

KEY PLAN

NOTES:-

- THE LOADS INDICATED ON FOUNDATION ARE WITHOUT ALLOWANCES FOR VIBRATIONS. CIVIL DESIGNERS ARE RESPONSIBLE FOR DESIGN OF FOUNDATION TAKING INTO ACCOUNT OF THE ALLOWANCES FOR VIBRATION ALSO.
- THE DIFFERENT NATURAL FREQUENCIES OF THE FOUNDATION HAVE TO BE 20% AWAY FROM THE SPEED FREQUENCY. $f_{max} = n/60$ AND 15% AWAY FROM THE DOUBLE OF THE SPEED FREQUENCY. $2f_{min}$. THE MEANS: $0.8f_{min}$ TO $1.2f_{min}$ AND $0.85(2f_{min})$ TO $1.15(2f_{min})$. SPEED FREQUENCY $f_{min} = 1.4166$ HZ ($2 * f_{min} = 2.8333$ HZ)
- THE STIFFNESS OF THE FOUNDATION HAS TO BE AT LEAST OF $> 1.0E+06$ N/MM FOR EACH LOAD POINT OF THE FAN IN LONGITUDINAL TRANSVERSAL AND VERTICAL DIRECTIONS RELATING TO THE AXIS. IT HAS TO BE TAKEN INTO CONSIDERATION THAT ON SETTLING THE FOUNDATION THE TOTAL NATURAL FREQUENCIES OF THE FOUNDATION CAN ARISE DUE TO THE SOIL COMPACTION AND THE RESULTING INCREASES OF THE ELASTIC MODULUS. AN UNEVEN SETTLING OF THE FOUNDATION HAS TO BE EXCLUDED.
- THE RATIO OF THE FOUNDATION MASS TO THE ROTOR MASS HAS TO BE GREATER THAN 25.
- ADOPT IS : 2974 / PART-IV FOR THE FOUNDATION DESIGN.
- THE CONNECTING DUCTS AT INLET AND OUTLET OF FAN MUST BE SELF SUPPORTED AND SHOULD NOT BE WELDED WITH EXPANSION JOINTS.
- FOUNDATION POCKETS SHOULD BE PERPENDICULAR TO THE FLAT SURFACES OF FOUNDATION.
- ACCURATE TEMPLATES SHALL BE USED FOR LOCATING CORES FOR POCKET HOLES TO ENSURE THEIR DIMENSIONAL ACCURACY.
- TOLERANCE BETWEEN ANY TWO POCKET CENTERS IS ± 5 mm.
- TOLERANCE ON CONCRETE LEVELS ± 5 mm.
- IN AREAS WHERE SOLE PLATES AND ANCHOR PLATES ARE TO BE INCORPORATED IN FOUNDATION CONCRETE, THE SIZE OF THE COARSE AGGREGATE USED SHALL NOT EXCEED 20mm AND DOWN GRADED TO FACILITATE CHIPPING AND SCRAPING AND THEREBY ENSURING MAXIMUM CONTACT ON THE MATING AREAS.
- NON-SHRINK GROUT IS TO BE USED. REFER GENERAL SPECIFICATIONS ISSUED BY BHEL/RANIPET FOR NON-SHRINK GROUT. THIS ALSO CONTAINS THE PREPARATIONS OF PRIMARY PACKERS & SHIMS.
- GROUTING SHOULD BE DONE ONLY AFTER FINAL ALIGNMENT OF FAN.
- ELEVATIONS & POCKET DEPTH SHOWN IN FOUNDATION PLAN ARE INCLUDING GROUTING THICKNESS.
- HANDRAILS, STEEL PLATFORMS, & CANOPY FOR MOTOR AND THEIR EMBEDMENTS ARE IN THE SCOPE OF BHEL/TRICHY.
- FAN FOUNDATION SHOULD NOT BE USED AS SUPPORT FOR OTHER STRUCTURES OR EQUIPMENTS.
- FOUNDATION CONFIGURATION SHOWN IN THIS DRAWING IS ONLY INFORMATIVE/TYPICAL TYPE AND DETAILS OF FOUNDATION ARE TO BE FINALIZED BY CIVIL DESIGNERS.
- FOR MOTOR ERECTION, REFER MOTOR SUPPLIER'S ERECTION MANUAL.
- BASE FRAME, SOLE PLATE, FOUNDATION BOLTS & FASTENERS RELATED TO MOTORS WILL BE IN SCOPE OF MOTOR SUPPLIER (BHEL BHOPAL INDIA).
- THE RATIO OF FOUNDATION MASS AND TO THE MACHINE MASS TO BE GREATER THAN 2.5.

FAN DETAILS:-

TYPE	: SAF 38.5/25-1
WEIGHT OF ROTATING PARTS	: 10000 Kg
TOTAL WEIGHT OF FAN (WITHOUT MOTOR, COUPLING ETC.)	: 56220 Kg (APPROX)
GD ² OF FAN	: 21400 Kg.m ²
SPEED OF FAN	: 745 RPM
NO. OF FANS	: TWO / BOILER

MOTOR DETAILS*

MAKE	: M/s. BHEL/BHOPAL	MOTOR COOLER DATA*	: WATER PRESSURE DROP ACROSS COOLER ² = 0.4 Kg/Cm.
TYPE	: 1RN1906-8/1P55/11000V		: TEMP. RISE OF WATER ACROSS COOLER = 5°C
CAPACITY KW/RPM	: 6100 KW / 746 RPM		: WATER INLET TEMP. = 38°C
GD ² OF MOTOR	: 3728 Kg.m ²		: MAX. OPERATING PRESSURE OF WATER = 6 Kg/Cm ²
WEIGHT OF MOTOR	: 23000 KG		: TOTAL REQUIREMENT OF WATER = 590 LPM
WEIGHT OF ROTATING PARTS:	7400 KG		
MOTOR DRAWING NUMBER :			

FOUNDATION LOAD OF MOTOR*

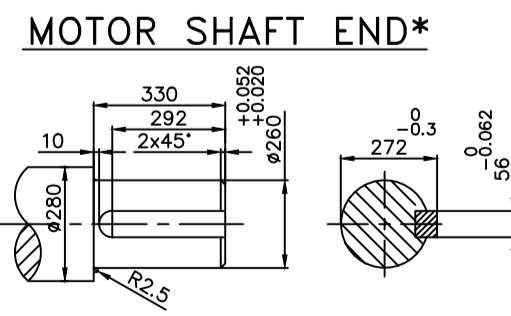
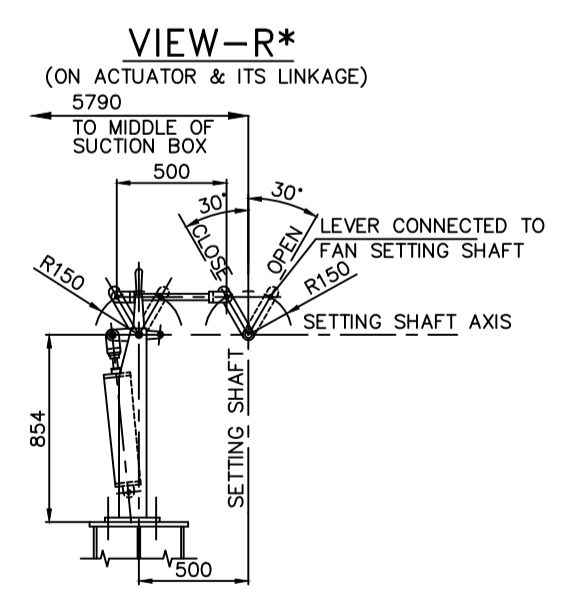
MAX. FORCE CALCULATED FROM THE MAX. IMPULSE TORQUE - FM = 446KN
 FORCE EXERTED BY WEIGHT ON EACH SIDE - FG = 115KN
 FOUNDATION LOAD ON EACH SIDE COMPRESSION - FA = FM+FG = 561KN
 TENSILE FORCE - FB = FM-FG = 331KN
 THE FORCE OCCUR ALTERNATIVELY INDEPENDENT OF THE DIRECTION OF ROTATION.

30/2	12401	Stat. and dyn. forces caused by air stream of suction box in vert. direction
30/1	52856	Stat. and dyn. forces caused by air stream of suction box in horiz. direction
28		Sealing/cooling air fan
16	54818	Axial thrust of the fan (due to pressure increase)
15		Load during starting sequence by short-circuit torque of the motor
14		Foundation
13/2	94760	Max. load when lifting the fan housings upper part
13/1	90240	Max. load when lifting the rotor assembly
12	35445	Unbalance in case of damage
11	21863	Max. rotating load due to unbalance of the fan rotor
10		Oil supply unit with oil filling
9		Frame of the motor
8		Drive motor
7	9900	Rotational load on motor shaft
6	14489	Axial thrust on motor shaft for motor with fixed bearing
5	1800	Intermediate shaft with coupling
4	12330	Diffuser with tail fairing
3	9188	Complete rotor assembly
2	21465	Fan housing with straightener vane section and nose fairing
1	10425	Suction box with inlet nozzle and intermediate shaft cover

FAN SHAFT	42Cr Mo4 V	1
13 SHIMS	S.S	AS RECD.
12 PRIMARY PACKER	IS : 2062	AS RECD.
11 FOUNDATION FASTENERS FOR FAN	ASTM A105	17
10 COUPLING GUARD	IS : 2062	1
09 SPACER COUPLING	STEEL	1
08 MOTOR WITH FDN. FASTENERS	REFER MOTOR DRG.	1
07 BLADES	GGG 40	14
06 IMPELLER HUB	P355NH	1
05 HOUSING CORE (FAN HOUSING HUB)	IS : 2062	1
04 DIFFUSER	IS : 2062	1
03 OUTLET GUIDE VANE ASSY.	IS : 2062	1
02 IMPELLER HOUSING	IS : 2062	1
01 SUCTION CHAMBER	IS : 2062	1
SL	DESCRIPTION	MATERIAL QTY

BILL OF MATERIAL

VIII	±2300	±11300	±12400
VII	+180400	±11300	±12400
VI	±74700	±14600	±2700
V	±3000	±14600	±2700
IV	+45200	±6800	±9100
III	+66400	±5600	±13300
II	+103900	±94100	±20800
I	+89700	±2700	±18000
Point Forces in [N]	Dead Load Vertical	Dyn. Load Vertical	Stat. horiz. Dead Load horiz. across to the axis
	↑	↑	↑



MOTOR BEARING DATA*:

BEARING SIZE	DE	NDE
22-#225	22-#225	23 LITERS
OIL QTY.	23 LITERS	40°C
MAX. OIL INLET TEMP.	40°C	ISO VG 68 OR EQUIV
OIL GRADE	ISO VG 68 OR EQUIV	ISO VG 68 OR EQUIV

DIMENSIONS / ITEMS MARKED WITH ** WILL BE CONFIRMED LATER.

CUSTOMER NO: R667 & R668

PROJECT: 2 X 660MW ENNORE SEZ SUPERCRITICAL TPP AT ASH DYKE OF NCTPS, CHENNAI

DESIGNER: TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.

DESIGNER PRIVATE LIMITED SEENI HOUSE, NEW DELHI

CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED NEW DELHI

UNIT: BOILER AUXILIARIES PLANT; RANIPET- 632406

TITLE: GENERAL ARRANGEMENT OF INDUCED DRAFT FAN SAF 38.5/25-1

SCALE: NTS

DATE: 22.01.2016

APPROVED BY: 1-00-099-28997 00