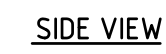







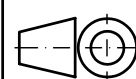


SH. 02 OF 03



GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT						2x800MW BFP DRIVE TURBINE RAICHUR POWER CORPORATION, YERAMARUS						STATUS: PRELIMINARY																		
				BHARAT HEAVY ELECTRICALS LTD. HYDERABAD				<table><tr><th>DRN</th><th>NAME</th><th>SIG.</th><th>DATE</th><th>NO OF VAR.</th></tr><tr><td>CHD</td><td>PANKAJ</td><td></td><td>21.09.2011</td><td>-N.A.-</td></tr><tr><td>APPD</td><td>G.N.PAWAR</td><td></td><td>21.09.2011</td><td>-N.A.-</td></tr></table>				DRN	NAME	SIG.	DATE	NO OF VAR.	CHD	PANKAJ		21.09.2011	-N.A.-	APPD	G.N.PAWAR		21.09.2011	-N.A.-	<div>PRELIMINARY</div>			
DRN	NAME	SIG.	DATE	NO OF VAR.																										
CHD	PANKAJ		21.09.2011	-N.A.-																										
APPD	G.N.PAWAR		21.09.2011	-N.A.-																										
DEPT		TECP		UNTL. DIMS. GR				SCALE		WEIGHT (KG)		REF. TO ASSY. DRG.		ITEM NO.		NO OF ITEMS														
		415		CHAF				1:35		-N.A.-		-N.A.-		-N.A.-		-N.A.-														
TITLE FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE												(CARD CODE) N.A.		DRAWING NO. 1-313-00-98135				REV. 00												
10								11				12				13														

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INVENTORY NO. _____

SIGN AND DATE _____

REF. DRG. NO. _____

COMPUTER FILE NAME _____

FIRST ANGLE PROJECTION

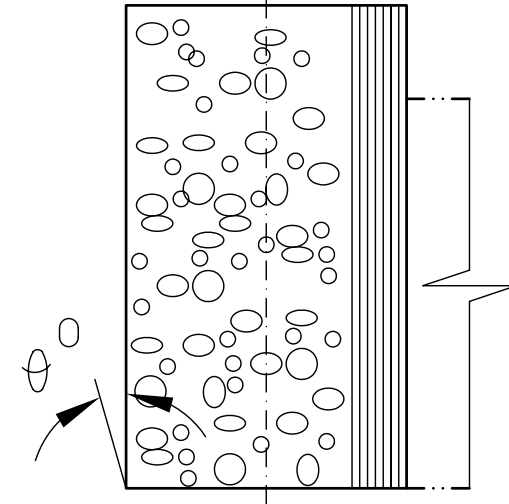
(ALL DIMENSIONS ARE IN mm)

SEL86-00-ELE-1

2
EO 40 EO 'HS

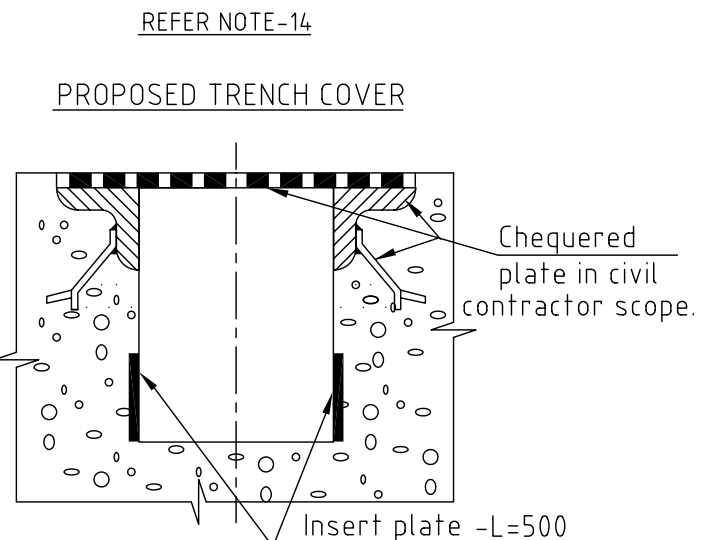
TYPE OF TURBINE :- NK 63/71-3			
TYPE OF BOILER FEED PUMP :- MDG 455			
TYPE OF BOOSTER PUMP :- MLC 450x350H			
WEIGHT OF SINGLE HEAVIEST PIECE FOR			
	ERECTION	in kg.	MAINTENANCE
TURBINE	26,000		14,000
BFP	25,700		6,900
BP	8,500		3,100
DIRECTION OF ROTATION VIEWED FROM BOOSTER PUMP TO BFP FOR :-			
TURBINE	-	CLOCKWISE	
BFP	-	CLOCKWISE	
BP	-	COUNTER CLOCK WISE	

DETAIL 'PED'



THE THICKNESS OF THE CONCRETE MEMBER MUST BE SUFFICIENT TO ENSURE THAT THE ANGULAR DEFLECTION DOES NOT EXCEED : 0.015 DEG. WITH THE HORIZONTAL FORCES SPECIFIED.

DETAIL 'TRENCH'



NOT INCLUDED IN B.H.E.L. SCOPE OF SUPPLY.

Speeds in rpm

EQUIPMENT	RATED SPEED	CRITICAL SPEEDS	
		FIRST	SECOND
TURBINE	1016-5080	-	-
BFP	-	-	-
BP	-	-	-

NOTE :- The installation details shown here are only informative. For final installation, ref. the Assembly drawings furnished alongwith the respective equipment.

FORCES ON FOUNDATION IN kgf

LOAD POINT	LOAD CONDITION						
	STATIC LOAD WITHOUT ROTATING WEIGHT	ROTATING WEIGHT	OPERATING WEIGHT OF CONDENSER/VACUUM PULL	SHORT CIRCUIT LOAD *	LOAD DUE TO OPERATING TORQUE	OPERATING UNBALANCE **	FAILURE MODE LOAD **
	1	2	3	4	5	6	7
A	-	2920	-	-	-	1058	6348
A1	14375	-	1403	-	1025	-	-
A2	14375	-	1403	-	-1025	-	-
B	-	-	-	-	-	-	-
B1	15955	1555	13318	-	-339	564	3384
B2	15955	1555	13318	-	339	564	3384
C	1100	-	-	-	-	-	-
C1	-	110	-	-	2588	40	240
C2	-	440	-	-	-2588	44	264

FOUNDATION LOADING DATA


LOAD APPLICATION POINT	EQUIPMENT	STATIC LOAD ON EACH POINT (kg's)					
		WEIGHT		DYNAMIC LOAD ON EACH POINT (kg's)			
		DRY	WET	VERTICAL	VERTICAL	HORIZONTAL	AXIAL
5A	BOILER FEED PUMP (MDG 455)	25700	26000	26000	28650	28650	19100
3A	BOOSTER PUMP (MLC 450x350 H)	8500	9000	9000	8850	8850	5900

** At each supporting point acting in radial direction over 360 deg.
* Loads on either side of TG axis act in opposite directions and the direction changes at 50 cycles/sec.
NOTE :-1. DOWNWARD FORCES ARE POSITIVE
2. GRADE OF BALANCING: BFP, BP:G2.5
3. MASS MOMENT OF INERTIA:

$$\left[\begin{matrix} \text{BFP : } 215 \text{ N-Sq.m} \\ \text{BP : } 466 \text{ N-Sq.m} \end{matrix} \right] \text{GD}^2$$

DETAILS FOR FOUNDATION CALCULATIONS


NOTES :-

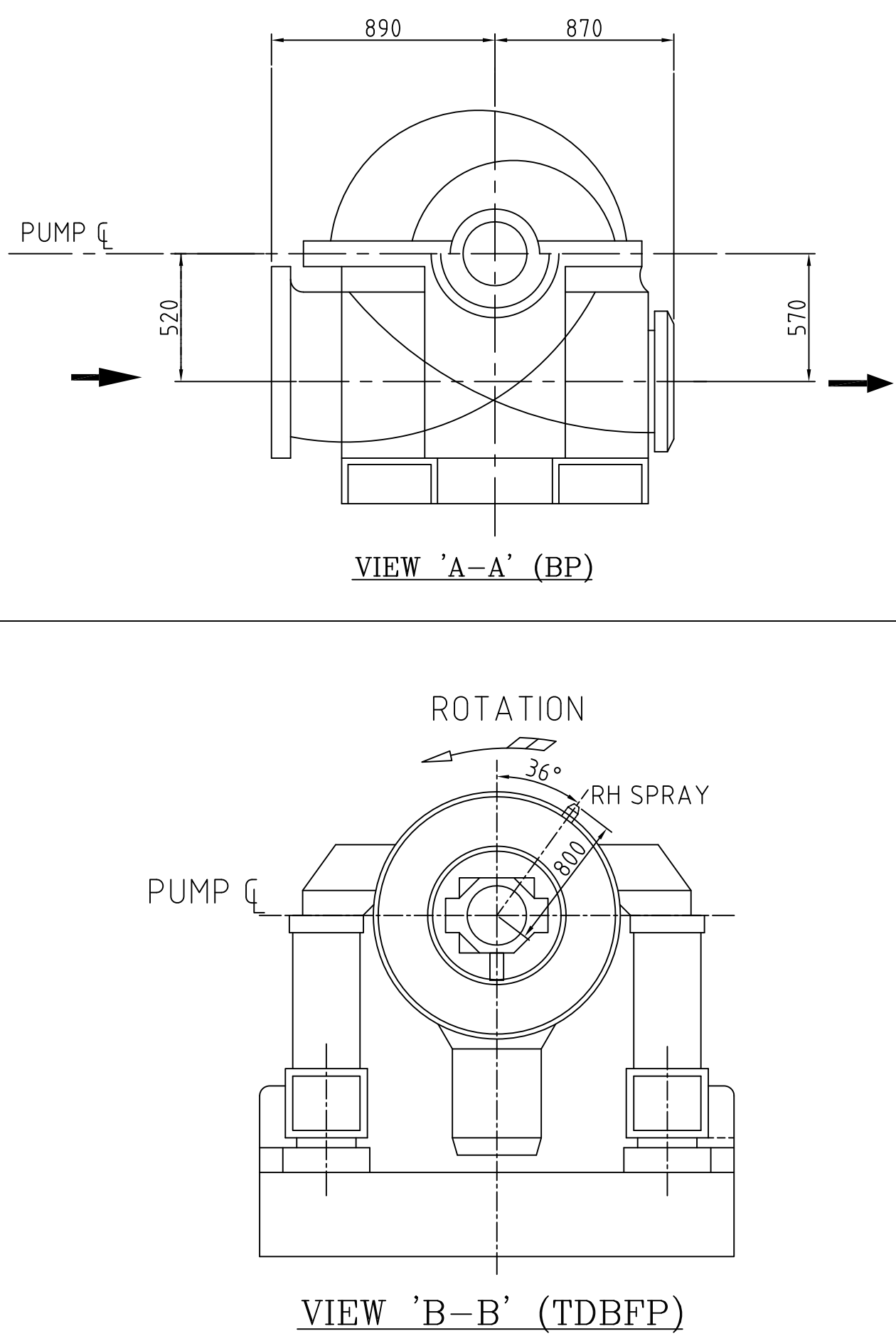
- All dimensions are in mm and elevations are in metres.
- This foundation drawing is only intended as basis for preparing the layout for foundation (by the BHEL). All civil structural dimensions are tentative and same shall be decided by the civil engineer concerned. The foundation design calculations shall consider all the static and dynamic loads acting simultaneously.
- Suitable earth quake coefficient applicable for the project site should be adopted for seismic design of foundation as per IS 1893.
- The foundation block should be designed so that natural frequencies of foundation are sufficiently away from the frequencies of machines. The design shall be as per DIN 4024 standard and IS 2974 part III.
- Design of the foundation shall consider the allowable limits of vibration behaviour of machines (Group - T) as per VDI 2056.
- Bearing failure loads are less than failure load condition loads specified in col. 7 of the "Forces on Foundation" table.
- Dynamic loads in axial direction are negligible.
- Magnitude of unbalanced forces can be taken in vertical and horizontal directions as equal.
- Max. live load on top of the deck is : 2000 kg/sq.m
- Foundation block must not be joined to any other structure to avoid vibration transmission.
- Portions shown thus  in top deck are filled with secondary grouting. The concrete surface in these areas is to be ensured free from dust, grease and oil. Any wooden plugs present in these areas are to be removed. The packing plates below the machine sole plates shall be embedded into a 20 mm thick layer of special grout (local to plates) and are to be levelled horizontally. later, total secondary grouting may be completed.
- For grouting instructions ref. TC-9-1901 (5 sheets). And for grouting cement specification ref. TC-9-1900.
- All embedded plates, angles, sleeves, pipes, ducts and any other structurals are not part of Turbine scope of supply unless otherwise specified.

STATUS : PRELIMINARY

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT 2x800MW BFP DRIVE TURBINE RAICHUR POWER CORPORATION, YERAMARUS

DEPT.	TCEP	UNTOOL DIMS. GR. E/M/AF	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO OF ITEMS
415			N.T.S	-N.A-			

DEPT.	TCEP	UNTL DIMS. GR. <i>EMMA</i>		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO OF ITEMS
CODE	415			N.T.S	-N.A.-	-N.A.-	-N.A.-	-N.A.-
TITLE					CARD CODE	DRAWING NO.		REV
FOUNDATION ARRANGEMENT						1-313-00-98135		00
FOR BFP & DRIVE TURBINE					N.A.	SHT. No 03		NO. OF SHT. 03



TERMINAL POINT	DESCRIPTION	SIZE INCHES	TERMINATED WITH	QTY
TP-F1	SUCTION OF FEED PUMP	14	350 A BW	1
TP-F2	DISCHARGE OF FEED PUMP	16	400A BW	1
TP-F3	R.H.SPRAY	3	80A BW	1
TP-F4	SUCTION OF BOOSTER PUMP	16	ASME 600Lb-400A	1
TP-F5	DISCHARGE OF BOOSTER PUMP	12	ASME 600Lb-300A	1

STATIC & DYNAMIC LOADS FOR BP & BFP

		BOOSTER PUMP	BFP
STATIC LOAD (kg)	VERTICAL	9000	26000
DYNAMIC LOAD (kg)	VERTICAL	8850	28650
	HORIZONTAL	8850	28650
	AXIAL	5900	19100





WEIGHTS OF PUMPS

ITEM	BOILER FEED PUMP		BOOSTER PUMP	
	DRY (kg)	WET (kg)	DRY (kg)	WET (kg)
PUMP	18800	19100	5400	5900
BASE	6900	6900	3100	3100
TOTAL	25700	26000	8500	9000

CUSTOMER:
RAICHUR POWER CORPORATION LIMITED
(A JVC OF KPCL & BHEL)

CONSULTANT:
EVONIK ENERGY SERVICES (INDIA) PVT LTD
NOIDA

PROJECT: 2 X 800 MW YERAMARUS STPS

		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD		DRN PRC CHD APPD	NAME AVINASH B.A.KUMAR	SIGN.  	DATE 21/12/20 21/12/20 21/12/20	NO OF VOUCHERS NA NA
DEPT. PUMPS CQD 410		SCALE NTS	WEIGHT (KG) NA	REF. TO ASS'Y. DRG. NO.		ITEM NO NA	NO OF DRAWING NA REV.	
TITLE GENERAL ARRANGEMENT OF TDBFP SET				DRAWING NO. HY-DG-1-18000-57402				00
				SHEET NO. 01	NO OF SHEETS 01		00	

1.	JOB NO :	326
2.	STATUS:	CONTRACT
3.	DRG./REF. NO.(INTERNAL)	1 180 005 7402
4.	DISTRIBUTION	
5.	TO	
6.	No. OF	

NOTE :

1. FOR LOADING POINTS & LOADING DETAILS, REFER TDBFP SET FOUND. DRG.
2. TERMINAL POINTS SHOWN IN THE HYD. SCOPE INCLUDES COUNTER FLANGES ALONG WITH FASTENERS & GASKETS.
3. GEAR BOX DIMENSIONS SHOWN WITHIN [] ARE PRELIMINARY.

SCOPE OF SUPPLY	↑	HY	BHEL, HYD SCOPE
	↓	PE	BHEL, PEM SCOPE

NOTE:

1. SPACE TO BE CLEAR OF ANY OBSTRUCTION (NO PIPING SHALL BE ROUTED IN THIS AREA) WHICH WILL RESTRICT ACCESS TO CRANE HOOK.

BHARAT HEAVY ELECTRICALS LIMITED.
IN THE INTEREST OF THE COMPANY

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY

COMP. FILE NAME
EP11800057402-00

INVENTORY NO	SIGN. AND DATE
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THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

COMPUTER FILE NAME
FP18000057508-00

REF. DRG. NO.

SIGN. AND DATE

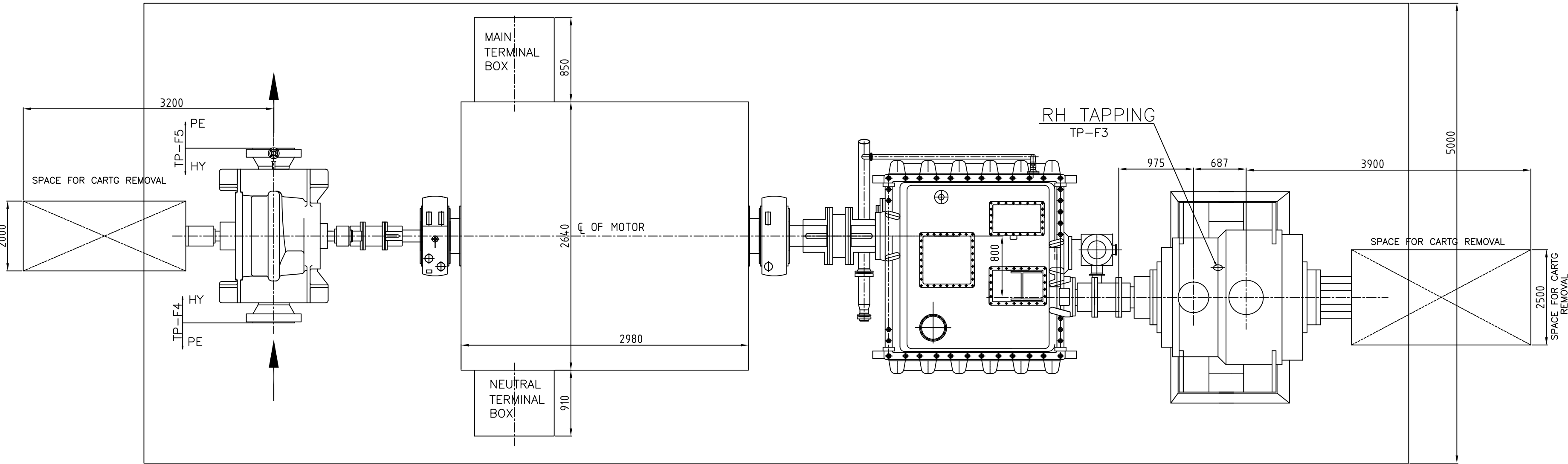
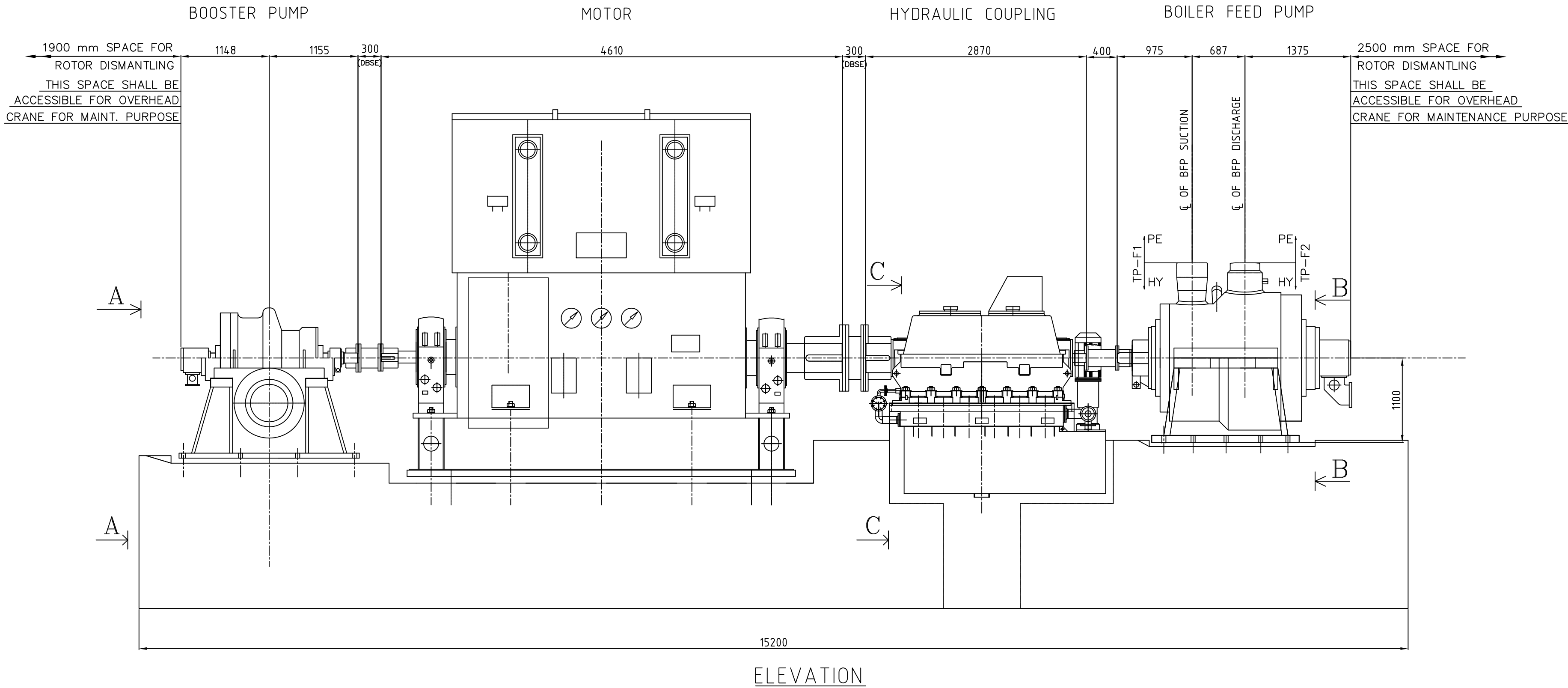
INVENTORY NO

HY-DG-1-18000-57508

DRG. NO.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)



TERMINAL POINTS

TERMINAL POINT	DESCRIPTION	SIZE (INCH)	TERMINATED WITH	QTY.
TP-F1	SUCTION OF FEED PUMP	16	400A (B.W.)	1
TP-F2	DISCHARGE OF FEED PUMP	18	450A (B.W.)	1
TP-F3	R.H.SPRAY	3	ASME 1500 Lb-80A R.J.	1
TP-F4	SUCTION OF BOOSTER PUMP	18	ASME 600Lb-450A	1
TP-F5	DISCHARGE OF BOOSTER PUMP	14	ASME 600Lb-350A	1

FOUNDATION LOADING (APPROX)

LOAD APPLICATION POINT	EQUIPMENT	STATIC LOAD (Kgs.)	DYNAMIC LOAD (Kgs)			EQPT. WEIGHT (Kgs)	
			VERTICAL	HORIZONTAL	AXIAL	DRY	WET
1	BOILER FEED PUMP	26000	28650	28650	19100	25700	26000
2	BOOSTER PUMP	9000	8850	8850	5900	8500	9000
3	HYDRAULIC COUPLING	23000	LATER		20000	23000	

MOTOR FOUNDATION LOADING DETAILS

Reaction Due to Wt on Each Side (G) = 209 KN
MAX Short circuit force (MS) = 572 KN
Reaction Downward MS+G = 781 KN
Reaction upward MS-G = 363 KN

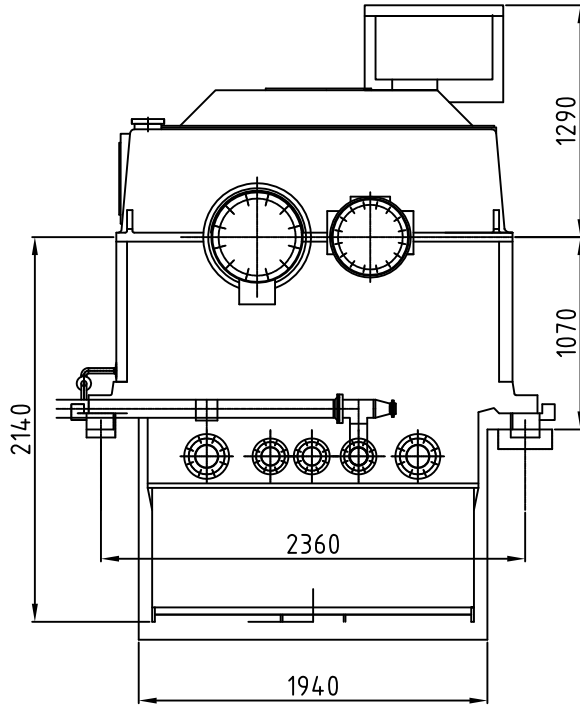
NOTE:

1-THE FORCES OCCUR ALTERNATELY INDEPENDENT OF THE DIRECTION OF ROTATION. (REFER LOADING ON FOUNDATION TABLE).
2-THE TRANSFER OF VIBRATIONS FROM SURROUNDING EQUIPMENT HAS TO BE AVOIDED BY SUITABLE LAYOUT OF FOUNDATION.
3-THE FIRST NATURAL FREQUENCY 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

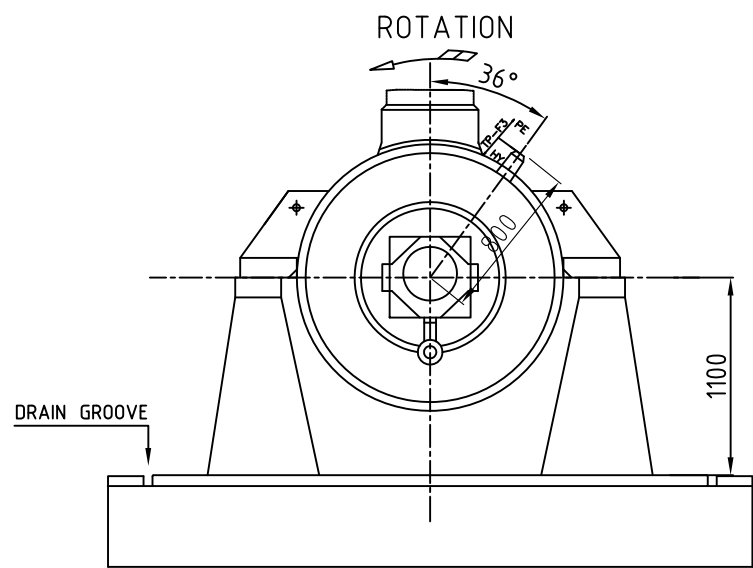
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		CHECKED			CHECKED			CHECKED			CHECKED			CHECKED			CHECKED
		APPD.			APPD.			APPD.			APPD.			APPD.			APPD.

ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE	ZONE
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

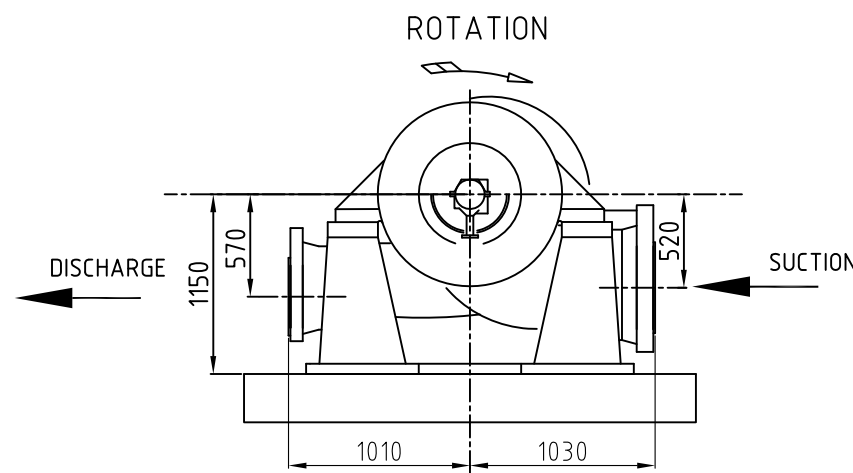
1. JOB NO : 262
2. STATUS : CONTRACT
3. DRG./REF. NO. (INTERNAL) 1 180 005 7508
4. DISTRIBUTION
5. TO
6. No. Of



VIEW-'CC' (HYD. COUPLING)



VIEW-'BB' (BFP)



VIEW-'AA' (BP)

SCOPE OF SUPPLY

↑ HY BHEL HYDERABAD SCOPE
↓ PE BHEL PEM SCOPE

NOTE :

- TERMINAL POINTS SHOWN IN THE HYD./MHI SCOPE INCLUDES COUNTER FLANGES ALONG WITH FASTENERS & GASKETS.
- FOR LOADING POINTS & LOADS, REFER MDBFP FOUND. DRG.NO.: LATER

CUSTOMER:

RAICHUR POWER CORPORATION LIMITED
(A JVC OF KPCL & BHEL)

CONSULTANT:

EVONIK ENERGY SERVICES (INDIA) PVT LTD
NOIDA

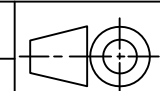
PROJECT:

2 X 800 MW YERAMARUS STPS



भारत हेवी इलेक्ट्रिकल्स लिमिटेड
HYDERABAD
BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

DEPT. PUMPS ENGG
CODE 410



SCALE
NTS

WEIGHT (KG)
NA

REF. TO ASSY DRG.
NA

ITEM NO.
NA

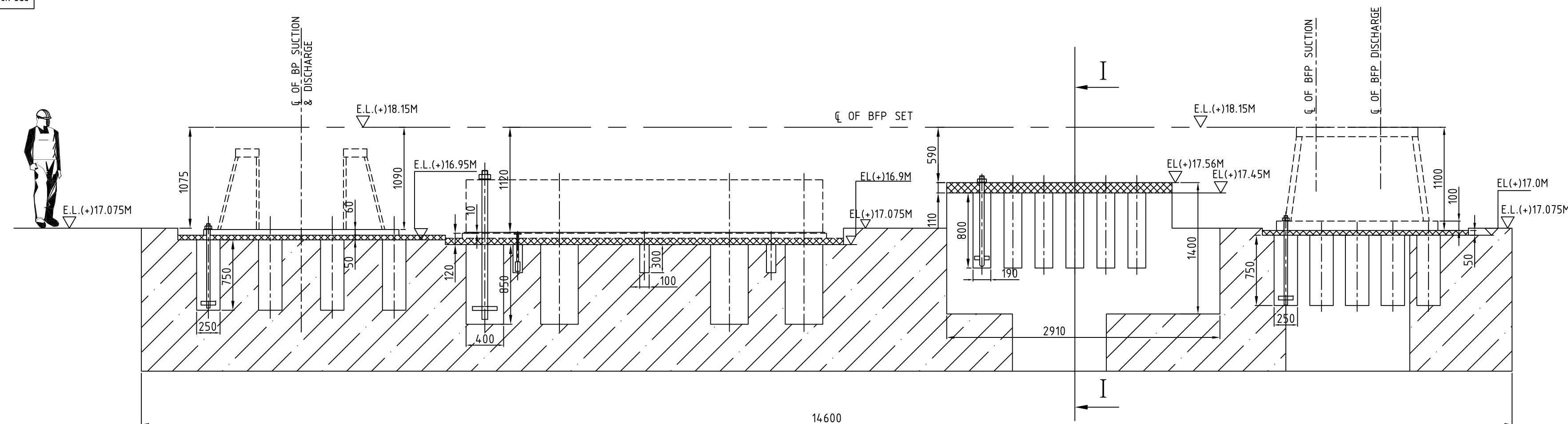
NO OF ITEMS
NA

TITLE
GENERAL ARRANGEMENT OF
MDBFP SET

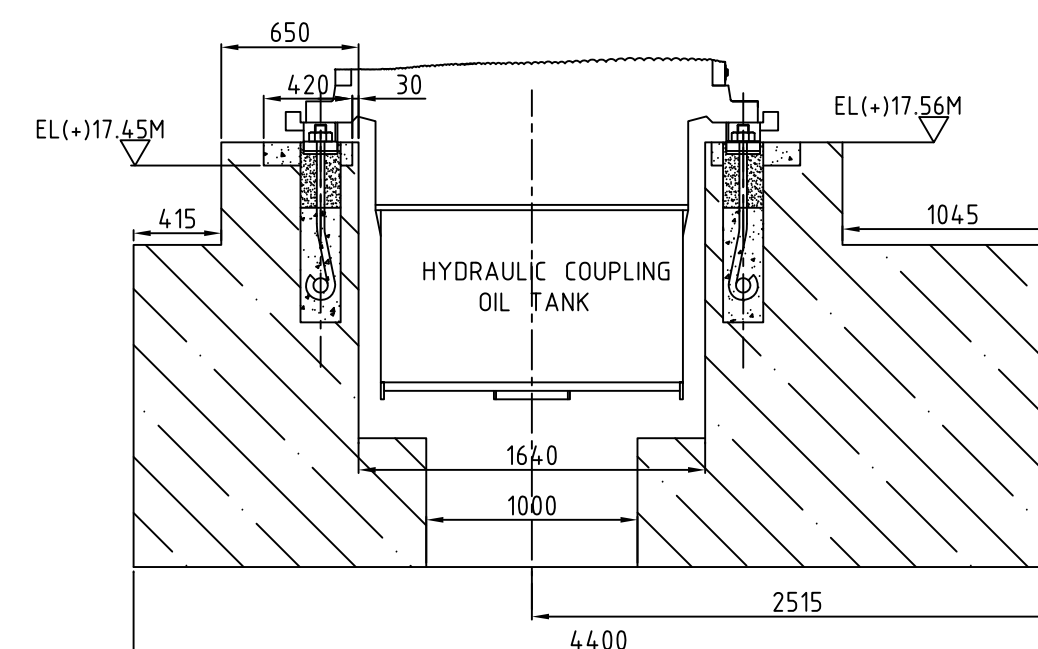
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HY-DG-1-18000-57508

REV.
00

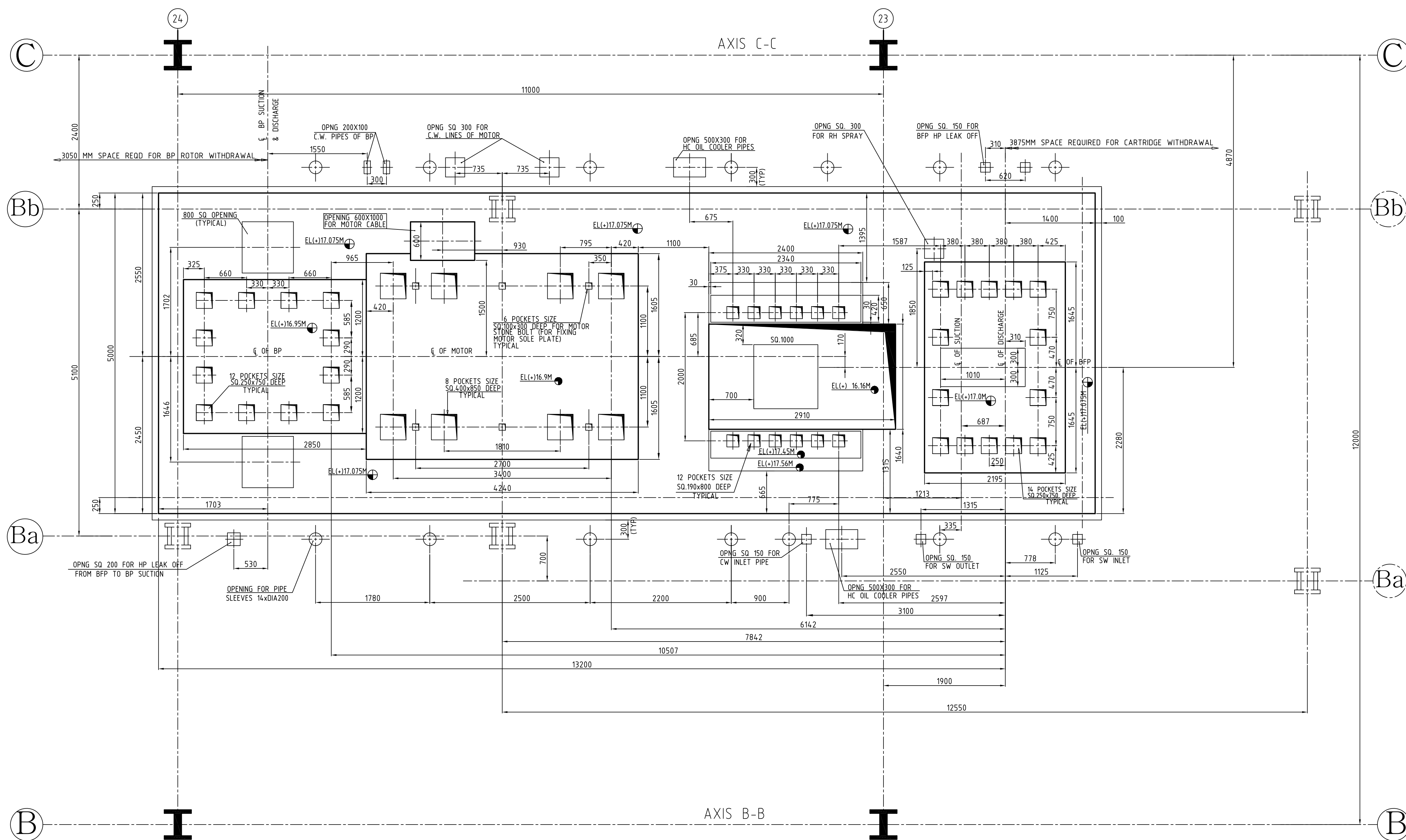
SHEET NO. NO OF SHEETS



ELEVATION



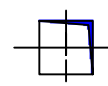
SECTION I-I



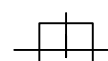
PLAN (BEFORE GROUTING)

TECHNICAL DATA OF BOILER FEED PUMP & BOOSTER PUMP		
PUMP TYPE	BOILER FEED PUMP	BOOSTER PUMP
MODEL	MDG 455 (MHI)	MLC 450X350 H (MHI)
TYPE	MULTI STAGE,AXIALLY SPLIT INNER CASING & BARREL TYPE OUTER CASING	SINGLE STAGE RADIALLY SPLIT TYPE
DIRECTION OF ROTATION (VIEWED FROM PUMP DRIVE END)	CLOCKWISE	COUNTER CLOCKWISE
DESIGN CAPACITY/PUMP (M ³ /Hr)	1580	1580
DESIGN HEAD (MLC)	3087	243
TEMPERATURE (DEG C)	189.2	189.2
NPSH REQUIRED (MLC)	54	8.2
GRADE OF BALANCING	G 2.5	
MOTOR RATING OF BFP SET (kW)	20,500	

LEGEND



BLIND POCKET



OPENING



ELEVATION



THROUGH OPENINGS

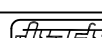


NOTE:

- 1) FOR GENERAL ARRANGEMENT OF MD BFP SET,
REFER DRG NO. HY-DG-1-18000-57508.
- 2) ALL ELEVATIONS ARE W.R.T TO TG HALL
FINISHED FLOOR LEVEL WHICH IS EL0.0M
- 3) ALL GROUTINGS ARE IN THE SCOPE OF BHEL-PSSR.
- 4) TOLERANCES FOR POCKET LOCATIONS ± 5 MM.
- 5) TOLERANCES FOR CONCRETE DIMENSIONS ± 10 MM.
- 6) TOLERANCES FOR TOP OF FOUNDATION BEFORE
GROUTING $+0$ & -10 MM

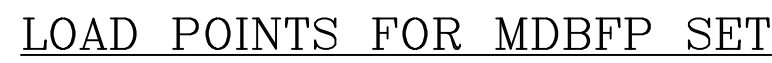
CUSTOMER:
RAICHUR POWER CORPORATION LIMITED
(A JVC OF KPCL & BHEL)

CONSULTANT:	EVONIK ENERGY SERVICES (INDIA) PVT LTD NOIDA
-------------	---

PROJECT:	2 X 800 MW YERAMARUS STPS
----------	---------------------------

		भारत हेवी इलेक्ट्रिकल्स लिमिटेड भारती हेवी इलेक्ट्रिकल्स लिमिटेड BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		NAME CHARY		SIGN 		DATE 10.10.11		NO OF VAR	
DEPT. PUMPS ENGG				SCALE NTS		WEIGHT (KG) NA		REF. TO ASSY. DRG. NA		ITEM NO.	
QTY. 4 TO		TITLE GENERAL ARRANGEMENT OF MDFF SET		DRAWING NO. HY-DG-1-18000-57500		REV 00		NO OF ITEMS		NO OF SHEETS	
				SHEET NO. 01		NO OF SHEETS 02					

1. JOB NO : 262									
2. STATUS : CONTRACT									
3. DRG./REF. NO.(INTERNAL)									
1 180 005 7509									
4. DISTRIBUTION									
5. TO									
6. No. OF									



* INCLUDES ROTOR WEIGHTS.

NOTE:

SPEEDS AT OPERATING POINTS (RPM)

GD² VALUES (KG-M²)

BLIND POCKET

1. JOB NO : 262

CUSTOMER:
RAICHUR POWER CORPORATION LIMITED
(A JVC OF KPCL & BHEL)

CONSULTANT:
EVONIK ENERGY SERVICES (INDIA) PVT LTD
NOIDA

PROJECT: 2 X 800 MW YERAMARUS STPS

		भारत भारतीय विद्युत लिमिटेड भारत भारतीय विद्युत लिमिटेड भारत भारतीय विद्युत लिमिटेड		NAME CHARY		SIGN 		DATE 10.10.11		NO OF PAGES	
DEPT PUMPS ENGG				SCALE NTS		WEIGHT KGS		REF. TO ASSY OR NA		ITEM NO	
CD 4.10				SCALE NTS		WEIGHT KGS		REF. TO ASSY OR NA		ITEM NO	
TITLE GENERAL ARRANGEMENT OF MDBFP SET				SCALE NTS		WEIGHT KGS		REF. TO ASSY OR NA		ITEM NO	
DRAWING NO. HY-DG-1-18000-57509				SCALE NTS		WEIGHT KGS		REF. TO ASSY OR NA		ITEM NO	
SHEET NO. 02				SCALE NTS		WEIGHT KGS		REF. TO ASSY OR NA		ITEM NO	
NO OF SHEETS 02				SCALE NTS		WEIGHT KGS		REF. TO ASSY OR NA		ITEM NO	

[illegible]

**RAICHUR POWER CORPORATION LIMITED
(A JVC OF KPCL & BHEL)**

2X800 MW YERAMARUS THERMAL POWER STATION

VOLUME-II B

**TECHNICAL SPECIFICATIONS
FOR
VIBRATION ISOLATION SYSTEM
FOR
TD BFP (2 NOS FOR EACH UNIT)
MD BFP (1 NOS FOR EACH UNIT)**

SPECIFICATION NO. PE-TS-362-614-C001



**BHARAT HEAVY ELECTRICALS LIMITED
Project Engineering Management
PPEI BUILDING, HRD & ESI COMPLEX
Plot No. 25, Sector 16A
NOIDA, U.P. – 201301
CONTENTS**

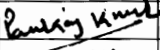


PROJECT ENGINEERING MANAGEMENT
(CIVIL ENGINEERING DEPARTMENT)

PROJECT TITLE: 2X 800 MW YERAMARUS THERMAL POWER STATION

JOB NO. 362 **DOCUMENT NO.** PE-TS-362-614-C001

BUILDING/SYSTEM: VIBRATION ISOLATION SYSTEM

SUBJECT: TECHNICAL SPECIFICATION FOR VIBRATION ISOLATION SYSTEM FOR TD/MD BFP FOUNDATION

REV. NO.	PARTICULARS	PREPD. BY	CHECKED BY	APPROVED BY	REMARKS
00.	NAME	PANKAJ	SKM	HM	
	SIGN				
	DATE	29/11/11	29-11-11	29.11.11	

1. SECTION-A SCOPE OF WORK
2. SECTION-B PROJECT INFORMATION
3. SECTION-C SPECIFIC TECHNICAL REQUIREMENTS
4. SECTION-D STANDARD TECHNICAL SPECIFICATON FOR VIS



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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SECTION A

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SECTION 'A'

SCOPE OF WORK

	PROJECT: 2 X 800 MW YERAMARUS TPS	SPECIFICATION NO. PE-TS-362-614-C001
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	<u>FOR TD BFP (4 NOS.) MD BFP(2 NOS.)</u>	SECTION A
	<u>FOUNDATION</u>	REV.NO. 0 DATE 23-11-2011
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SCOPE

1. Supply of Vibration Isolation System (VIS)

- i) Vibration Isolation System (VIS)
- ii) Tools and facilities required for erection and commissioning including seaworthy packing & transportation etc. complete.

2. Supervision of erection and commissioning of the VIS.

Vendor shall deploy experienced manpower for setting the VIS in position and final adjustments after machine installation. Vendor shall also confirm the readiness at site before deploying the manpower for supervision of erection. Vendor shall furnish proposed erection strategy of the entire system and procedure for replacement of VIS and downtime involved.

3. Design & Engineering for the Vibration Isolation System

Design and engineering shall consist of the following:

- i) Selection of Vibration Isolation System (VIS).
- ii) Static and dynamic analysis and design of RCC deck slab (supporting arrangement for the equipment supported on VIS)
- iii) Calculation of loads on supporting structure along with their points of application and deflection limitations.
- iv) Calculation should establish that no dynamic loads are transferred to the structure supporting VIS and that the foundation system meets the amplitude/frequency requirements.
- v) Checking of stiffness for structure supporting VIS.

4. Documentation

Vendor shall furnish following documents:

- i) Bill of materials of various elements included in the supply along with detailed specifications of system and various items included in supply and standards local or international standards to which they conform.
- ii) General Arrangement (GA) drawing showing location and supporting details of VIS.
- iii) GA and reinforced concrete details drawings for deck slab including bar bending schedule.
- iv) Embedment drawings showing location of all embedment and their details pertaining to RCC deck slab.
- v) Design document
- vi) Methodology of providing the shuttering and its removal as well as concreting of deck slab, installation of VIS and sequence of above operation.
- vii) Installation and maintenance manual indicating equipment, procedures, etc. necessary for installation/maintenance VIS.



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
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- viii) List of power plants where such systems have been successfully installed for such applications.
- ix) Performance certificate from the end user/customer for at least two successfully executed contracts for such system.



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION**

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SECTION 'B'

PROJECT INFORMATION



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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PROJECT INFORMATION

OWNER	Raichur Power Corporation Limited (A JVC OF KPCL & BHEL)
CONSULTANT	M/s Evonik Energy Services (I) Pvt. Ltd. A-29, Sector 16 Noida-201301(UP), India
NAME OF PROJECT	2X800 MW Yeramarus Thermal Power Station
SITE LOCATION	Yeramarus, Raichur Dist. Karnataka State, India It is situated at about 8 Kms from Raichur on the Raichur- Hyderabad State Highway-13 and 12 kms away from Bank of river Krishna and about 5 kms from Raichur Thermal Power Station.
NEAREST RAILWAY STATION	Nearest Railway Station is Chicksugur Railway Station which is about 2 kms from site.
NEAREST AIRPORT	Hyderabad around 200 kms
NEAREST PORT	Chennai around at about 470 kms from site.
Climatic Conditions	
a. Ambient Temperature	
i) Maximum (Average)	43.3 ^o C
ii) Minimum (Average)	13.9 ^o C



PROJECT: 2 x 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP (2 NOS.)
FOUNDATION**

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SECTION 'C'

SPECIFIC TECHNICAL REQUIREMENTS



PROJECT: 2 x 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP (2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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1. General Requirement

- 1.01. Vendor shall supply vibration isolation system for TDBFP (4 nos.) and MDBFP (2nos.) foundation. The vibration isolation system shall consist of helical spring units and viscous dampers supporting the RCC deck which support the machine. The spring units shall conform to DIN 2089 and DIN 2096.
- 1.02. The input drawings of TDBFP and MDBFP are listed in Table-1. Vendor shall note that there may be minor changes in the location and loading of gear box for TDBFP.

Table-1

<u>Sl. No</u>	<u>TITLE</u>	<u>DRAWING NO.</u>
1	GENERAL ARRANGEMENT OF TDBFP SET	HY-DG-1-18000-57402 (R0)
2	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	1-313-00-98135 (R0), SH 1/3
3	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	1-313-00-98135 (R0), SH 2/3
4	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	1-313-00-98135 (R0), SH 3/3
5	GENERAL ARRANGEMENT OF MDBFP SET	HY-DG-1-18000-57508 (R0)
6	GENERAL ARRANGEMENT OF MDBFP SET	HY-DG-1-18000-57509 (R0), SH 1/2
7	GENERAL ARRANGEMENT OF MDBFP SET	HY-DG-1-18000-57509 (R0), SH 2/2

- 1.03. The helical spring units and viscous dampers supplied by vendor should be of proven make.

2. Seismic Loading:

Seismic forces shall be as per zone III of IS: 1893 Part IV. Importance factor shall be taken as 1.75. Ductile detailing in accordance with IS 13920 to be adopted for all concrete structures, which is mandatory for Zone –III.

3. Wind Loading :

Wind load on structures shall be calculated as per provisions of IS: 875 (Part 3), latest revisions taking into account the following:

- Basic wind speed of 39 m/sec as given in Fig.1 of the code.
- Factor K1 shall be taken as 1.06.
- Terrain category shall be 2 and corresponding values shall be taken for K2.
- Factor K3 shall be taken as 1.0.

The wind shall be assumed to blow in any direction and most unfavourable condition shall be considered for design.

In design of structures, wind force on equipment supported on frame including all fixtures, piping, stair case, ladder etc. shall also be considered.



PROJECT: 2 x 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP (2 NOS.)
FOUNDATION**

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4. Material of construction

- i. Grade of Concrete M35.
- ii. Reinforcement bars shall be as per the following codes:

TMT of Grade Fe 500	: IS 1786
Mild steel bars	: Grade I of IS: 432
Welded wire fabric	: IS: 1566

5. Documents to be submitted by vendor

- i. Soft copy of all documents/drawings shall be furnished in pdf and AutoCAD format as applicable.
- ii. Hard copies shall also be submitted.
- iii. Submission of civil drawings/documents shall be as mentioned in the table-2.

Table-2

	Drawing	Document
For Approval	Soft copy + 8 nos. hard copies	Soft copy + 4 nos. hard copies
For RFC	Soft copy + 13 nos. hard copies	



TITLE:

**STANDARD TECHNICAL
SPECIFICATION FOR VIBRATION
ISOLATION SYSTEM**

SPECIFICATION NO. PE-TS-999-600-C026

VOLUME - II B

SECTION - D

REV. NO. 0 DATE 05/07/2010

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VOLUME: II B

SECTION - D

SUB-SECTION - D26

VIBRATION ISOLATION SYSTEM

SPECIFICATION NO. PE-TS-999-600-C026



Bharat Heavy Electricals Limited
Project Engineering Management



TITLE:

**STANDARD TECHNICAL
SPECIFICATION FOR VIBRATION
ISOLATION SYSYTEM**

SPECIFICATION NO. PE-TS-999-600-C026

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C O N T E N T

CLAUSE NO.	DESCRIPTION	SHEET NO.
1.00.00	SCOPE	3
2.00.00	Supply of VIS	3
3.00.00	Supervision of Erection and Commissioning	3
4.00.00	Design Engineering of Vibration Isolation System	3
5.00.00	Quality Plan and Test Certificate	5
6.00.00	Environmental Protection	5



TITLE:

**STANDARD TECHNICAL
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VIBRATION ISOLATION SYSTEM**1.00.00 SCOPE**

This section covers supply, supervision of erection/ commissioning & design engineering of the vibration isolation system (VIS) suitable for ID/PA/FD Fans/ TDBFP/MDBFP/TURBOGENERATORS/MILLS .The vibration isolation system shall be of proven make and should be in successful operation for similar machines.

2.00.00 Supply of VIS

VIS shall be supplied complete along with recommended spares if any. The selection of VIS shall be done by the vendor, in case not done by customer , so that the amplitude at bearing locations are within permissible limits as per machine supplier recommendation or ISO10816 whichever is governing and no dynamic loads are transferred to the structure supporting VIS. Minimum 90 % isolation shall be achieved and the system shall be capable of withstanding Seismic/Wind forces.

3.00.00 Supervision of Erection and Commissioning**3.01.00 Manual**


Vendor shall supply installation and maintenance manual indicating equipment, procedures etc. necessary for installation and replacement of VIS with downtime involved.

3.02.00 Tools and facilities

Vendor shall supply all tools and facilities as required for successful erection and commissioning of VIS. Vendor shall deploy experienced manpower to supervise successful installation of VIS

4.00.00 Design Engineering of Vibration Isolation System**4.01.00 Dynamic Analysis**

The dynamic analysis shall consist of free vibration analysis and forced vibration analysis. Isolation efficiency of at least 90 % shall be obtained. The fundamental natural frequency shall be sufficiently above or below the

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	STANDARD TECHNICAL SPECIFICATION FOR VIBRATION ISOLATION SYSYTEM	VOLUME - II B	
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frequency corresponding to operating speed .Vibration amplitude shall be calculated at all bearing locations and shall satisfy the permissible limits as per ISO 10816 or as specified by the machine supplier. Transient analysis shall be carried out for the short circuit /blade failure condition with an appropriate force function if required by the machine supplier. The forces for which substructure is to be designed shall be furnished.

4.02.00 Static Analysis

The static analysis shall include the

- a) Dead weights of machine stationary parts,
- b) Dead weights of machine rotary parts
- c) Loads due to machine power torque
- d) Loads due to maximum allowable unbalance
- e) Temperature loads
- f) Loads due to blade unbalance/short circuit
- g) Erections loads
- h) Seismic Loads
- i) Any other loads given by the supplier

Various load combinations must be investigated to obtain the most severe loads for foundation design purpose as per relevant IS codes or as per machine supplier recommendation whichever is more critical.

4.03.00 Check for Shaft Misalignment

Foundation deck must be adequately stiff to withstand all operating load combinations without excessively upsetting the rotor shaft alignment .The structural design must carefully be analysed for relative deflection for the members supporting machine shaft to satisfy the limits as given by machine supplier if any.

4.04.00 Design of RCC deck supported on VIS

Vendor shall provide General arrangement drawing of deck showing location and supporting detail of VIS, all embedment and their details as per the machine supplier drawing.

RCC design shall be done by working stress method for all machine foundations. Minimum reinforcement shall be governed by IS : 2974 as well IS : 456.

All documents/drawings shall be supplied in 25 (twenty five) prints. All calculations shall be supplied in 6 (six) sets. Soft copy of the drawings in Auto Cad shall be supplied along with the soft copy of the documents supplied



TITLE:

**STANDARD TECHNICAL
SPECIFICATION FOR VIBRATION
ISOLATION SYSYTEM**

SPECIFICATION NO. PE-TS-999-600-C026

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All documentation shall be in English language and all RCC/structural design shall be conforming to the relevant Indian Standard Code of practice.

5.00.00 Quality Plan and Test Certificate

Vendor shall furnish the quality plan and Test certificate for the hardware in their scope of supply. The quality plan shall be reviewed by BHEL /Consultant wherein the inspection and hold points shall be indicated. Vendor shall submit test certificate based on approved Quality Plan. Despatch of material by the vendor shall only take place after the receipt of Material Dispatch Clearance Certificate (MDCC) issued by BHEL/Consultant on the basis of test reports/test certificates submitted by the Vendor after manufacture.

6.00.00 Environmental Protection

VIS shall be suitably protected against environmental damages e.g. abrasion, discolouration, corrosion, oily water etc. to give a prolonged service matching the plant life.

**RAICHUR POWER CORPORATION LIMITED
(A JVC OF KPCL & BHEL)**

2X800 MW YERAMARUS THERMAL POWER STATION

VOLUME-II B

**TECHNICAL SPECIFICATIONS
FOR
VIBRATION ISOLATION SYSTEM
FOR
TD BFP (2 NOS FOR EACH UNIT)
MD BFP (1 NOS FOR EACH UNIT)**

SPECIFICATION NO. PE-TS-362-614-C001



**BHARAT HEAVY ELECTRICALS LIMITED
Project Engineering Management
PPEI BUILDING, HRD & ESI COMPLEX
Plot No. 25, Sector 16A
NOIDA, U.P. – 201301
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1. SECTION-A SCOPE OF WORK
2. SECTION-B PROJECT INFORMATION
3. SECTION-C SPECIFIC TECHNICAL REQUIREMENTS
4. SECTION-D STANDARD TECHNICAL SPECIFICATON FOR VIS



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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SECTION 'A'

SCOPE OF WORK



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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SCOPE

1. Supply of Vibration Isolation System (VIS)

- i) Vibration Isolation System (VIS)
- ii) Tools and facilities required for erection and commissioning including seaworthy packing & transportation etc. complete.

2. Supervision of erection and commissioning of the VIS.

Vendor shall deploy experienced manpower for setting the VIS in position and final adjustments after machine installation. Vendor shall also confirm the readiness at site before deploying the manpower for supervision of erection. Vendor shall furnish proposed erection strategy of the entire system and procedure for replacement of VIS and downtime involved.

3. Design & Engineering for the Vibration Isolation System

Design and engineering shall consist of the following:

- i) Selection of Vibration Isolation System (VIS).
- ii) Static and dynamic analysis and design of RCC deck slab (supporting arrangement for the equipment supported on VIS)
- iii) Calculation of loads on supporting structure along with their points of application and deflection limitations.
- iv) Calculation should establish that no dynamic loads are transferred to the structure supporting VIS and that the foundation system meets the amplitude/frequency requirements.
- v) Checking of stiffness for structure supporting VIS.

4. Documentation

Vendor shall furnish following documents:

- i) Bill of materials of various elements included in the supply along with detailed specifications of system and various items included in supply and standards local or international standards to which they conform.
- ii) General Arrangement (GA) drawing showing location and supporting details of VIS.
- iii) GA and reinforced concrete details drawings for deck slab including bar bending schedule.
- iv) Embedment drawings showing location of all embedment and their details pertaining to RCC deck slab.
- v) Design document
- vi) Methodology of providing the shuttering and its removal as well as concreting of deck slab, installation of VIS and sequence of above operation.
- vii) Installation and maintenance manual indicating equipment, procedures, etc. necessary for installation/maintenance VIS.



PROJECT: 2 X 800 MW YERAMARUS TPS

TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION

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- viii) List of power plants where such systems have been successfully installed for such applications.
- ix) Performance certificate from the end user/customer for at least two successfully executed contracts for such system.



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
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SECTION 'B'

PROJECT INFORMATION



PROJECT: 2 X 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP(2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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PROJECT INFORMATION

OWNER	Raichur Power Corporation Limited (A JVC OF KPCL & BHEL)
CONSULTANT	M/s Evonik Energy Services (I) Pvt. Ltd. A-29, Sector 16 Noida-201301(UP), India
NAME OF PROJECT	2X800 MW Yeramarus Thermal Power Station
SITE LOCATION	Yeramarus, Raichur Dist. Karnataka State, India It is situated at about 8 Kms from Raichur on the Raichur- Hyderabad State Highway-13 and 12 kms away from Bank of river Krishna and about 5 kms from Raichur Thermal Power Station.
NEAREST RAILWAY STATION	Nearest Railway Station is Chicksugur Railway Station which is about 2 kms from site.
NEAREST AIRPORT	Hyderabad around 200 kms
NEAREST PORT	Chennai around at about 470 kms from site.
Climatic Conditions	
a. Ambient Temperature	
i) Maximum (Average)	43.3 ⁰ C
ii) Minimum (Average)	13.9 ⁰ C



PROJECT: 2 x 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP (2 NOS.)
FOUNDATION**

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SECTION 'C'

SPECIFIC TECHNICAL REQUIREMENTS

	PROJECT: 2 x 800 MW YERAMARUS TPS TECHNICAL SPECIFICATIONS FOR VIS FOR TD BFP (4 NOS.) MD BFP (2 NOS.) FOUNDATION	SPECIFICATION NO. PE-TS-362-614-C001	
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1. General Requirement

- 1.01. Vendor shall supply vibration isolation system for TDBFP (4 nos.) and MDBFP (2nos.) foundation. The vibration isolation system shall consist of helical spring units and viscous dampers supporting the RCC deck which support the machine. The spring units shall conform to DIN 2089 and DIN 2096.
- 1.02. The input drawings of TDBFP and MDBFP are listed in Table-1. Vendor shall note that there may be minor changes in the location and loading of gear box for TDBFP.

Table-1

<u>Sl. No</u>	<u>TITLE</u>	<u>DRAWING NO.</u>
1	GENERAL ARRANGEMENT OF TDBFP SET	HY-DG-1-18000-57402 (R0)
2	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	1-313-00-98135 (R0), SH 1/3
3	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	1-313-00-98135 (R0), SH 2/3
4	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	1-313-00-98135 (R0), SH 3/3
5	GENERAL ARRANGEMENT OF MDBFP SET	HY-DG-1-18000-57508 (R0)
6	GENERAL ARRANGEMENT OF MDBFP SET	HY-DG-1-18000-57509 (R0), SH 1/2
7	GENERAL ARRANGEMENT OF MDBFP SET	HY-DG-1-18000-57509 (R0), SH 2/2

- 1.03. The helical spring units and viscous dampers supplied by vendor should be of proven make.

2. Seismic Loading:

Seismic forces shall be as per zone III of IS: 1893 Part IV. Importance factor shall be taken as 1.75. Ductile detailing in accordance with IS 13920 to be adopted for all concrete structures, which is mandatory for Zone –III.

3. Wind Loading :

Wind load on structures shall be calculated as per provisions of IS: 875 (Part 3), latest revisions taking into account the following:

- Basic wind speed of 39 m/sec as given in Fig.1 of the code.
- Factor K1 shall be taken as 1.06.
- Terrain category shall be 2 and corresponding values shall be taken for K2.
- Factor K3 shall be taken as 1.0.

The wind shall be assumed to blow in any direction and most unfavourable condition shall be considered for design.

In design of structures, wind force on equipment supported on frame including all fixtures, piping, stair case, ladder etc. shall also be considered.



PROJECT: 2 x 800 MW YERAMARUS TPS

**TECHNICAL SPECIFICATIONS FOR VIS
FOR TD BFP (4 NOS.) MD BFP (2 NOS.)
FOUNDATION**

SPECIFICATION NO. PE-TS-362-614-C001

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SECTION C

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4. Material of construction

- i. Grade of Concrete M35.
- ii. Reinforcement bars shall be as per the following codes:
 - TMT of Grade Fe 500 : IS 1786
 - Mild steel bars : Grade I of IS: 432
 - Welded wire fabric : IS: 1566

5. Documents to be submitted by vendor

- i. Soft copy of all documents/drawings shall be furnished in pdf and AutoCAD format as applicable.
- ii. Hard copies shall also be submitted.
- iii. Submission of civil drawings/documents shall be as mentioned in the table-2.

Table-2

	Drawing	Document
For Approval	Soft copy + 8 nos. hard copies	Soft copy + 4 nos. hard copies
For RFC	Soft copy + 13 nos. hard copies	



TITLE:

**STANDARD TECHNICAL
SPECIFICATION FOR VIBRATION
ISOLATION SYSTEM**

SPECIFICATION NO. PE-TS-999-600-C026

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VOLUME: II B

SECTION - D

SUB-SECTION - D26

VIBRATION ISOLATION SYSTEM

SPECIFICATION NO. PE-TS-999-600-C026



Bharat Heavy Electricals Limited
Project Engineering Management



TITLE:

**STANDARD TECHNICAL
SPECIFICATION FOR VIBRATION
ISOLATION SYSYTEM**

SPECIFICATION NO. PE-TS-999-600-C026

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C O N T E N T

CLAUSE NO.	DESCRIPTION	SHEET NO.
1.00.00	SCOPE	3
2.00.00	Supply of VIS	3
3.00.00	Supervision of Erèction and Commissioning	3
4.00.00	Design Engineering of Vibration Isolation System	3
5.00.00	Quality Plan and Test Certificate	5
6.00.00	Environmental Protection	5

	TITLE: STANDARD TECHNICAL SPECIFICATION FOR VIBRATION ISOLATION SYSYTEM	SPECIFICATION NO. PE-TS-999-600-C026	
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VIBRATION ISOLATION SYSTEM

1.00.00	SCOPE This section covers supply, supervision of erection/ commissioning & design engineering of the vibration isolation system (VIS) suitable for ID/PA/FD Fans/ TDBFP/MDBFP/TURBOGENERATORS/MILLS .The vibration isolation system shall be of proven make and should be in successful operation for similar machines.
2.00.00	Supply of VIS VIS shall be supplied complete along with recommended spares if any. The selection of VIS shall be done by the vendor, in case not done by customer , so that the amplitude at bearing locations are within permissible limits as per machine supplier recommendation or ISO10816 whichever is governing and no dynamic loads are transferred to the structure supporting VIS. Minimum 90 % isolation shall be achieved and the system shall be capable of withstanding Seismic/Wind forces.
3.00.00	Supervision of Erection and Commissioning
3.01.00	Manual Vendor shall supply installation and maintenance manual indicating equipment, procedures etc. necessary for installation and replacement of VIS with downtime involved.
3.02.00	Tools and facilities Vendor shall supply all tools and facilities as required for successful erection and commissioning of VIS. Vendor shall deploy experienced manpower to supervise successful installation of VIS
4.00.00	Design Engineering of Vibration Isolation System
4.01.00	Dynamic Analysis The dynamic analysis shall consist of free vibration analysis and forced vibration analysis. Isolation efficiency of at least 90 % shall be obtained. The fundamental natural frequency shall be sufficiently above or below the



TITLE:

**STANDARD TECHNICAL
SPECIFICATION FOR VIBRATION
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frequency corresponding to operating speed. Vibration amplitude shall be calculated at all bearing locations and shall satisfy the permissible limits as per ISO 10816 or as specified by the machine supplier. Transient analysis shall be carried out for the short circuit /blade failure condition with an appropriate force function if required by the machine supplier. The forces for which substructure is to be designed shall be furnished.

4.02.00 Static Analysis

The static analysis shall include the

- a) Dead weights of machine stationary parts,
- b) Dead weights of machine rotary parts
- c) Loads due to machine power torque
- d) Loads due to maximum allowable unbalance
- e) Temperature loads
- f) Loads due to blade unbalance/short circuit
- g) Erections loads
- h) Seismic Loads
- i) Any other loads given by the supplier

Various load combinations must be investigated to obtain the most severe loads for foundation design purpose as per relevant IS codes or as per machine supplier recommendation whichever is more critical.

4.03.00 Check for Shaft Misalignment

Foundation deck must be adequately stiff to withstand all operating load combinations without excessively upsetting the rotor shaft alignment. The structural design must carefully be analysed for relative deflection for the members supporting machine shaft to satisfy the limits as given by machine supplier if any.

4.04.00 Design of RCC deck supported on VIS

Vendor shall provide General arrangement drawing of deck showing location and supporting detail of VIS, all embedment and their details as per the machine supplier drawing.

RCC design shall be done by working stress method for all machine foundations. Minimum reinforcement shall be governed by IS : 2974 as well IS : 456.

All documents/drawings shall be supplied in 25 (twenty five) prints. All calculations shall be supplied in 6 (six) sets. Soft copy of the drawings in Auto Cad shall be supplied along with the soft copy of the documents supplied



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SPECIFICATION FOR VIBRATION
ISOLATION SYSYTEM**

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All documentation shall be in English language and all RCC/structural design shall be conforming to the relevant Indian Standard Code of practice.

5.00.00 Quality Plan and Test Certificate

Vendor shall furnish the quality plan and Test certificate for the hardware in their scope of supply. The quality plan shall be reviewed by BHEL/Consultant wherein the inspection and hold points shall be indicated. Vendor shall submit test certificate based on approved Quality Plan. Despatch of material by the vendor shall only take place after the receipt of Material Dispatch Clearance Certificate (MDCC) issued by BHEL/Consultant on the basis of test reports/test certificates submitted by the Vendor after manufacture.

6.00.00 Environmental Protection

VIS shall be suitably protected against environmental damages e.g. abrasion, discolouration, corrosion, oily water etc. to give a prolonged service matching the plant life.