परियोजना
इंजीनियरिंग
प्रबंधन

Project Engineering
Management

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(भारत सरकार का उपक्रम)
Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)

Ref: PE/PG/MMN/E-6178/2019 /Corrigendum/01

Date: 25/04/2019

DUE DATE
29/04/2019
BY 02:00 PM (IST)

Project: 4x270 MW TSGENCO MANUGURU TPS- MOEF NORMS
Package: VIS FOR BOOSTER FAN FOUNDATION
References: 1. Enquiry. No.: PE/PG/MMN/E-6178/2019 dated 19/04/2019

Subject: Corrigendum due to GA of BOOSTER FAN

With reference to the above Tender Enquiry, Bidders to note the following:

GA drawing of BOOSTER FAN is enclosed herewith. Bidder are requested to quote accordingly for subject tender.

Thanking You

25/4/19

With regards
For & on behalf of BHEL
Rohit Juneja
Sr. Engineer | PG II, BHEL PEM | Noida

कृपया प्रेषित करे :
बीएचइएल, पीएस-पीइएम्
पीपीइआई भवन
प्लाट न २५, सेक्टर १६ ए
नोएडा - २०१ ३०१ उ प्र
भारत

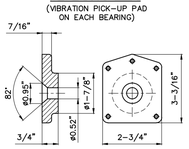
Please reply to :
BHEL, PS-PEM,
PPEI Building,
Plot No.25, Sector 16A,
Noida-201301 (U.P.)
INDIA

फ़ोन Phone No:
91-120 – 436 8848

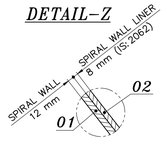
पंजीकृत कार्यालय
बीएचइएल हाउस
सीरी फोर्ट
नयी दिल्ली – ११० ०४९
भारत

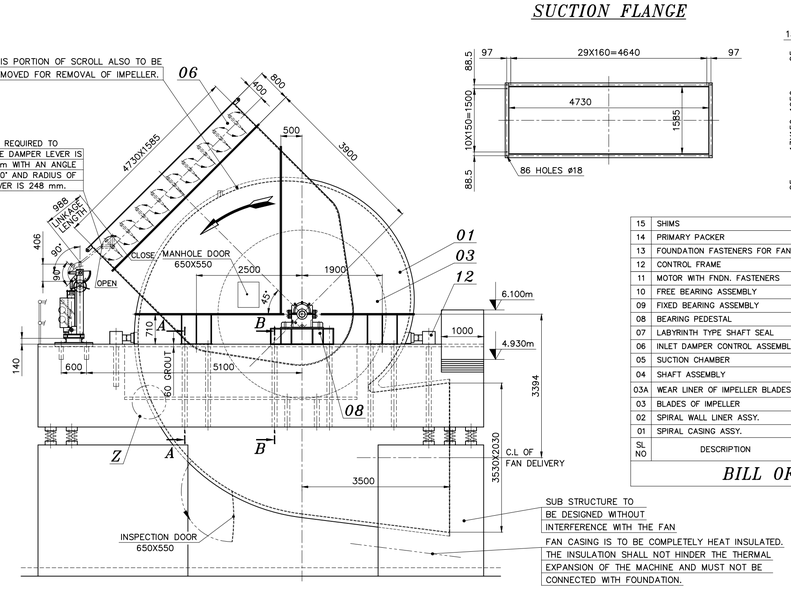
Registered Office :
BHEL House,
Siri Fort,
New Delhi-110049
INDIA

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



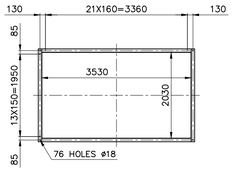
DETAIL–Z





SUCTION FLANGE

DELIVERY FLANGE



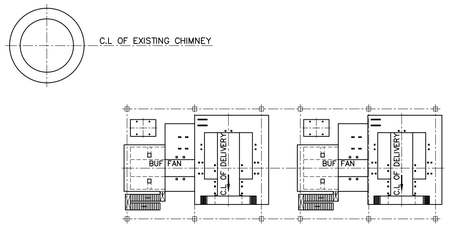
SL NO	DESCRIPTION	MATERIAL	THICKNESS mm	QTY.
15	SHIMS	S.S	–	AS REQD.
14	PRIMARY PACKER	IS 2062	20	AS REQD.
13	FOUNDATION FASTENERS FOR FAN	ASTM A105	–	AS REQD.
12	CONTROL FRAME	IS 2062	–	4
11	MOTOR WITH FNDN. FASTENERS	REFER MOTOR DRG.	–	1
10	FREE BEARING ASSEMBLY	8" RTL	–	1
09	FIXED BEARING ASSEMBLY	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

REFER DRG. No. PE–DG–411–100–M001 (KEY PLAN SHOWN IS INFORMATIVE ONLY. FOR EXACT LOCATION REFER PLOT PLAN)

NORTH



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/RANIPET.
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. LUBE OIL SYSTEM WILL BE PROVIDED WITH SUITABLE CANOPY.
19. SOLE PLATE, FOUNDATION BOLTS & FASTENERS RELATED TO MOTORS WILL BE IN THE SCOPE OF MOTOR SUPPLIER (BHEL BHOPAL UNIT)
20. METALLIC EXPANSION JOINTS SHALL BE PROVIDED BY BHEL/RANIPET AT SUCTION AND DISCHARGE OF BOOSTER FAN.

FAN DETAILS:–

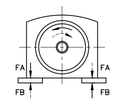
TYPE	: NDZV 37 SIDOR
WEIGHT OF FAN WITHOUT MOTOR & COUPLING	: 57500 Kg
WEIGHT OF ROTATING PARTS	: 14500 kg
GD^2 OF FAN	: 86000 kg.m^2
SPEED OF FAN	: VARIABLE (RANGE 110 RPM TO 580 RPM)
OPERATING SPEED AT DESIGN POINT	: 580 RPM
NO. OF FANS PER BOILER	: TWO (IDENTICAL)
MAXIMUM WEIGHT TO BE HANDLED FOR MAINTENANCE	: 17000 kg
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 ROTOR SHALL BE	Q2.5 AS PER ISO 1940

MOTOR DETAILS:–

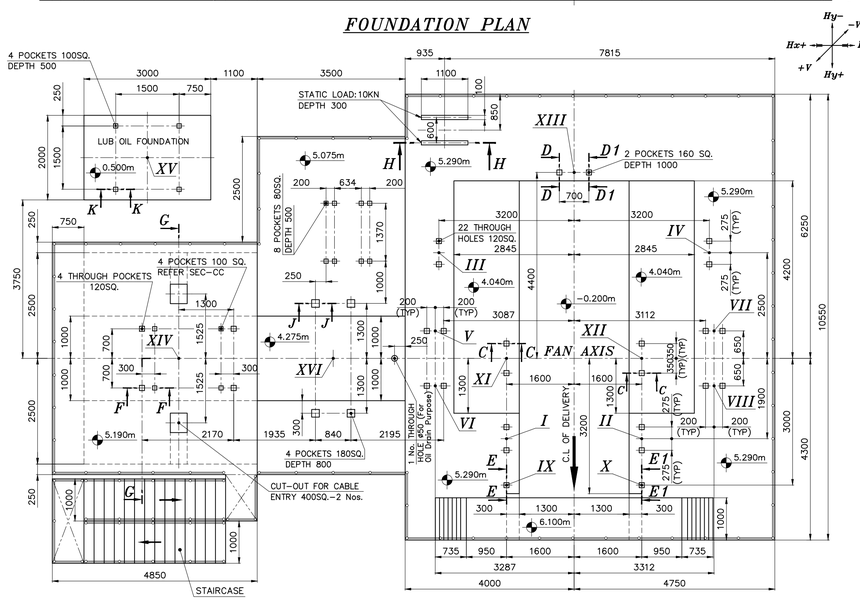
MAKE	: M/s. BHEL/BHOPAL
FRAME SIZE	: 1RQ1806–3, CACA, IP55, 6.6KV
RATING	: 2025 KW / 596 RPM
WEIGHT OF ROTOR OF MOTOR	: 5000 kg
TOTAL WEIGHT OF MACHINE	: 16500 kg
GD^2 OF MOTOR	: 1896 kg.m^2
MOTOR DRAWING NO.	: 1 40 200 41346

FOUNDATION LOADING DATA OF MOTOR

MAX. FORCE CALCULATED FROM THE MAX. IMPULSE TORQUE – FM = 260 KN
FORCE EXERTED BY THE WEIGHT ON EACH SIDE ---------- FG = 82.5 KN
FOUNDATION LOAD ON EACH SIDE COMPRESSION ---FA = FM+FG = 342.5 KN
TENSILE FORCE ----------FB = FM–FG = 177.5 KN
THE FORCES OCCUR ALTERNATIVELY INDEPENDENT OF THE DIRECTION OF DIRECTION



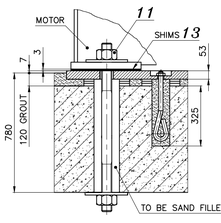
FOUNDATION PLAN



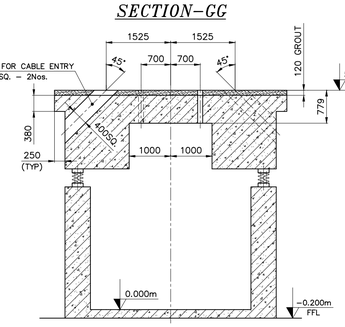
LOAD DATA FOR FOUNDATION

LINE	LOAD POINT	LOAD CASE	SUPPORTING FORCE RESULTING FROM OWN WEIGHT	MAX. PERMISSIBLE UNBALANCE FORCE REFERRED TO SUPPORTING POINT 1	MAX. PERMISSIBLE UNBALANCE FORCE REFERRED TO SUPPORTING POINT 2	FORCE DUE TO AXIAL THRUST	SUPPORTING FORCE RESULTING FROM PRESSURES,IMPULSES &REACTIONS 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	II	86	1				–5.2			±8.3	±9.9
3	III	194	1				–18.2			±22.9	±18
4	IV	194	1				–18.2			±22.9	±18
5	V	43	1	44.2		±11.2					
6	VI	43	1	44.2		±11.2					
7	VII	40	1	44.2							
8	VIII	40	1	44.2							
9	IX	3.5	1							±1.4	
10	X	3.5	1							±1.4	
11	XI	3.5	1								
12	XII	3.5	1								
13	XIII	4	1								±16
14	XIV	170	1								
15	XV	25	1								
16	XVI	150	1								
			2	24.2	44.2						

SECTION–FF



SECTION–GG



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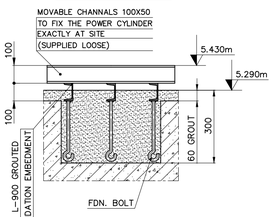
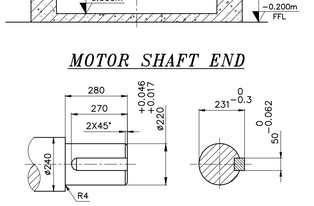
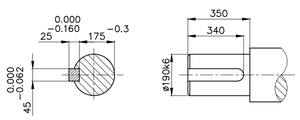


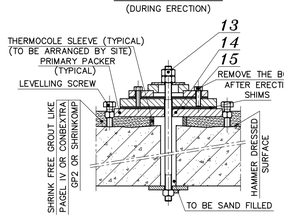
MOTOR SHAFT END



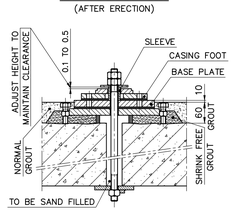
FAN SHAFT END



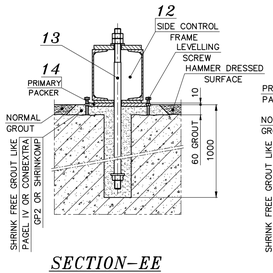
SECTION–AA
(DURING ERECTION)



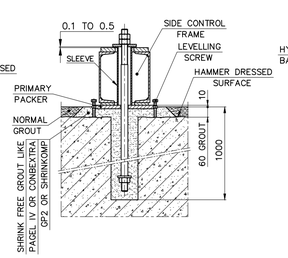
SECTION–AA
(AFTER ERECTION)



SECTION–DD



SECTION–D1D1



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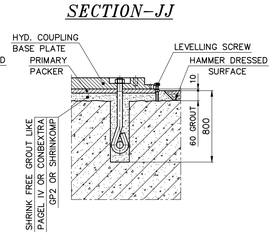

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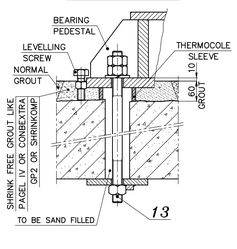

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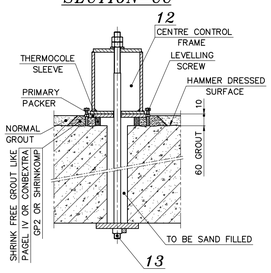

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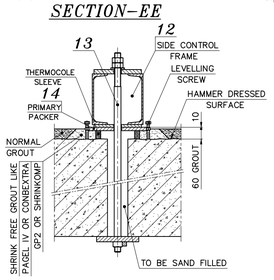
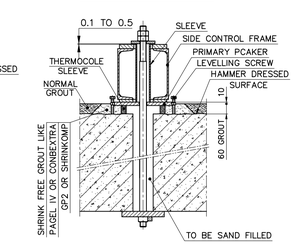
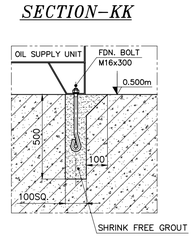


SECTION–E1E1



SECTION–KK



BEARING DRIVE END:

ROLLER BRG.	– NU 1048 MC3 BORE ø240
BALL BRG.	– 6048 MC3
LUBRICATION	– IOC GREASE SERVOGEM 3 OR EQUVL.
GREASE QUANTITY	– 2000 GRAMS (INITIAL FILLING)
RELUBRICATION	– 1500 OPERATING HRS. 90 g.

BEARING NON DRIVE END (INSULATED)

ROLLER BRG.	– NU 1040 MC3 BORE ø200
LUBRICATION	– IOC GREASE SERVOGEM 3 OR EQUVL.
GREASE QUANTITY	– 700 GRAMS (INITIAL FILLING)
RELUBRICATION	– 1500 OPERATING HRS. 60 g.

HYD. COUPLING DETAILS:–

MAKE	: VOITH TURBO PVT. LTD.
TYPE OF MACHINE	: VARIABLE SPEED HYDRAULIC COUPLING
COUPLING SIZE	: 1330 SVNL 21–50 G
TOTAL WEIGHT WITHOUT OIL	: 12000 kg
WEIGHT OF ROTATING PARTS WITH OIL	: 2400 kg
OIL GRADE	: ISO VG 32
MOMENT OF INERTIA:	
PRIMARY WITH OIL	: 500 kg.m^2
SECONDARY WITH OIL	: 125 kg.m^2
DYNAMIC FOUNDATION LOADING F (dyn)	: 700 N

CUSTOMER Nos. : R373 TO R376

TELANGANA STATE POWER GENERATION CO. LTD.

DESEIN PRIVATE LIMITED

BHADRADRI TPS, UNITS # 1 TO 4 (4X270 MW), MANUGURU, KHAMMAM DISTRICT

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

DEPT CODE		NAME	SIGN	DATE
-	DRAWN	P.SARAVANAN	Sd/–	16.02.2019
	CHD	PRASANNA	Sd/–	16.02.2019
	APPD	P.M.JAVID	Sd/–	16.02.2019

TITLE

GENERAL ARRANGEMENT OF BOOSTER FAN – NDZV 37 SIDOR

DEPT | SCALE N.T.S | SIGN

DRAWING No. 1–00–099–29341

SHEET 1 OF 1 | REV. 00

10021645

Size A1