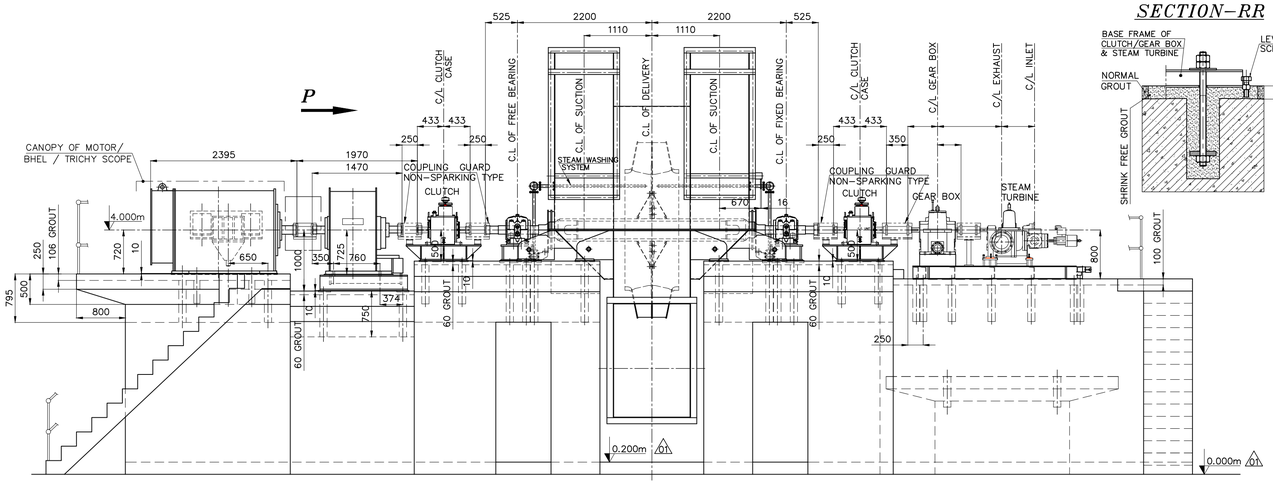
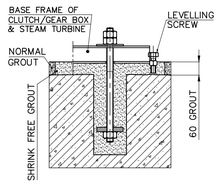
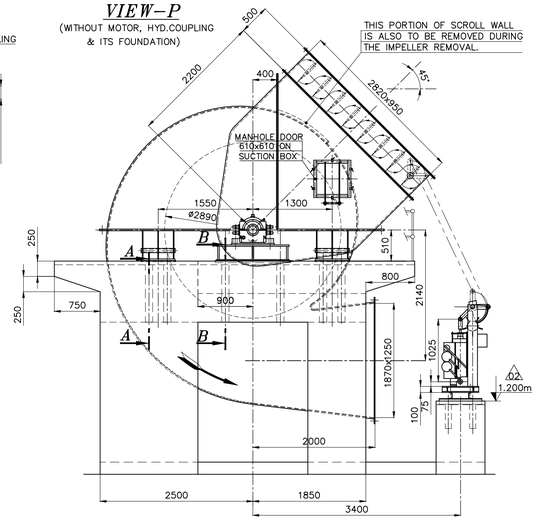
SECTION–RR





VIEW–P

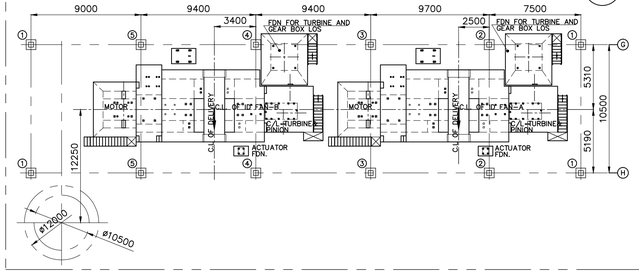
(WITHOUT MOTOR, HYD.COUPLING & ITS FOUNDATION)



KEY PLAN

NORTH

BHEL/TRICHY REFERENCE DRGS. 0-00-020-75498 (LAYOUT OF ID SYSTEM)
(KEY PLAN SHOWN IS INFORMATIVE ONLY. FOR EXACT LOCATION REFER BOILER LAYOUT DRAWINGS.)



NOTES:–

01. THE LOADS INDICATED ON FOUNDATION ARE WITHOUT ALLOWANCES FOR VIBRATIONS. CIVIL DESIGNERS/CONSULTANTS ARE 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. △01
03. ADOPT IS: 2974 / PART–IV FOR THE FOUNDATION DESIGN.
04. THE CONNECTING DUCTS AT INLET AND OUTLET OF FAN MUST BE 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 IS ±5 mm.
08. TOLERANCE ON CONCRETE LEVELS $^{+25}_{-0}$mm.
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 AND 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. ELEVATION LEVELS & POCKET DEPTH SHOWN IN FOUNDATION PLAN INCLUDE GROUTING THICKNESS.
13. GROUTING IS IN THE SCOPE OF ERECTION GROUP/CONTRACTOR.
14. CANOPY OF MOTOR, HANDRAILS, STEEL PLATFORMS, STEEL LADDERS & 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 FINALISED BY CIVIL DESIGNERS/CONSULTANTS.
17. FOR MOTOR ERECTION, REFER MOTOR SUPPLIER'S ERECTION MANUAL.
18. FOR STEAM TURBINE ERECTION, REFER STEAM TURBINE SUPPLIER'S ERECTION MANUAL.

FAN DETAILS:–

TYPE	:	RADIAL, DOUBLE SUCTION, BACKWARD CURVED
MODEL	:	NDZV 25
WEIGHT OE FAN WITHOUT MOTOR & COUPLING	:	20000 kg
WEIGHT OF ROTATING PARTS OF FAN	:	5500 kg
GD^2 OF FAN	:	11250 $kg.m^2$
OPERATING SPEED OF FAN	:	VARIABLE 200 – 980RPM
NO. OF FANS PER BOILER	:	TWO PER BOILER
MAX. WEIGHT TO BE HANDLED FOR MAINTENANCE	:	6000 Kg (APPROX)

MOTOR DETAILS:– △02

MAKE	:	M/s. BHEL, BHOPAL
TYPE	:	1LA7712–6, TETV, IP55
RATING	:	800 kw / 990 RPM / 6600 V. △02
WEIGHT OF MOTOR	:	6850 KG
WEIGHT OF ROTATING PARTS	:	1600 KG
GD^2 OF MOTOR	:	256 KGM^2
SIZE OF FOUNDATION BOLT	:	4 Nos. x M42 x 1000 LG.
MOTOR DRAWING NO.	:	3 402 00 45200
MAXIMUM FOUNDATION LOADING ALTERNATING	:	86 kn UPWARDS
PER MOTOR LONGITUDINAL SIDE	:	153 kn DNWARDS
BEARINGS DE	:	NU230M+6230C3
BEARINGS NDE	:	NU226M
LUBRICATION	:	GREASE, SERVOGEM – 3 OR EQUIVALENT.

STEAM TURBINE DETAILS:–

MAKE	:	SHALL BE FURNISHED LATER
MODEL	:	
STAGE	:	
TURBINE OUTPUT SPEED	:	
TURBINE WEIGHT	:	

GEAR BOX DETAILS:–

MAKE	:	SHALL BE FURNISHED LATER
INPUT SPEED	:	
OUTPUT SPEED	:	
WEIGHT	:	

HYDRAULIC COUPLING:*

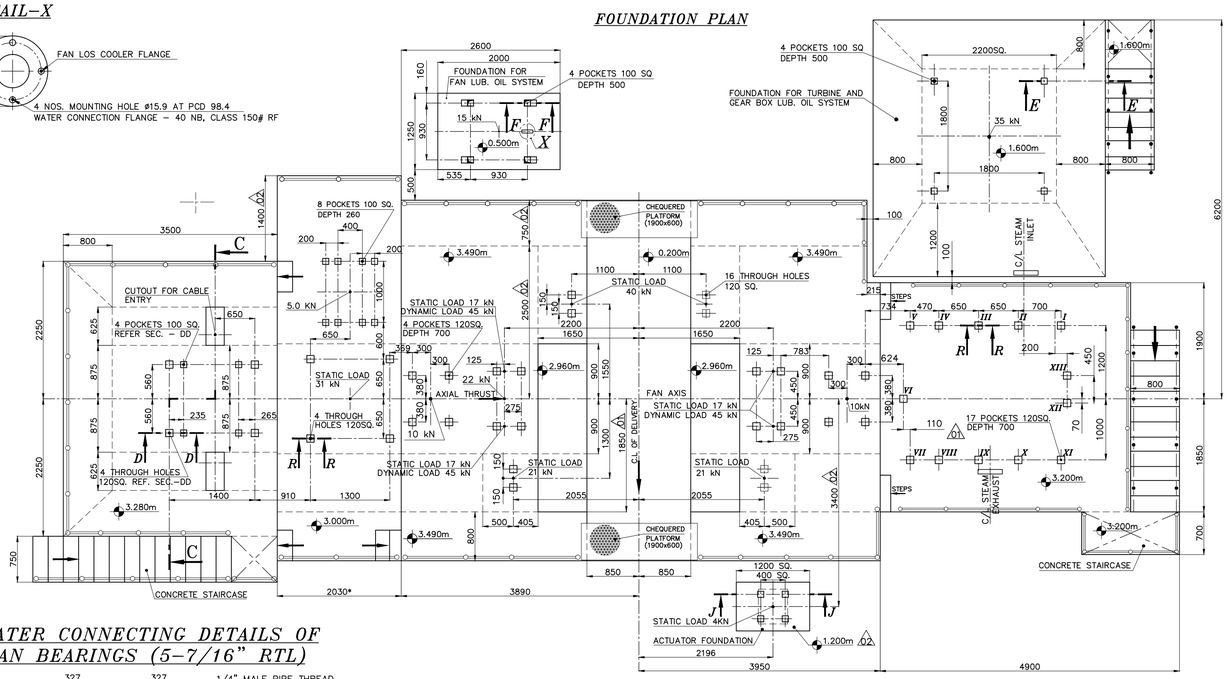
TYPE OF MACHINE	:	VARIABLE SPEED HYDRAULIC COUPLING
COUPLING SIZE	:	SHALL BE FURNISHED LATER
TOTAL WEIGHT WITHOUT OIL	:	1850 kg
WEIGHT OF ROTATING PARTS WITH OIL	:	606 kg
DYNAMIC FOUNDATION LOADING	:	375 N

MOMENT OF INERTIA:*

PRIMARY WITH OIL	:	42.02 kgm^2
SECONDARY WITH OIL	:	9.78 kgm^2

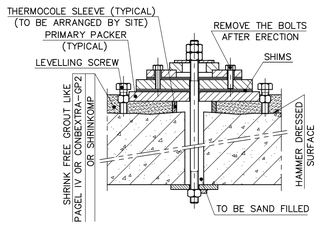
DETAIL–X

FOUNDATION PLAN



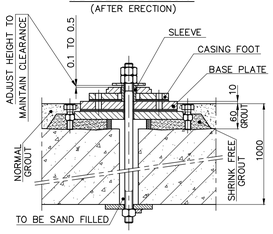
SECTION–AA

(DURING ERECTION)

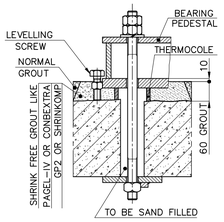


SECTION–AA

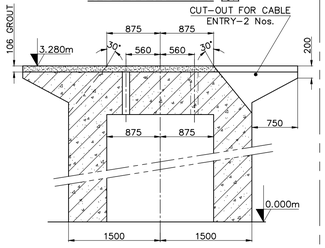
(AFTER ERECTION)



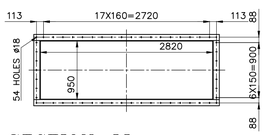
SECTION–BB



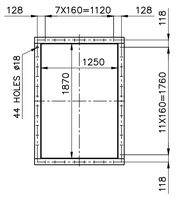
SECTION–CC △01



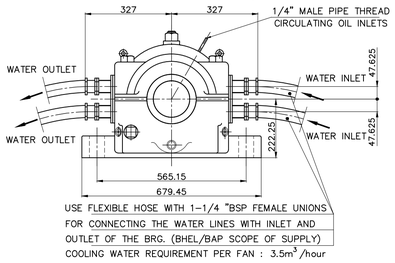
SUCTION FLANGE



DELIVERY FLANGE



WATER CONNECTING DETAILS OF FAN BEARINGS (5–7/16" RTL)



USE FLEXIBLE HOSE WITH 1–1/4 "BSP FEMALE UNIONS FOR CONNECTING THE WATER LINES WITH INLET AND OUTLET OF THE BRG. (BHEL/BAP SCOPE OF SUPPLY)

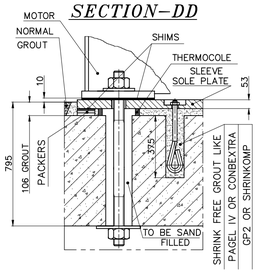
COOLING WATER REQUIREMENT PER FAN : 3.5m^3 /hour

STEAM TURBINE FOUNDATION LOADING △01

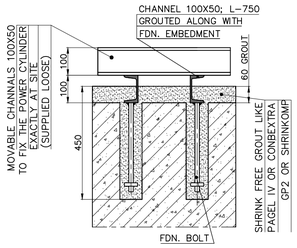
STATIC AND REACTION LOADS AT BOLTING LOCATIONS

BOLTING LOCATION	STATIC LOAD	MAX.REACTION FORCE
	N	N
I	5000	3710
II	5000	4336
III	5000	4110
IV	5000	1040
V	5000	1300
VI	5000	2040
VII	5000	6170
VIII	5000	7300
IX	5000	3900
X	5000	4000
XI	5000	5465
XII	5000	1280
XIII	5000	1280

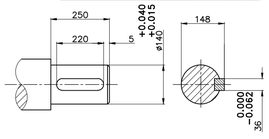
SECTION–DD



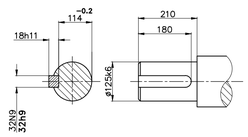
SECTION–JJ



MOTOR SHAFT END

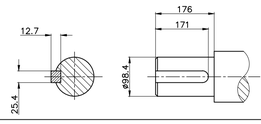


FAN SHAFT END



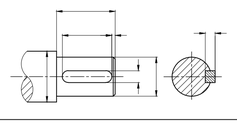
CLUTCH SHAFT END*

(INPUT & OUTPUT SHAFT END)

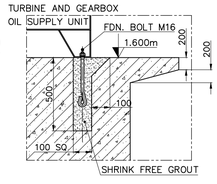


GEAR BOX OUTPUT SHAFT END

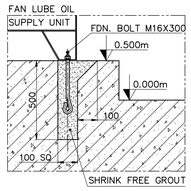
(FAN SIDE)



SECTION–EE*



SECTION–FF



REV	DATE	ALTERED: S.S.B
02	29.03.2011	CHECKED: P.M.J

01. ACTUATOR AND ITS FOUNDATION DIM. UPDATED.
02. DIMENSIONS ALTD.
03. MOTOR DETAILS UPDATED.

REV	DATE	ALTERED: S.S.B
01	01.01.2011	CHECKED: P.M.J

01. FFL –0.200m DELETED BASED ON TRICHY LAYOUT DRAWING.
02. NOTE 02 ALTD.
03. ELEVATION 2.960m DIM. 900 CHANGED TO 1850
04. TURBINE BASE PLATE DETAILS ADDED.

CAUTION: 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.

CUSTOMER No. : R470–R473

CUSTOMER: INDIAN OIL CORPORATION LIMITED

CONSULTANT: ENGINEERS INDIA LIMITED

PROJECT: PARADIP REFINERY CPP
4 X 300 TPH

355–029

BHARAT HEAVY ELECTRICALS LIMITED,
BOILER AUXILIARIES PLANT ; RANIPET–632 406

	NAME	SIGNATURE	DATE
DRN	S.S.B	Sd...	10.12.2010
CHD	P.M.J	Sd...	10.12.2010
APPD	P.M.J	Sd...	10.12.2010

ALL DIMENSIONS ARE IN MILLIMETER

PROJECTION | SCALE 1:50

TITLE: GENERAL ARRANGEMENT OF INDUCED DRAFT FAN NDZV 25 HERAKLES

DRG.NO. 1–00–099–21880 | REV 02

Size A1