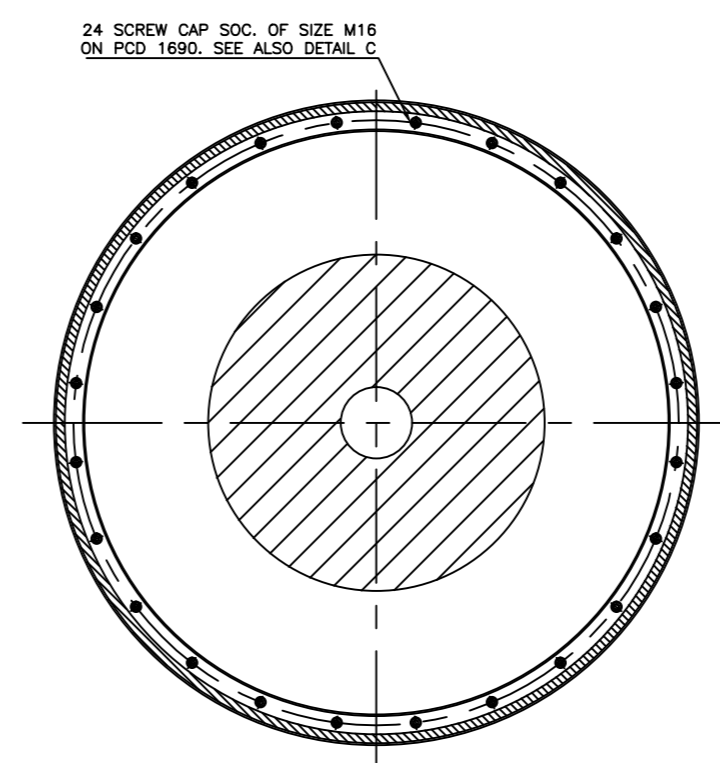
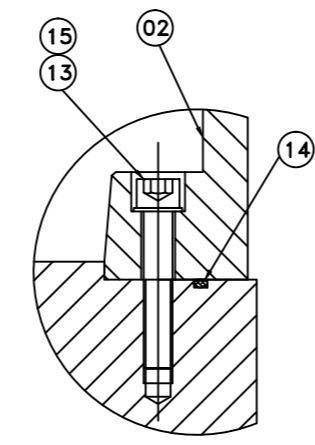
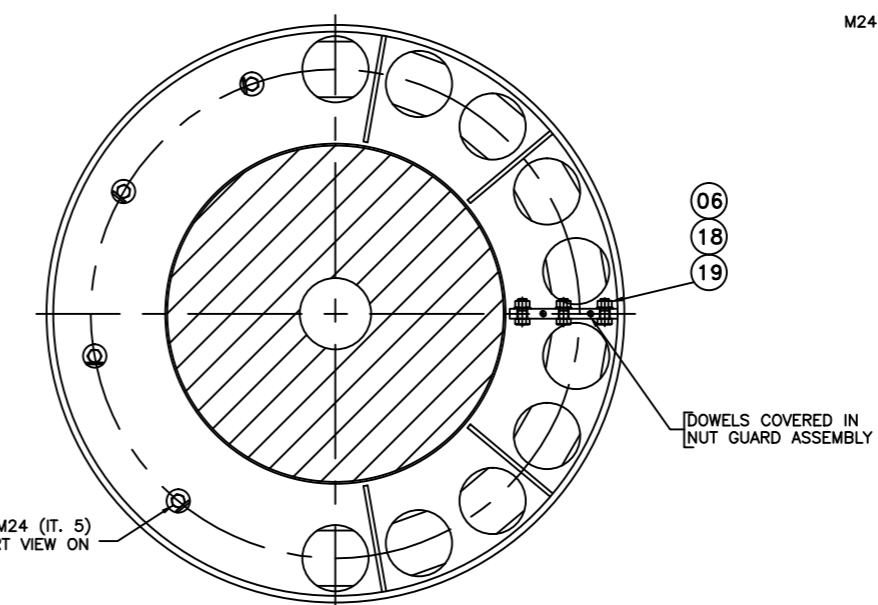
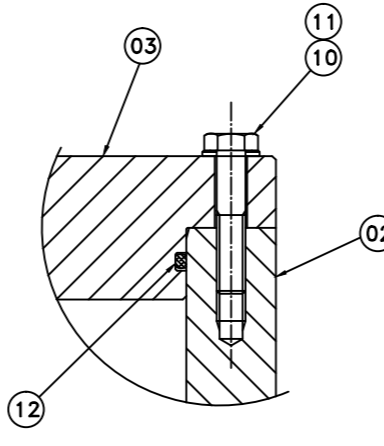
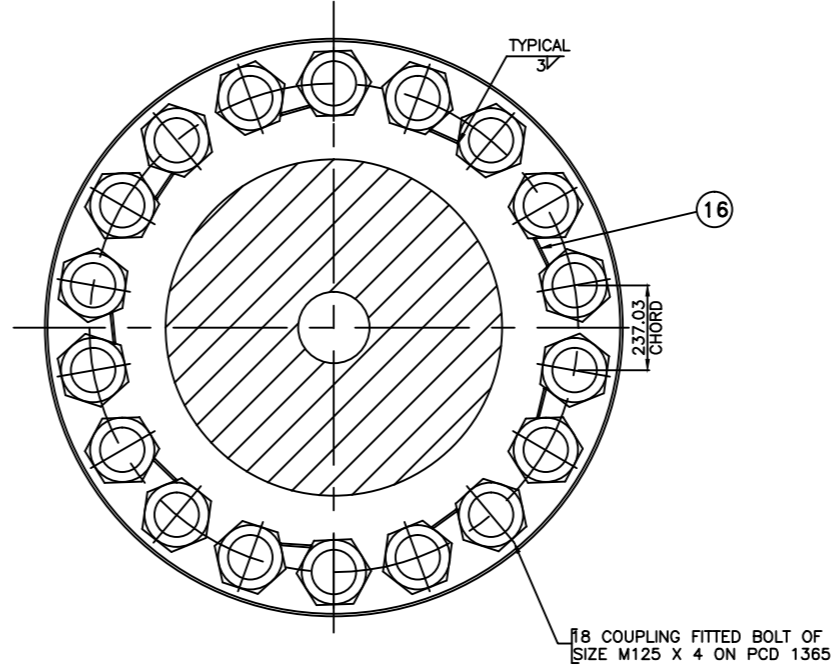
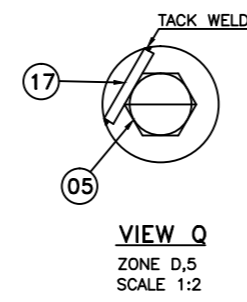
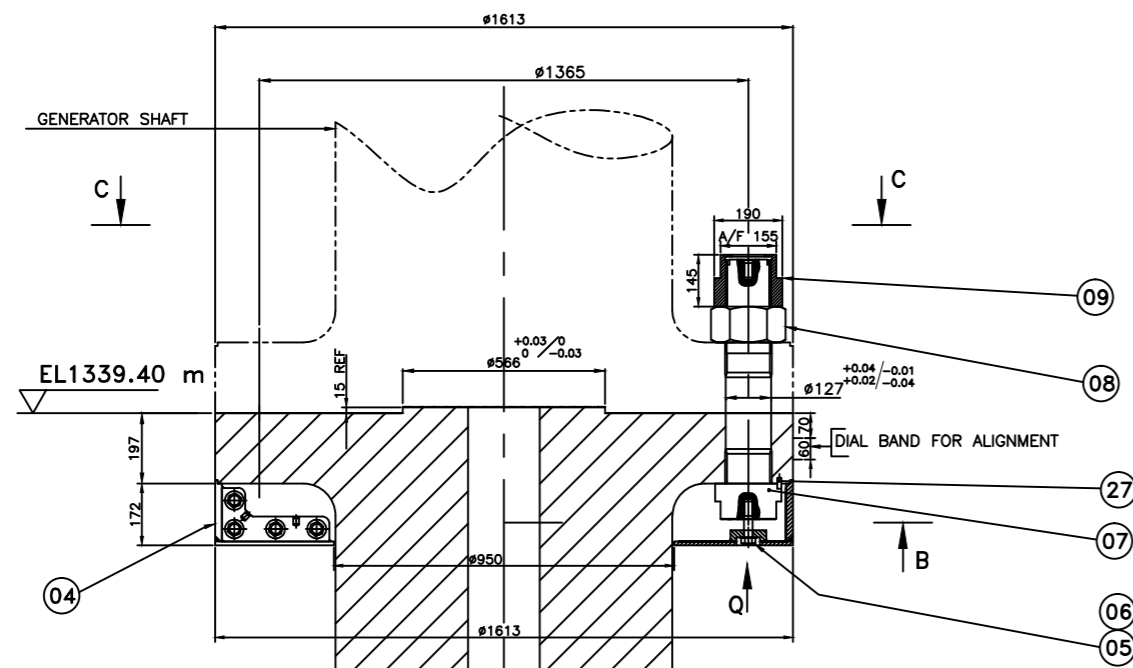


GENERATOR END



TECHNICAL REQUIREMENTS:

- a) AT WORKS:
1. THE ASSEMBLIES OF NUT GUARD(IT-4) AND OIL SUMP(ITEM-2) ARE TO BE PROVED IN THE SHOP WITH MAIN SHAFT.
 2. GRAVITY TEST OF OIL SUMP IS TO BE CARRIED OUT AT OUR WORKS BEFORE DESPATCH.
 3. ALL FASTENERS EXCEPT THOSE OF STAINLESS STEEL ARE TO BE ZINC ELECTROPLATED AS PER BP 0673693 HAVING PLATING THICKNESS 10 TO 14 MICRONS.
 4. DIMENSIONS OF FITTED BOLT (ITEM-7) & FITTED SLEEVE (ITEM-23) TO BE RECORDED.
- b) AT SITE:
1. WHILE ASSEMBLING TURBINE SHAFT WITH GENERATOR SHAFT, ALIGN THEIR MATCH MARK LINES (MARKED AT WORKS).
 2. OIL SUMP IS IN ONE PIECE. TO BE ASSEMBLED WITH SHAFT BEFORE COMMENCE OF GENERATOR SHAFT ASSEMBLY.
 3. FITTED BOLTS IT.7&8 TO BE TIGHTENED TO ACHIEVE AN ELONGATION OF 0.44mm APPROX (CORRESPONDING TO STRESS OF 2000 Kg/cmSQ. APPROX.).
 4. STUD BOLTS (IT.24) TO BE TIGHTENED TO ACHIEVE AN ELONGATION OF 1.08mm APPROX (CORRESPONDING TO STRESS OF 4250Kg/cmSQ. APPROX.).
 5. HIGH QUALITY MOLYBDENUM DISULFIDE LUBRICANT TO BE APPLIED ON THREAD AND CONTACT SURFACES OF NUT AND FITTED BOLT.
 6. HOLDITE TO BE APPLIED ON JOINT FACES OF OIL SUMP COVER.

REFERENCE DRAWINGS-

INSTALLATION OF TURBINE HOUSING	0 202 11 14401	PBT-II-TUB02DD004
ARRANGEMENT OF GUIDE BEARING	0 206 01 14401	PBT-II-TUB05DD003
ARRANGEMENT OF RUNNER	0 204 07 14401	PBT-II-TUB05DD001

TIGHTENING MOMENT OF BOLTS

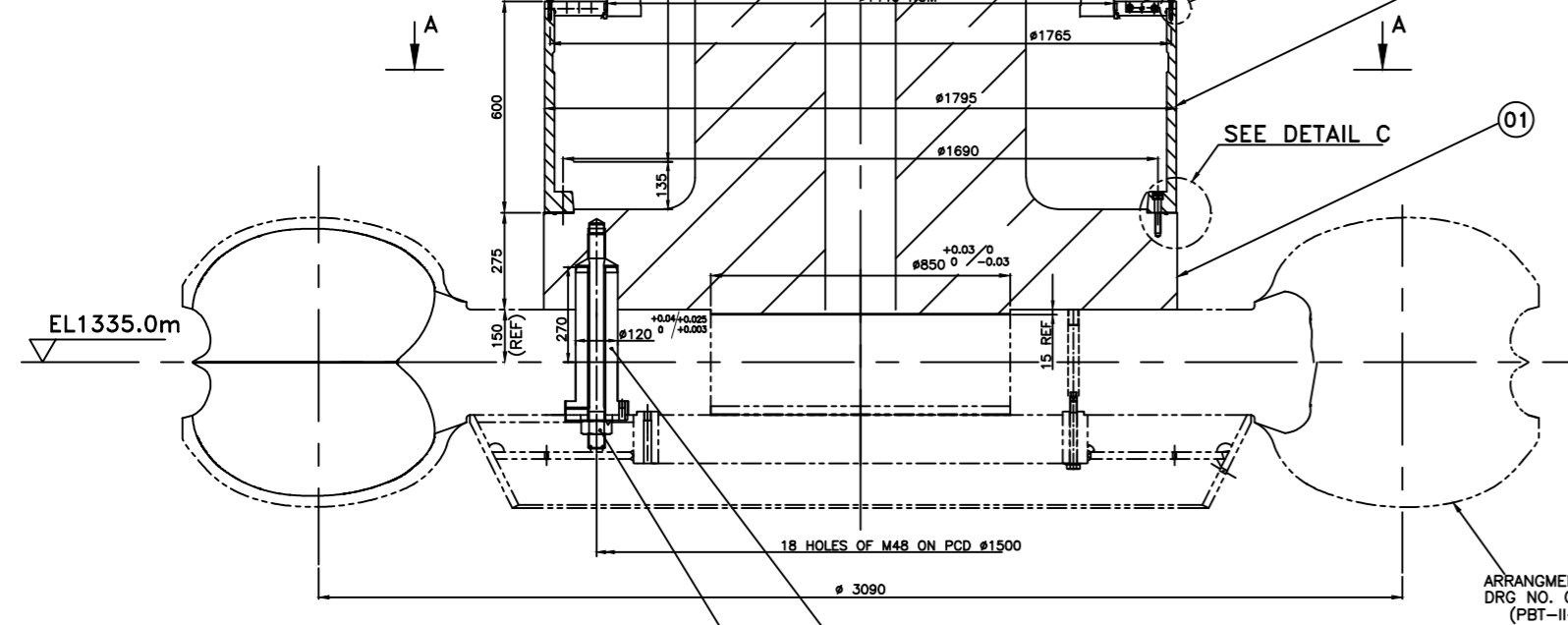
M8	7Nm
M12	24Nm
M16	57Nm
M24	192Nm

REFER ARRANGEMENT OF GUIDE BEARING DRG NO. 0 206 01 14401 (PBT-II-TUB05DD003)

REFER INSTALLATION OF TURBINE HOUSING DRG NO. 0 202 11 14401 (PBT-II-TUB02DD004)

ARRANGEMENT OF RUNNER DRG NO. 0 204 07 14401 (PBT-II-TUB05DD001)

RUNNER END



QTY	ITEM NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL PRICE	REMARKS
2 X 4	27	PIN	4 203 04 135013	Gr: C20	0.030		
2 X 4	26	LOCKING WASHER	4 205 01 14409	IS:9550	0.018		
2 X 4	25	HEX NUT M48 X 5	4 205 01 14409	SS	0.004		
2 X 4	24	STUD M48 X 5 X 640LG.	3 205 01 14404	TP-409	0.18		
2 X 4	23	FITTED SLEEVE	3 205 01 14403	TYPE-431	2.60		
2 X 4	22	SPRING PIN #10 X 30 LG.	4 203 04 13504	ASTM A276	0.18		
2 X 4	21	WASHER SPRING LOCK SC B12-ST	AA7123123271	TYPE-431	9.00		
2 X 4	20	HEX. SOC. HD. CAP SCREW M12X65LG.P-12.9	AA7123123271	ASTM A276	NO 018		
2 X 4	19	NUT HEX A M24 P-8	IS:1367 (PL.3)	ASTM A276	34.50		
2 X 4	18	HEX SCREW A M24X55 LG. P-8.8	IS:1367 (PL.3)	ASTM A276	NO 018		
2 X 4	17	LOCKING STRIP 6TK X 25 X 600	IS:2062 Gr:A	IS:2507	0.040		
2 X 4	16	LOCKING STRIP 6TK X 40 X 1MTR	IS:2062 Gr:A	AA7164002070	NO 002		
2 X 4	15	WASHER SPRING SC B 16 - ST	AA7164002088	SPRING STEEL	0.004		
2 X 4	14	NITRILE RUBBER CORD DIA 6 X 6MTR. LG	AA5984407080	SPRING STEEL	NO 004		
2 X 4	13	SCRU CAP SOC M16 X 90 LG.	4 205 01 13511	IS:1367 (PL.3)	0.071		
2 X 4	12	NITRILE RUBBER CORD DIA 4 X 6MTR. LG	AA5984407043	IS:1367 (PL.1)	0.099		
2 X 4	11	WASHER SPRING SC B 8 - ST	AA7164002053	IS:1367 (PL.3)	NO 008		
2 X 4	10	BOLT HEX A M8X40 LG. P-8.8	IS:1367 (PT.3)	AA7121131048	0.384		
2 X 4	09	PROTECTION SLEEVE	4 205 01 14405	IS:1367 (PL.3)	NO 08		
2 X 4	08	NUT HEX M125 X 4 P-8	HT-00106	AA1010308998	0.700		
2 X 4	07	FITTED BOLT M125 X 4 X 626 LG	3 205 01 14401	IS:2062 Gr:A	NO 001		
2 X 4	06	WASHER SPRING SC B 24 - ST	AA7164002100	IS:2062 Gr:A	1.800		
2 X 4	05	BOLT HEX A M24X100 LG-P8.8	IS:1367 (PT.3)	IS:2062 Gr:A	NO 001		
2 X 4	04	NUT GUARD (IN HALVES)	1 205 01 14402	AA711122054	0.009		
2 X 4	03	OIL SUMP COVER (IN HALVES)	2 205 01 14402	IS:1367 (PT.3)	NO 024		
2 X 4	02	OIL SUMP (IN ONE PIECE)	2 205 01 14401	CLASS-2	0.02		
2 X 4	01	SHAFT (MACHINING)	0 205 01 14402	IS:2004	28.0		

NATIONAL HYDRO ELECTRIC POWER CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)

PARBATI HYDROELECTRIC PROJECT STAGE-II (H.P.) INDIA

STATUS OF DRAWING: U

DISTRIBUTION OF PRINTS: HTE-2, WTM-5, THX-1

SUB - VENDOR: BHARAT HEAVY ELECTRICALS LTD.

LOGO / NAME: BHARAT HEAVY ELECTRICALS LTD.

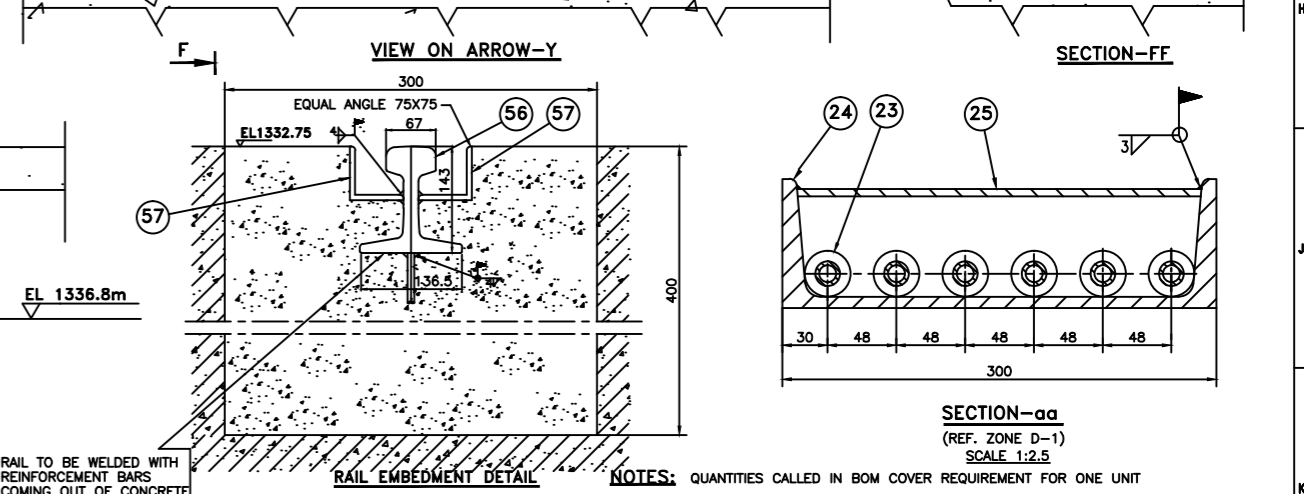
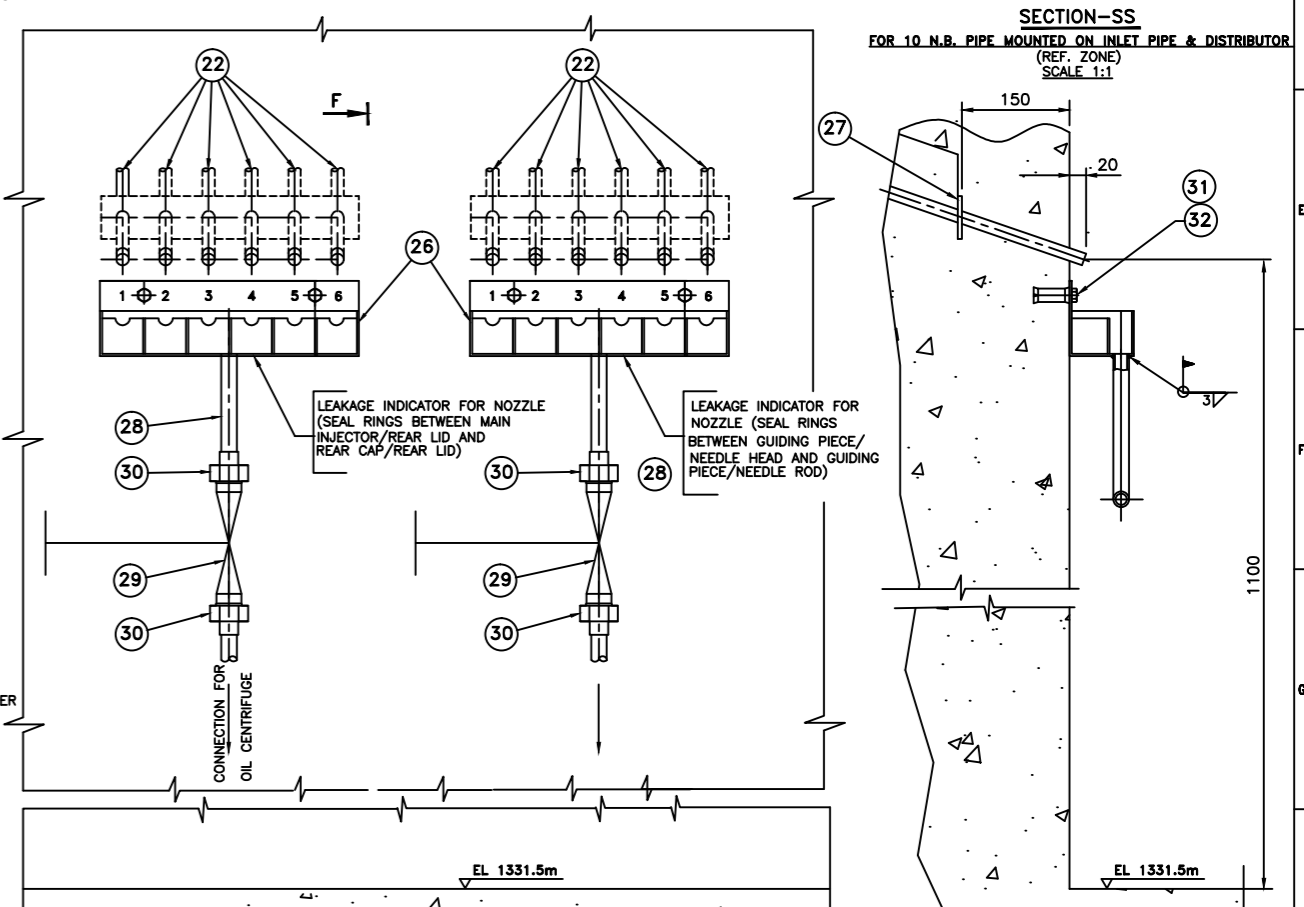
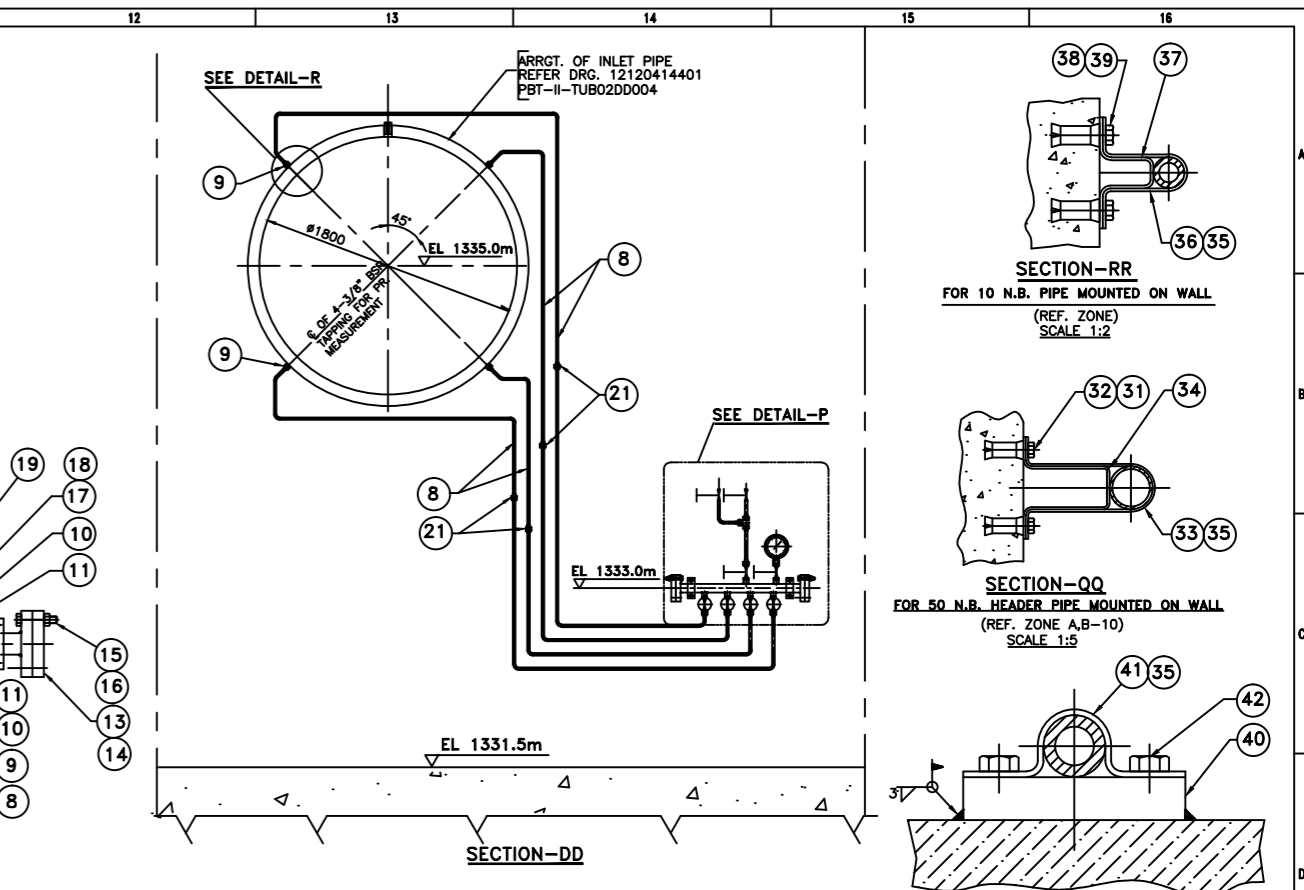
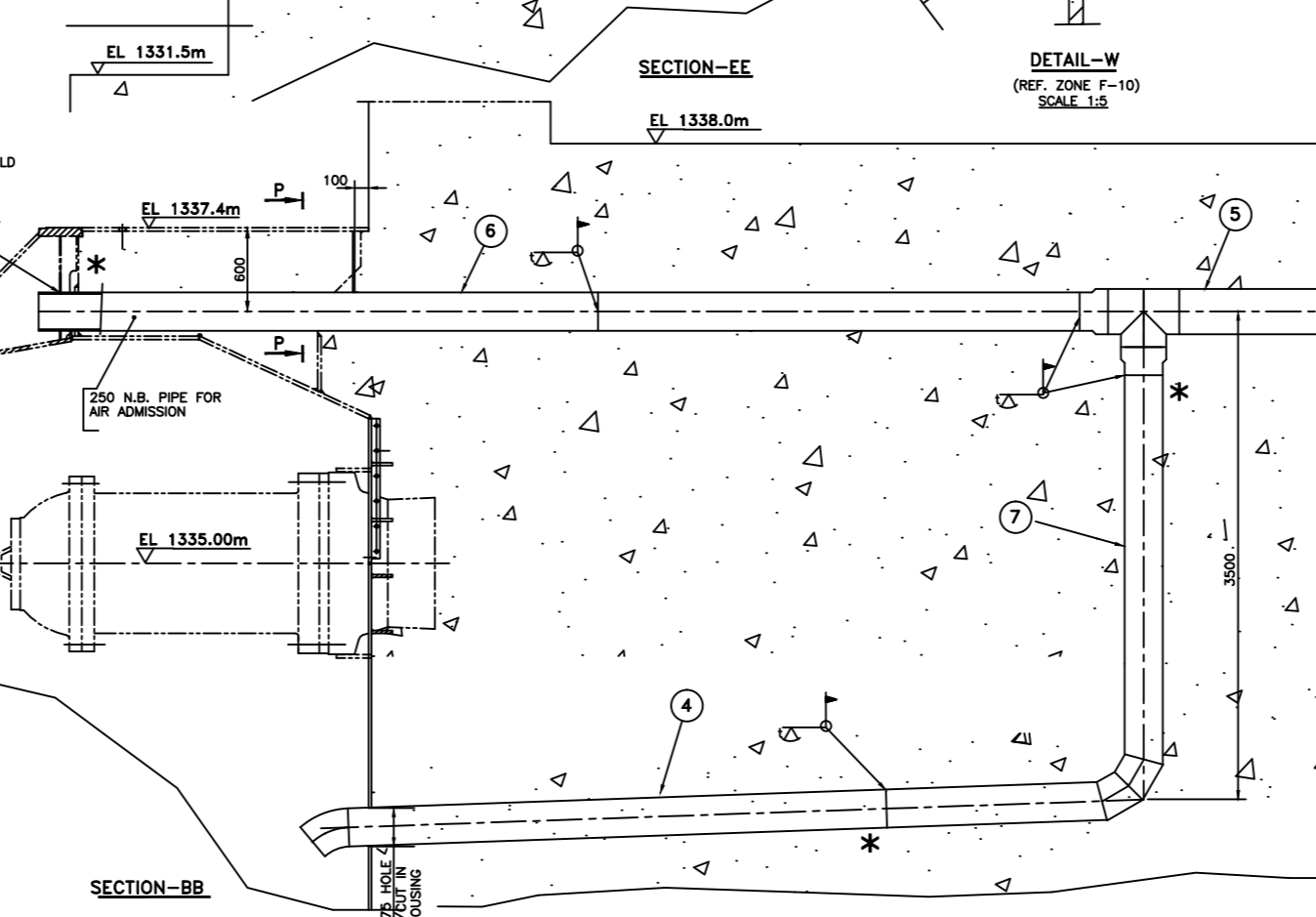
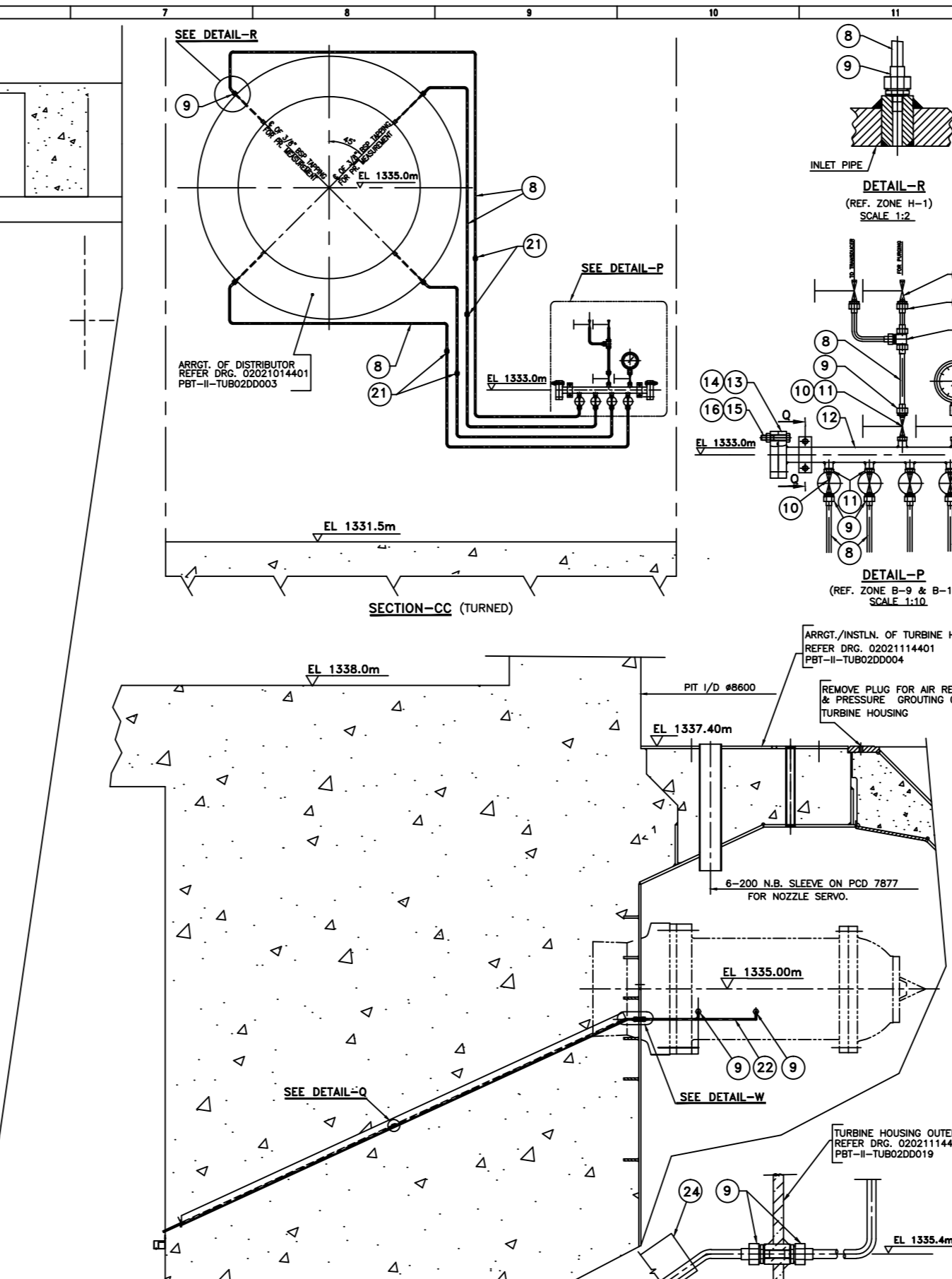
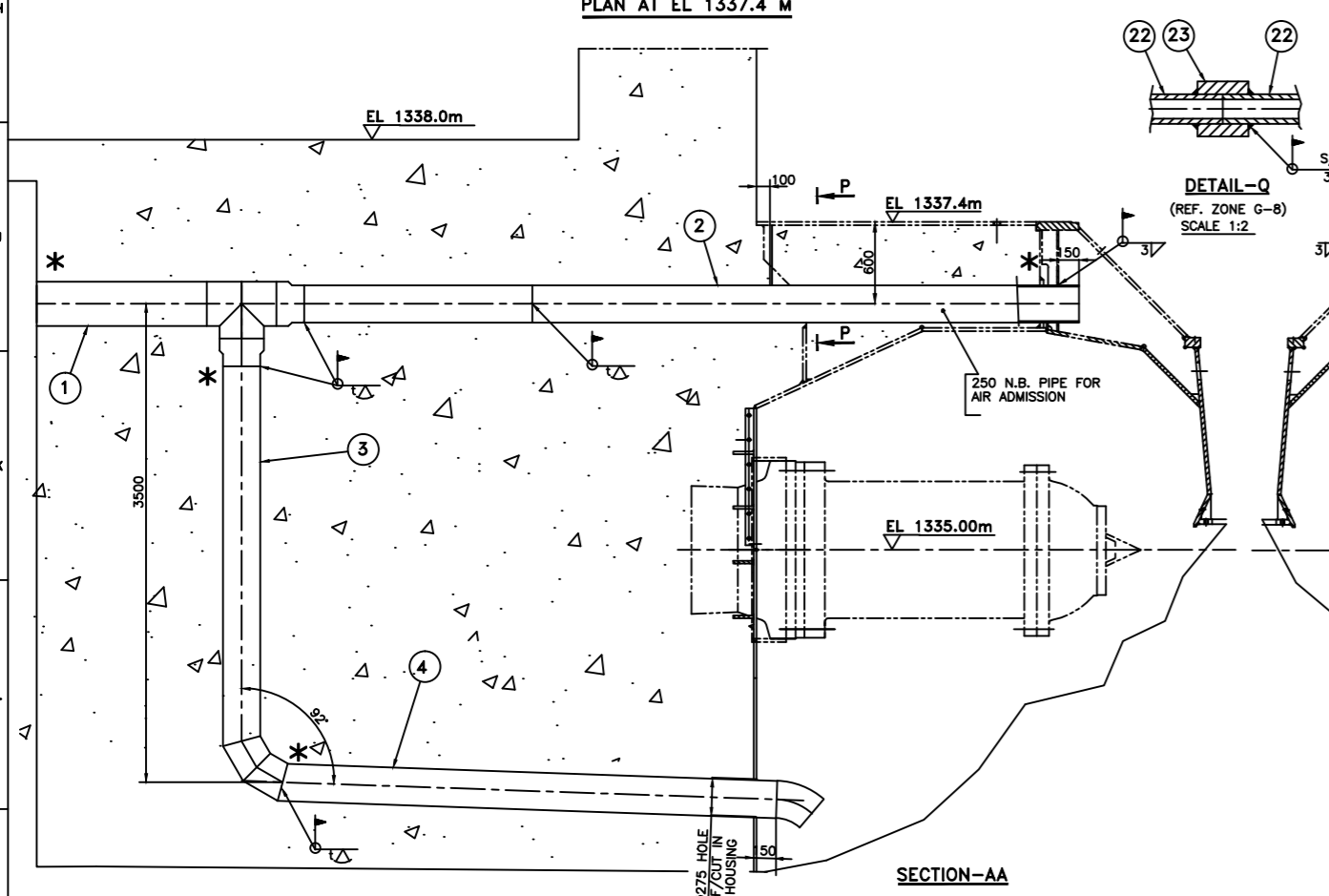
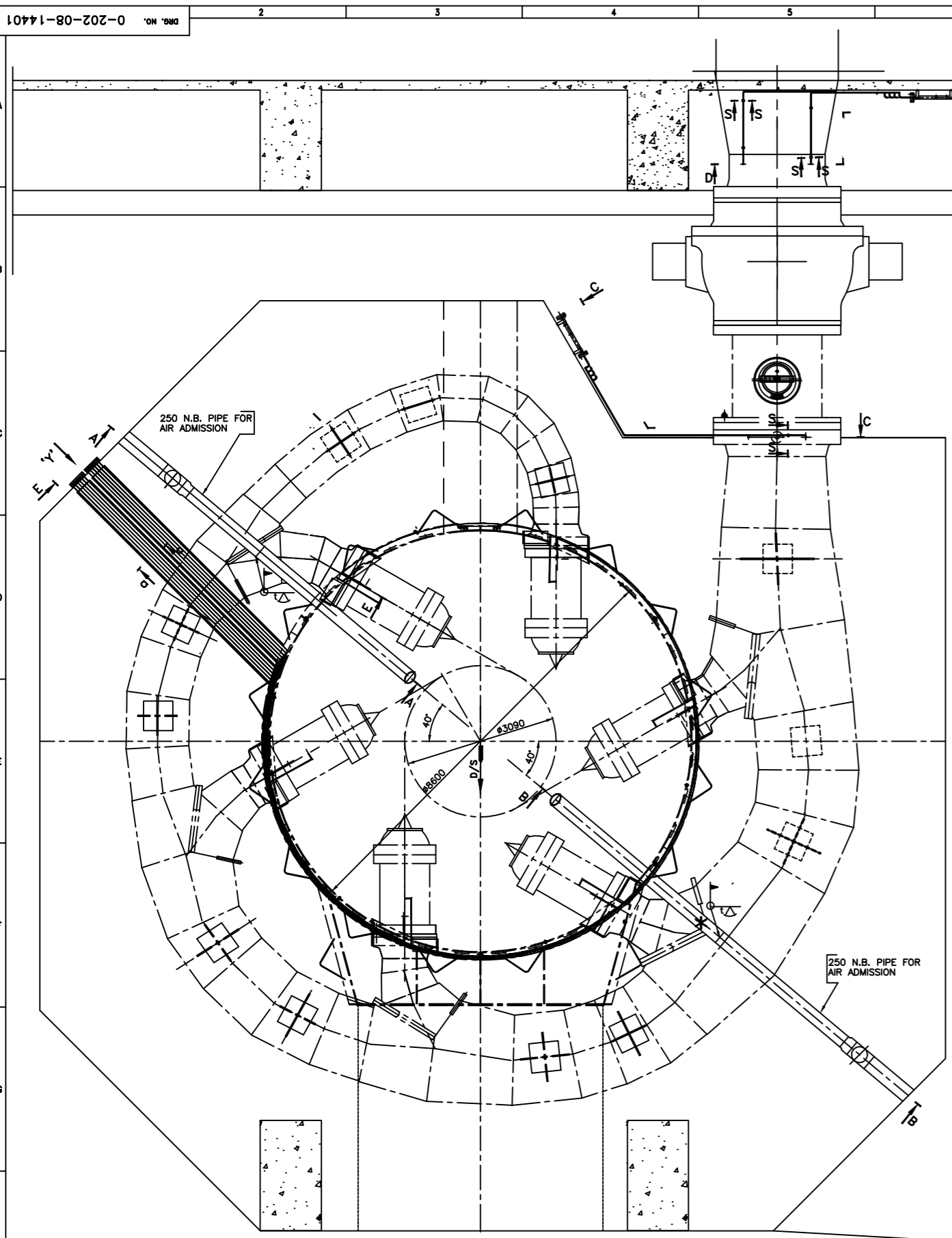
REVISED AS PER CUSTOMER'S COMMENT

SHAFT ARRANGEMENT

0 205 01 14401 03

REV.	DATE	ALTERED	CHECKED	APPROVED	REV.	DATE	ALTERED	CHECKED	APPROVED	REV.	DATE	ALTERED	CHECKED	APPROVED
03	24-8-05	CHECKED	AMRESH		02	4-7-05	CHECKED	AMRESH		01	20-2-04	CHECKED	AMRESH	

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.



IN LENGTHS OF 4-5M LG.	057	EQUAL ANGLE 75X75 75X75X56mm LONG	AA1012508129	KG	380.00
	058	RAIL SECTION-28m LONG (45 Kg/m) <td>AA 10108</td> <td>KG</td> <td>001</td>	AA 10108	KG	001
	055	HOOK <td>3-202-08-14404</td> <td>KG</td> <td>17.30</td>	3-202-08-14404	KG	17.30
				KG	010

REV.	DATE	ALTERED	APPROVED	REV.	DATE	ALTERED	APPROVED	REV.	DATE	ALTERED	APPROVED	REV.	DATE	ALTERED	APPROVED
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2	27.7.05	APPROVED		2	27.7.05	APPROVED		2	27.7.05	APPROVED		2	27.7.05	APPROVED	
3	22.11.06	CHECKED		3	22.11.06	CHECKED		3	22.11.06	CHECKED		3	22.11.06	CHECKED	

NATIONAL HYDRO ELECTRIC POWER CORPORATION LTD.
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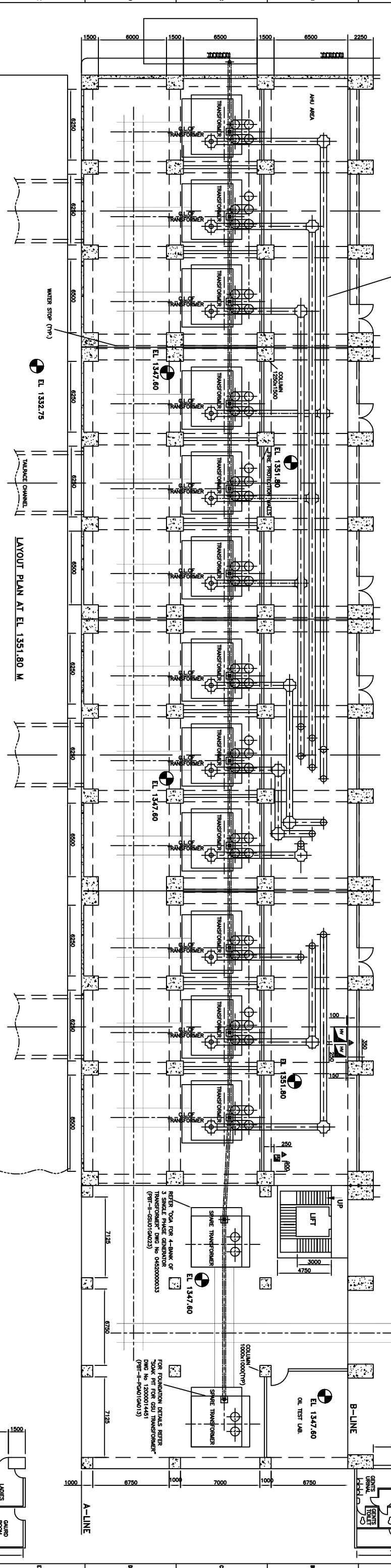
PARBATI HYDROELECTRIC PROJECT STAGE-II (H.P.) INDIA

PIPES AND EMBEDMENTS IN SECOND STAGE

0-202-08-14401 3

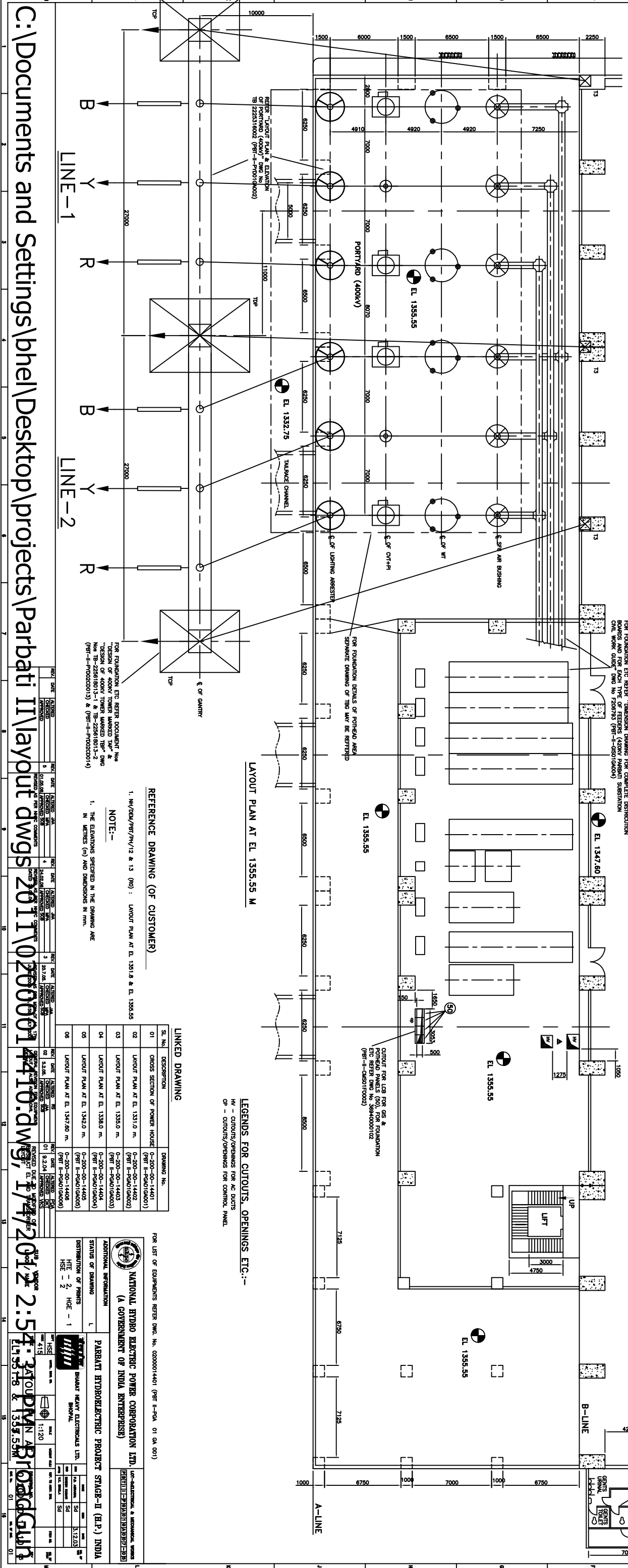
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REFER "CROSS SECTION OF INDIVIDUAL BAYS" DWG No. PZ0701 (PRT-I-CROSS0001) & PZ0702 (PRT-I-CROSS0002) FOR FOUNDATION ETC REFER "DIMENSION DRAWING FOR COMPLETE DISTRIBUTION BAYS AND FOR EACH TYPE OF FEEDERS (420KV PARBATI SUBSTATION DWG No. PZ06793 (PRT-I-CROSS0004)) ONL WORK QUOTE" DWG No. PZ06793 (PRT-I-CROSS0004)



LAYOUT PLAN AT EL. 1351.80 M

FOR FURTHER DETAILS REFER "CROSS SECTION OF INDIVIDUAL BAYS" DWG No. PZ0701 (PRT-I-CROSS0001) & PZ0702 (PRT-I-CROSS0002) FOR FOUNDATION ETC REFER "DIMENSION DRAWING FOR COMPLETE DISTRIBUTION BAYS AND FOR EACH TYPE OF FEEDERS (420KV PARBATI SUBSTATION DWG No. PZ06793 (PRT-I-CROSS0004)) ONL WORK QUOTE" DWG No. PZ06793 (PRT-I-CROSS0004)



LAYOUT PLAN AT EL. 1355.55 M

LEGENDS FOR CUTOUTS, OPENINGS ETC.:-
HW - CUTOUTS/OPENINGS FOR AC DUCTS
OP - CUTOUTS/OPENINGS FOR CONTROL PANEL

REFERENCE DRAWING (OF CUSTOMER)
1. NH/BEH/PRT/PH/12 & 13 (NO) : LAYOUT PLAN AT EL. 1351.8 & EL. 1355.55

NOTE:-
1. THE ELEVATIONS SHOWN IN THE DRAWING ARE IN METERS (M) AND DIMENSIONS IN MM.

LINKED DRAWING

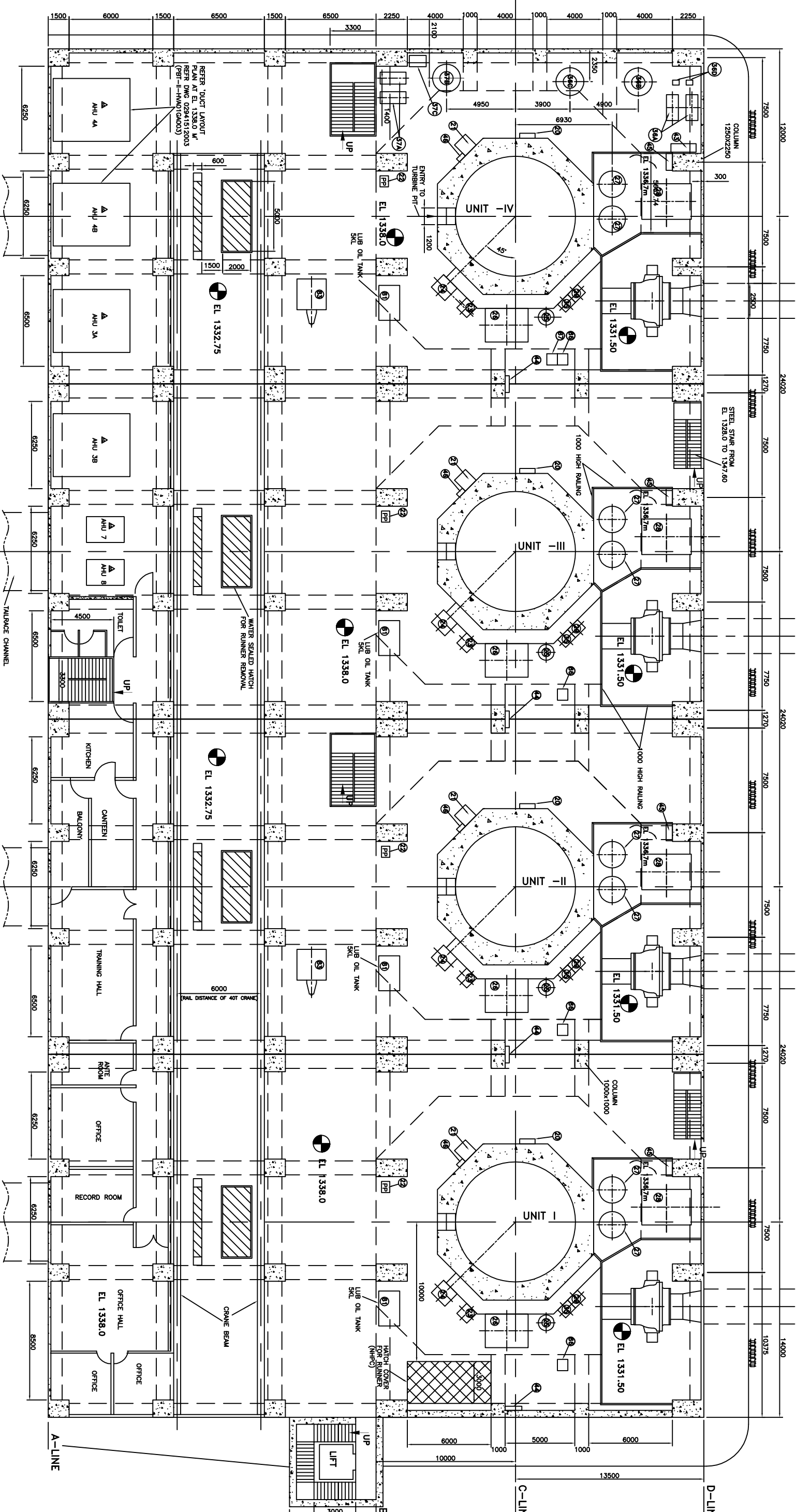
Sl. No.	DESCRIPTION	DRAWING No.
01	CROSS SECTION OF POWER HOUSE (PRT-I-CROSS0001)	01
02	LAYOUT PLAN AT EL. 1351.0 M. (PRT-I-PH010001)	02
03	LAYOUT PLAN AT EL. 1355.0 M. (PRT-I-PH010002)	03
04	LAYOUT PLAN AT EL. 1358.0 M. (PRT-I-PH010003)	04
05	LAYOUT PLAN AT EL. 1342.0 M. (PRT-I-PH010004)	05
06	LAYOUT PLAN AT EL. 1347.60 M. (PRT-I-PH010005)	06

FOR LIST OF EQUIPMENTS REFER DWG. No. 0200001401 (PRT-I-PH-01-04-001)

NATIONAL HYDRO ELECTRIC POWER CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)

PARBATI HYDROELECTRIC PROJECT STAGE-II (B.P.) INDIA
BHARAT HEAVY ELECTRICALS LTD. BHOPAL

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BY: [Signature]
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SCALE: 1:120



LAYOUT PLAN AT EL. 1338.0 M

LINKED DRAWING

Sl. No.	DESCRIPTION	DRAWING No.
01	GROSS SECTION OF POWER HOUSE (PRT II-PGA01GA001)	0-200-00-14401
02	LAYOUT PLAN AT EL. 1335.0 m. (PRT II-PGA01GA003)	0-200-00-14403
03	LAYOUT PLAN AT EL. 1331.0 m. (PRT II-PGA01GA002)	0-200-00-14402
04	LAYOUT PLAN AT EL. 1342.0 m. (PRT II-PGA01GA005)	0-200-00-14405
05	LAYOUT PLAN AT EL. 1347.80 m. (PRT II-PGA01GA006)	0-200-00-14406
06	LAYOUT PLAN AT EL. 1351.8 & 1355.55 m. (PRT II-PGA01GA007)	0-200-00-14410

REFERENCE DRAWING (OF CUSTOMER)

Sl. No.	DESCRIPTION	DRAWING No.
01	CONCEPTUAL LAYOUT FOR COOLING WATER, DRAINAGE & DEWATERING SYSTEM	02292014401 (PRT II-CNS01PS003)
02	PIPES & EMBEDMENTS IN SECOND STAGE	02020814401 (PRT II-UB02PS008)
03	DUCT LAYOUT PLAN AT EL. 1338.0 M	0238132003 (PRT II-HVA01GA003)

NOTE:-
1. THE ELEVATIONS SPECIFIED IN THE DRAWING ARE IN METRES (m) AND DIMENSIONS IN mm.

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FOR LIST OF EQUIPMENTS REFER DWG. No. 02000014401 (PRT II-PGA 01 GA 001)

NATIONAL HYDRO ELECTRIC POWER CORPORATION LTD.
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PARBATI HYDROELECTRIC PROJECT STAGE-II (B.P.) INDIA

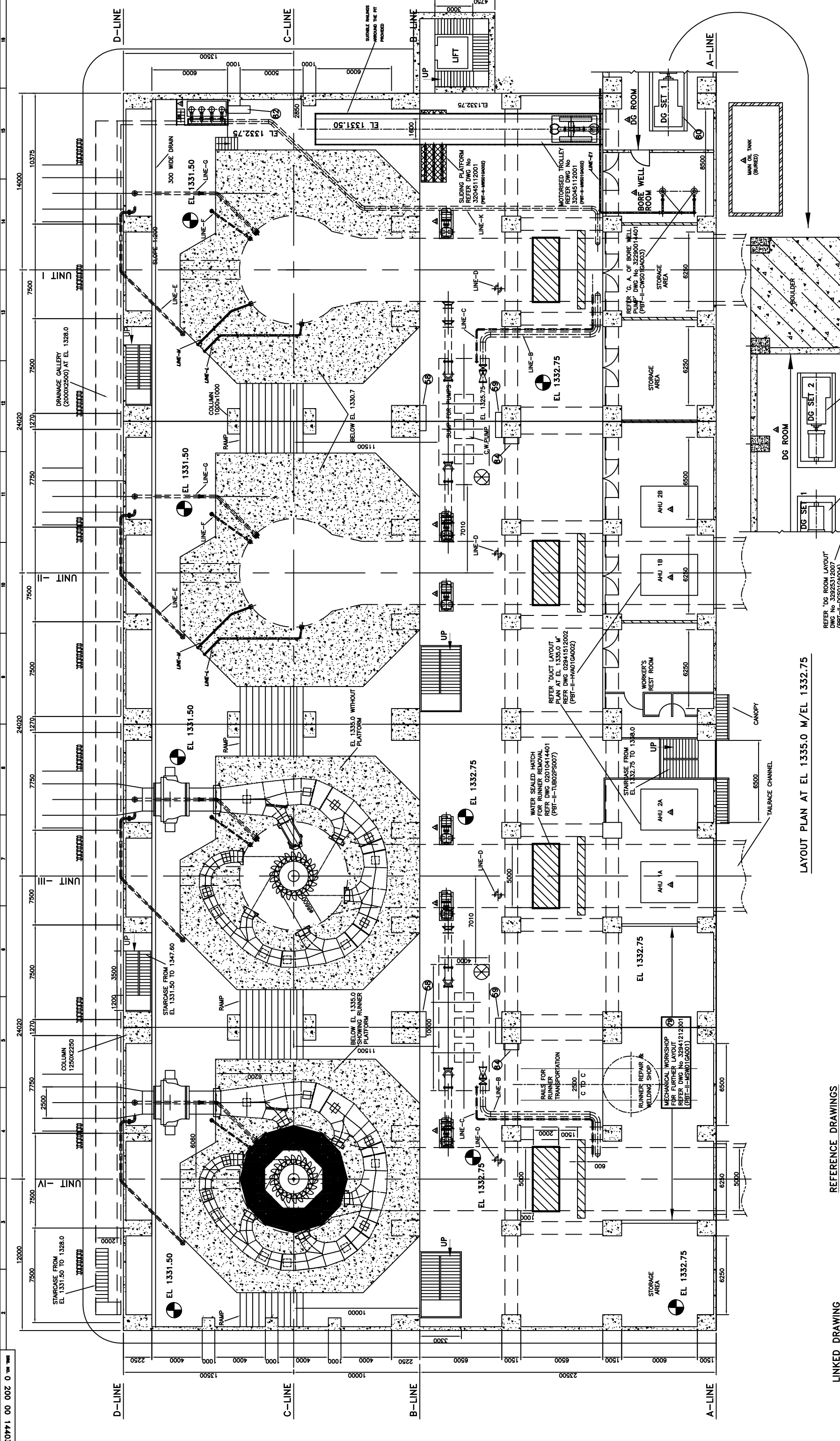
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DISTRIBUTION OF PRINTS: HSE - 2, HCE - 1
DATE: 24.11.06

UNDER REVISION (10)
SUBMITTED FOR NHPIC REVIEW

DATE: 24.11.06

DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 24.11.06

PROJECT MANAGER: [Signature]
DATE: 24.11.06



LAYOUT PLAN AT EL 1335.0 M/EL 1332.75

LINKED DRAWING

SL. No.	DESCRIPTION	DRAWING No.
01	CROSS SECTION OF POWER HOUSE	0-200-00-1401 (PBT II-PG01GA001)
02	LAYOUT PLAN AT EL 1331.0 m.	0-200-00-1402 (PBT II-PG01GA002)
03	LAYOUT PLAN AT EL 1338.0 m.	0-200-00-1404 (PBT II-PG01GA004)
04	LAYOUT PLAN AT EL 1342.0 m.	0-200-00-1405 (PBT II-PG01GA005)
05	LAYOUT PLAN AT EL 1347.60 m.	0-200-00-1406 (PBT II-PG01GA006)
06	LAYOUT PLAN AT EL 1351.8 & 1356.55 m.	0-200-00-1410 (PBT II-PG01GA007)

REFERENCE DRAWINGS

SL. No.	DESCRIPTION	DRAWING No.
01	CONCEPTUAL LAYOUT FOR COOLING WATER, DRAINAGE & DETERMINING SYSTEM	0230031401 (PBT II-CNS01PS003)
02	FIRST STAGE PIPES & EMBEDMENTS	0201041401 (PBT II-CNS01PS002)
03	DG ROOM LAYOUT	0294121201 (PBT II-CNS01GA001)
04	GENERAL ARRGT. OF MECHANICAL WORKSHOP	0294121201 (PBT II-CNS01GA001)
05	GENERAL ARRGT. OF TRAVELLING TROLLEY & SLIDING PLATEFORM	0294121201 (PBT II-CNS01GA001)
06	GA OF BORE WELL PUMP	0294121201 (PBT II-CNS01GA001)
07	DUCT LAYOUT PLAN AT EL 1335.0 M	0294151202 (PBT II-RW01GA002)

REFERENCE DRAWING (OF CUSTOMER)

- NH/DEM/PBT/PH/08 (R0) : LAYOUT PLAN AT EL 1335.0

UNDER REVISION (10)
SUBMITTED FOR
NHPC REVIEW
DATE:-24.11.08

NATIONAL HYDRO ELECTRIC POWER CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)

PARBATI HYDROELECTRIC PROJECT STAGE-II (H.P.) INDIA

STATUS OF DRAWING : L
DISTRIBUTION OF PRINTS : HTE - 2, HGE - 1
HSE - 2

REVISIONS:

NO.	DATE	BY	CHKD.	DESCRIPTION
01	14.02.08	...	...	...
02	19.03.08	...	...	...
03	12.04.08	...	...	...
04	14.02.08	...	...	...
05	19.03.08	...	...	...
06	12.04.08	...	...	...
07	14.02.08	...	...	...
08	19.03.08	...	...	...
09	12.04.08	...	...	...
10	24.11.08	...	...	...

FOR LIST OF EQUIPMENTS REFER DWG. No. 02000014401 (PBT II-PGA 01 GA 001)

