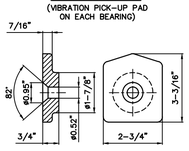
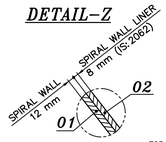
DETAIL–Y
(VIBRATION PICK–UP PAD ON EACH BEARING)

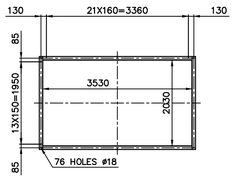


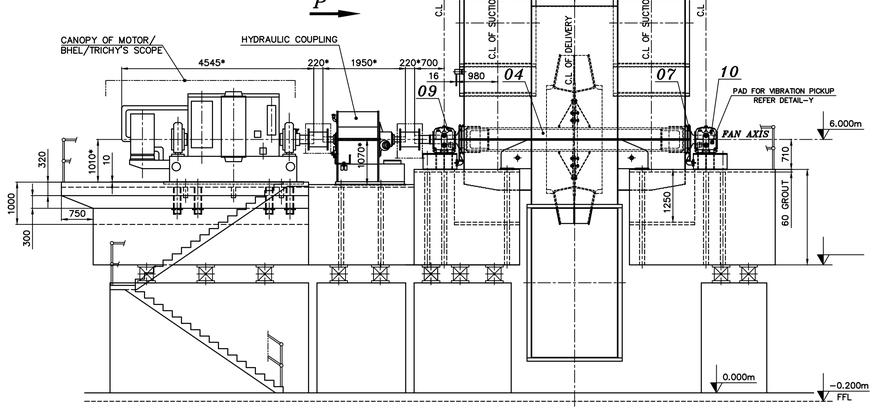
DETAIL–Z

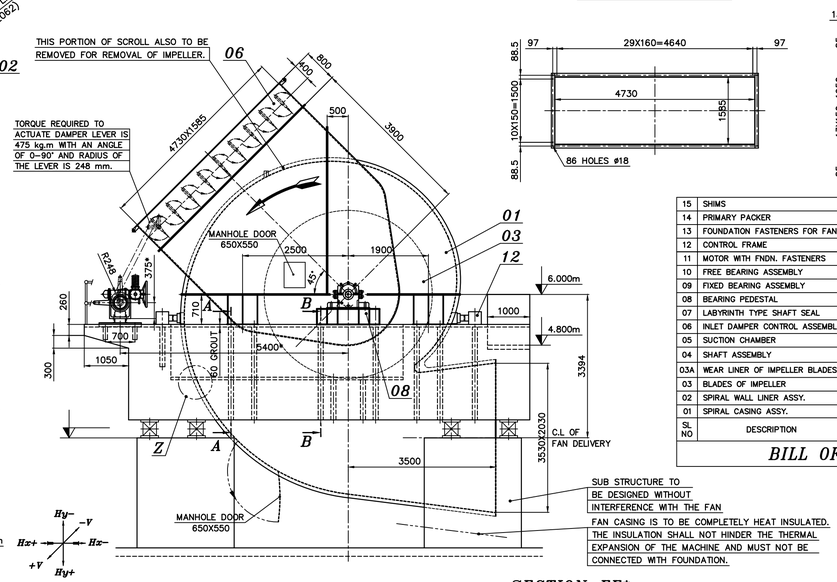


SUCTION FLANGE

DELIVERY FLANGE







SL NO	DESCRIPTION	MATERIAL	THICKNESS mm	QTY.
15	SHIMS	S.S	–	AS REQD.
14	PRIMARY PACKER	IS 2062	20	AS REQD.
13	FOUNDATION FASTENERS FOR FAN	ASTM A105	–	AS REQD.
12	CONTROL FRAME	IS 2062	–	4
11	MOTOR WITH FNDN. FASTENERS		–	1
10	FREE BEARING ASSEMBLY	8" RTL	–	1
09	FIXED BEARING ASSEMBLY	8" RTL	–	1
08	BEARING PEDESTAL	IS 2062	–	2
07	LABYRINTH TYPE SHAFT SEAL	IS 2062 WITH CAF	–	2
06	INLET DAMPER CONTROL ASSEMBLY	IS 2062	8/12	2
05	SUCTION CHAMBER	IS 2062	8	2
04	SHAFT ASSEMBLY	TUBE : ST 37 END PINS : 2C35	–	1
03A	WEAR LINER OF IMPELLER BLADES	XAR 400	7	11
03	BLADES OF IMPELLER	P355NH OR EQUIVALENT	18	11
02	SPIRAL WALL LINER ASSY.	IS 2062	8	1
01	SPIRAL CASING ASSY.	IS 2062	12	1

BILL OF MATERIAL

KEY PLAN

NOTES:–

01. THE LOADS INDICATED ON FOUNDATION ARE WITHOUT ALLOWANCES FOR VIBRATIONS. CIVIL DESIGNER IS RESPONSIBLE FOR PROPER DESIGN OF FOUNDATION TAKING INTO ACCOUNT OF THE ALLOWANCES FOR VIBRATION ALSO.
02. THE NATURAL FREQUENCY OF THE FOUNDATION SHOULD BE MINIMUM +20% AWAY FROM THE OPERATING FREQUENCY OF THE FAN. THE NATURAL FREQUENCY OF THE CONNECTING DUCT AND SUPPORTING STRUCTURE SHOULD BE CLEARLY AWAY FROM THE OPERATING FREQUENCY OF THE FAN.
03. ADOPT IS: 2974 / PART–IV FOR THE FOUNDATION DESIGN.
04. THE CONNECTING DUCTS AT INLET AND OUTLET OF FAN ARE SELF SUPPORTED AND SHOULD NOT BE WELDED WITH EXPANSION JOINTS.
05. FOUNDATION POCKETS SHOULD BE PERPENDICULAR TO THE FLAT SURFACES OF FOUNDATION.
06. ACCURATE TEMPLATES SHALL BE USED FOR LOCATING CORES FOR POCKET HOLES TO ENSURE THEIR DIMENSIONAL ACCURACY.
07. TOLERANCE BETWEEN ANY TWO POCKET CENTRES ±5 mm.
08. TOLERANCE ON CONCRETE LEVELS +0mm/–25mm.
09. 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 THEREBY ENSURING MAXIMUM CONTACT ON THE MATING AREAS.
10. 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.
11. GROUTING SHOULD BE DONE ONLY AFTER FINAL ALIGNMENT OF FAN.
12. ELEVATIONS SHOWN IN FOUNDATION PLAN INCLUDE GROUT THICKNESS.
13. GROUTING IS IN THE SCOPE OF ERECTION GROUP.
14. HANDRAILS, STEEL PLATFORMS & CANOPY OF MOTOR AND THEIR EMBEDMENTS ARE IN THE SCOPE OF BHEL/TRICHY.
15. FAN FOUNDATION SHOULD NOT BE USED AS SUPPORT FOR OTHER STRUCTURES OR EQUIPMENTS.
16. FOUNDATION CONFIGURATION SHOWN IN THIS DRAWING IS ONLY INFORMATIVE/TYPICAL. TYPE AND DETAILS OF FOUNDATION ARE TO BE FINALIZED BY CIVIL DESIGNERS/CONSULTANTS.
17. FOR MOTOR ERECTION, REFER MOTOR SUPPLIER'S ERECTION MANUAL.
18. LUB OIL SYSTEM WILL BE PROVIDED WITH SUITABLE CANOPY.
19. FOUNDATION SLEEVE IS EMBEDDED IN CONCRETE AS PER THIS DIMENSION. AFTER CONCRETE HAS SET, THE EXCESS PROTRUDING HEIGHT OF SLEEVE IS TO BE CUT OFF.
20. SOLE PLATE, FOUNDATION BOLTS & FASTENERS RELATED TO MOTORS WILL BE IN THE SCOPE OF MOTOR SUPPLIER (BHEL BHOPAL UNIT)

FAN DETAILS:–

TYPE	: NDZV 37 SIDOR
WEIGHT OF FAN WITHOUT MOTOR & COUPLING	: 57500 Kg
WEIGHT OF ROTATING PARTS	: 15500 kg
GD^2 OF FAN	: 86000 kg.m^2
SPEED OF FAN	: VARIABLE (RANGE 110 RPM TO 580 RPM)
OPERATING SPEED AT DESIGN POINT	: 580 RPM
NO. OF FANS PER BOILER	: TWO (IDENTICAL)
MAX. ROTATING UNBALANCE FORCE AT AXIS LEVEL	: 54.6 kN
TYPE OF FAN BRG LUBRICATION/COOLING	: FORCED OIL CIRCULATION
MECHANICAL DESIGN TEMPERATURE OF FAN CASING	: 200 °C
ALLOWABLE UN BALANCEMENT FOR FAN SHALL BE	Q2.5 AS PER ISO 1940

MOTOR DETAILS:–*

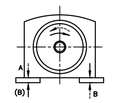
MAKE	: M/s. BHEL/BHOPAL
FRAME SIZE	: 1D04139
RATING	: 2027 KW AT 580 RPM (12 PULSE)
	: 898 KW AT 410 RPM (6 PULSE)
WEIGHT OF STATOR	: 4250 kg
WEIGHT OF ROTOR	: 7800 kg
TOTAL WEIGHT OF MACHINE	: 21600 kg
GD^2 OF MOTOR	: 4200 kg.m^2
MOTOR DRAWING NO.	: 1 40 300 40459

FOUNDATION LOADING DATA OF MOTOR*

MAX.FORCE CALCULATED FROM THE MAX. SUDDEN TORQUE – Ms = 161 KN (THREE PHASE SHORT CIRCUIT)

FORCE EXERTED BY THE WEIGHT ON EACH SIDE----------G = 108 KN
FOUNDATION LOAD ON EACH SIDE COMPRESSIVE LOAD-------A = MS+G = 269 KN
FOUNDATION LOAD ON EACH SIDE TENSILE LOAD----------B = MS–G = 53 KN

1.THE FORCES OCCUR ALTERNATIVELY INDEPENDENT OF THE DIRECTION OF ROTATION. (A) & (B) ARE THE DIRECTION OF FORCES IN SECOND HALF CYCLE.
2.THE TRANSFER OF VIBRATIONS FROM SURROUNDING EQUIPMENT HAS TO BE AVOIDED BY SUITABLE LAYOUT OF FOUNDATION.

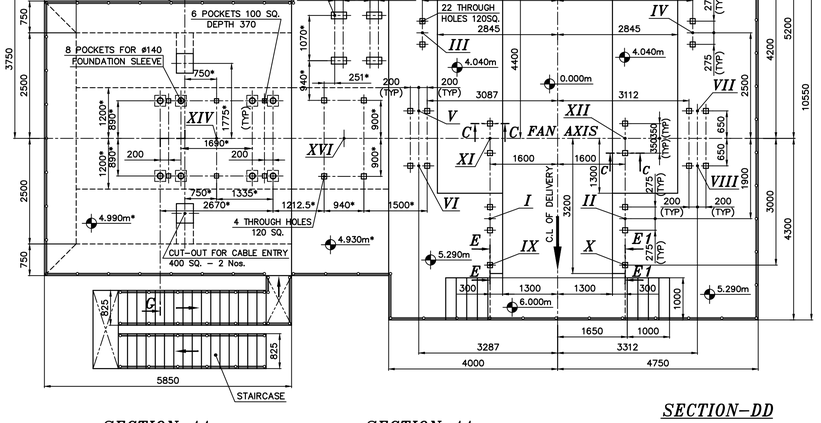


MOTOR COOLER DATA:*

WATER FLOW RATE (FOR TWO ELEMENTS) = 350 LPM
WATER INLET / OUTLET TEMPERATURE = 38°C/43°C
PRESSURE DROP = 0.4 bar
OPERATING PRESSURE = Max. 6 bar
TEST PRESSURE = 10 bar

MOTOR BRG. LUBRICATION*		
	D.E	N.D.E
BEARING SIZE	ø220	ø220
OIL FILLING QTY.	28 litre	28 litre
LUBRICATION	RING LUBRICATED	
OIL GRADE	IOC SERVOPRIME – 68 OR EQUIVALENT	

FOUNDATION PLAN

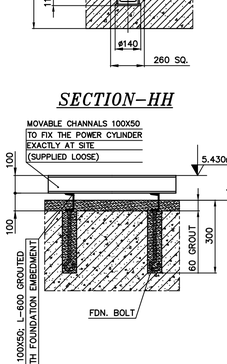


LOAD DATA FOR FOUNDATION

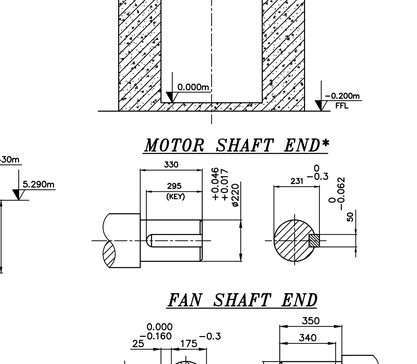
LINE	LOAD POINT	LOAD CASE	SUPPORTING FORCE RESULTING FROM OWN WEIGHT	MAX. PERMISSIBLE UNBALANCE FORCE REFERRED TO SUPPORTING POINT 1	2	FORCE DUE TO AXIAL THRUST	SUPPORTING FORCE RESULTING FROM PRESS/IMPULSES BRG. THRUST & NORMAL MOMENT OF MOTOR			SUPPORTING FORCE DUE TO THERMAL EXPANSION	
			KN	KN		KN	KN			KN	
			V	±V	±Hy	Hx	V	Hx	Hy	Hx	Hy
	1	2	3	4	5	6	7	8	9		
1	I	86	1				–5.2			±8.3	±9.9
			2								
2	II	86	1				–5.2			±8.3	±9.9
			2								
3	III	194	1				–18.2			±22.9	±18
			2								
4	IV	194	1				–18.2			±22.9	±18
			2								
5	V	43	1	44.2		±11.2					
6	VI	43	1	24.2	44.2	±11.2					
			2	44.2							
7	VII	40	1	24.2	44.2						
			2	44.2							
8	VIII	40	1	24.2	44.2						
			2	44.2							
9	IX	3.5	1							±1.4	
			2								
10	X	3.5	1							±1.4	
			2								
11	XI	3.5	1				–35.2				
			2								
12	XII	3.5	1				–35.2				
			2								
13	XIII	4	1								±16
			2								
14	XIV	215*	1								
			2								
15	XV	25	1								
			2								
16	XVI	60*									

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

SECTION–FF*



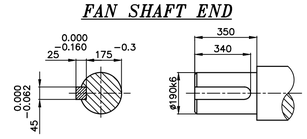
SECTION–GG*



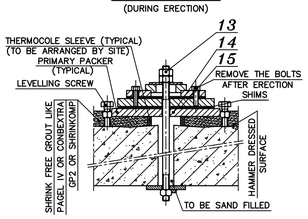
SECTION–HH

MOTOR SHAFT END*

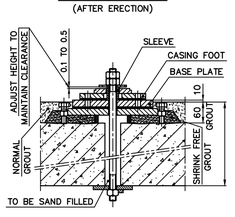
FAN SHAFT END



SECTION–AA
(DURING ERECTION)



SECTION–AA
(AFTER ERECTION)



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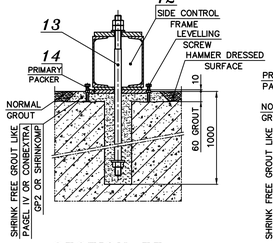

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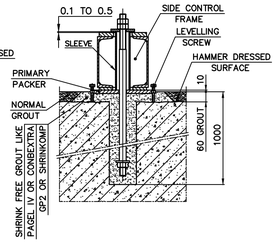

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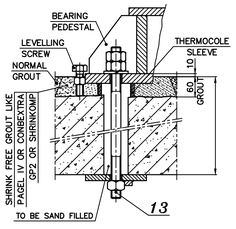
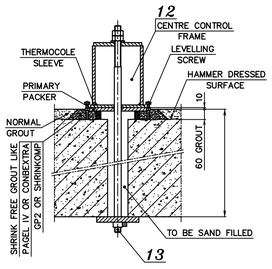


SECTION–CC



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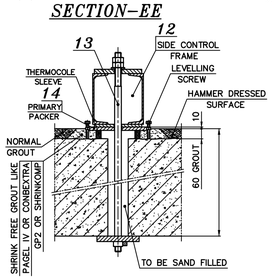
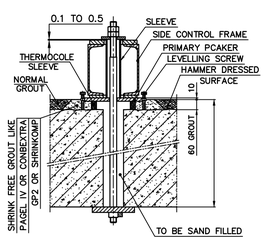


SECTION–E1E1



CUSTOMER NO. R373 TO R376

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PROJECT: MANUGURU THERMAL POWER PROJECT 4X270MW EPC PROJECT

OWNER: M/s. TSGENCO, TELANGANA

CONSULTANT: DESEIN CONSULTING ENGINEERS NEW DELHI

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

	NAME	SIGN	DATE
DRN.	P.SARAVANAN	Sd/–	17.04.2015
CHD.	SANDEEP	Sd/–	17.04.2015
APPD.	V.P.SHYAM	Sd/–	17.04.2015

ALL DIMENSIONS IN MILLIMETRE

PROJECTION | SCALE N.T.S

TITLE: GENERAL ARRANGEMENT OF INDUCED DRAFT FAN NDZV 37 SIDOR

DRG. NO. 1–00–099–29011

REV. 00

10021645

Size A1