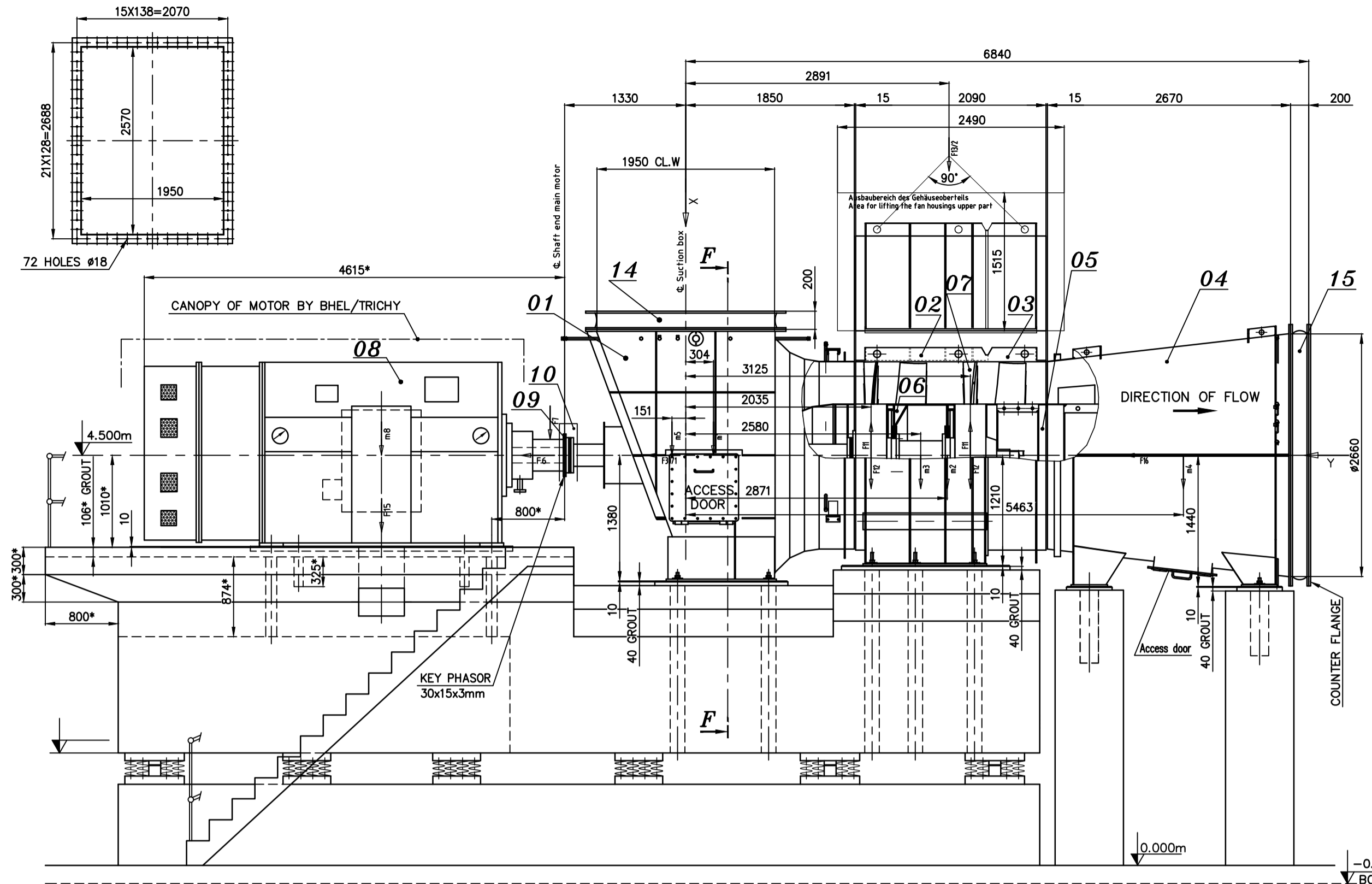
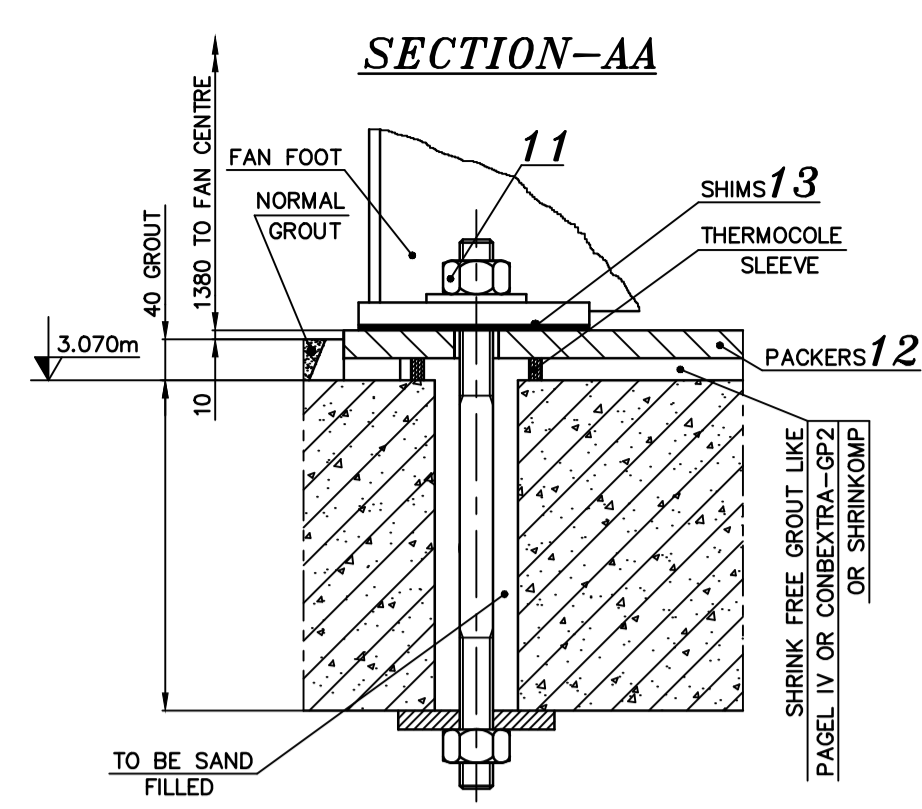


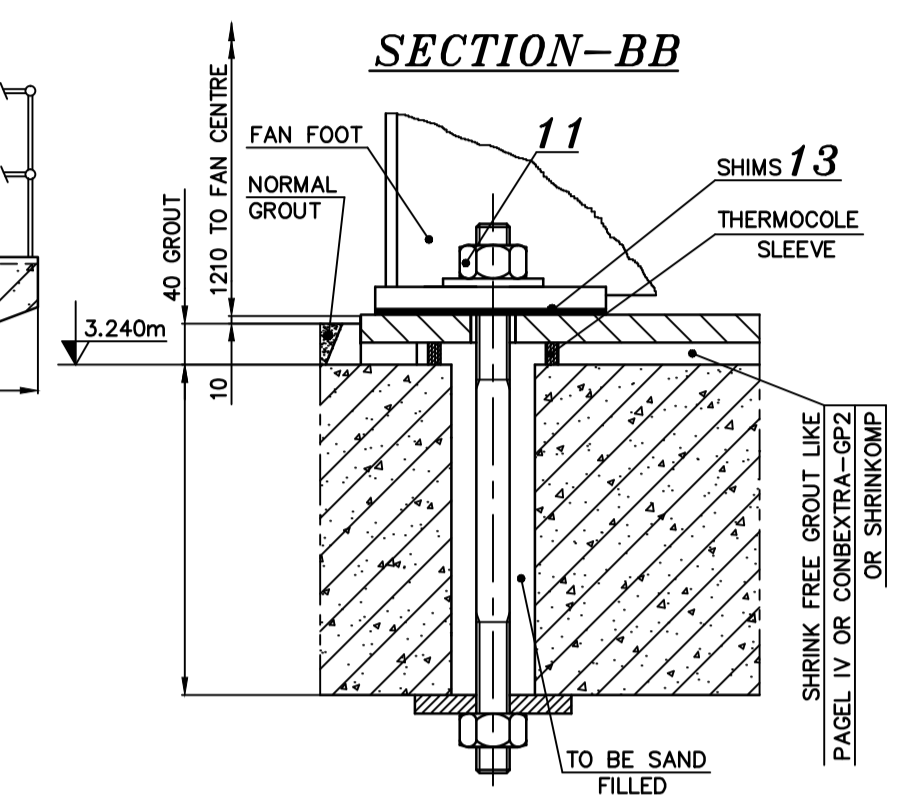
SUCTION FLANGE



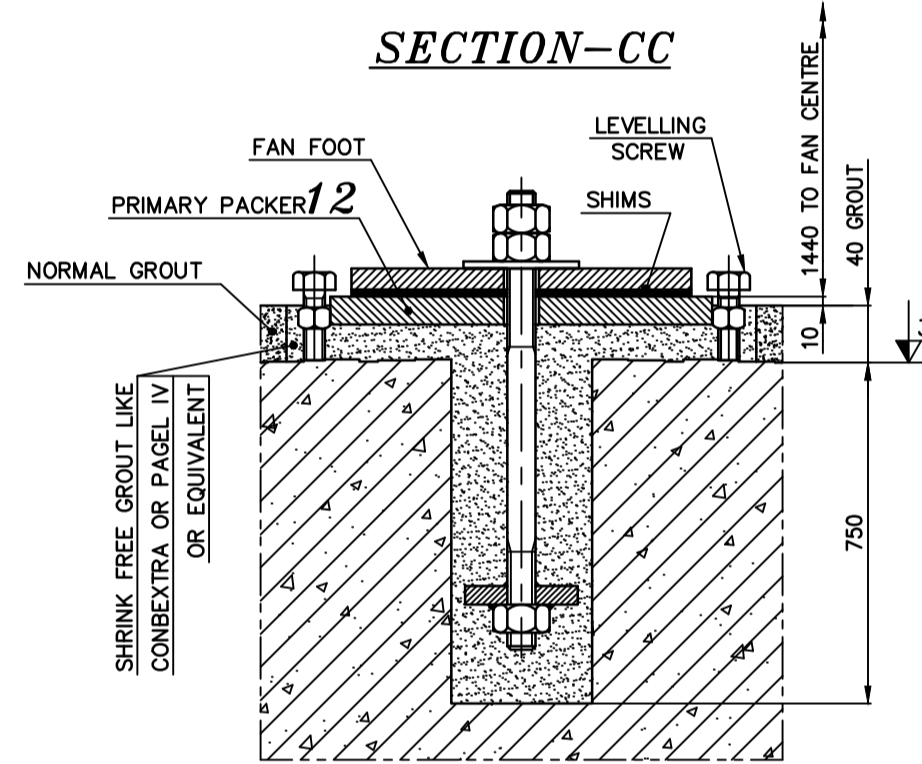
SECTION-AA



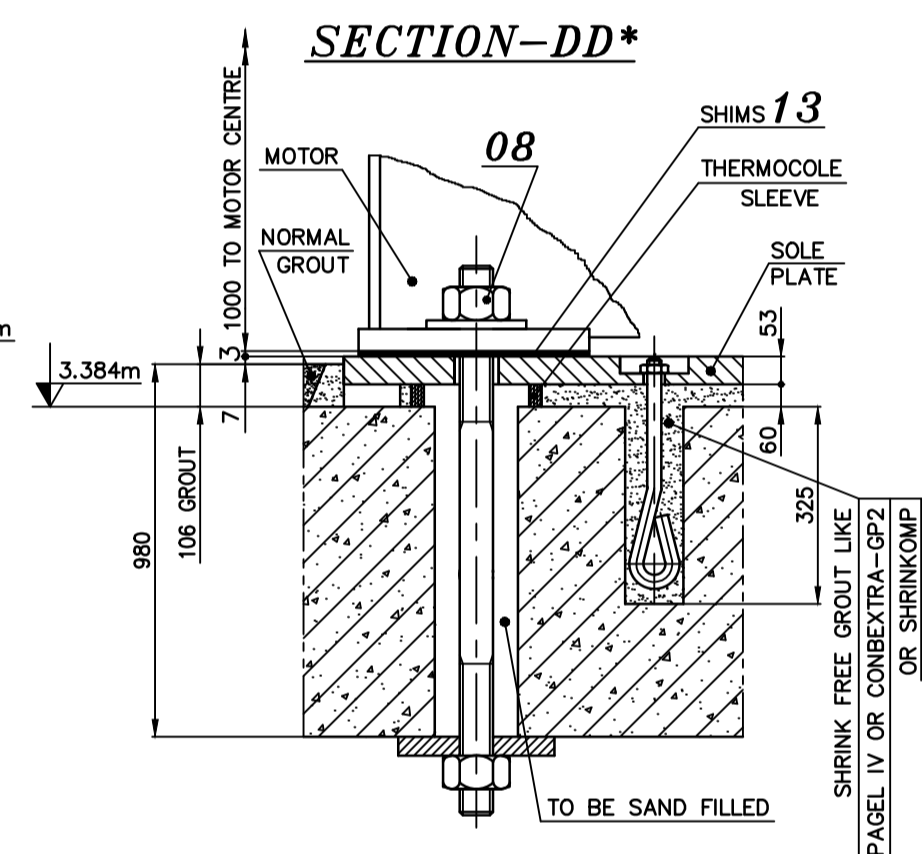
SECTION-BB



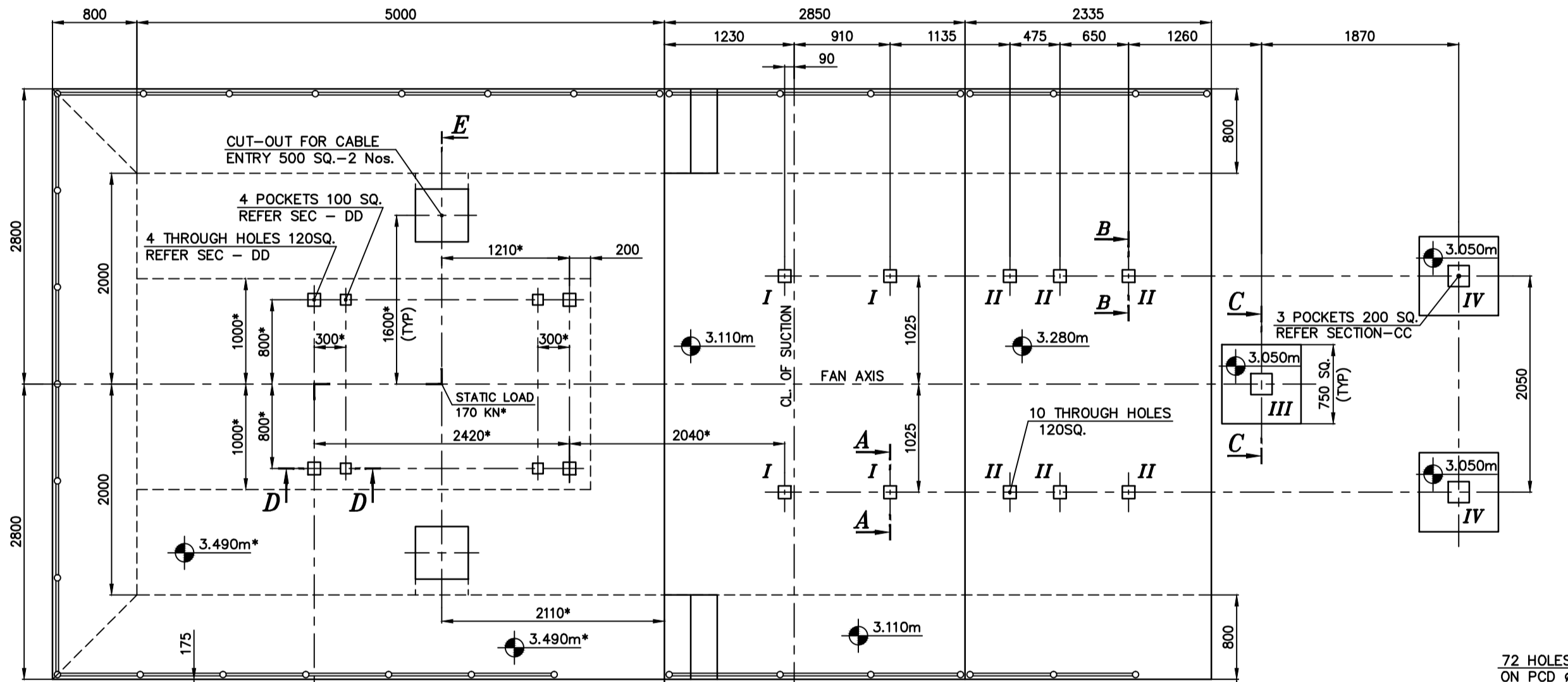
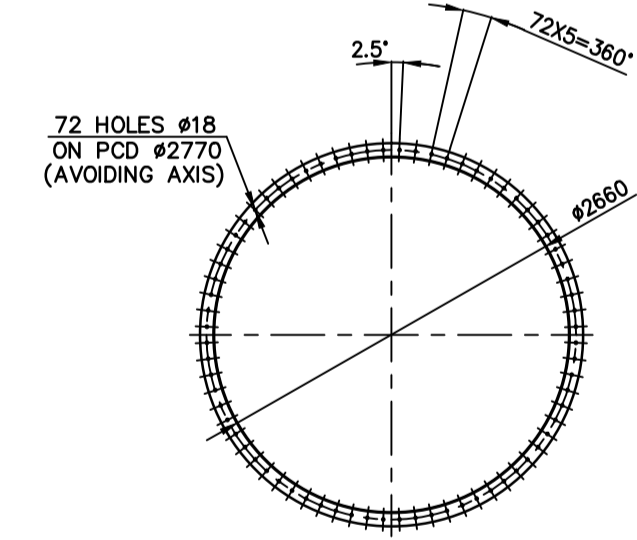
SECTION-CC



SECTION-DD*



DELIVERY FLANGE

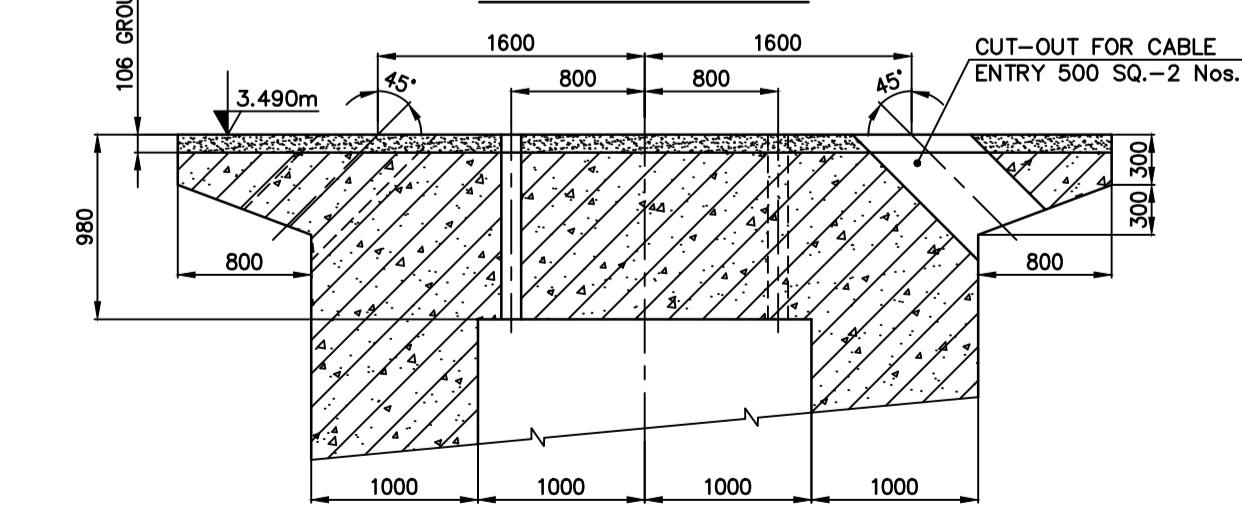


NO	DESCRIPTION	MATERIAL	QTY.
15	OULET EXPANSION JOINT	IS: 2062 & RUBBER	1
14	INLET EXPANSION JOINT	IS: 2062 & RUBBER	1
13	SHIMS	S.S	AS REQD.
12	PRIMARY PACKER	IS : 2062	8
11	FOUNDATION FASTENERS FOR FAN	ASTM A105	15
10	COUPLING GUARD	IS : 2062	1
09	SPACER COUPLING	STEEL	1
08	MOTOR WITH FNDN. FASTENERS	4125 KW /1494 RPM*	1
07	BLADES	ENAC-AISI9MgT6	40
06	IMPELLER HUB	S355J2G3	1
05	HOUSING CORE	IS : 2062	1
04	DIFFUSER	IS : 2062	1
03	OUTLET GUIDE VANE ASSY.	IS : 2062	1
02	IMPELLER HOUSING	IS : 2062	1
01	SUCTION CHAMBER	IS : 2062	1

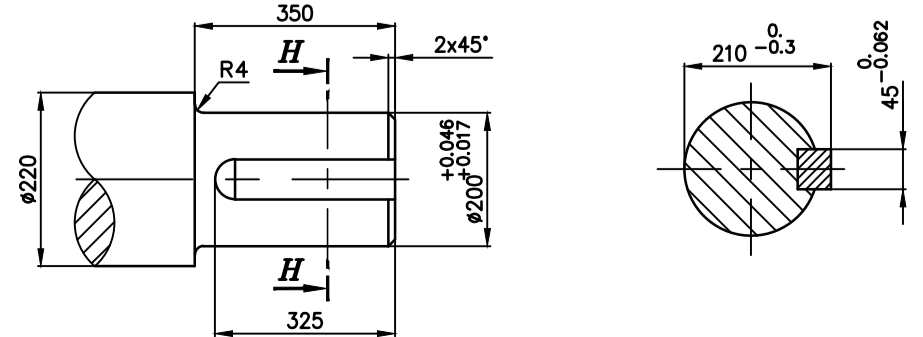
BILL OF MATERIAL

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

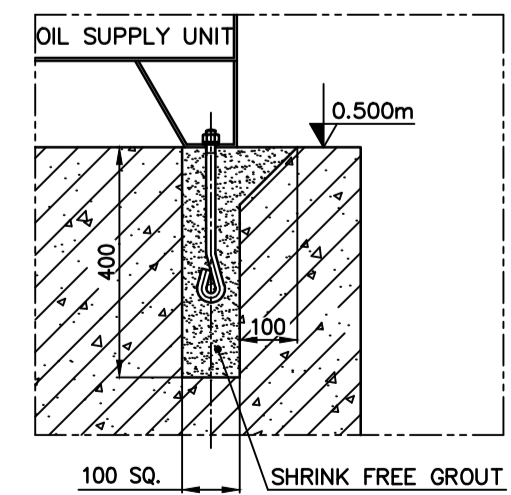
SECTION-EE*



MOTOR SHAFT END* SECTION-HH*



SECTION-GG



MOTOR BEARING LUBRICATION DETAILS:*

	DE	NDE
BEARING SIZE	#180X150	#180X150
OIL FLOW RATE	5.6 LPM	5.6 LPM
MAX. OIL INLET PRESSURE	0.2 TO 0.5 Kg/cm ²	0.2 TO 0.5 Kg/cm ²
OIL GRADE	ISO VG 68	ISO VG 68
LUBRICATION TYPE	FORCED OIL LUBRICATION	

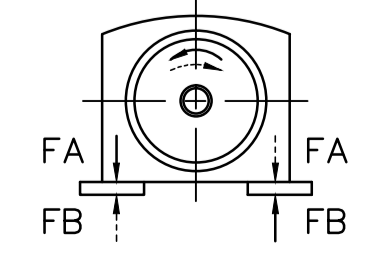
ID. NO.	(m) MASS IN (KG) INCLUDING INSULATION	(F) FORCE IN (N)	DESIGNATION
30/2	10617		Stat. and dyn. forces caused by air stream of suction box in vert. direction
30/1	25410		Stat. and dyn. forces caused by air stream of suction box in horiz. direction
16	33545		Axial thrust of the fan (due to pressure increase)
15	226830		Load during starting sequence by short-circuit torque of the motor
14	-		Foundation
13/2	21950		Max. load when lifting the fan housings upper part
13/1	20780		Max. load when lifting the rotor assembly
12	90070		Unbalance in case of damage
11	11206		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	3740		Radial load on motor shaft
6	2284		Axial thrust on motor shaft for motor with fixed bearing
5	680		Intermediate shaft with coupling
4	3030		Diffuser with tail fairing
3	2118		Complete rotor assembly
2	5050		Fan housing with straightener vane section
1	3130		Suction box with nose fairing & inlet nozzle and intermediate shaft cover

FOUNDATION LOAD DATA

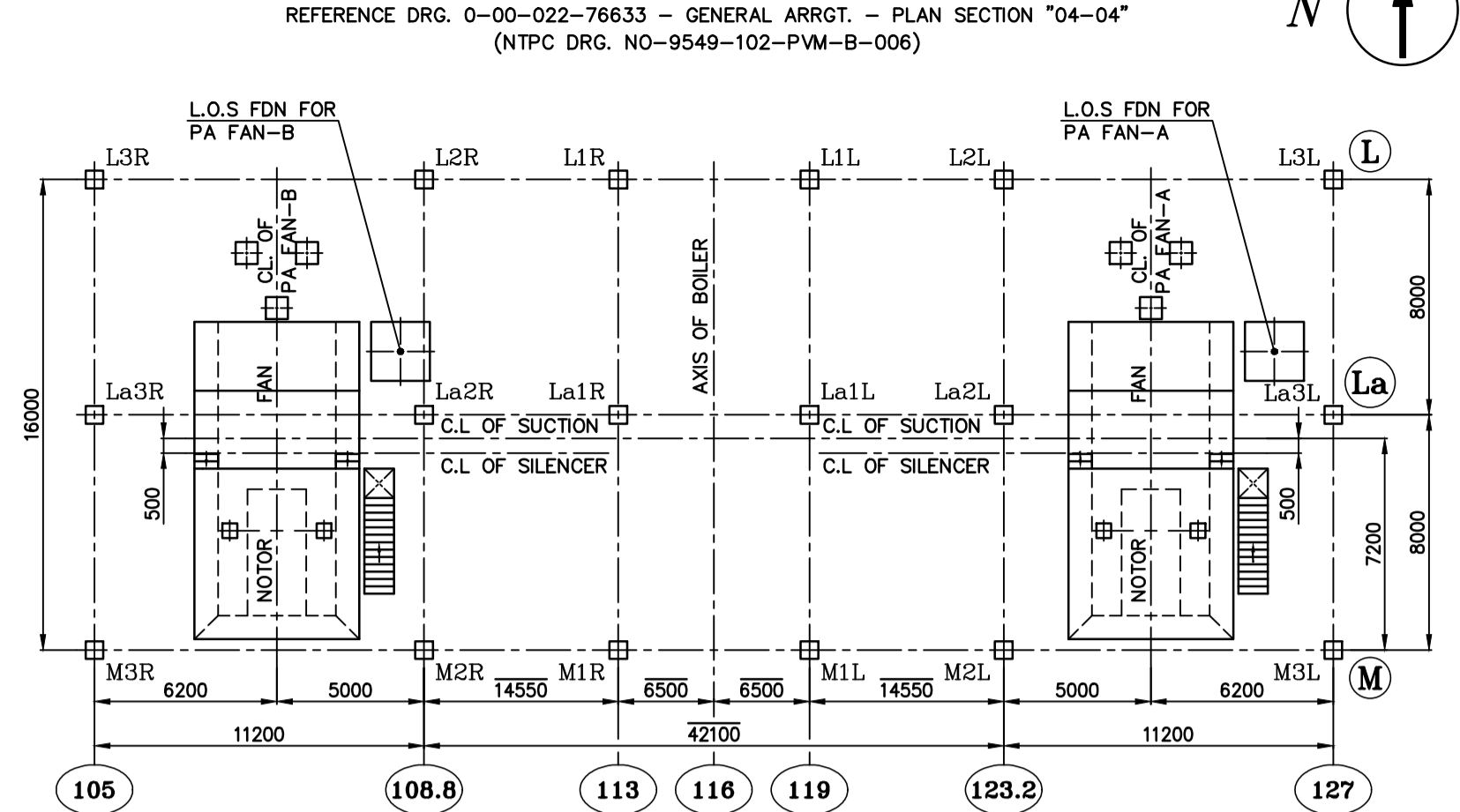
LOAD POINT	STATIC VERTICAL FORCE [N]	DYNAMIC VERTICAL FORCE [N]	STATIC HORIZONTAL IN AXIAL DIRECTION FORCE [N]	STATIC HORIZONTAL ACROSS TO AXIS FORCE [N]	DYN. HORIZONTAL ACROSS TO AXIS FORCE [N]
I	+28800	±800	±8800	±2400	±800
II	+31700	±2300	±5600	±1300	±1900
III	+16800	±19000	±1100	±3300	±16300
IV	+11600	±1100	±1100	±3300	±1100

FOUNDATION LOAD OF MOTOR*

MAX. FORCE CALCULATED FROM THE MAX. IMPULSE TORQUE - FM = 170 KN
 FORCE EXERTED BY WEIGHT ON EACH SIDE----- FG = 79 KN
 FOUNDATION LOAD ON EACH SIDE COMPRESSION - FA = FM+FG = 249 KN
 TENSILE FORCE ----- FB = FM-FG = 91 KN
 THE FORCE OCCUR ALTERNATIVELY INDEPENDENT OF THE DIRECTION OF ROTATION.



KEY PLAN



NOTES:-

- THE LOADS INDICATED ON FOUNDATION ARE WITHOUT ALLOWANCES FOR VIBRATIONS. CIVIL DESIGNERS ARE RESPONSIBLE FOR PROPER DESIGN OF FOUNDATION TAKING INTO ACCOUNT THE ALLOWANCES FOR VIBRATION ALSO.
- THE DIFFERENT NATURAL FREQUENCIES OF THE FOUNDATION HAVE TO BE 20% AWAY FROM THE SPEED FREQUENCY, $f_{nmax} = n/60$ AND 15% AWAY FROM THE DOUBLE OF THE SPEED FREQUENCY, $2 \times f_{nmax}$. THIS MEANS: $0.8x f_n$ TO $1.2x f_n$ AND $0.85x(2x f_n)$ TO $1.15x(2x f_n)$.
 SPEED FREQUENCY $f_{nmax} = 25$ HZ
 ($2 \times f_{nmax} = 50$ HZ)
- THE STIFFNESS OF THE FOUNDATION HAS TO BE AT LEAST $CF > 1.0E+06$ N/mm IN LONGITUDINAL, TRANSVERSAL AND VERTICAL DIRECTIONS RELATING TO THE FAN AXIS. IT HAS TO BE TAKEN INTO CONSIDERATION THAT ON SETTLING 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.
- THE RATIO OF THE FOUNDATION MASS TO THE ROTOR MASS HAS TO BE GREATER THAN 25.
- ADOPT IS: 2974 / PART-IV FOR THE FOUNDATION DESIGN.
- THE CONNECTING DUCTS AT INLET AND OUTLET OF FAN MUST BE SELF SUPPORTED AND SHOULD NOT BE WELDED WITH EXPANSION JOINTS.
- FOUNDATION POCKETS SHOULD BE PERPENDICULAR TO THE FLAT SURFACES OF FOUNDATION.
- ACCURATE TEMPLATES SHALL BE USED FOR LOCATING CORES FOR POCKET HOLES TO ENSURE THEIR DIMENSIONAL ACCURACY.
- TOLERANCE BETWEEN ANY TWO POCKET CENTRES IS ± 5 mm.
- TOLERANCE ON CONCRETE LEVELS ± 25 mm.
- 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 SCRAPING AND THEREBY ENSURING MAXIMUM CONTACT ON THE MATING AREAS.
- 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.
- GROUTING SHOULD BE DONE ONLY AFTER FINAL ALIGNMENT OF FAN.
- ELEVATIONS & POCKET DEPTH SHOWN IN FOUNDATION PLAN ARE INCLUDING GROUTING THICKNESS.
- GROUTING IS IN SCOPE OF ERECTION GROUP OF BHEL/AUTHORISED AGENCY.
- HANDRAILS, STEEL PLATFORMS, LADDERS & CANOPY FOR MOTOR AND THEIR EMBEDMENTS ARE IN THE SCOPE OF BHEL/TRICHY.
- FAN FOUNDATION SHOULD NOT BE USED AS SUPPORT FOR OTHER STRUCTURES OR EQUIPMENTS.
- FOUNDATION CONFIGURATION SHOWN IN THIS DRAWING IS ONLY INFORMATIVE/TYPICAL. TYPE AND DETAILS OF FOUNDATION ARE TO BE FINALISED BY CIVIL DESIGNERS.
- FOR MOTOR ERECTION, REFER MOTOR SUPPLIER'S ERECTION MANUAL.
- BASE FRAME, SOLE PLATE, FOUNDATION BOLTS, FDN. SLEEVE & FASTENERS RELATED TO MOTORS WILL BE IN THE SCOPE OF MOTOR SUPPLIER (BHEL BHOPAL UNIT)

FAN DETAILS:

TYPE	: PAF 20.5/11.2-2
NO. OF FANS PER BOILER	: TWO (IDENTICAL)
WEIGHT OF ROTATING PARTS	: 2200 kg
GD ² OF FAN	: 1200 kg.m ²
SPEED OF FAN	: 1490 RPM

MOTOR DETAILS:*

RATING	: 4125 KW/1494 RPM/243 AMP/11 KV
TYPE	: 1LA7925-4
MAKE	: M/s. BHEL/BHOPAL
WEIGHT OF MOTOR	: 15800 kg
WEIGHT OF ROTATING PARTS	: 4500 kg
GD ² OF MOTOR	: 1236 kg.m ²
MOTOR DRG. NO.	: 1 402 00 41257

FAN IS SIMILAR TO PA FAN OF GADARWARA 2X800 MW

REV	ISSUED FOR NTPC REVIEW	DESCRIPTION	DATE	P.S.N	S.AGARWAL	V.P.SHYAM
00			10.07.2014			

BHEL CUSTOMER NOS. R821 & R822

NTPC DRG NO. **9549-102-PVM-B-019**

CUSTOMER: **NTPC LIMITED.**
 (A Government of India Enterprise)

PROJECT: **DARLIPALI SUPER THERMAL POWER PROJECT**
 STAGE-I 2 X 800MW
 STEAM GENERATOR PACKAGE

BHARAT HEAVY ELECTRICALS LIMITED.,
 BOILER AUXILIARIES PLANT
 RANIPET - 632 406

TITLE: **GA DRAWING FOR PA FAN WITH FOUNDATION PLAN AND LOADING DATA PAF 20.5/11.2-2**

ALL DIMENSIONS IN MILLIMETRE BHEL DRG. NO. **1-00-100-28963**

SCALE: N.T.S

PROJECTION:

REV. **00**