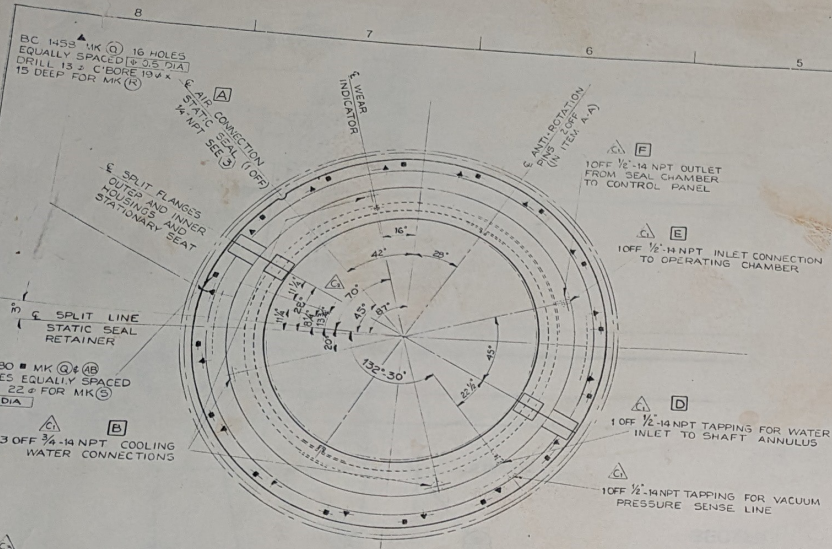


KIAM 00150
KIAM00248

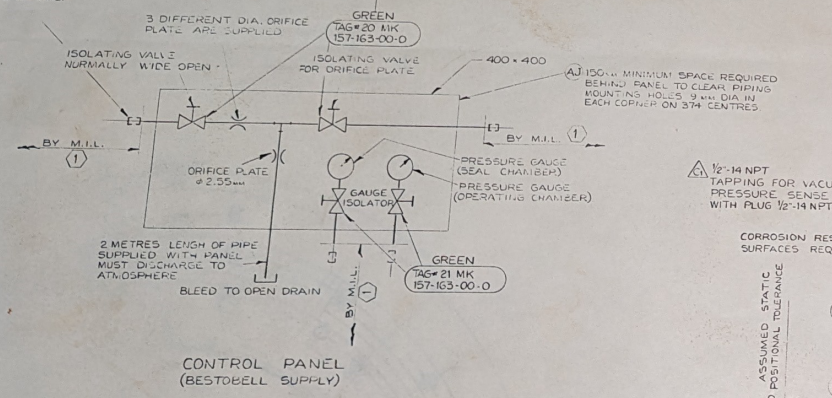
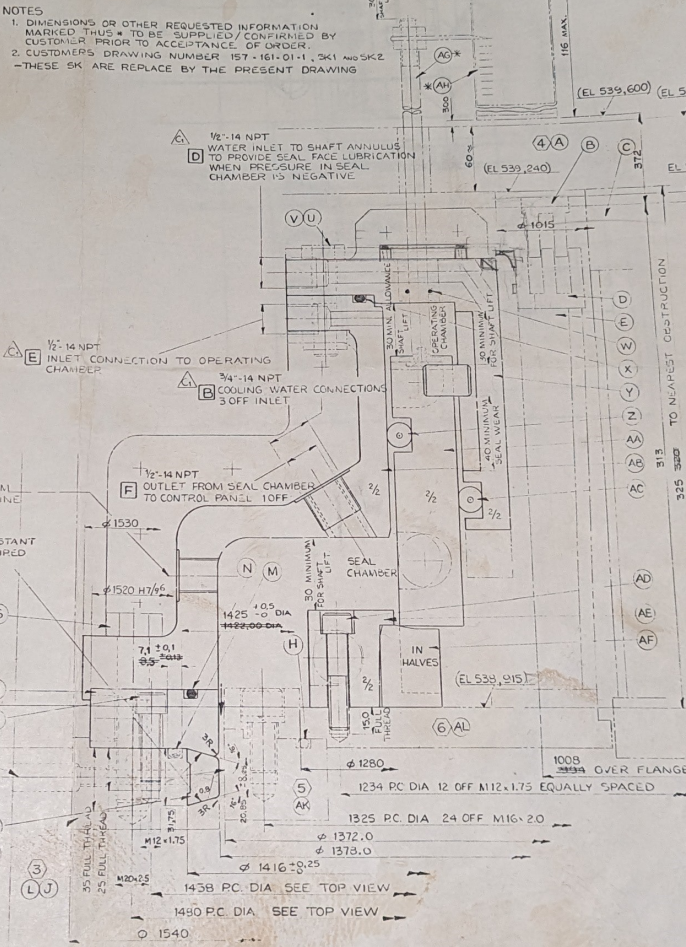
transverse
1500 1800



ULTIMATE CUSTOMER: TANA & ATHI RIVERS DEVELOPMENT AUTHORITY
CUSTOMER: MARINE INDUSTRIE LTEE
SITE: KIAMBERE
MACHINE: FRANCIS TURBINE
MEDIUM: FRESH WATER
TEMPERATURE: 26°C MAXIMUM
SHAFT SPEED: 300 RPM NORMAL
485 RPM SURGE
550 RPM RUNAWAY
PRESSURES IN SEAL CHAMBER:
1 UNIT IN OPERATION: MINIMUM MINUS 5M
MAXIMUM PLUS 0.5M
2 UNITS IN OPERATION: MINIMUM MINUS 13M
MAXIMUM PLUS 0.5M
AFTER PHASE 2 MODIFICATIONS TO INCREASE TAIL WATER LEVEL
2 UNITS IN OPERATION: MINIMUM MINUS 19M
MAXIMUM PLUS 26M
TRANSIENT AT REJECTION: MINIMUM MINUS 7M
MAXIMUM PLUS 39M
SHAFT RADIAL MOVEMENT DURING RUNNING: ±0.25mm MAXIMUM (BEARING CLEARANCE 0.4mm MAX)
SHAFT LIFT FOR MAINTENANCE: 130mm
SHAFT DROP FOR DISMANTLING: 130mm

- NOTES
1. DIMENSIONS OR OTHER REQUESTED INFORMATION MARKED * TO BE SUPPLIED/CONFIRMED BY CUSTOMER PRIOR TO ACCEPTANCE OF ORDER.
2. CUSTOMER'S DRAWING NUMBER 157-161-01-1, SK1 AND SK2 - THESE SK ARE REPLACE BY THE PRESENT DRAWING

QUOTATION DWS NO	DESCRIPTION	MIL NO
157-161	SHAFT SEAL	157-163-02-1
210-8055	PIPING INSTRUMENT	157-163-60-0
210-8706	OVERSPEED DETECTOR	157-162-01-3
210-9121	HEAD COVER MACH	157-161-02-1
	BEARING SUPPORT	157-161-02-1
	ROTATING SUMP TANK	157-161-03-1
	ROTATING COVER	157-161-04-1
210 8907	TURBINE GUIDE BEAR. ARR	157-161-01-0



DATE	DESCRIPTION	BY	CHKD	REMARKS
15.02.12	ISSUED			

EWBANK & PARTNERS LTD.
CONSULTING ENGINEERS
BRIGHTON, U.K.

DRG. NO. E&P: 8122- WLP: 1671-
210-8100 REV 4

MARINE INDUSTRIE LTEE
TRACY P.O.
CANADA

HYDRO-ELECTRIC MATERIAL DIVISION
TANA & ATHI RIVERS DEVELOPMENT AUTHORITY
KIAMBERE HYDRO-ELECTRIC PROJECT
CONTRACT NO. KE 100
2 TURBINES - 300 RPM - NET HEAD 150.5 M

SHAFT SEAL ARRANGEMENT
M.I.L. DRAWING NO. 157-163-00-0
REV.

Four Execution

TO BE WITHIN THE FOLLOWING TOL
OTHERWISE SPEC. REQ.
SCALE OF WORK
DATE
BY

NO	DESCRIPTION	TOLERANCE
1	GENERAL	±0.1
2	POSITION	±0.2
3	ANGLE	±0.1
4	PERPENDICULARITY	±0.1
5	PARALLELISM	±0.1
6	CONCENTRICITY	±0.1
7	CIRCULAR RUNOUT	±0.1
8	AXIAL RUNOUT	±0.1

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NO	DESCRIPTION	TOLERANCE
1	GENERAL	±0.1
2	POSITION	±0.2
3	ANGLE	±0.1
4	PERPENDICULARITY	±0.1
5	PARALLELISM	±0.1
6	CONCENTRICITY	±0.1
7	CIRCULAR RUNOUT	±0.1
8	AXIAL RUNOUT	±0.1

P. 157-163-00-00