

**TENDER ENQUIRY FOR VIS FOR BFP FOUNDATION FOR 2 X 800 MW TANGEDCO UPPUR
TPP-BTG**

Date: 18.11.2017

CORRIGENDA-1

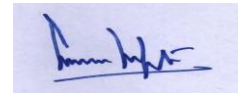
Tender Enquiry no.: PE/PG/UPP/E-5769/2017 Dt: 06.11.2017

DUE DATE
27-NOV-2017
02:00 PM IST

It may please be noted that bid submission due date for tender enquiry no. PE/PG/UPP/E-5769/2017 Dt: 06.11.2017 floated for "VIS FOR BFP FOUNDATION" package for subject project has been extended till 27.11.2017 (02.00 PM). Techno-commercial bid shall be opened on 27.11.2017 (03.00 PM). It may also be noted that drawings & revised Price format uploaded for this tender enquiry.

NO FURTHER EXTENSION FOR BID SUBMISSION SHALL BE GRANTED FOR THIS TENDER.

With Regards,
For & on behalf of BHEL



(Gaurav Gupta)
Dy. Mgr/PG-II/ BHEL-PEM

Please reply to:

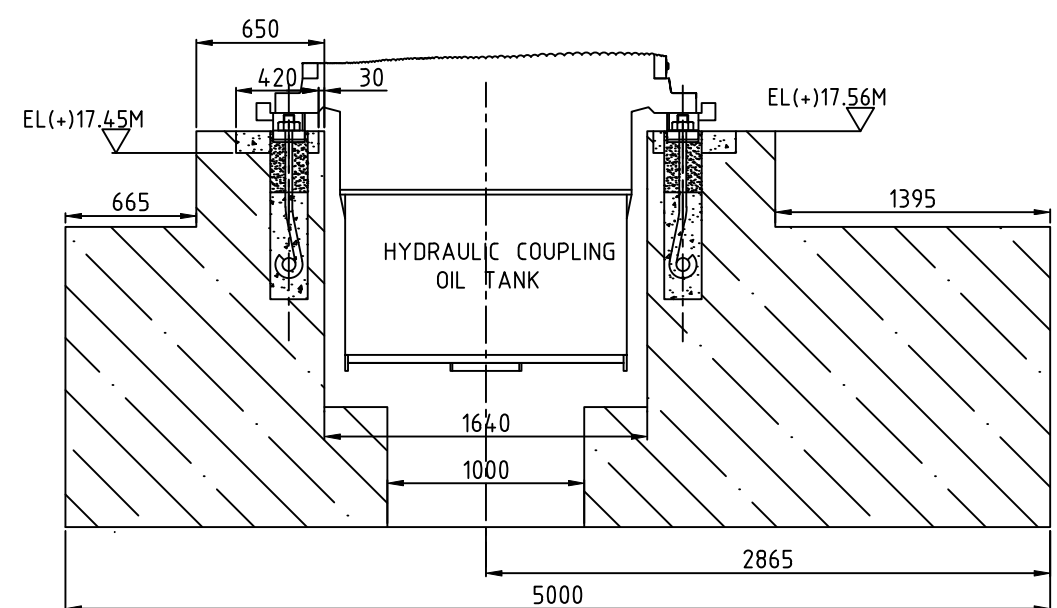
**Gaurav Gupta, Dy.Mgr
PG-II**

Power Project Engineering Institute Building
HRD & ESI Complex Plot No. 25, Sector -16 A,
BHEL-PEM, Noida-201301 (U.P.)

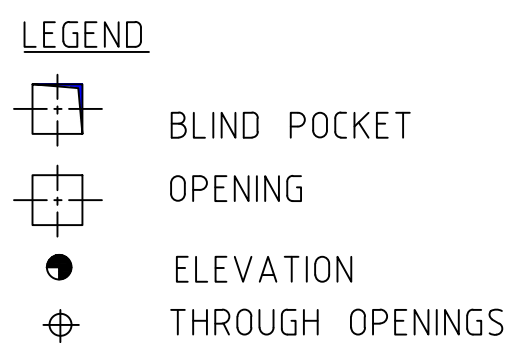
Tel No. 0120-4368685/4368519, Fax: 0120-4329106

PROJECT:-2 X 800 MW TANGEDCO UPPUR TPP-BTG																	
TENDER ENQUIRY NO.PE/PG/UPP/E-5769/2017 Dt: 06.11.2017																	
ANNEXURE-I BOQ CUM PRICE SCHEDULE FOR SUPPLY OF VIS (STEEL HELICAL SPRING AND VISCOUS DAMPER) FOR TD BFP(4 NOS.) & MD BFP (2 NOS.) FOUNDATION																	
FOR INDIAN BIDDER																	
NAME OF VENDOR:-																	
SL NO (1)	ITEM DESCRIPTION AS PER TENDER BOQ (2)	Required Load carrying Capacity (kN) for each foundation (3)	No of machine foundation (4)	HSN CODE TO BE FILLED BY THE BIDDER FOR EACH ITEM (5)	UNIT EX-WORKS PRICE (INR) (6)	TOTAL EX- WORKS PRICE (INR) (7)	FREIGHT CHARGES (8) @ % OF TOTAL EX WORKS (8A) AMOUNT IN (INR) (8B)=(7X8A)		TOTAL PRICES (ex-works + freight) (INR) (9)	APPLICABLE GST RATE IN % ON FREIGHT BOTH (INR) (10) GST RATE IN % ON TOTAL EX WORKS + FREIGHT (10A)	TOTAL PRICE F.O.R Prices with taxes (INR) (11) [9+10B]	UNIT C&F Channel Sea Port Price (Currency) (12)	Total C&F Channel Sea Port Price (Currency) (13)	APPLICABLE GST RATE IN % ON Site Activities (Currency)(14)	GRAND TOTAL (Currency) (15)	REMARKS	
SUPPLY OF VIS (STEEL HELICAL SPRING AND VISCOUS DAMPER) FOR TD BFP(4 NOS.) & MD BFP(2 Nos.) FOUNDATION																	
A1*	COST OF VIS FOR TD BFP FOUNDATION	5172	4						[7+8B]							(12+13+14)	
A2*	COST OF VIS FOR MD BFP FOUNDATION	5994	2														
A3	PACKING & FORWARDING CHARGES																
A4	TOOLS FOR ACCESSORIES (Electric pump included)																
A	TOTAL COST OF VIS, INCLUDING PACKING FORWARDING & TOOLS FOR ERECTION(A1+A2+A3+A4)																
DESIGN ENGINEERING OF TD BFP & MD BFP FOUNDATION DECK SUPPORTED ON VIS (SPRING TYPE)																	
B1	CIVIL DESIGN ENGINEERING DOCUMENT FOR TD BFP FOUNDATION RESTING ON VIS																
B2	CIVIL DESIGN ENGINEERING DOCUMENT FOR MD BFP FOUNDATION RESTING ON VIS																
B	TOTAL COST OF DESIGN ENGINEERING DOCUMENT OF OF TD BFP & MD BFP FOUNDATION RESTING ON VIS (B1+B2)																
C	TOTAL COST OF VIS INCLUDING CIVIL DESIGN ENGINEERING DOCUMENT (A+B)																
SUPERVISION OF ERECTION AND COMMISSIONING OF VIS (STEEL HELICAL SPRING AND VISCOUS DAMPER) FOR TD BFP(4 NOS.) MD BFP(2 NOS.) FOUNDATION																	
			NO OF VISITS														
D1	SUPERVISION OF ERECTION & COMMISSIONING OF VIS FOR TD BFP FOUNDATION		8														One visit consisting of 3 days
D2	SUPERVISION OF ERECTION & COMMISSIONING OF VIS FOR MD BFP FOUNDATION		4														One visit consisting of 3 days
D	TOTAL SUPERVISION PRICE (D1+D2)																
In case of an extra visit, the above charges would be applicable for the visit and if there is any extra/less stay during the visit at site, the charges shall be @ Rs. — / per day																	
E	TOTAL COST OF PACKAGE (C+D)																
Note (As per NIT requirement/Technical Specification) if any :-																	
1. Load carrying capacity mentioned for the variable items ("marked") is tentative only and shall be used for bid evaluation and ordering purpose.																	
2. The actual load carrying capacity of the springs may undergo change after ordering, based on springs selected during detailed engineering.																	
3. In such a case, price bid evaluation shall be done again based on revised load carrying capacity of the springs keeping all the prices same as quoted originally, in case of change in L1 status, the quoted price per unit load carrying capacity (kN) of the variable items (i.e A1 & A2) of the original L1 vendor shall be proportionately reduced to maintain L1 status.																	
4. Based on above, amendment to PO, if required, shall be issued.																	
5. Generally the damping shall be required in the range of 5% to 20% of critical damping of whole machine foundation system to meet the design requirement. In exceptional case it may vary upto 30 % depending upon the available/selected spring unit as well as layout constraints. The bidder shall accordingly include the cost of damping in their quoted price for Cost of VIS per Unit load carrying capacity(KN). No extra price shall be provided on account of required damping. Cost of dampers is deemed to be included in the quoted rate of VIS (per KN).																	
6. Price per Visit is lumpsum which includes travel and accommodation charge.																	
Points for consideration before filling above price schedule-																	
1. PRICES SHALL BE FIRM UNLESS OTHERWISE SPECIFICALLY INDICATED IN NIT.																	
2. Vendor to mention HSN Code in specific Column for each item of BOQ.																	
3. In case of discrepancy in GST rate corresponding to HSN code and quoted GST, the evaluation shall be done on quoted price and correct GST rate shall be considered for ordering (limited to quoted For Site price)																	
4. Unless the contract requires otherwise, in all tenders and tender related documents any reference to taxes such as ED, CST/VAT/ Services, Tax etc. shall refer to GST as implemented by GOI w.e.f. 1.07.2017.																	
5. COST/ GST/UGST shall be paid at actuals against documentary evidence but restricted to the amount and percentage in the order/contract.																	
6. In case, any GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry to timeline prescribed in the relevant Act for availing such ITC, or any other reasons not attributable to BHEL, tax amount shall be recoverable from the vendor/contractor along with interest levied/feasible on BHEL.																	
7. All taxes and duties other than CGST/SGST/UGST shall be deemed to be included in the Ex-Works prices unless specified otherwise by the bidder in the price bid. No variation in other taxes and duties shall be payable by Purchaser.																	

18/11/17



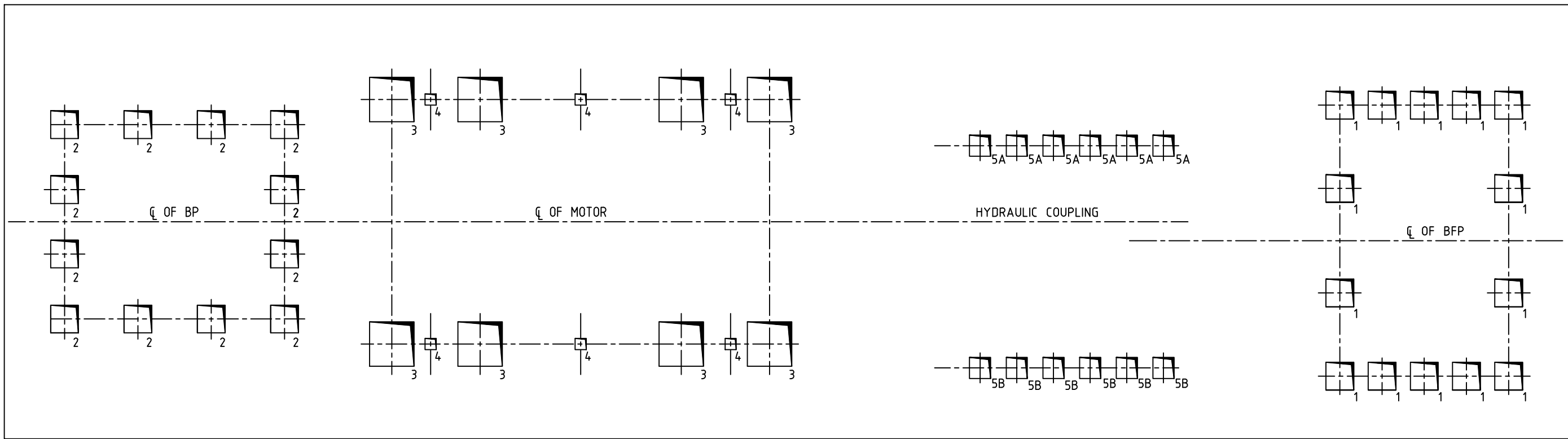
SECTION I-I



- 1) FOR GENERAL ARRANGEMENT OF MD BFP SET,
REFER DRG NO. HY-DG-1-18000-57806.
- 2) ALL ELEVATIONS ARE W.R.T TO TG HALL
FINISHED FLOOR LEVEL WHICH IS CORRESPOND TO RL9.5M
- 3) ALL GROUTINGS ARE IN THE SCOPE OF BHEL-SITE.
- 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
- 7) FOR DETAILED COLUMN DETAILS REFER BHEL/PEM
DRG NO. PE-DG-425-100-M005.
- 8) FOR OUTLINE & GENERAL ARRANGEMENT OF MOTOR
REFER BHEL BHOPAL DRG.

1.	JOB NO :	410
2.	STATUS:	CONTRACT
3.	DRG./REF. NO. (INTERNAL)	1-18000-57805
4.	DISTRIBUTION	
5.	TO	
6.	No. OF	

CUSTOMER: 	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED									
CONSULTANT: 	TRACTEBEL ENGINEERING PRIVATE LIMITED									
PROJECT:	2X800MW UPPUR STPP (UNIT #1&2) RAMANATHAPURAM DISTRICT, TAMILNADU									
 BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	DEPT CODE M	NAME KARNI	SIGN -SD/-	DATE 24.04.2017						
	APPD KARNI		-SD/-	24.04.2017						
TITLE	FOUNDATION ARRANGEMENT OF MDBFP SET									
	DEPT.	SCALE				DRAWING NO. HY-DG-1-18000-57805				
	SIGN					SHEET 2 1 OF REV. 01				
						SIZE-A0				



LOAD POINTS FOR MDBFP SET

FOUNDATION LOADING								
LOAD APPLICATION POINT	EQUIPMENT	STATIC * LOADING ON EACH POINT (Kgs.)	DYNAMIC LOADING ON EACH POINT (Kgs)		EQPT. WEIGHT (Kgs)			ROTOR WEIGHT (Kgs)
			VERTI CAL	HORIZO NTAL	AXIAL	DRY	WET	
1	BOILER FEED PUMP	2492	2925	2925	1950	34600	34900	--
2	BOOSTER PUMP	750	738	738	492	8500	9000	450
5A	HYDRAULIC COUPLING	2075	370	370	---	17000	20800	INPUT ROTOR =1703 PRIMARY ROTOR=978 SECONDARY ROTOR=972 OUTPUT ROTOR=368
5B		2005	220	220	---			
3	MOTOR WITH BASE PLATE	5330	REFER TABLE - MOTOR FOUNDATION LOADING DETAILS			42100	---	11850

* INCLUDES ROTOR WEIGHTS.

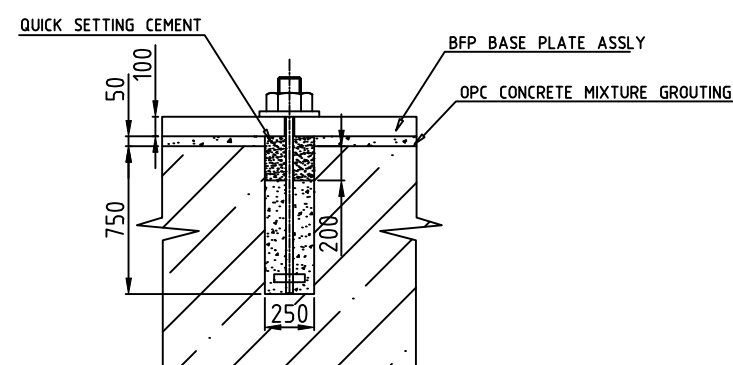
SPEEDS AT OPERATING POINTS (RPM)				
EQUIPMENT	DESIGN POINT	EMERGENCY POINT	BEP	RUN OUT POINT
BFP	5180	5291	4903	4281
BOOSTER PUMP	1495	1495	1495	1495
MOTOR	1495	1495	1495	1495
HYDRAULIC COUP. (INPUT SHAFT)	1495	1495	1495	1495
HYDRAULIC COUP (OUTPUT SHAFT)	5180	5291	4903	4281

MOTOR FOUNDATION LOADING DETAILS	
Reaction Due to Wt on Each Side (G) =	211 KN
MAX Short circuit force (MS) =	531 KN
Reaction Downward MS+G =	742 KN
Reaction upward MS-G =	320 KN

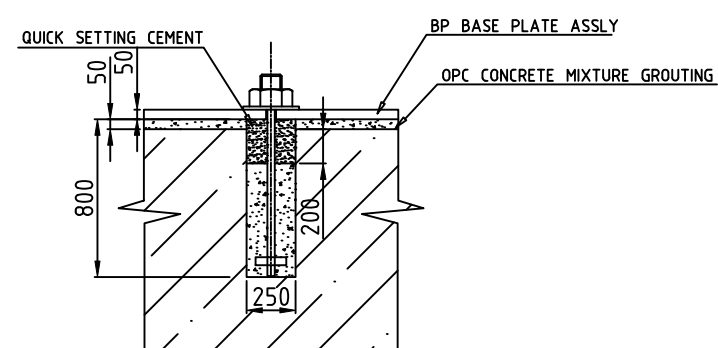
NOTE:

- 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

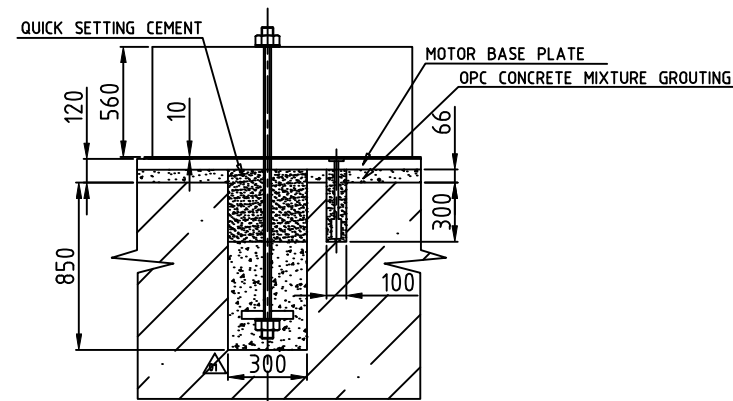
GD ² VALUES (KG-M ²)	
BFP	21.9
BOOSTER PUMP	47.5
MOTOR	4800
HYDRAULIC COUP. INPUT SHAFT & PRIMARY PARTS	1872
HYDRAULIC COUP. OUTPUT SHAFT & SECONDARY PARTS REFERRED TO MOTOR SPEED.	532



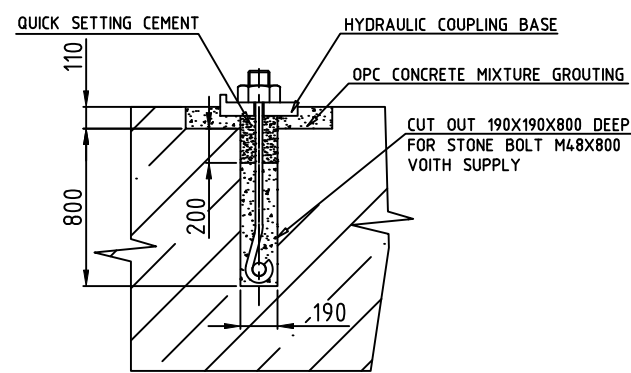
BFP FOUNDATION
BOLT ARRANGEMENT



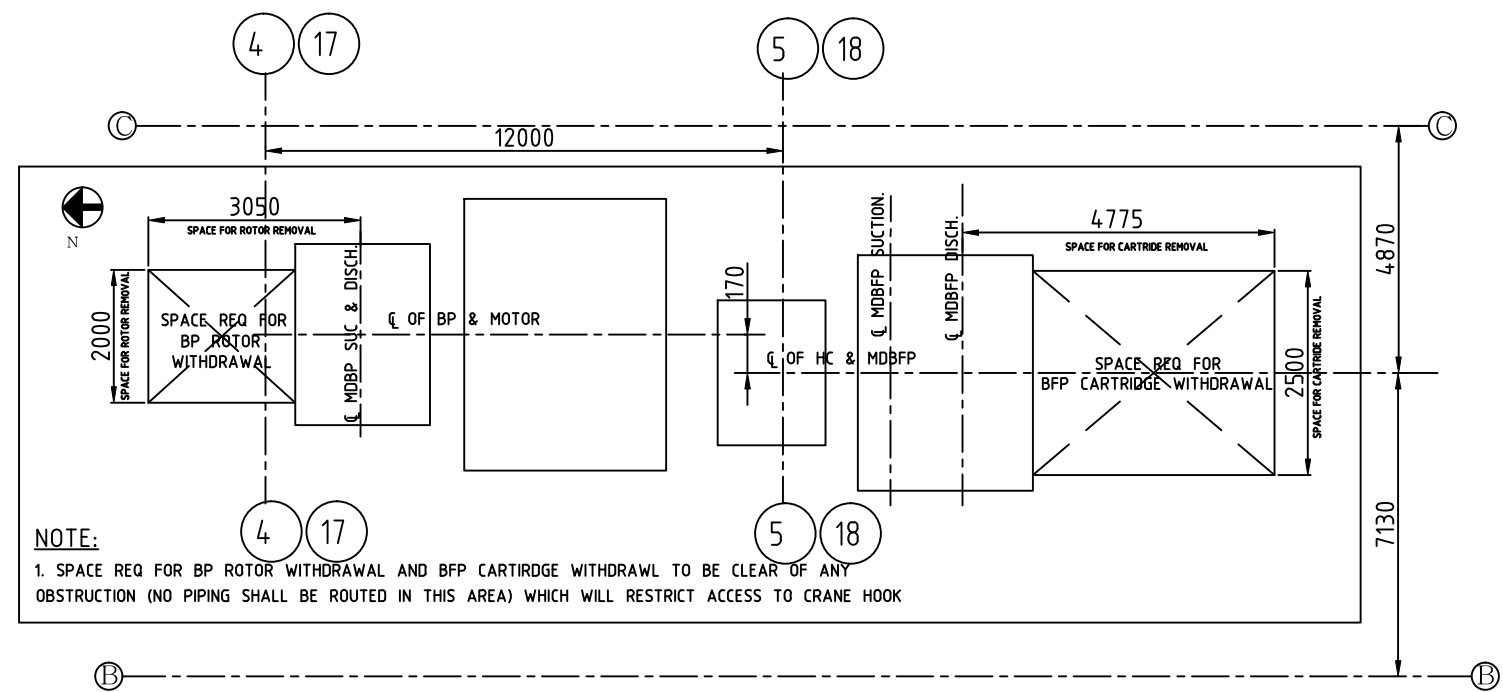
BP FOUNDATION
BOLT ARRANGEMENT



MOTOR FOUNDATION
BOLT ARRANGEMENT



HYDRAULIC COUPLING FOUNDATION BOLT ARRANGEMENT



KEY PLAN & CARTRIDGE REMOVAL SPACE OF MDBFP SET

LEGEND



BLIND POCKET

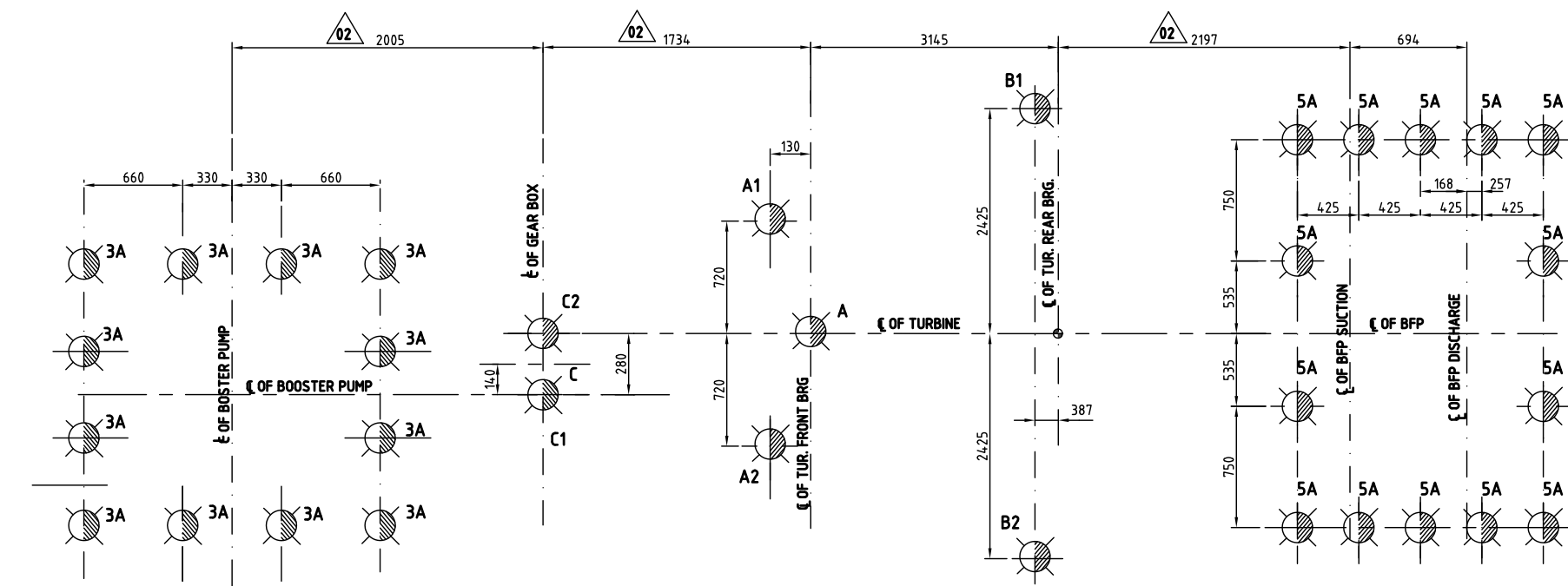
[illegible]

1.	JOB NO :	410
2.	STATUS:	CONTRACT
3.	DRG./REF. NO. (INTERNAL)	1-18000-57805
4.	DISTRIBUTION	
5.	TO	
6.	No. OF	

CUSTOMER: 	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED																		
CONSULTANT: 	TRACTEBEL ENGINEERING PRIVATE LIMITED																		
PROJECT:	2X800MW UPPUR STPP (UNIT #1&2) RAMANATHAPURAM DISTRICT, TAMILNADU																		
	BHARAT HEAVY ELECTRICALS LTD. HYDRABAD	<table border="1"> <thead> <tr> <th>ENTRY CODE</th> <th>NAME</th> <th>SDN</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>00N</td> <td>AKHARAPUR</td> <td>-96/1</td> <td>24-04-2007</td> </tr> <tr> <td>010</td> <td>HYDRABAD</td> <td>-96/2</td> <td>24-04-2007</td> </tr> <tr> <td>4-10</td> <td>UPPUR</td> <td>-96/3</td> <td>24-04-2007</td> </tr> </tbody> </table>	ENTRY CODE	NAME	SDN	DATE	00N	AKHARAPUR	-96/1	24-04-2007	010	HYDRABAD	-96/2	24-04-2007	4-10	UPPUR	-96/3	24-04-2007	
ENTRY CODE	NAME	SDN	DATE																
00N	AKHARAPUR	-96/1	24-04-2007																
010	HYDRABAD	-96/2	24-04-2007																
4-10	UPPUR	-96/3	24-04-2007																

TITLE														FOUNDATION ARANGEMENT OF MDBFP SET													
				DEPT.		SCALE		DRAWING NO. HY-DG-1-18000-57805																			
				SIGN																							
								SHEET				2		OF		REV. 00											
										SIZE-A0																	

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261



LOCATION OF LOAD POINTS ON FOUNDATION TOP DECK (FOR PUMP-A & B)

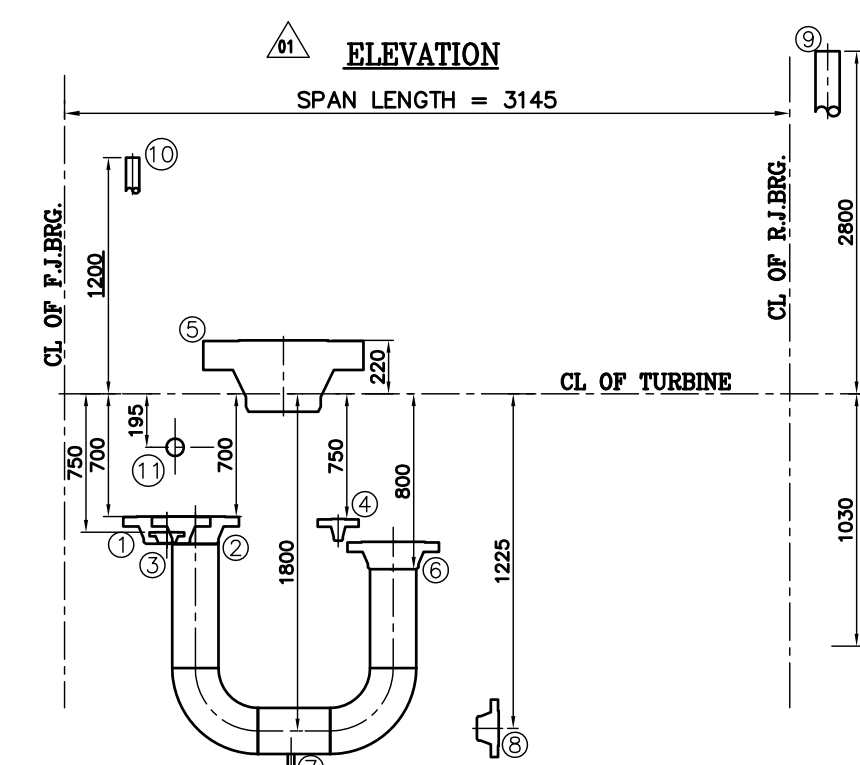
SUPPORT PLATES				81		81	
DESG.	PLATE SIZE	LOAD FOR EACH	QTY No's	LOCATION	OPERATING LOAD ON EP		
EP-1	800X300	3T EACH	2	BP SUCTION & ON BOTTOM OF THE DECK	3.0 T TOTAL		
EP-2	800X300	1.5 EACH	2	BP DISCHARGE & ON BOTTOM OF THE DECK	1.5 T TOTAL		
EP-3	300X300	1.5 T	1	STEAM TO BFPT & ON BOTTOM OF THE DECK	1.0 T		
EP-4	300X300	2.5 T	1	STEAM TO BFPT & ON BOTTOM OF THE DECK	1.5 T		
EP-5	1300X300	9.0T EACH	2	TDBFP SUCTION /DISCHARGE ON BOTTOM OF THE DECK	9.0 T TOTAL		
EP-6	300X300	1 T	2	RH SPRAY ON TOP	1.0 T		
EP-7	500 X 500	4.5 T	6	VERTICAL SIDE OF DECK (CL EL 16.300 M)	(SPARE)		
EP-8	2335 X 500	5.5 T	2	VERTICAL SIDE OF DECK (CL EL 16.450M)	(SPARE)		
EP-9	500 X 580	5 T	2	OPENING SIDES (CL EL 16.60 M)	(SPARE)		
EP-10	400 X 1150	6.5 T	2	OPENING SIDES (CL EL 16.60 M)	(SPARE)		

NOTES:-

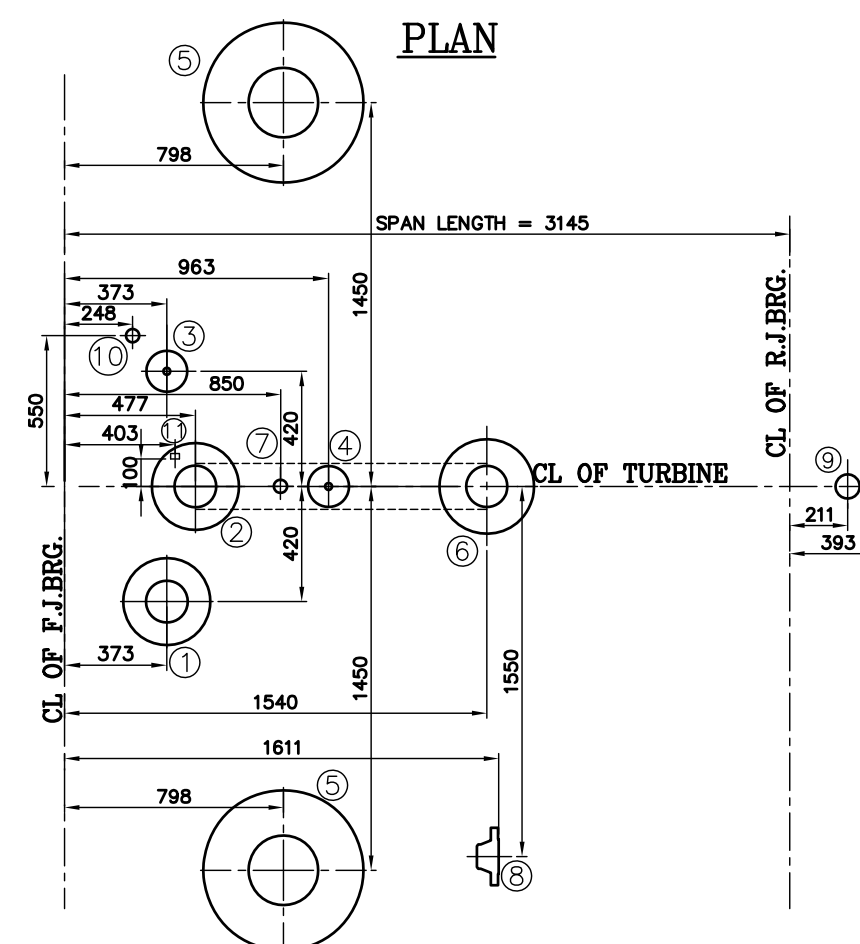
1. ALL ELEVATIONS MARKED ARE W.R.T TO HALL FINISHED FLOOR ELEVATION OF 0.00M WHICH CORRESPONDS TO EL 10'00"
2. ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS.
3. THIS DRG IS VALIED FOR BOTH TOBEP'S (A & B)
4. ALL SUPPORT PLATES SHALL BE IN THE SCOPE OF CIVIL DESIGNER.
5. SPRINGS HEIGHT AND LOCATIONS ARE TO BE DECIDED BY CIVIL DESIGNER.
6. * INDICATED DIMENSIONS ARE TO BE DECIDED CIVIL DESIGNER
7. FOR POINT LOAD DATA PLEASE REFER BHFL-PEM DRAWING.
8. HOLD REMOVED.

LEGEND:-

1.  INDICATES LOAD POINTS.
2. 
 - a) ALL EP MARKED ON PLAN ARE REQUIRED AT BOTTOM OF DECK.
 - b) EP MARKED ON SIDE (SECTION A-A & VIEW A) ARE REQUIRED AT BOTH SIDES OF DECK.
3.  ADDITIONAL EP OF 500 SD ARE REQUIRED AT OPPOSITE SIDES OF OPENING FOR TURBINE EXHAUST AT 400MM BELOW EP-5 ALONG CENTRE LINE OF EXHAUST HOOD
4.  ALL EP MARKED ON PLAN ARE REQUIRED AT TOP OF CENTRE LINE
5.  INSULATION FOR FOUNDATION PROTECTION FOR TURBINE CUTOUT.
6.  POCKETS.
7. 
 5. TOC TOP OF CONCRETE
 6. TOG TOP OF GROUT
 7.  CUT OUT IN TG DECK (Thorough Opening)



PLAN

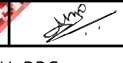
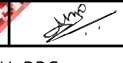
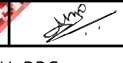


SL NO.	DESCRIPTION	QTY	TYPE OF FLANGE	MATERIAL
1.	FRONT GLAND INLET	1	6" #300 WNR,F,SCH=40	SA105
2.	BLAND PISTON GLAND	1	6" #300 WNR,F,SCH=40	SA105
3.	CASING DRAIN FLANGE-1	1	1" #600 WNR,F,SCH=80	SA105
4.	CASING DRAIN FLANGE-2	1	1" #600 WNR,F,SCH=40	SA105
5.	MAIN STEAM INLET	2	10" #1500 *	SA105
6.	B.P. GLAND INTO CASING	1	6" #150 WNR,F,SCH=40	SA105
7.	BP PIPING DRAIN	1	1" SOCKET	SA105
8.	REAR GLAND INLET	1	4" #300 WNR,F,SCH=40	SA105
9.	REAR STEAM VENT	1	PIPE DIA 89.94	SA105
10.	FRONT STEAM VENT	1	PIPE DIA 48.3x5.08	SA105
11.	FRONT STEAM GLAND DRAIN	1	PIPE 10.2x2, SA312,TP321	SS
12.	REAR STEAM GLAND DRAIN	1	DIL0 G 3/8" S.S	SS

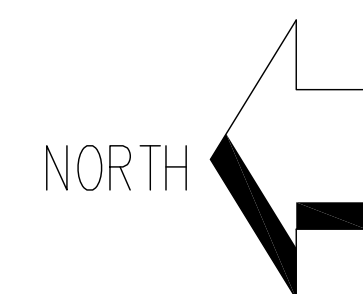
* MAIN STEAM FLANGE TYPE AND SCHEDULE TO BE DECIDED AND TO INFORMED TO PE GROUP

PLAN AT 17.00m (FOR PUMP-A)
(FOR PUMP-B ROTATE TOP DECK BY 180°)

REV.			DATE	ALTERED		REV.			DATE	ALTERED		REV.			DATE	ALTERED		REV.	DATE	ALTERED		REV.			DATE	ALTERED		REV.	DATE	ALTERED		REV.	DATE	ALTERED		REV.	DATE	ALTERED	
ZONE				CHD/APPD		ZONE				CHD/APPD		ZONE				CHD/APPD		03		CHD/APPD		ZONE				CHD/APPD		02		CHD/APPD, C.BALA/JI S.JH/MAH		01		CHD/APPD, S.JH/MAH		06.07.17		CHD/APPD, S.JH/MAH	
ZONE						ZONE						ZONE								DRAWING REVISED FOR FINAL GEAR BOX DETAILS AND MARKED AS <u>A2</u>		ZONE								DRAWING REVISED AS PER CUSTOMER & PEM COMMENTS FOR EP LOADING AND MARKED AS <u>A1</u>									

CUSTOMER:		TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED 5th Floor, Western Wing, NPKRR Madgal, 144, Anna Salai, Chennai-600002																							
CONSULTANT		TRACTEBEL ENGINEERING PVT LTD																							
PROJECT:		2x800MW TANGEDCO UPPUR STPP (UNIT 1 & 2) RAMANTHAPURAM DIST. TAMILNADU																							
		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		<table><tr><th></th><th>NAME</th><th>SIGNATURE</th><th>DATE</th><th>NO OF VAR.</th></tr><tr><td>DRN</td><td>C.B.A.LAJI</td><td></td><td>10.05.2017</td><td></td></tr><tr><td>CHD</td><td>S.J.HUSSAIN</td><td></td><td>10.05.2017</td><td>-N-A-</td></tr><tr><td>APPD</td><td>M.A.HASEEB</td><td></td><td>10.05.2017</td><td>-N-A-</td></tr></table>			NAME	SIGNATURE	DATE	NO OF VAR.	DRN	C.B.A.LAJI		10.05.2017		CHD	S.J.HUSSAIN		10.05.2017	-N-A-	APPD	M.A.HASEEB		10.05.2017	-N-A-
	NAME	SIGNATURE	DATE	NO OF VAR.																					
DRN	C.B.A.LAJI		10.05.2017																						
CHD	S.J.HUSSAIN		10.05.2017	-N-A-																					
APPD	M.A.HASEEB		10.05.2017	-N-A-																					
DEPT. TCEP	UNITOL DIMS. GR EPMAR		SCALE 1:30	WEIGHT (KG) -N-A-	<table><tr><th></th><th>REF TO ASSY. DRG.</th><th>ITEM NO.</th><th>NO OF ITEMS</th></tr><tr><td></td><td>-N-A-</td><td>-N-A-</td><td>-N-A-</td></tr></table>		REF TO ASSY. DRG.	ITEM NO.	NO OF ITEMS		-N-A-	-N-A-	-N-A-												
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	-N-A-	-N-A-	-N-A-																						
CODE 615		TITLE FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE		<table><tr><th></th><th>CARD CODE N.A.</th><th>REV.</th></tr><tr><td></td><td>DRAWING NO. <u>11-313-01-17135</u> HY-DG-1-31301-17135</td><td>02</td></tr></table>		CARD CODE N.A.	REV.		DRAWING NO. <u>11-313-01-17135</u> HY-DG-1-31301-17135	02															
	CARD CODE N.A.	REV.																							
	DRAWING NO. <u>11-313-01-17135</u> HY-DG-1-31301-17135	02																							
		SHT. No. 01		NO. OF SHT. 03																					

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261



REF. DRGS.: —

S.No.	BHEL DRG.No.	TITLE
1	PE-DG-425-100-M005	TG EQUIPMENT PLAN AT EL.17.0 m.

CUSTOMER:		TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED													
		5th Floor, Western Wing, NPKRR Maaligal, 144, Anna Salai, Chennai - 600002													
CONSULTANT		TRACTEBEL ENGINEERING PVT LTD													
PROJECT:		2x800MW TANGEDCO UPSTP STPP (UNIT 1 & 2) RAMANTHAPURAM DIST. TAMILNADU													
		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD						NAME C BALAJI S J HUSSAIN M A HASEEB		SIGN 		DATE 10.05.2017 10.05.2017 10.05.2017		NO. OF VAR. -N-A- -N-A-	
						SCALE 1:30		WEIGHT (KG) -N-A-		REF. TO ASSY. DRG. -N-A-		ITEM NO. -N-A-		NO. OF ITEMS -N-A-	
DEPT. TCEP CODE 415		UNTOL. DIMS. GR. 415													
TITLE		FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE								CARB CODE N.A.		DRAWING NO. (11-313-0117135) HY-DG-1-31301-17135		REV 02	
10		11		11		12		12		12		12		12	

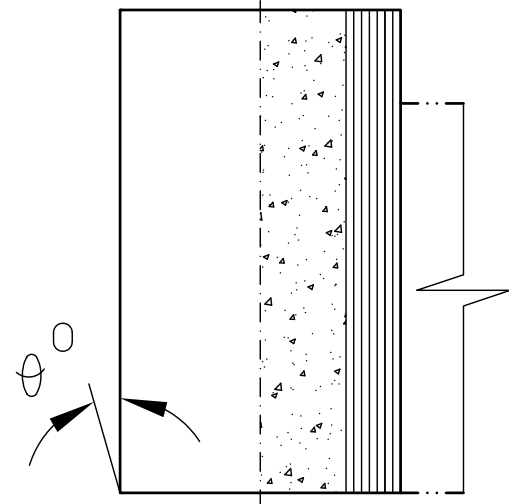
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

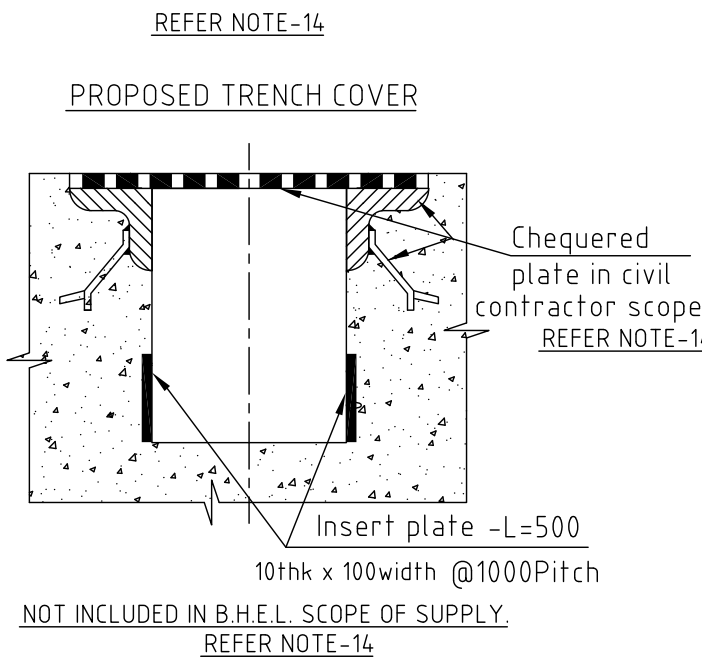
TYPE OF TURBINE :- NK 63/80-3			
TYPE OF BOILER FEED PUMP :- MDG 436			
TYPE OF BOOSTER PUMP :- MLC 450x350H			
WEIGHT OF SINGLE HEAVIEST PIECE FOR			
	ERECTION	in kg.	MAINTENANCE
TURBINE	32,000		26,000
BFP	34,600		3,500
BP	8,500		1,500
DIRECTION OF ROTATION VIEWED FROM BOOSTER PUMP TO BFP FOR :-			
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. REFER NOTE-14

Speeds in rpm

EQUIPMENT	RATED SPEED	CRITICAL SPEEDS	
		FIRST	SECOND
TURBINE	5180	Beyond 125% of mcs	-
BFP	5180	-	-
BP	1495	-	-

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 ** (ROTATING)	FAILURE MODE LOAD ** (Turbine - Blade breakage)
		1	2	3	4	5	6	7
A	-	-	4050	-	-	-	144.0	864.0
A1	13640	-	700	-	104.0	-	-	-
A2	13640	-	700	-	-104.0	-	-	-
B	-	-	-	-	-	-	-	-
B1	24360	2475	19100	-	-310	880	5280	
B2	24360	2475	19100	-	310	880	5280	
C	660	-	-	-	-	-	-	-
C1	-	220	-	-	3600	80	480	
C2	-	550	-	-	-3600	60	360	

FOUNDATION LOADING DATA

LOAD APPLICATION POINT	EQUIPMENT	WEIGHT		STATIC LOAD ON EACH POINT(kg's)		DYNAMIC LOAD ON EACH POINT(kg's)	
		DRY	WET	VERTICAL	HORIZONTAL	VERTICAL	AXIAL
5A	BOILER FEED PUMP (MDG 436)	34600	34900	2493	2925	2925	1950
3A	BOOSTER PUMP (MLC 450x350 H)	8500	9000	750	738	738	492

- ** 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:

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

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 - 1) 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 OF DRAWING: FINAL

CUSTOMER: TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED
5th Floor, Western Wing, NPKRR Moolgali,
144, Anna Salai, Chennai-600002

CONSULTANT: TRACTEBEL ENGINEERING PVT LTD

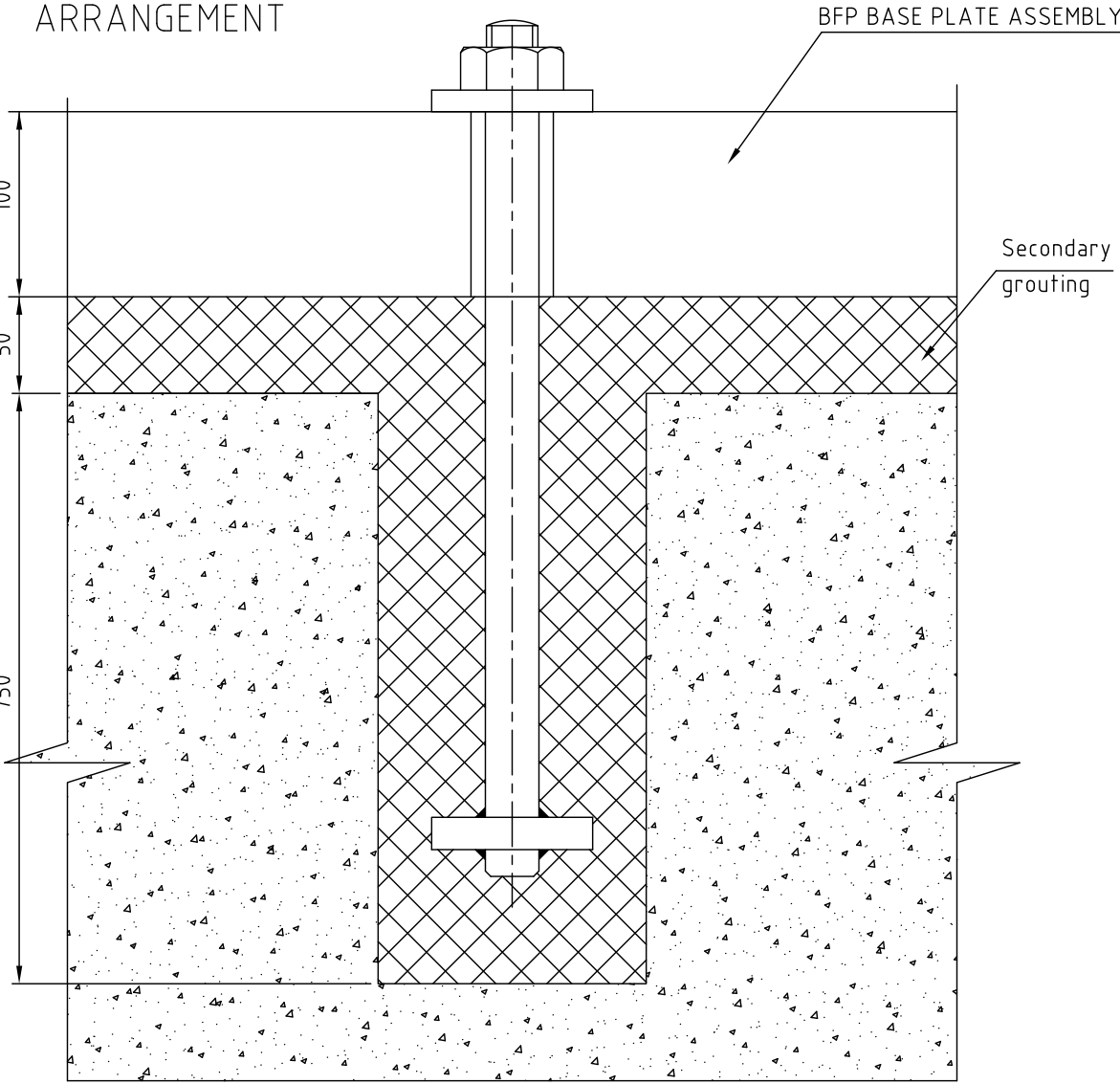
PROJECT: 2x800MW TANGEDCO UPPUR STPP (UNIT 1 & 2)
RAMANTHAPURAM DIST. TAMILNADU

BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	NAME	SIGNED	DATE	NO OF VAR
	DRN. C.BALAJI		10.05.2017	
	CHD. S.J.HUSSAIN		10.05.2017	-N.A.-
	APPD. M.A.HASEEB		10.05.2017	-N.A.-

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

TITLE: FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE
DRAWING NO. (1-313-01-17135)
HY-DG-1-31301-17135 02
SHT. No 03 NO OF SHT. 03

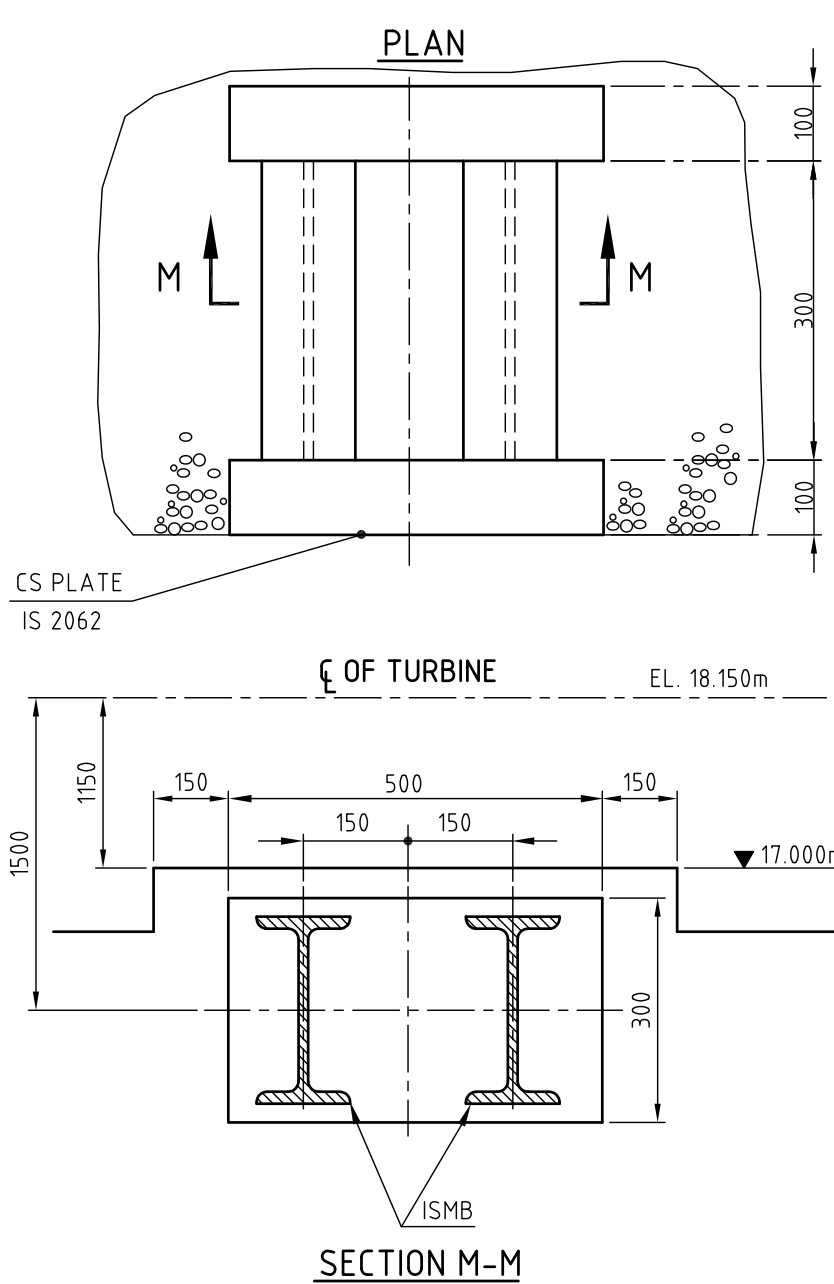
FOUNDATION BOLT ARRANGEMENT



Note: Sealing mortar pouring and bitumen shall be part of ERECTION contract

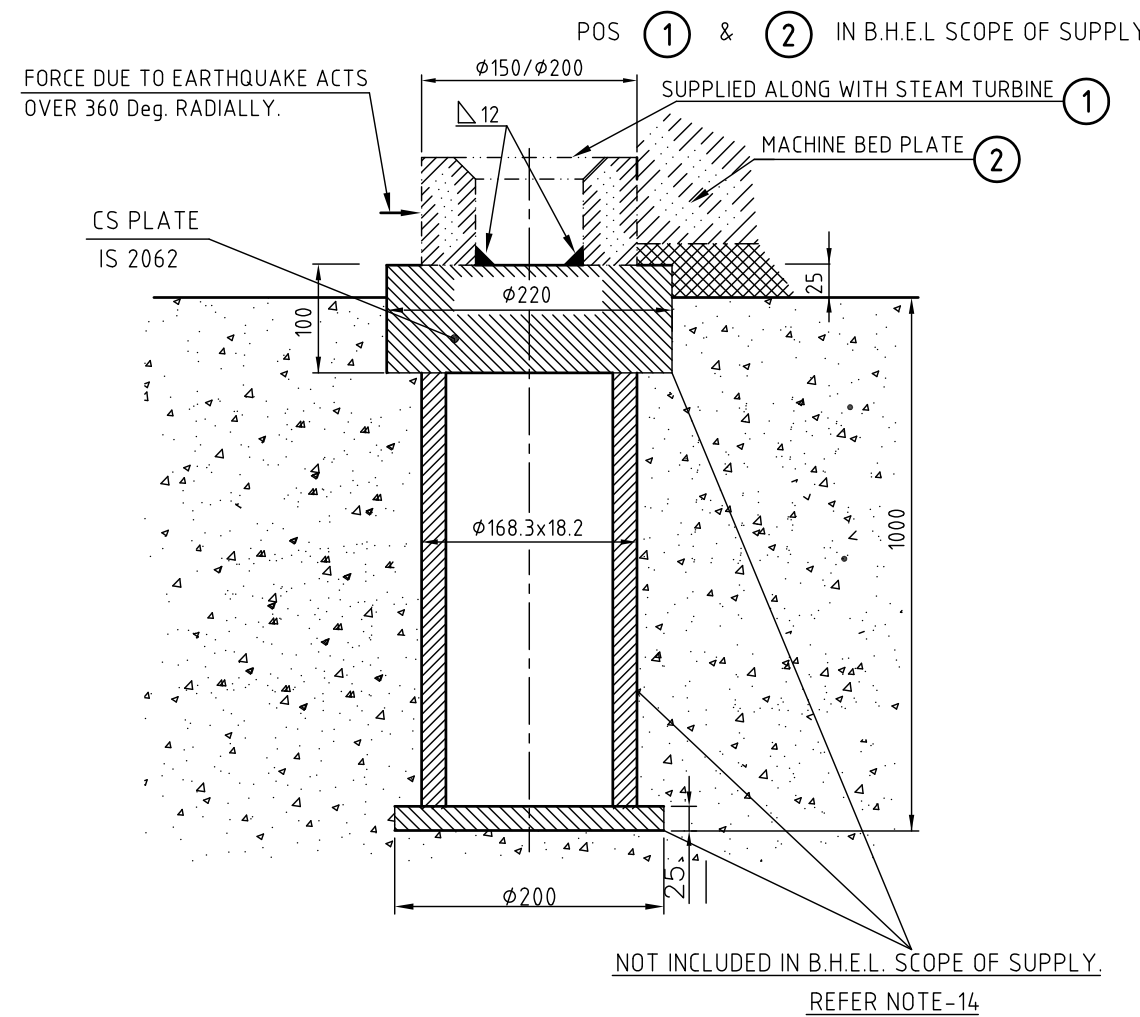
DETAIL 'GUIDE'

(FOR EXHAUST HOOD GUIDE SUPPORT)
NOT INCLUDED IN B.H.E.L. SCOPE OF SUPPLY. REFER NOTE-14

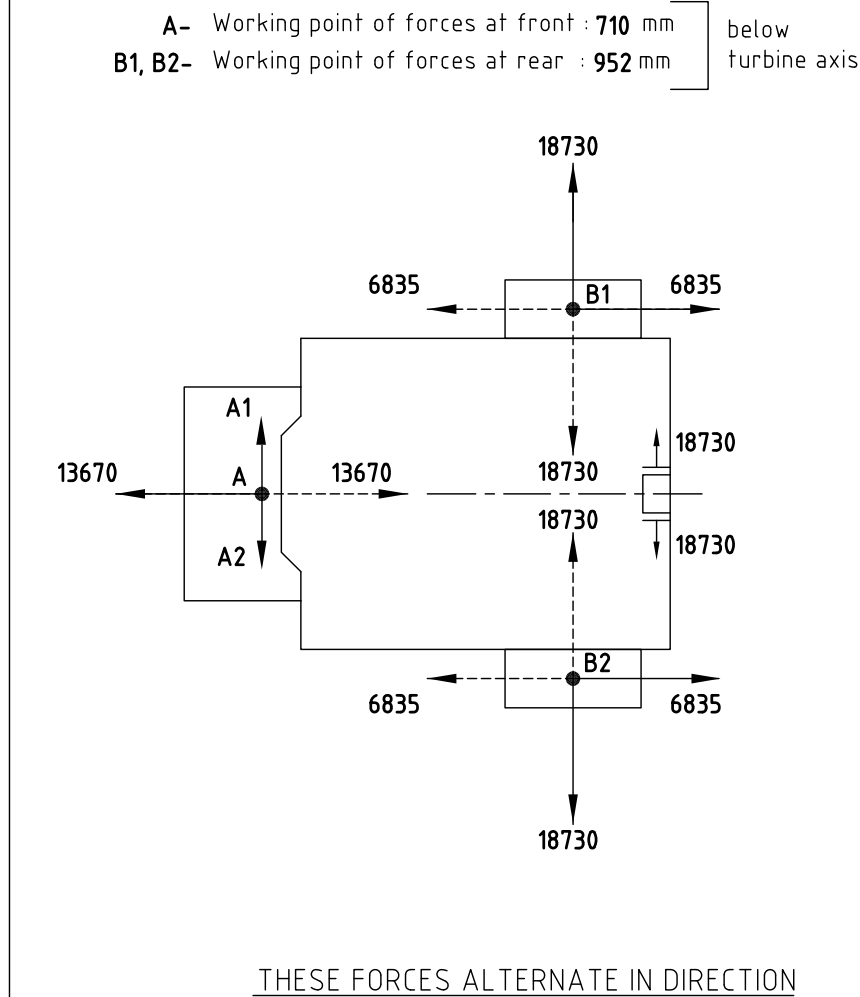


DETAIL 'EQ-TG'

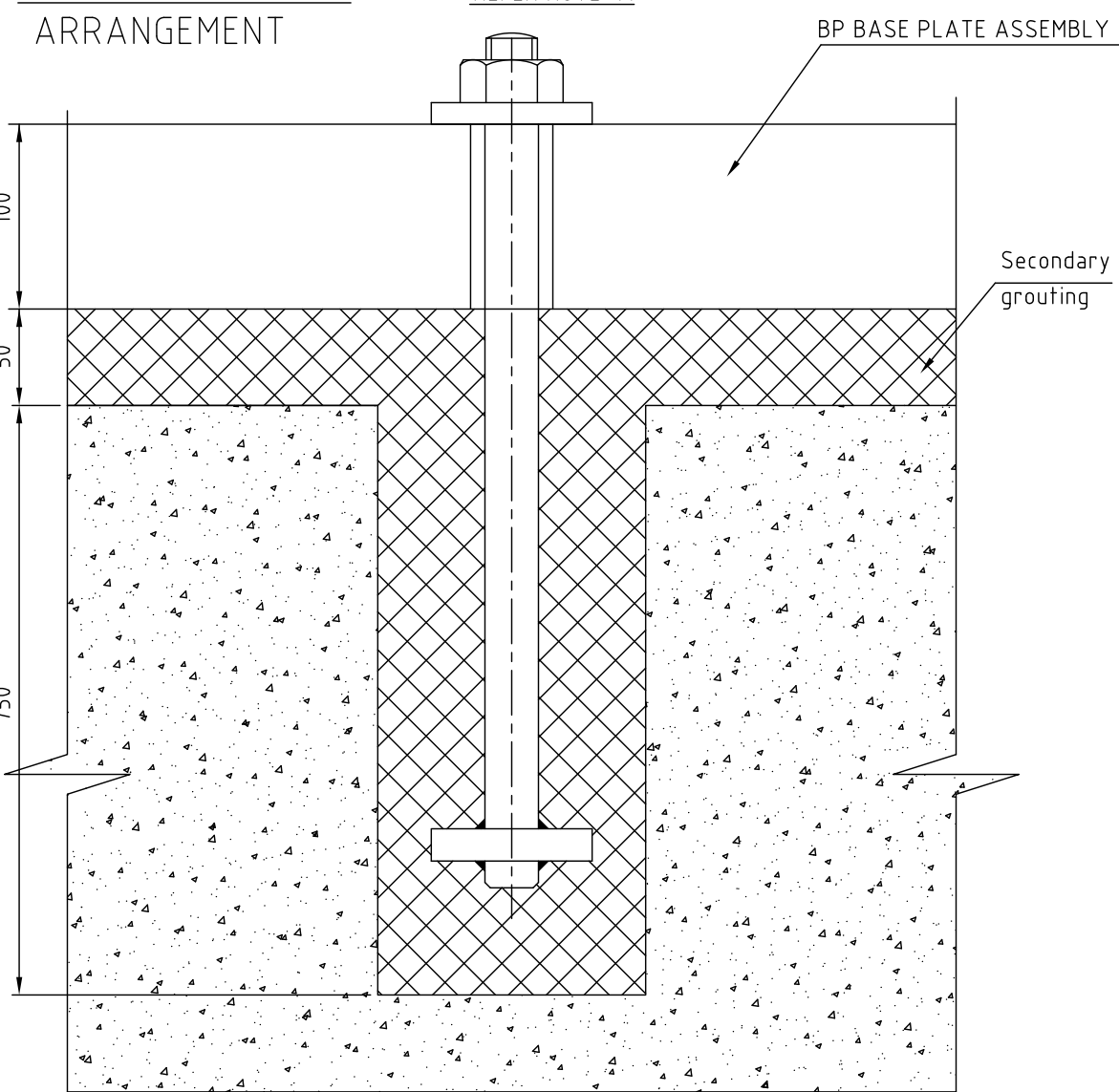
REFER NOTE-14



HORIZONTAL FRICTIONAL FORCES IN kgf



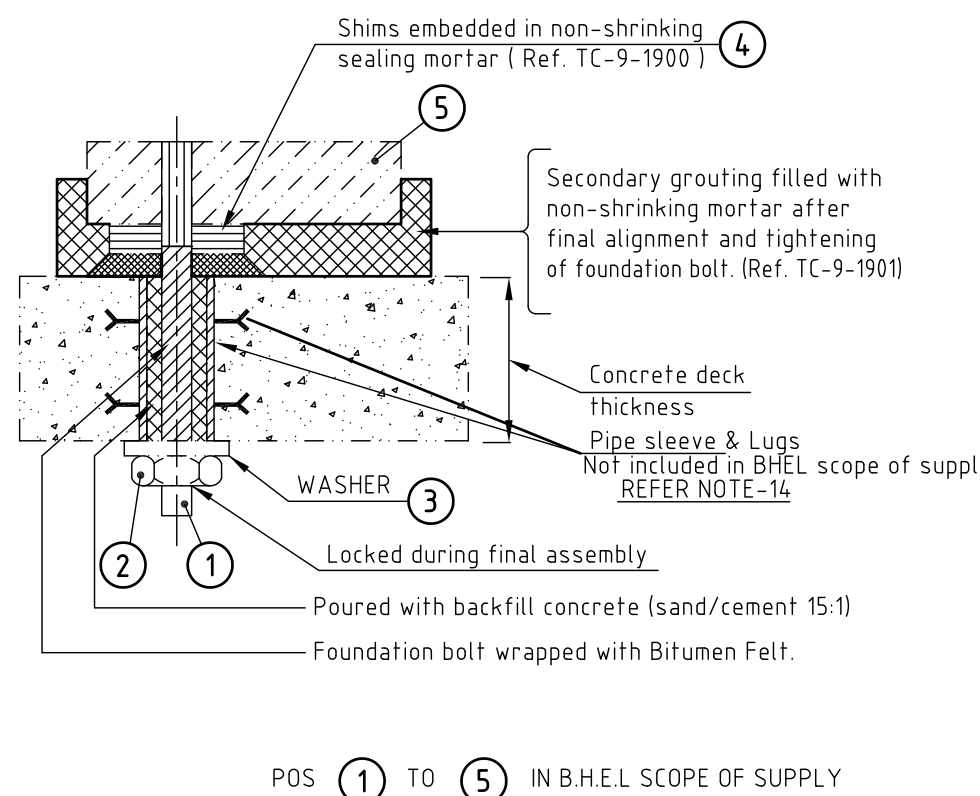
FOUNDATION BOLT ARRANGEMENT



Note: Sealing mortar pouring and bitumen shall be part of ERECTION contract

DETAIL 'SP-WN'

FOUNDATION BOLT ASSEMBLY
REFER NOTE-14



POS ① TO ⑤ IN B.H.E.L. SCOPE OF SUPPLY

DETAIL 'SP-N'

REFER NOTE-14

