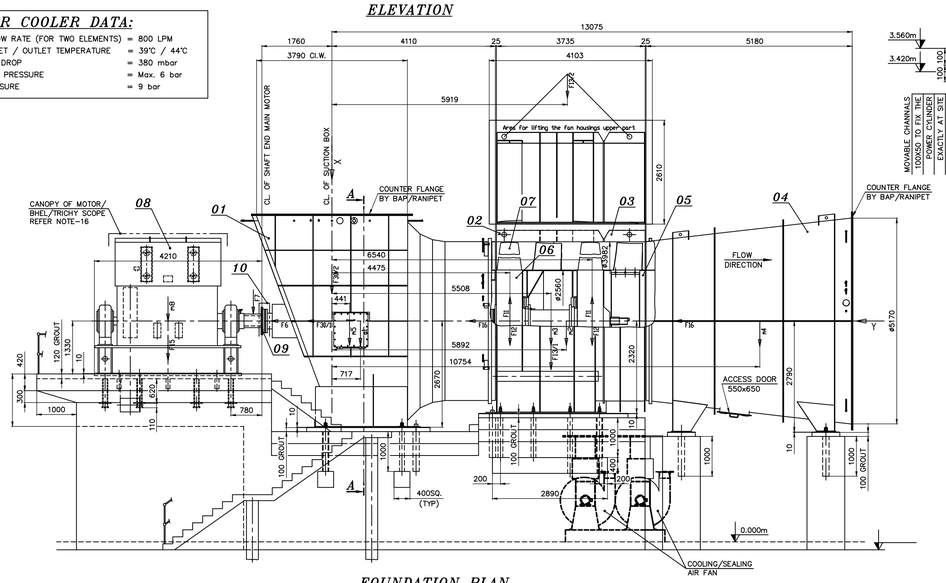
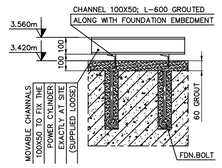
MOTOR COOLER DATA:

WATER FLOW RATE (FOR TWO ELEMENTS)	= 800 LPM
WATER INLET / OUTLET TEMPERATURE	= 39°C / 44°C
PRESSURE DROP	= 380 mbar
OPERATING PRESSURE	= Max. 6 bar
TEST PRESSURE	= 9 bar

ELEVATION



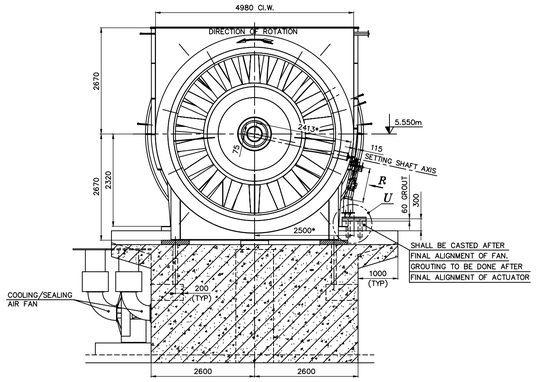
DETAIL-U



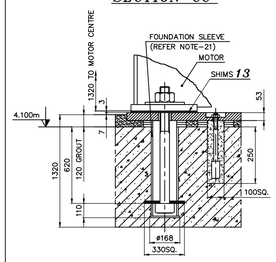
MOTOR NOTES:

01. THE FORCES OCCUR ALTERNATELY INDEPENDENT OF THE DIRECTION OF ROTATION. (REFER LOADING ON MOTOR FOUNDATION)
02. THE TRANSFER OF VIBRATIONS FROM SURROUNDING EQUIPMENT HAS TO BE AVOIDED BY SUITABLE LAYOUT OF FOUNDATION.
03. THE FIRST NATURAL FREQUENCIES OF THE FOUNDATION AFTER ERECTION OF THE MACHINE MUST DIFFER ATLEAST +25% & -20%, FROM ONE & TWO TIMES RUNNING SPEED FREQUENCIES & TWO TIMES THE ELECTRICAL FREQUENCY.

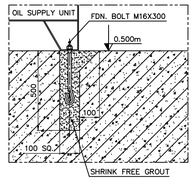
SECTION-AA



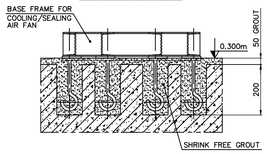
SECTION-CC*



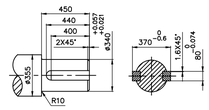
SECTION-FF



SECTION-HH



MOTOR SHAFT END

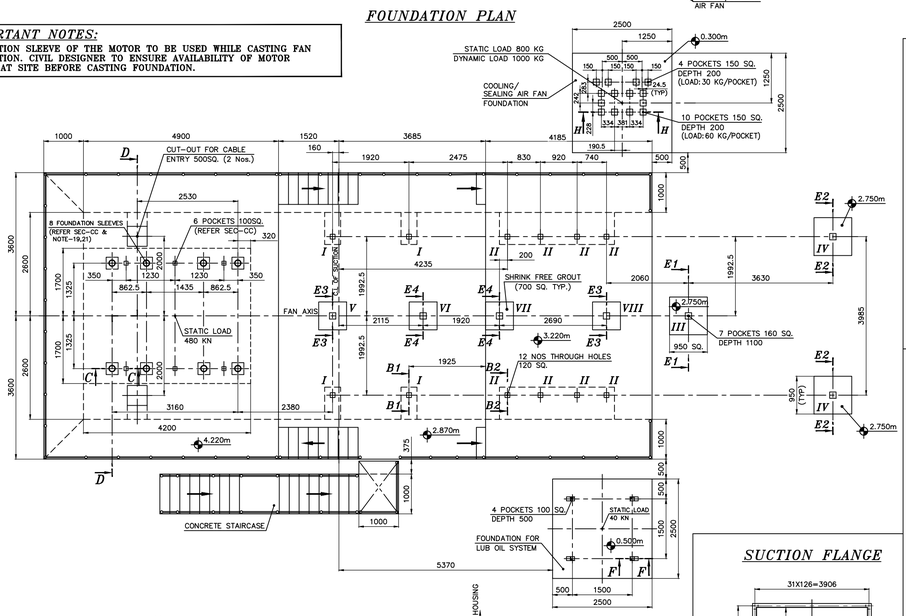


KEY PLAN

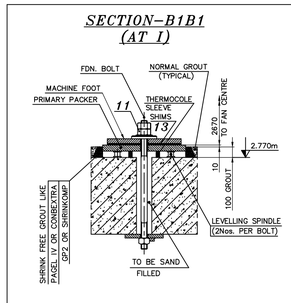
IMPORTANT NOTES:

FOUNDATION SLEEVE OF THE MOTOR TO BE USED WHILE CASTING FAN FOUNDATION. CIVIL DESIGNER TO ENSURE AVAILABILITY OF MOTOR SLEEVE AT SITE BEFORE CASTING FOUNDATION.

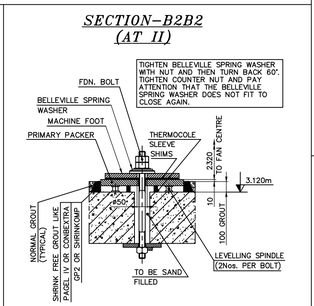
FOUNDATION PLAN



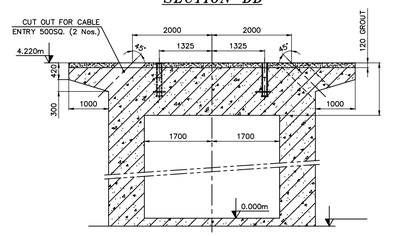
SECTION-B1B1 (AT I)



SECTION-B2B2 (AT II)

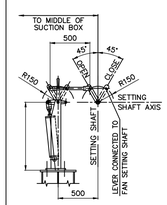


SECTION-DD



VIEW-R*

(ON ACTUATOR & ITS LINKAGE)



VIII			±2500	±12400	±21300 ±194800
VII			+320900 −76700	±12400	±21300 ±194800
VI			±73600	±19300	±3700
V			±3800	±19200	±3700
IV	+47900	±3600	±9600	±9600	±3600
III	+70200	±5900	±14100	±12200	±5900
II	+122700	±6200 ±62100	±24600	±24600	±5400 ±54100
I	+87200	±3700	±17500	±17500	±3700
Point Forces in [N]	Dead Load Vertical	Dynamic Load Vertical	Stat. horiz. Dead Load horiz. in axial Direction	Stat. horiz. Dead Load horiz. across to the axis	Dyn. horiz. Dyn. Load horiz. across to the axis

NOTES:-

01. THE LOADS INDICATED ON FOUNDATION ARE WITHOUT ALLOWANCES FOR VIBRATIONS. CIVIL DESIGNERS ARE RESPONSIBLE FOR PROPER DESIGN OF FOUNDATION TAKING INTO ACCOUNT OF THE ALLOWANCES FOR VIBRATION ALSO.
02. THE DIFFERENT NATURAL FREQUENCY OF THE FOUNDATION HAVE TO BE 20% AWAY FROM THE SPEED FREQUENCY, fnmax = n/60 AND 15% AWAY FROM THE DOUBLE OF THE SPEED FREQUENCY, 2 x fnmax. THIS MEANS : 0.8xfn TO 1.2xfn AND 0.85x(2xfn) TO 1.15x(2xfn). SPEED FREQUENCY fnmax. = 12.42 HZ (2 * fnmax.) = 24.84 HZ
03. THE STIFFNESS OF THE FOUNDATION HAS TO BE ATLEAST CF>1.0E+06 N/mm FOR EACH LOAD POINT IN LONGITUDINAL, TRANSVERSAL AND VERTICAL DIRECTIONS RELATING TO THE FAN AXIS. IT HAS TO BE TAKEN INTO CONSIDERATION THAT ON SETTLING OF 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.
04. THE RATIO OF THE FOUNDATION MASS TO THE ROTOR MASS HAS TO BE GREATER THAN 25.
05. ADOPT IS: 2974 / PART-IV FOR THE FOUNDATION DESIGN.
06. THE CONNECTING DUCTS AT INLET AND OUTLET OF FAN MUST BE SELF SUPPORTED AND SHOULD NOT BE WELDED WITH EXPANSION JOINTS.
07. FOUNDATION POCKETS SHOULD BE PERPENDICULAR TO THE FLAT SURFACES OF FOUNDATION.
08. ACCURATE TEMPLATES SHALL BE USED FOR LOCATING CORES FOR POCKET HOLES TO ENSURE THEIR DIMENSIONAL ACCURACY.
09. TOLERANCE BETWEEN ANY TWO POCKET CENTRES IS ±5 mm.
10. TOLERANCE ON CONCRETE LEVELS +0mm/−25mm.
11. 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 20 mm AND DOWN GRADED TO FACILITATE CHIPPING AND SCRAPPING AND THEREBY ENSURING MAXIMUM CONTACT ON THE MATING AREAS.
12. 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.
13. GROUTING SHOULD BE DONE ONLY AFTER FINAL ALIGNMENT OF FAN.
14. ELEVATION & POCKET DEPTHS SHOWN IN FOUNDATION PLAN ARE INCLUDING GROUTING THICKNESS.
15. GROUTING IS IN THE SCOPE OF ERECTION GROUP/CONTRACTOR.
16. HANDRAILS, STEEL PLATFORMS & CANOPY FOR MOTOR AND THEIR EMBEDMENTS ARE IN THE SCOPE OF BHEL/TRICHY.
17. FAN FOUNDATION SHOULD NOT BE USED AS SUPPORT FOR OTHER STRUCTURES OR EQUIPMENTS.
18. FOUNDATION CONFIGURATION SHOWN IN THIS DRAWING IS ONLY INFORMATIVE/TYPICAL. TYPE AND DETAILS OF FOUNDATION ARE TO BE FINALISED BY CIVIL DESIGNERS.
19. FOR MOTOR ERECTION, REFER MOTOR SUPPLIER'S ERECTION MANUAL.
20. BASE FRAME, SOLE PLATE, FOUNDATION BOLTS, FDN. SLEEVE & FASTENERS RELATED TO MOTORS ARE IN THE SCOPE OF MOTOR SUPPLIER (BHEL BHOPAL UNIT)
21. FOUNDATION SLEEVE OF THE MOTOR IS TO BE EMBEDDED IN THE CONCRETE AS PER THE DIMENSION SHOWN. AFTER CONCRETE HAS SET, THE EXCESS PROTRUDING HEIGHT TO BE SUITABLY CUT-OFF.

FAN DETAILS:-

TYPE	: SAF 40/25.6-2
NO. OF FANS PER BOILER	: TWO (IDENTICAL)
WEIGHT OF ROTATING PARTS	: 17500 Kg
GD^2 OF FAN	: 36000 $kg.m^2$
SPEED OF FAN	: 745 RPM
MAXIMUM WEIGHT TO BE HANDLED FOR MAINTENANCE	: 17500 Kg

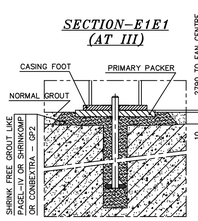
MOTOR DETAILS:-

MAKE	: M/s BHEL/BHOPAL
RATING	: 11800 KW /747 RPM/729 AMP/11 KV
FRAME SIZE	: 1TF8843-8, IP55
WEIGHT OF MOTOR	: 47500 Kg
WEIGHT OF ROTOR	: 13200 Kg
GD^2 OF MOTOR	: 10500 $kg.m^2$
MOTOR DRG. NO.	: 1 402 00 41458
METHOD OF COOLING	: IC 81W
MAXIMUM WEIGHT TO BE HANDLED FOR MAINTENANCE	: 48000 Kg

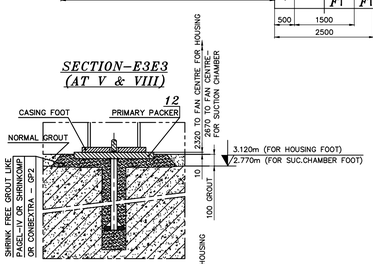
LOADING ON MOTOR FOUNDATION

REACTION DUE TO WEIGHT ON EACH SIDE (G)		= 237 kN
MAX. SHORT CIRCUIT FORCE (MS)		= 545 kN
REACTION DOWNWARD	(MS+G)	= 782 kN
REACTION UPWARD	(MS−G)	= 308 kN

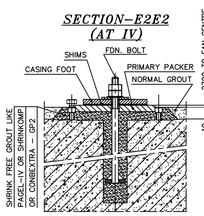
SECTION-E1E1 (AT III)



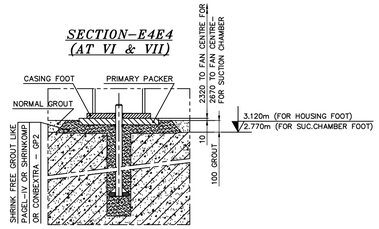
SECTION-E3E3 (AT V & VIII)



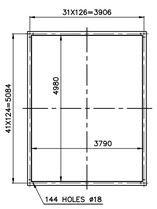
SECTION-E2E2 (AT IV)



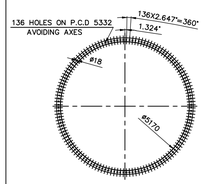
SECTION-E4E4 (AT VI & VII)



SUCTION FLANGE



DELIVERY FLANGE



ID. NO.	(m) MASS IN (KG)	(F) FORCE IN (N)	DESIGNATION
30/2		−110245	Stat. and dyn. forces caused by air stream of suction box in vert. direction
30/1		10513	Stat. and dyn. forces caused by air stream of suction box in horiz. direction
16		122108	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		106170	Max. load when lifting the fan housings upper part
13/1		157170	Max. load when lifting the rotor assembly
12		389528	Unbalance in case of damage
11		42515	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		12850	Radial load on motor shaft
6		21798	Axial thrust on motor shaft for motor with fixed bearing
5	2570		Intermediate shaft with coupling
4	13020		Diffuser with tail fairing
3	17192		Complete rotor assembly
2	24050		Fan housing with straightener vane section
1	14690		Suction box with nose fairing and inlet nozzle and intermediate shaft cover

MOTOR BEARING LUBRICATION DETAILS:

	DE	NDE
BEARING SIZE	ø315	ø315
OIL QTY.	15 LPM	15 LPM
OIL INLET PRESSURE	0.2 TO 0.5 kg/cm^2	0.2 TO 0.5 kg/cm^2
MAX. OIL INLET TEMP.	43°C	43°C
OIL GRADE	ISO VG 68 OR EQUI.	ISO VG 68 OR EQUI.
LUBRICATION TYPE	FORCED OIL LUBRICATION	

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

SL NO	DESCRIPTION	MATERIAL	QTY.
14	FAN SHAFT	42 CR Mo4	1
13	SHIMS	ASTM A240	AS REQD.
12	PRIMARY PACKER	IS : 2062	AS REQD.
11	FOUNDATION FASTENERS FOR FAN	ASTM A105	19
10	COUPLING GUARD	IS : 2062	1
09	SPACER COUPLING	STEEL	1
08	MOTOR WITH FNDN. FASTENERS	11800 KW/747 RPM	1
07	BLADES	GGG 40 OR EQUIVALENT (NODULAR CAST IRON)	36
06	IMPELLER HUB	P500 NH OR EQUIVALENT	1
05	HOUSING CORE (FAN HOUSING HUB)	IS : 2062 OR EQUIVALENT	1
04	DIFFUSER	IS : 2062 OR EQUIVALENT	1
03	OUTLET GUIDE VANE ASSY.	IS : 2062 OR EQUIVALENT	1
02	IMPELLER HOUSING	IS : 2062 OR EQUIVALENT	1
01	SUCTION CHAMBER	IS : 2062 OR EQUIVALENT	1

BILL OF MATERIAL

CUSTOMER Nos. R827 TO R831

CUSTOMER: TELANGANA STATE POWER GENERATION CORPORATION LTD.

PROJECT : YADADRI THERMAL POWER STATION-5X800MW
NALGONDA DIST., TELANGANA STATE, INDIA

BHARAT HEAVY ELECTRICALS LTD.
BOILER AUXILIARIES PLANT
RANIPET - 632 406

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DEPT		NAME	SIGN	DATE
—	CODE	P.SARAVANAN	Sd/-	29.11.2017
	DESN	PRASANNA	Sd/-	30.11.2017
	CHD	PRASANNA	Sd/-	30.11.2017
	APPD	P.M.JAVID	Sd/-	30.11.2017

TITLE: GA DRAWING FOR ID FAN WITH FOUNDATION PLAN AND LOADING DATA - SAF 40/25.6-2

DEPT. SCALE N.T.S DRAWING NO. 1-00-099-29051

SIGN SHEET 1 OF 1 REV. 00

Size A1