3 LOCATED IN CONTROL ASSY (A1) (C)

TABULATION

CONTROL-SENSOR PART NO.	ITEM 1 PART NO.	HZ
626-1057-01	300-2373-01	60
626-1057-02	300-2373-02	50

ITEM	SEE PART NO	DWG SIZE	QTY	DESCRIPTION OR MATERIAL
(E) (B) (A) 1	SEE TAB	D	2	SENSOR- 3 PH. OVERVOLT/Hz

TOLERANCES UNLESS OTHERWISE SPECIFIED

mm	INCH
X ±	XX ±
XX ±	XXX ±
XXX ±	XXXX ±
HOLES ± 0.15	± .006
± 0.05	± .002
ANGLES °	SCALE

NEXT ASSY

USED ON

APPLICATION

Third Angle Projection

The proprietary design or information on this print is owned by Onan Corporation. Unauthorized use of this print is not extended to others.

	INITIAL	DATE
DR	CIP	10-7-80
CHK	CIP	10-9-80
ENG	JTM	10-9-80
STAMP REL		
PROD REL		
PROD REL	JTM	10-9-80

A DIVISION OF ONAN CORPORATION
Minneapolis Minnesota

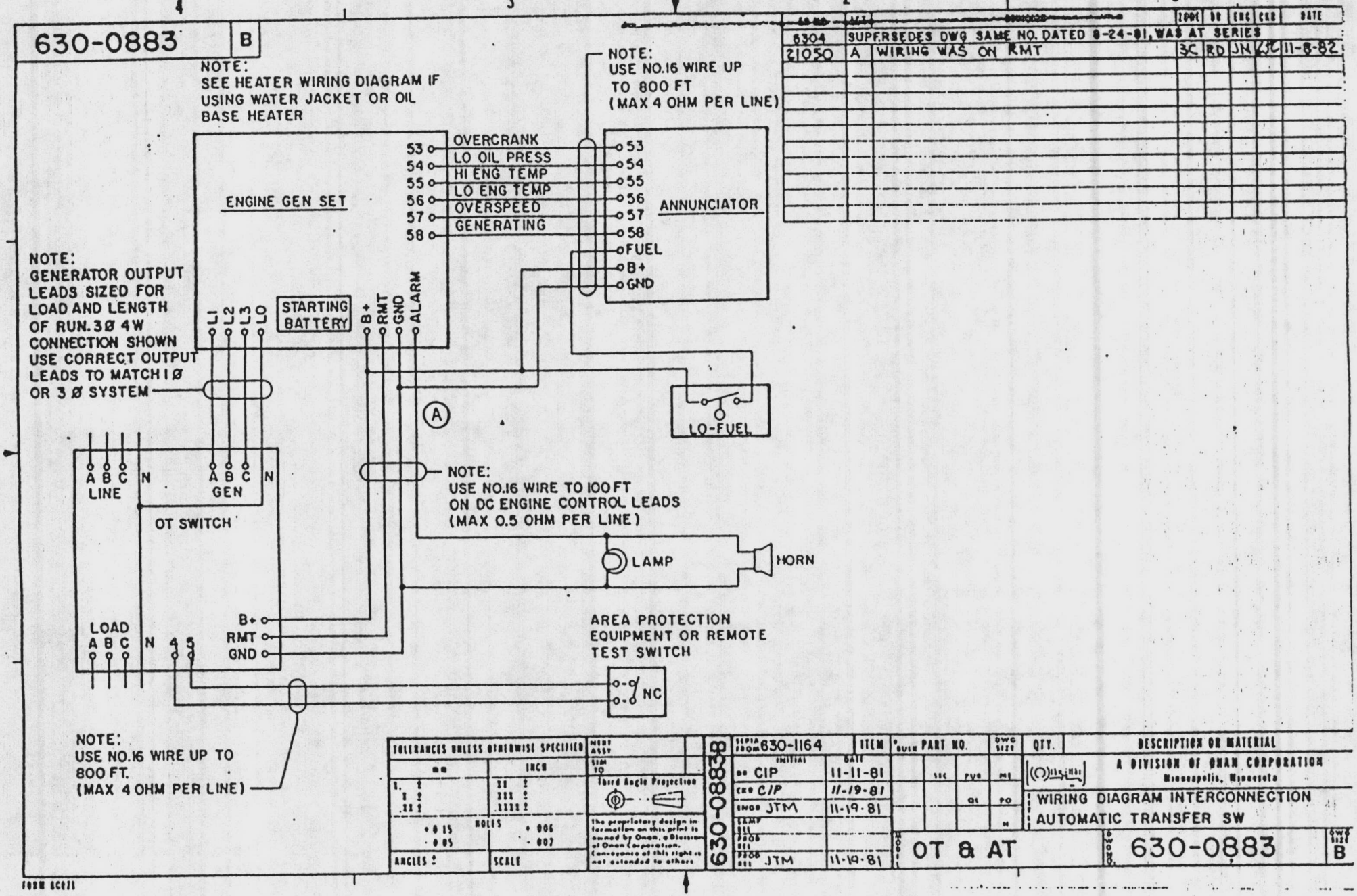
CONTROL-SENSOR

MODEL GROUP 34 (D)

DWG NO 626-1059

DWG SIZE A

FORM 8C024



			ENGR	DR	ENG	CKD	DATE
8304		SUPERSEDES DWG SAME NO. DATED 8-24-81, WAS AT SERIES					
21050	A	WIRING WAS ON RMT	BC	RD	JN	BC	11-8-82

TOLERANCES UNLESS OTHERWISE SPECIFIED
MM | INCH
ANGLES ±
SCALE
HOLES
NEXT ASSY
SIM TO
Third Angle Projection
The proprietary design information on this print is owned by Onan, a Division of Onan Corporation. Conveyance of this right is not extended to others.

630-0883B

SEPIA FROM 630-1164	ITEM	BLUE PRINT NO.	DWG SIZE	QTY.	DESCRIPTION OR MATERIAL
INITIAL	DATE				A DIVISION OF ONAN CORPORATION Minneapolis, Minnesota
DR CIP	11-11-81				WIRING DIAGRAM INTERCONNECTION
CKD CIP	11-19-81				AUTOMATIC TRANSFER SW
ENGR JTM	11-19-81				
LAMP					
SEL					
PROG					
SEL					
PROG SEL JTM	11-19-81				

OT & AT | 630-0883 | B

FORM 6C271

Onan

MANUFACTURER'S LIMITED WARRANTY

Onan extends to the original purchaser of goods for use, the following warranty covering goods manufactured or supplied by Onan and used within the United States, subject to the qualifications indicated.

THERE IS NO OTHER EXPRESS WARRANTY.

IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO PERIODS OF WARRANTY SET FORTH BELOW AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED.

IN NO EVENT IS ONAN LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Note: Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply in every instance.

(1) Onan warrants to original purchaser for the periods set forth below that goods manufactured or supplied by it will be free from defects in workmanship and material, provided such goods are installed, operated, and maintained in accordance with Onan's written instructions, and further provided, that installation inspection and initial start-up on commercial-industrial generator set or power system installations are conducted by an Onan Authorized Distributor or its designated service representative.

PRODUCT APPLICATION	PERIOD OF WARRANTY
☐ Goods used in personal, family and household applications.	One (1) year from date of purchase.
☐ Goods designed for and used in Recreational Vehicles.	Two (2) years from date of purchase.
☐ Goods used in commercial-industrial applications.	One (1) year from date of purchase.
☐ Commercial-industrial stationary generator sets.	One (1) year from date of initial start-up.
☐ Industrial Floodlighter generator sets.	Two (2) years or 2000 hours, whichever occurs first from date of purchase.
☐ Rental or demonstrator units.	One (1) year from date of first rental or demonstration.
☐ Commercial-industrial, standby power systems, and residential standby systems which are installed in the U.S. (must include Onan supplied generator sets, automatic transfer switch, exerciser and running time meter).	• Five (5) years or 1500 hours, whichever occurs first from date of initial start-up. Labor allowance for the first two (2) years or 1500 hours, whichever occurs first from the date of initial start-up. See your Onan distributor for the additional details.
☐ Power take-off (PTO) Alternators. (Direct drive only)	Five (5) years from date of purchase. Labor allowance for the first two (2) years.
☐ Repair or replacement parts	Ninety (90) days from date of purchase, excludes labor.

- Must be registered within thirty (30) days of initial start-up on Form No. 23-065, to be provided and completed by seller.

(2) Onan's sole liability and Purchaser's sole remedy for a failure of goods under this warranty and for any and all other claims arising out of the purchase and use of the goods, including negligence on the part of the manufacturer, shall be limited to the repair of the product by the repair or replacement, at Onan's option, of parts that do not conform to this warranty, provided that the product or parts are returned to Onan's factory at 1400 73rd Avenue NE, Minneapolis, Minnesota 55432, or to an Onan Authorized Distributor or its designated service representative, transportation prepaid.

Except as indicated below, this warranty does not include travel time, mileage, or labor for removal of Onan product from its application and reinstallation.

a) Removal and Reinstallation

Onan will pay the following stated labor at straight time only for warranty work requiring removal and reinstallation of Onan Products in the following applications, provided, such warranty labor is performed by an Onan Authorized Distributor or its designated service representative:

i. On-Highway Recreational and Commercial Vehicle Applications - Up to a maximum of two (2) hours.

ii. Marine Product installations - Up to a maximum of four (4) hours for all single and two cylinder engine powered Marine Generator Sets Installed below-deck.

—Up to eight (8) hours for all four and six cylinder engine powered Marine Generator Sets installed below-deck.

b) Travel Time and Mileage

i. Marine Generator Set Installations - Onan will for twelve (12) months after date of purchase, pay travel time up to two and one half (2.5) hours and mileage cost up to one hundred (100) miles on generator sets with a kilowatt (kW) rating of fifteen (15) or less, and up to six and one half (6.5) hours and mileage cost up to two hundred fifty (250) miles on generator sets with a kilowatt (kW) rating above fifteen (15) for related warranty repairs, provided, such travel and repairs are performed by an Onan Authorized Distributor or its designated service representative.

ii. Industrial Floodlighter Generator Sets - Onan will for twelve (12) months after date of purchase, pay travel time up to two and one half (2.5) hours and mileage cost up to one hundred (100) miles for related warranty repairs, provided, such travel and repairs are performed by an Onan Authorized Distributor or its designated service representative.

iii. Commercial-Industrial Standby Generator Set, System Installations, and Residential Standby Systems - Provided the generator set or system is permanently wired in a stationary installation, Onan will for twelve (12) months after initial start-up, pay travel time up to two and one half (2.5) hours and mileage cost up to one hundred (100) miles on generator sets with kilowatt (kW) rating of seventeen and one half (17.5) or less, and up to six and one half (6.5) hours and mileage cost up to two hundred fifty (250) miles on generator sets with a kilowatt (kW) rating above seventeen and one half (17.5) and for transfer switches used with industrial standby generator set and system installations, for warranty repairs performed by an Onan Authorized Distributor or its designated service representative.

(3) All claims must be brought to the attention of Onan or an Authorized Distributor or its designated service representative within thirty (30) days after discovery that goods or parts fail to meet this warranty.

(4) THIS WARRANTY SHALL NOT APPLY TO:

a) Cost of maintenance, adjustments, installation and start-up.

b) Failures due to normal wear, accident, misuse, abuse, negligence or improper installation, or lack of reasonable and necessary maintenance.

c) Products which are altered or modified in manner not authorized by manufacturer in writing.

d) Failure of goods caused by defects in the system or application in which the goods are installed.

e) Telephone, telegraph, teletype or other communication expenses.

f) Living and travel expenses of persons performing service, except as specifically included in Section 2.

g) Rental equipment used while warranty repairs are being performed.

h) Overtime labor requested by purchaser.

i) Optional engine coolant heaters after the first year.

j) Starting batteries.

No person is authorized to give any other warranties or to assume any other liabilities on Onan's behalf, unless made or assumed in writing by an officer of Onan, and no person is authorized to give any warranties or assume any other liability on behalf of Seller unless made or assumed in writing by Seller.

(5) This warranty gives the user specific legal rights, and the user may also have other rights which vary from state to state.

CERTIFICATE FOR PTS LINE
OF PROTOTYPE TEST SUPPORTED GENERATOR SETS

Electrical Products Division of Onan Corporation, certifies that Onan products bearing the Prototype Test Supported seal have benefitted from a development history which includes an extensive prototype testing program. A Prototype Test Supported production model has been built to documentation developed through comprehensive research, design, and design verification. Design verification is based on tests of preproduction prototype models built expressly for test purposes and not sold as new equipment. To be certified as a Prototype Test Supported model, an Onan generator set must have satisfied these prerequisites:

1. **Design Purpose.** The PTS certified generator must be designed specifically for application in standby or emergency power systems which, because of their critical nature, require high reliability and rapid response.
2. **Prototype Test Program.** The fitness of the PTS certified generator set for standby service must have been proven by tests on separate, representative, preproduction prototype models. The prototype test program is designed to:
   a. Assure that the prime mover and generator have reserve capacity beyond design limits so that surges and transitory overloads are not likely to damage the generator set or render it inoperable.
   b. Determine the sensitivity of generator set performance to variance in components and to the varying effects of time, temperature, and usage as a basis for establishing critical production tolerances.
   c. Investigate and identify failure modes to minimize the risk of any single component failure or human error leading to cascading, catastrophic consequences.
   d. Determine that electrical components are free of internal hot spots that would result in premature failure of the generator set.
   e. Establish short circuit capability. The generator set must survive, without damage, ten short circuits, each of thirty seconds duration, applied across all phases while the generator set is operating at rated voltage, amperage, power factor, and speed. When the short circuits are cleared, the generator must build up voltage and perform normally without manual intervention of any kind such as resetting breakers or other tripping devices. After the tests, inspection must not uncover electrical or mechanical damage to any system component.
   f. Demonstrate the capability of the generator set, its vital controls, and accessories to function reliably and compatibly when in-service demands are made by disturbances commonly occurring in actual load circuits, such as surges caused by motor starting, elevator operation, rectifiers, SCR controllers, X-ray equipment, and reactive discharges.
   g. Discover by endurance testing that there are no resonance conditions in the generator set, or its accessories, that will cause premature fatigue failures of components on production units.
   h. Prove a margin of safety, in actual trials, between the generator set and its protective system so that the generator set is not weakened or damaged before the protective system would shut it down.
   i. Verify that production generator sets will perform to specifications under all extremes of environment expected in actual service.
3. **Documentation and Software.** The PTS certified generator set must be documented in a single drawing package and all components identified with Onan part numbers. Software in support of the product-specification sheets, operator's manuals, parts lists, service manuals, and installation procedure—must be available and on record for future reference.
4. **Quality Assurance.** Engineering drawings, specifications, and test requirements for a PTS certified generator set must be classified by components and assembly quality characteristics. A component and in-process inspection and test plan must be developed and maintained to assure product conformance to the documentation requirements. The quality assurance inspection and test plan, along with supporting documents and records, must be available for customer review.
5. **Production Model Testing.** PTS certified generator sets must have passed tests that demonstrate conformance to specification at all rated conditions including startup, full load pick-up, and voltage regulation at full rated load and power factor as well as temperature stability tests. Data from selected non-destructive tests must confirm that the PTS certified generator set would function comparably with the preproduction prototype under more extreme conditions likely to occur in actual service.

ONAN

9/85 **R-562**

W E L L D A T A

Well No. 11

SPECIFICATIONS

Pump Base Elevation	33.0
Ground Elevation	31.0
Static Elevation	+ 6.0
Maximum allowed Drawdown	-11.0
Total Discharge	250 G.P.M.
Total Head	91 Feet

TEST

200 G.P.M.	34#	Pressure	Drawdown	+1.5
220 G.P.M.	30#	Pressure	Drawdown	+0.4
250 G.P.M.	26#	Pressure	Drawdown	-1.2
290 G.P.M.	18#	Pressure	Drawdown	-3.5

Recovers to elevation + 12.6 in three (3) minutes.

This Well pumps sand and should not be pumped over 200 G.P.M. (should have pipe installed to pump out side)

Marine Barracks
New River, N. C.
June 27, 1942

Wells: Permanent Water Supply, Regimental Area

By Layne Atlantic Company

Report on Well No. 11, this area.

Location: 4850' west of station 355 + 57 on Main Access Road as shown on M.B. Drawing No. 577.

Date Drilled: June, 1942

Drilling Equipment: Rotary rig and bits.

Status: A 23" hole drilled to a depth of 20 feet. 20' of 18" steel casing set and the amular space filled with cement grout to surface level. A 17½" hole drilled to a dtotal depth of 168'.

Log of Formation:

0 to 1'	Sandy top soil.
1' to 33'	Light yellow clay and sand mixed
33' to 35'	White clay
35' to 40'	Blue clay
40' to 45'	White sand with little clay
45' to 58'	White sand packed hard
58' to 86'	Fine blue sand
86' to 112'	Hard rock
112' to 121'	Hard rock with sand pockets
121' to 162'	Hard rock with fine sand in layers
162' to 168'	Fine blue sand and clay mixed.

Remarks: Well finished at 161'. Due to the presence of fine sand in the rock formation it was necessary to construct a gravel wall well.

Gravel Wall Construction: 61' of 8" steel pipe with sections of armco iron screen was placed in the well and the anular space around this was pumped full of 1/4" washed gravel.

Log of Screen Setting:	0 to 61'	8" steel pipe
	61' to 71'	8" Screen
	71' to 91'	8" steel pipe
	91' to 101'	8" screen
	101' to 121'	8" steel pipe
	121' to 136'	8" screen
	136' to 156'	8" steel pipe
	156' to 161'	8" screen

There was 40' of screen placed in the well. The bottom of the screen was filled with a cement plug.

Static Level: 15.5' below surface.

Air line: 60' of 1/4" pipe welded to steel casing.

Pumping: Well was cleaned with air lift and flow was measured with 12" weir. Well pumps 220 gallons per minute with a 24.5' draw down below static. Recovers to 9.5' below static in three minutes.

See separate report for chemical analysis.

N. H. Kellam
Asst. Chemical Engineer

WATER ANALYSIS

By N. H. Kellam

Date 6/29/42

Sample from Well No. 11 Rey area

Total Solids	244 PPM	Dissolved Solids	214 PPM
Suspended Solids	30 PPM	Volatile Solids	PPM

Phenol. Alk. as $CaCo_3$	0 PPM	Silica as Sio_2	28 PPM
Total Alk. " "	190 "	Ferrous Iron as Fe	0 "
Carbonates " "	0 "	Total Iron as Fe	1.0 "
Bicarbonates " "	190 "	Aluminum as Al.	4.8 "
Chlorides as Cl.	15 "	Calcium as Ca.	64.9 "
Sulphates as SO_4	16 "	Magnesium as Mg.	9.0 "
Nitrites as No_2	trace "	Sodium as Na.	7.2 "
Carbon Dioxide as CO_2	(1) 0 "		

pH 7.6 Soap Hardness as $CaCO_3$ 210 PPM

Odor Slight Turbidity 10

REMARKS (1) Pumped With air lift

146 154

FORM A-4
(JUNE '66)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF WATER DATA COORDINATION
INVENTORY OF HYDROLOGIC DATA STATIONS
QUALITY OF WATER

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

1. AGENCY CODE	2. TYPE	3. LATITUDE	4. LONGITUDE	5.
MC	Q	° ' " N: 34 42 11	° ' " W: 77 21 6	

6. AGENCY STATION NO.	7. STATION NAME
611	HP20-611

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

12. PERIOD OF RECORD Began	Discontinued	Y ☐ Continuous Interruption Exceeds 1 Year	13.	14.
1942				

15. SITE

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

16. FREQUENCY OF MEASUREMENT

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

17. TYPES OF DATA AVAILABLE

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

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

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

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

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

18. SUPPLEMENTARY DATA FOR SITE

- ☐ 421 Surface Water Station
- ☐ 422 Ground Water Station
- ☐ 423 Water Stage or Level
- ☑ 424 Water discharge
- ☐ 425 Time of Travel
- ☐ 426 Drainage Area

19. STORAGE OF DATA

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

20. OFFICE AT WHICH DATA AVAILABLE

Office: BASE MAINTENANCE DEPARTMENT, UTILITIES DIVISION

Street No.: MARINE CORPS BASE

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

City Code: 0735

21. OFFICE COMPLETING FORM

BASE MAINTENANCE DEPARTMENT

22. COMPILER'S NAME

E. E. TEW, JR.

23. DATE Month: SEPT. Year 19: 66

Log Of formation Well # 11 Records

0 To 1'	Sandy Top Soil
1' To 33'	Light yellow Clay and Sand Mixed
33' To 35'	White Clay
35 To 40	Blue Clay
40' To 45'	White Sand with little Clay
45' To 58'	White sand Packed Tight
58 To 86	Fine Blue Sand
86' To 112	Hard Rock
112 To 121	" " With sand Mixed
121 To 162	hard Rock and Soft and Pepper sand in layers
162 To 168	Fine Blue Sand and Blue Clay Mixed

Well Finished at 161'-0" deep

C.C. Mr Monroe
Mr Kellam

WELL # 611

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	CAP. PER FOOT OF DRAW DOWN	G.P.M TOTAL CAP.
1-10-79	60'	22'?	12'	10'	24 LBS		235

REMARKS: ALT. GAUGE
SET PUMP PRESSURE THIS DATE 24 LBS
WELL JUST CUT OFF. STATIC MAY BE HIGHER
TOP SCREEN 60'

EPTH OF ELL:
AIRLINE LEVATION: + -
DATE INSTALLED:

2) 1 2 4 1
9 2 4
4 6 2 4 4
5 4 W

Well # 11

Date	Line Ft.	G.P.M.	D.D. El.	Static El.	Shut Off head	D.D. Ft.
4-15-54			+8.0 GAGE READING			
5-5-54	70 - 280		43	28 FT	—	15
"	68 - 260		46	—	—	18
5-25-54	64 - ?		47	28	—	19
6-3-54	62		47	28	—	19
6-4-54			50	28		22
7-28-54	56		50	28		22
4-18-55	65		44	31		13
3/6/58	New pump installed					
12/13/66	162		50'			SE WELL TEST
8/13/69	224			28'		
9-4-69	244		-9'	+11'		20'

as of 3/1/67 Well 11 Has a Layne Pump

NEW PUMP INSTALLED. 5-5-54

STATIC HD. LINE - 54

measured 146' - 4-26-54
FILLED - 15 FT.

25 FT. - PUMP BASE TO WATER LEVEL - 4-15-54 - (BLOWN OUT WITH AIR - TO 154 FT)

Air Line 50'

W E L L D A T A

Well No. 11

SPECIFICATIONS

Pump Base Elevation	33.0
Ground Elevation	31.0
Static Elevation	+ 6.0
Maximum allowed Drawdown	-11.0
Total Discharge	250 G.P.M.
Total Head	91 Feet

TEST

200 G.P.M.	34#	Pressure	Drawdown	+1.5
220 G.P.M.	30#	Pressure	Drawdown	+0.4
250 G.P.M.	26#	Pressure	Drawdown	-1.2
290 G.P.M.	18#	Pressure	Drawdown	-3.5

Recovers to elevation + 12.6 in three (3) minutes.

This Well pumps sand and should not be pumped over 200 G.P.M.
(should have pipe installed to pump out side)

Air line 63'

Elev. D.D. Gauge 33.5'

H.P. Well 611