

CIVIL GUIDELINES PLAN AT EL 1017.00 (TURBINE FLOOR)

REFERENCE DRAWINGS:

S.NO	DRAWING NO	DRAWING DESCRIPTION
1	0-200-00-19251	CROSS SECTION OF POWER HOUSE
2	0-200-00-19272	CML GUIDELINES PLAN AT EL. 1010.0M
3	0-200-00-19271	CML GUIDELINES PLAN AT EL. 1005.0M
4	0-200-00-19274	CML GUIDELINES PLAN AT EL. 1021.5M
5	0-200-00-19275	CML GUIDELINES PLAN AT EL. 1028.4M
6	0-200-00-19278	CML GUIDELINES PLAN AT VARIOUS AUXILIARY BLOCKS
7	0-200-00-19258	L-SECTION OF POWER HOUSE
8	0-201-04-192-01	PIPES & EMBEDMENTS IN FIRST STAGE
9	0-201-08-192-01	CENTRAL FRAME WORK

TABLE FOR DIMENSIONS OF EQUIPMENTS PLACED AT TURBINE FLOOR:—

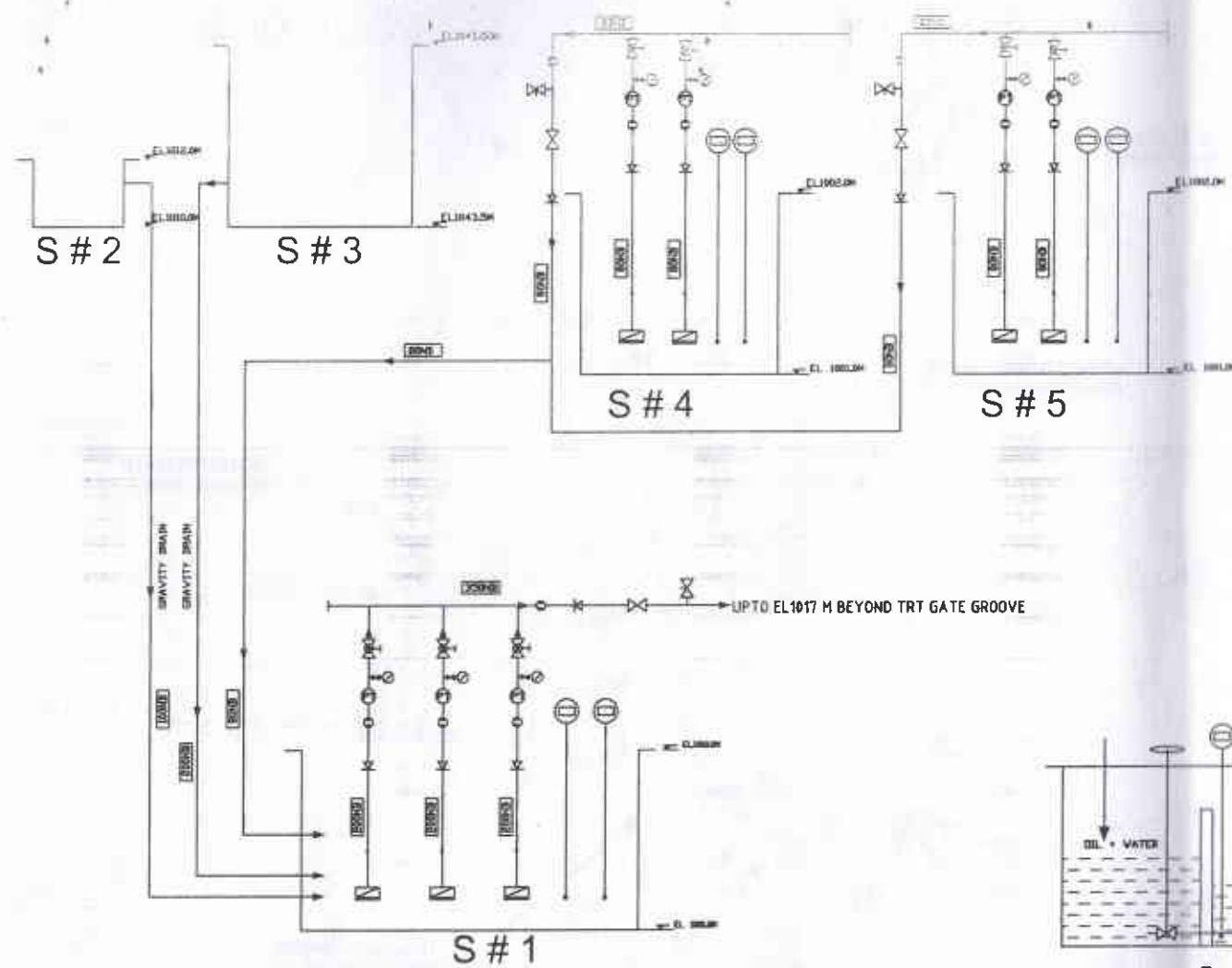
[illegible]

- NOTES - 1) LAYOUT SHOWS THE OVERALL DIMENSIONS OF POWER HOUSE FOR ELECTRO MECHANICAL EQUIPMENT
- 2) ALL CIVIL DESIGN INCLUDING CONCRETE THICKNESSES OF TURBINE GENERATOR, WALLS , BEAMS, FLOORS TO BE DEVELOPED BY CIVIL PARTNER
 - 3) OTHER DESIGNS LIKE SUPER STRUCTURE, STAIRWAY, RAILINGS ALSO TO BE DESIGNED BY CIVIL
 - 4) OPENINGS AND CUTOUTS OF EQUIPMENT ARE TENTATIVE AND MAY CHANGE DURING DETAIL DESIGN
 - 5) ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES

LEGEND -

-  FIRST STAGE CONCRETE
 SECOND STAGE CONCRETE
 THIRD STAGE CONCRETE

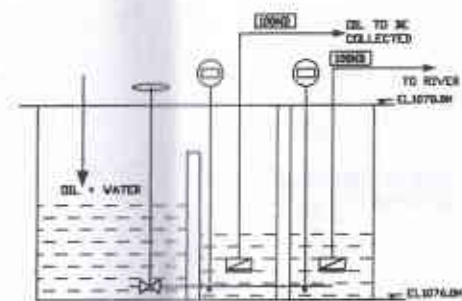
ADDITIONAL INFORMATION				PROPERTY		4X180MW MANGDECHHU HEP																															
STATUS OF DRAWING				CUSTOMER				MHPA, BHUTAN																													
								MHPA DRG. NO. <u>MHP-PGACBUBA004-4</u>																													
DESCRIPTION OF PRINTS				CONSULTANT				NHPC LIMITED (A UNIT OF NHPC LTD.)																													
<table border="1"><thead><tr><th>NO.</th><th>NAME</th><th>DES.</th><th>DATE</th><th>REVISION</th><th>BY</th></tr></thead><tbody><tr><td>001</td><td>DES.</td><td></td><td>04.07.10</td><td></td><td></td></tr><tr><td>002</td><td>DES.</td><td></td><td>04.07.10</td><td></td><td></td></tr><tr><td>003</td><td>DES.</td><td></td><td>04.07.10</td><td></td><td></td></tr></tbody></table>				NO.	NAME	DES.	DATE	REVISION	BY	001	DES.		04.07.10			002	DES.		04.07.10			003	DES.		04.07.10			CONTRACTOR				BHARAT HEAVY ELECTRICALS LTD. BHOPAL.					
NO.	NAME	DES.	DATE	REVISION	BY																																
001	DES.		04.07.10																																		
002	DES.		04.07.10																																		
003	DES.		04.07.10																																		
DESIGNER/SUPPLIER/VIDEOS				SCALE		SHEET NO. (X)		SHEET TOTAL		DRAWING NO.																											
TITLE								02.07.10 AMT/001		020000019273																											
										020000019273																											
CHN, GOVERNMENT PLAN AT 1:50,000				DATE 04.07.10		SHEET NO. 02		SHEET TOTAL 04		DRAWING NO.																											



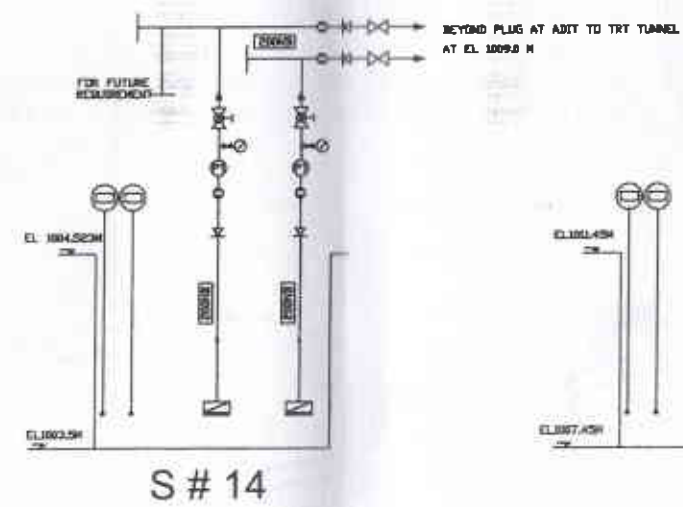
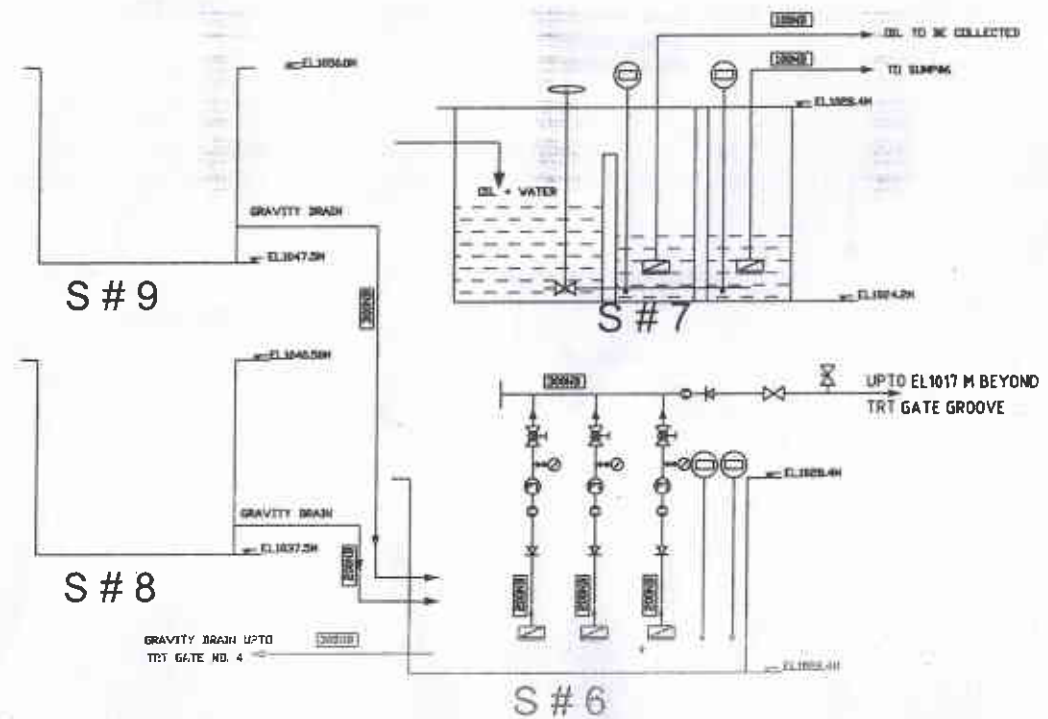
- S # 1 - MAIN DRAINAGE SUMP IN PH CAVERN
- S # 2 - ELEVATOR PIT IN POWER HOUSE
- S # 3 - VENTILATION TUNNEL SUMP OF PH CAVERN
- S # 4 - SUMP IN COOLING WATER DRY PIT #1
- S # 5 - SUMP IN COOLING WATER DRY PIT #2
- S # 6 - MAIN DRAINAGE SUMP IN TRANSFORMER CUM GIS CAVERN
- S # 7 - OIL WATER SUMP IN TRANSFORMER CUM GIS CAVERN
- S # 8 - CABLE TUNNEL SUMP IN TRANSFORMER CUM GIS CAVERN
- S # 9 - VENTILATION TUNNEL SUMP OF TRANSFORMER CUM GIS CAVERN
- S # 10 - MAT SUMP AT JUNCTION OF PRESSURE SHAFT BOTTOM ADIT (DELETED)
- S # 11 - SUMP AT PRESSURE SHAFT BOTTOM ADIT
- S # 12 - MAT SUMP AT JUNCTION OF UPSTREAM DRAINAGE GALLERY
- S # 13 - OIL WATER SUMP IN POT YARD FOR ICT
- S # 14 - SUMP NEAR PLUG IN ADIT TO TRT TUNNEL

SUMP PUMP CAPACITY

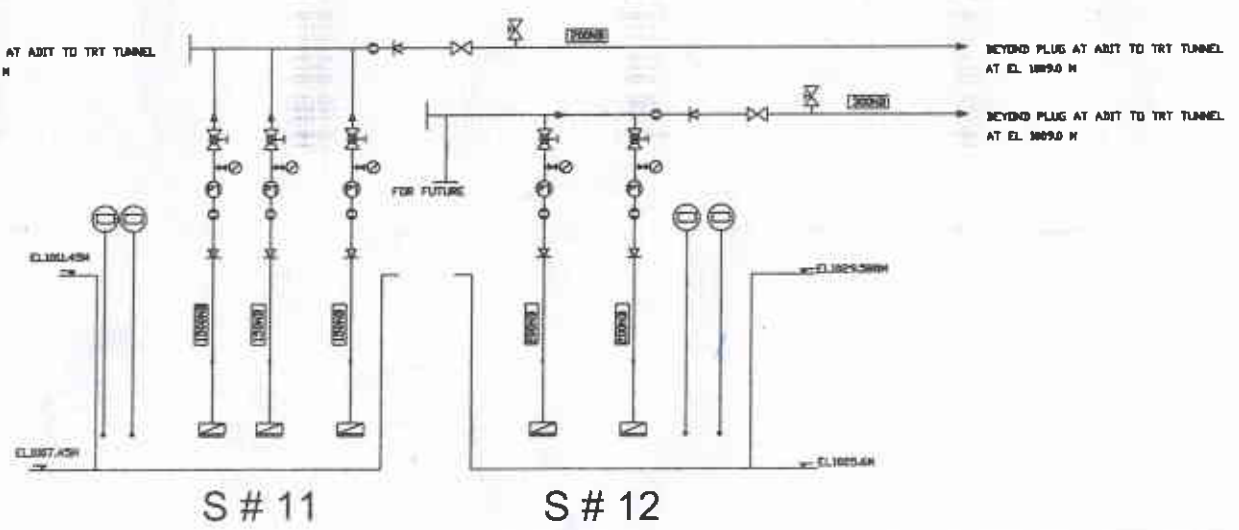
SUMP # 1 PUMP CAPACITY UPTO EL 1017.0 M	(2+1) NO. 4500 LPM
SUMP # 4 PUMP CAPACITY	(1+1) NO. 200 LPM
SUMP # 5 PUMP CAPACITY	(1+1) NO. 200 LPM
SUMP # 6 PUMP CAPACITY	(2+1) NO. 3000 LPM
SUMP # 7 PUMP CAPACITY	(1+1) NO. 500 LPM
SUMP # 10 PUMP CAPACITY	DELETED
SUMP # 11 PUMP CAPACITY	(2+1) NO. 1200 LPM
SUMP # 12 PUMP CAPACITY	(1+1) NO. 1500 LPM
SUMP # 13 PUMP CAPACITY	(1+1) NO. 200 LPM
SUMP # 14 PUMP CAPACITY	(1+1) NO. 4000 LPM



S # 13



S # 14

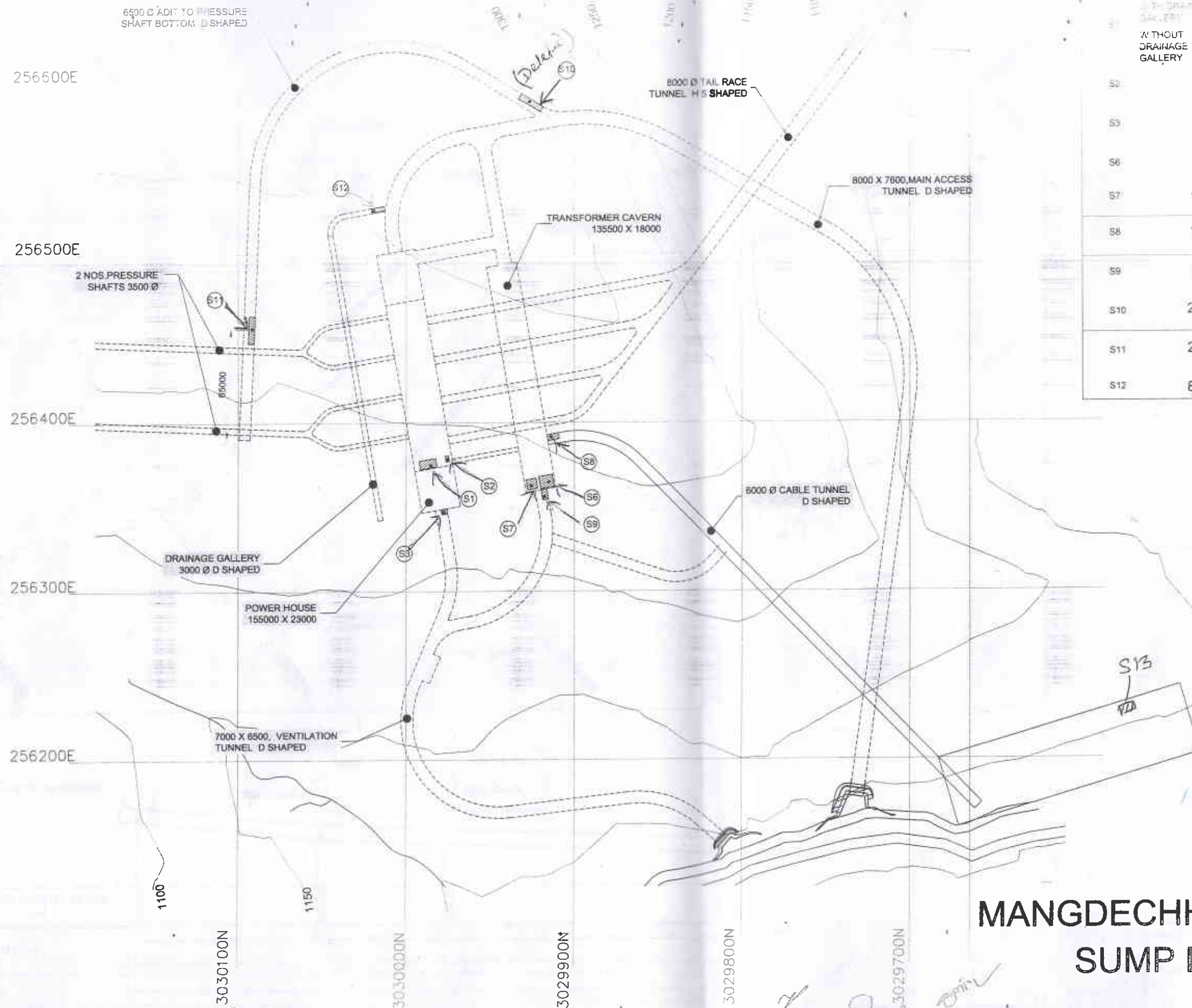


S # 11

S # 12

LEGEND

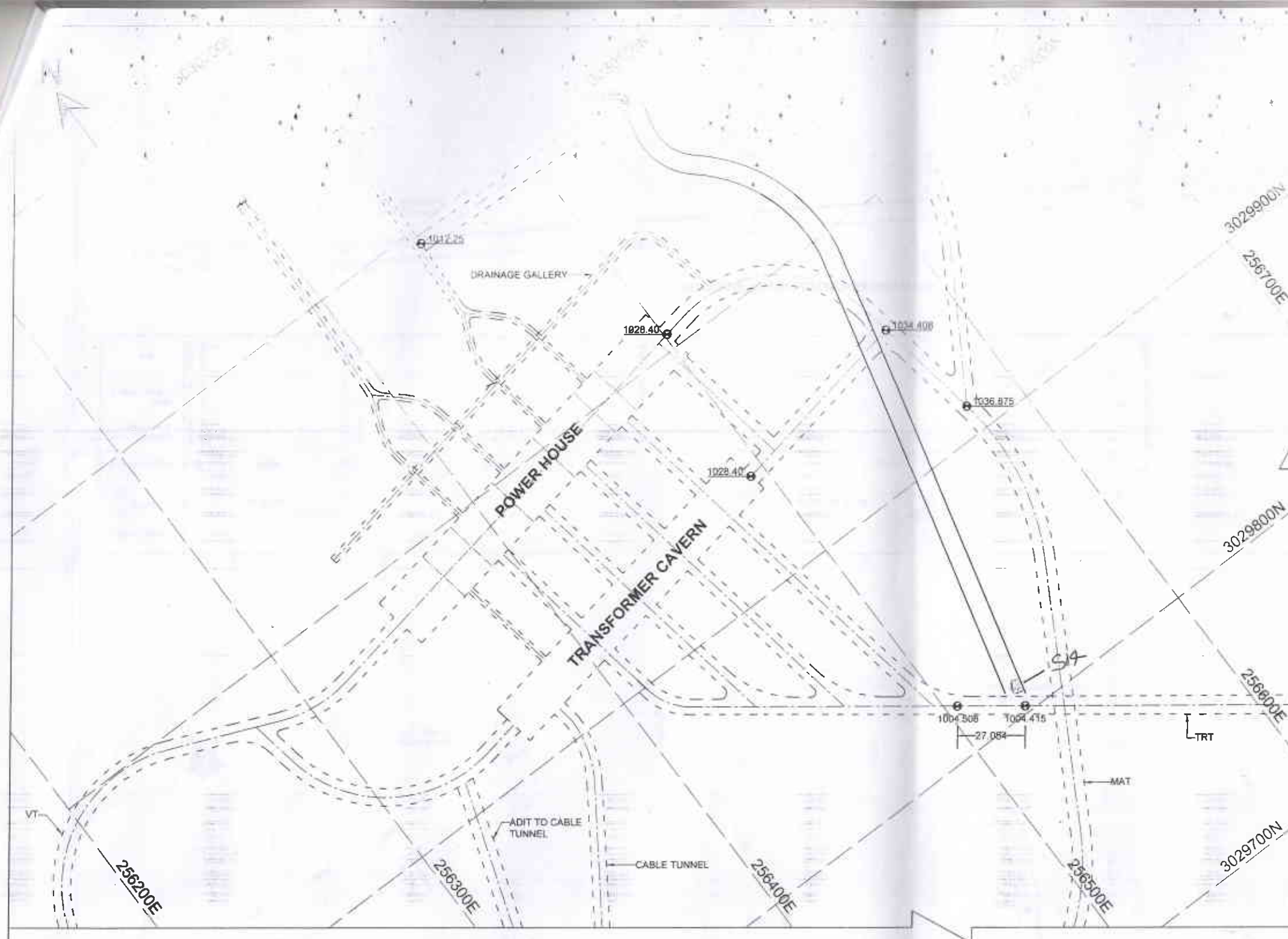
	ISOLATING VALVE
	NON RETURN VALVE (CHECKING OPERATED)
	FLOW METER CUM SWITCH
	PUMP MOTOR SET
	PRESSURE GAUGE
	TWO LEVEL SWITCH / CONTROLLER OF DIFFERENT PRINCIPLE
	PRESSURE TRANSMITTER
	FLOW CONTROL VALVE (GLOBE VALVE)
	AIR TURBINE VALVE



LEGEND:-

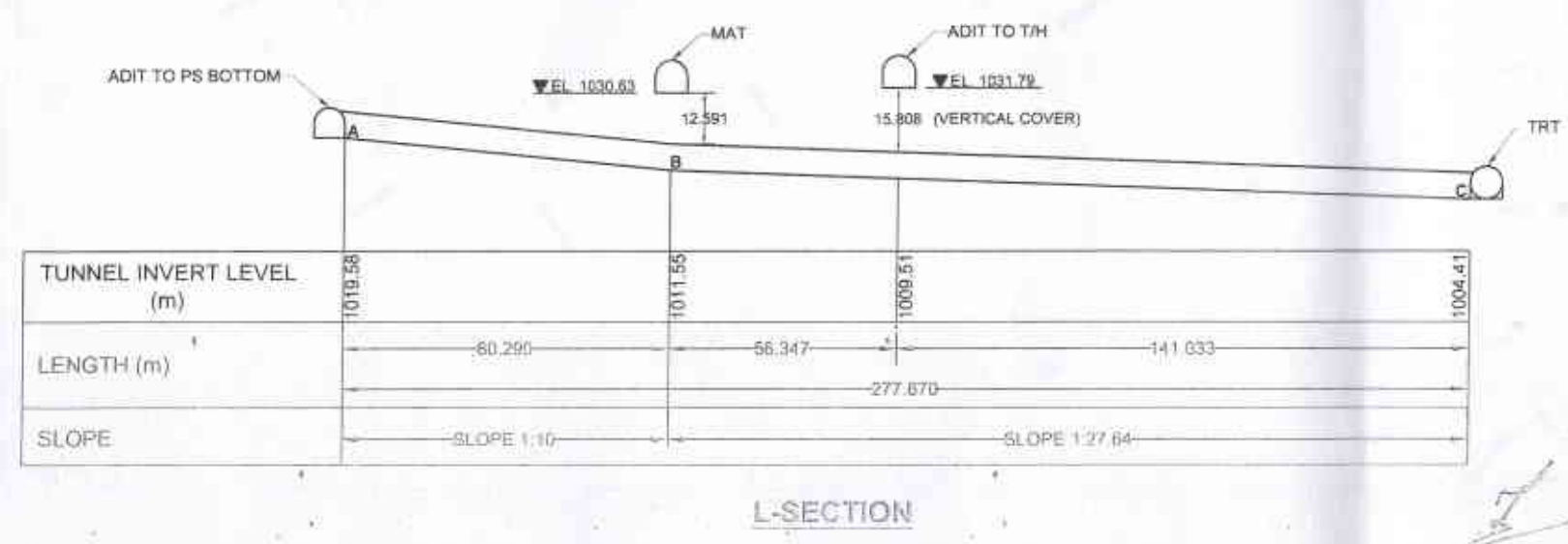
POINT	VOLUME PROVIDED	LENGTH	WIDTH	BOTTOM ELEVATION
S1	640			
S2	WITHOUT DRAINAGE GALLERY	188	10.0	5.00
S3				1001.00
S4	21	3.0	3.5	1043.50
S5	357	8.25	7.25	1022.40
S6	151	6.0	6.0	1024.20
S7	74	7.0	3.5	1037.50
S8	53	6.0	3.5	1047.50
S9	210	15.0	3.5	1031.98
S10	224	16.0	3.5	1007.45
S11	80	8.0	2.5	1025.6
S12				
S13				

MANGDECHHU HE PROJECT SUMP DETAIL

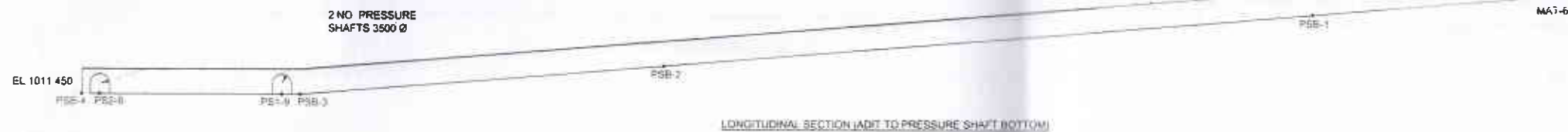


PROPOSAL

NOTES
1. ALL DIMENSIONS AND LEVEL ARE IN M.



OWNER	MANGDECHHU H.E. PROJECT AUTHORITY
PROJECT	MANGDECHHU H.E. PROJECT (BHUTAN)
TITLE	INTERMEDIATE ADIT TO TRT
DATE: 25.11.18	DRAWING NO: 011
REV: 0	



NSL	1239.80	1241.00	1250.70	1301.90	1325.40	1354.08
TUNNEL INVERT LEVEL	1011.45	1011.45	1011.45	1018.06	1032.46	1036.60
CUMULATIVE LENGTH	386.354	386.354	333.634	233.108	62.325	61.180
PARTIAL LENGTH	4750	43050	5000	95526	170783	50225
SLOPE		NO SLOPE			SLOPE 1 IN 12.886	NO SLOPE
CURVE DATA					R = 82500	

CO-ORDINATES

POINTS	NORTHING	EASTING	INVERT ELEVATION
MAT-6	3029911.380	256578.637	1036.60
PSB-1	3029964.809	256610.637	1032.46
PSB-C1	3030007.300	256540.321	
PSB-2	3030088.728	256543.664	1018.06
PSB-3	3030093.715	256448.221	1011.45
PS1-B	3030093.623	256443.228	1011.45
PS2-B	3030095.827	256395.287	1011.45
PSB-4	3030096.125	256380.621	1011.45

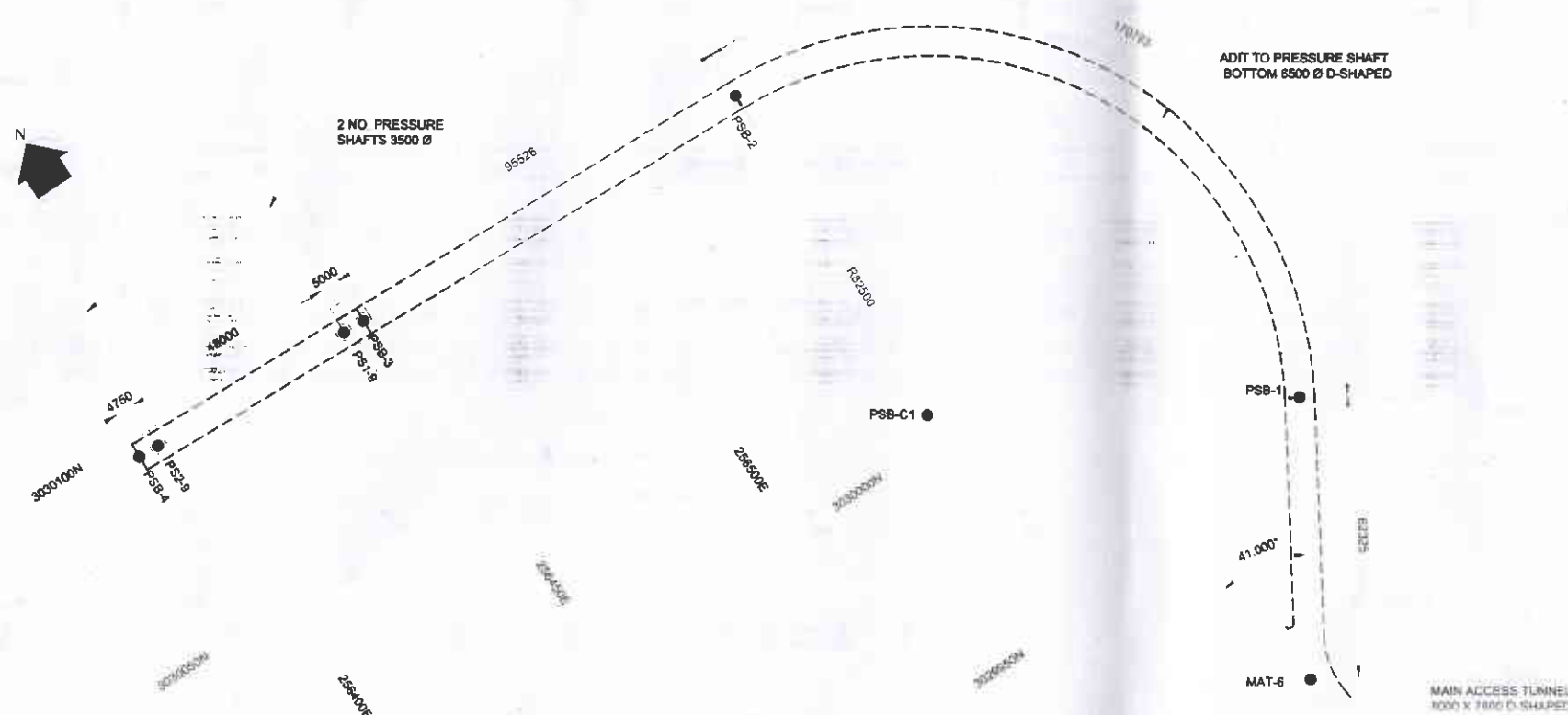
NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS.
- THIS DRAWING HAS BEEN DEVELOPED BASED ON DPR LEVEL SURVEY (REFER MHPA LETTER NO. 2MD/MHPA/CONSULTANCY/2012/888 DATED 18/04/2012)
- EXISTING LEVELS SHALL BE VERIFIED ON SITE PRIOR TO EXCAVATION WORKS

REFERENCE DRAWINGS :-

- NHNM/CC3-41-DD-001

SCALE:-



		MANGDECHHU HYDROELECTRIC PROJECT AUTHORITY THIMPHU BHUTAN	
		एन एच पी सी लिमिटेड NHPC Limited (A GOVT. OF INDIA ENTERPRISE)	
मंगदेचु जलविद्युत परियोजना (भूटान) MANGDECHHU H.E PROJECT (BHUTAN)			
PRESSURE SHAFTS ADIT TO PRESSURE SHAFT BOTTOM SETTING OUT DETAILS			
DATE	DESIGNED BY	CHECKED BY	APPROVED BY
01/07/2012	DRD	DRD	DRD
01/07/2012	DRD	DRD	DRD
01/07/2012	DRD	DRD	DRD
01/07/2012	DRD	DRD	DRD

LONGITUDINAL SECTION

NSI 1219
TUNNEL INVERT LEVEL 1031.728
CUMULATIVE LENGTH 213.971
PARTIAL LENGTH
SLOPE
CURVE DATA

R=10000

CO-ORDINATES

POINTS	NORTHING	EASTING	INVERT ELEVATION
DG-1	3030012.102	256327.081	1029.588
DG-2	3030036.281	256322.483	1029.654
DG-3	3030046.292	256316.861	1030.611
DG-4	3030014.615	256341.734	1031.728
DGR-1	3030036.544	256312.597	
PH-1	3029990.314	256344.568	
PH-4	3030017.428	256489.213	
U-1	3029997.334	256460.108	
U-2	3029993.166	256436.473	
U-3	3029988.988	256473.836	
U-4	3029984.831	256389.202	

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS
- THIS DRAWING HAS BEEN REVISED AS PER THE REQUEST FROM MHPA VIDE LETTER NO. 20/MHPA/UGPH/CONSULTANCY/2013/337 DATED 02-05-2013.
- EXISTING LEVELS SHALL BE VERIFIED ON SITE PRIOR TO EXCAVATION WORKS
- NSL SHOWN IS INDICATIVE ONLY
- THE LOCATION OF CONNECTING TUNNEL MAY CHANGE DEPENDING UPON THE LOCATION OF CONTROL BLOCK/ SERVICE BAY

REFERENCE DRAWINGS

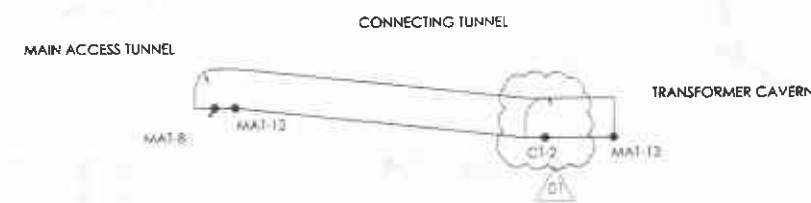
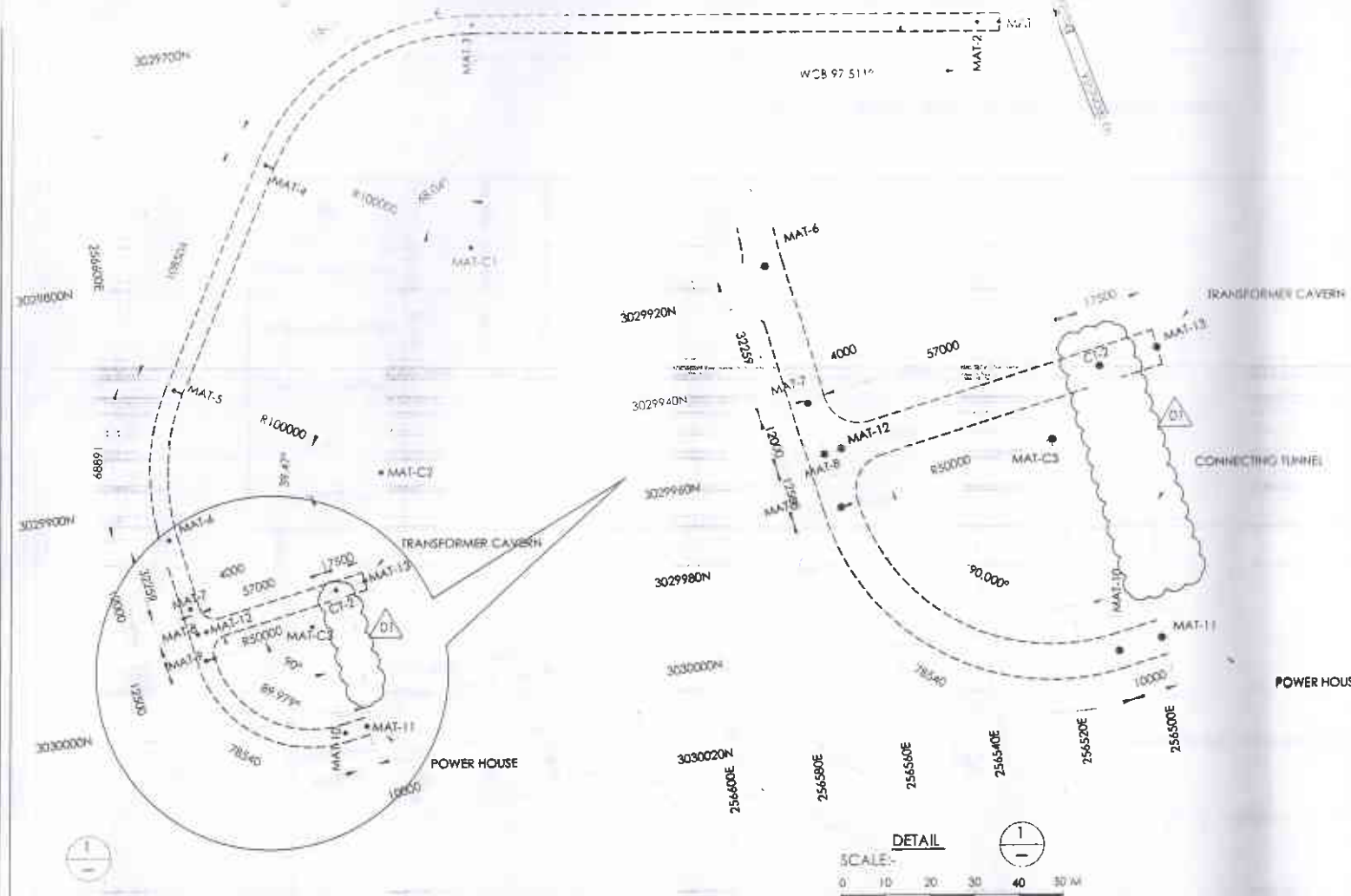
- NHMN-ACC3-41-DD-001

SCALE:-

0 4 8 12 16 20 M

PLAN

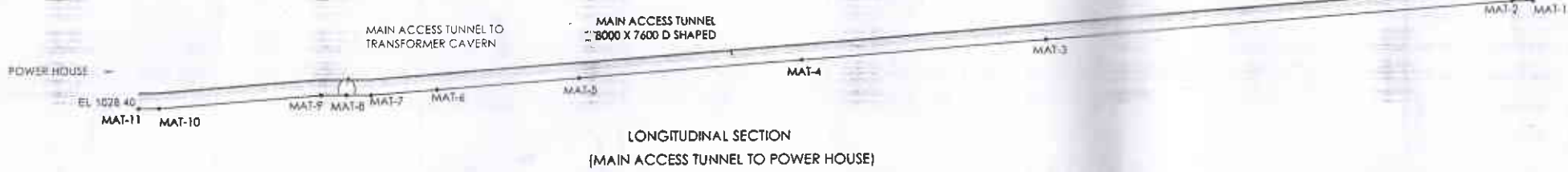
MANGDECHHU HYDROELECTRIC PROJECT AUTHORITY	
THIMPHU BHUTAN	
 एन एच पी सी लिमिटेड (गणतन्त्र नेपालको नाममा) NHPA Limited (A PRIVATE COMPANY LIMITED)	
मंगदेचु जलविद्युत परियोजना (भूटान) MANGDECHHU H.E PROJECT (BHUTAN)	
POWER HOUSE DRAINAGE GALLERY SETTING-OUT DETAILS	
DRAWN DATE 01/05/2013	CHECKED DATE 01/05/2013
DESIGNED DATE 01/05/2013	APPROVED DATE 01/05/2013
NHM-ACC3-41-DD-001	



LONGITUDINAL SECTION
(MAIN ACCESS TUNNEL TO TRANSFORMER CAVERN)

SCALE:-
0 10 20 30 40 50 M

NSL	000	4000	41000	48000	78500	131103
TUNNEL INVERT LEVEL	1034.408	1034.408	1028.40	1028.40	1028.40	1028.40
CUMULATIVE LENGTH	000	4000	41000	48000	78500	131103
PARTIAL LENGTH	4000	57000	4000	13500		
SLOPE		1 IN 487		NO SLOPE		
CURVE DATA						



LONGITUDINAL SECTION
(MAIN ACCESS TUNNEL TO POWER HOUSE)

NSL	679872	689512	591132	578832	566832	534573	463682	351178	338426	10000	10000
TUNNEL INVERT LEVEL	1028.40	1028.40	1034.408	1034.408	1034.408	1036.875	1042.145	1050.444	1059.526	1077.00	1077.00
CUMULATIVE LENGTH	0000	10000	12800	17000	30259	48881	108504	116732	228436	10000	10000
PARTIAL LENGTH		10000	2800	4200	12000	18622	58224	88232	90000	10000	10000
SLOPE		1 IN 13.073					1 IN 13.073				
CURVE DATA		R=50000				R=100000					

MAT-1	3029731.582	256177.521	1077.00
MAT-2	3029730.273	256187.435	1077.00
MAT-3	3029750.415	256413.901	1028.40
MAT-4	3029750.356	256514.033	1035.444
MAT-5	3029844.822	256567.416	1042.145
MAT-6	3029911.366	256573.837	1034.873
MAT-7	3029943.155	256573.235	1034.408
MAT-8	3029934.973	256571.151	1034.408
MAT-9	3029967.283	256568.881	1034.408
MAT-10	3030007.841	256511.058	1028.400
MAT-11	3030006.104	256501.210	1028.400
MAT-12	3029954.278	256347.212	1034.408
CT-2	3029943.683	256307.139	1028.400
MAT-13	3029941.341	256493.844	1028.400
MAT-C1	3029799.557	256426.973	
MAT-C2	3029894.021	256480.356	
MAT-C3	3029958.600	256519.741	

- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS
 - THIS DRAWING HAS BEEN DEVELOPED BASED ON DPR LEVEL SURVEY (REFER MHPA LETTER NO. 2/MD/MHPA/CONSULTANCY/ 2012/888 DATED 18/04/2012) AND TOPOGRAPHICAL MAP OF RIVER WASHOUT AREA BETWEEN NALLA U/S OF POWER HOUSE AND YURMU NALLA.
 - EXISTING LEVELS SHALL BE VERIFIED ON SITE PRIOR TO EXCAVATION WORKS.
 - TRONGSA - GELEPHU HIGHWAY SHOWN IS INDICATIVE ONLY.
 - FOR SETTING OUT OF CONNECTING TUNNEL REFER DRAWING NO NHMN-ACC3-41-DD-007.
- PORTAL CO-ORDINATE**
- MAT-1 N 3029731.582 E 256177.521 EL 1077.00

REFERENCE DRG:-

- NHMN-ACC3-41-DD-007

SCALE:-

0 20 40 60 80 100 M

MANGDECHHU HYDROELECTRIC PROJECT AUTHORITY
THIMPHU BHUTAN

एन एच पी सी लिमिटेड
(एन एच पी सी लिमिटेड)
NHPC Limited
a SOE of India Corporation

मंगदेचू जलविद्युत परियोजना (भूटान)
MANGDECHHU H.E PROJECT (BHUTAN)

POWER HOUSE
MAIN ACCESS TUNNEL
SETTING OUT DETAILS

DATE	28 OCT 2012	DRG. NO.	ACC3-41-DD-007	REV.	01
BY	...	CHECKED	...	APPROVED	...



256400E
256300E
256200E
256100E
256000E

KEY PLAN
(NOT TO SCALE)

VENTILATION TUNNEL
TO TRANSFORMER CAVERN

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS.
2. THIS DRAWING HAS BEEN DEVELOPED BASED ON DPR LEVEL SURVEY (REFER MHPA LETTER NO. 2/M/ MHPA/ CONSULTANCY/ 2012/688 DATED - 18 APRIL, 2012).

REFERENCE DRAWINGS :-

1. NHMN4CC3-41-DD-002

CO-ORDINATES

POINTS	NORTHING	EASTING	INVERT ELEVATION
VT-5	3029965.104	256245.143	1053.547
VT-6	3029984.154	256270.987	1050.862
VT-7	3029976.602	256276.135	1050.862
VT-12	3029977.085	256279.048	1050.862
VT-13	3029961.821	256281.741	1050.742
VT-14	3029971.371	256335.906	-
VT-15	3029917.307	256345.456	1050.894
VT-16	3029916.282	256352.177	1050.000
VT-16	3029919.781	256360.056	1050.000

SCALE:-



		MANGDECHHU HYDROELECTRIC PROJECT AUTHORITY THIMPHU, BHUTAN	
		एन एच पी सी लिमिटेड (विद्युत उत्पादन का अड्डा) NHPC Limited A UNIT OF NHPC ENTERPRISES	
मंगदेचु जलविद्युत परियोजना (भूटान) MANGDECHHU H.E PROJECT (BHUTAN)			
POWER HOUSE VENTILATION TUNNEL TO TRANSFORMER CAVERN SETTING OUT DETAILS			
DATE	24.04.2012	DATE	24.04.2012
BY	DRG NO.	BY	DRG NO.
DRG NO.	4CC3-41-DD-003	DRG NO.	4CC3-41-DD-003

TRB-1	3029925.784	25647.132	1005.000
TRB-1-1	3029977.825	25645.031	1005.000
TRB-1-2	3029854.083	25643.852	1004.714
TRB-2	3029866.855	25643.721	1004.749
TRB-2-1	3029927.616	25644.912	1005.000
TRB-2-2	3029973.657	25643.674	1005.000
TRB-3	3029875.504	25643.677	1004.825
TRB-3-1	3029889.292	25642.246	1004.883
TRB-3-2	3029917.449	25642.281	1005.000
TRB-3-3	3029969.490	25641.510	1005.000

TRB-4	3029913.281	25640.644	1005.000
TRB-4-1	3029965.322	25639.147	1005.000
TRB-4-2	3029910.897	25642.452	1005.000
TRB-4-3	3029931.643	25647.519	1005.000
TRB-4-4	3029927.476	25644.883	1005.000
TRB-4-5	3029923.308	25643.248	1005.000
TRB-4-6	3029919.141	25639.613	1005.000
U1	3029997.133	25645.971	
U2	3029992.966	25643.336	
U3	3029988.798	25641.700	
U4	3029994.630	25643.145	



KEY PLAN (NTS)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS
2. EXISTING LEVELS SHALL BE VERIFIED ON SITE PRIOR TO EXCAVATION WORKS.

REFERENCE DRAWINGS:-

1. NHMN-4DC3-41-DD-001-02
2. NHMN-4CC3-41-DD-004-01

SCALE:-



		MANGDECHHU HYDROELECTRIC PROJECT AUTHORITY THIMPHU, BHUTAN	
		NHPC Limited 40, GPO, LAL BAZAR, KATHMANDU-11, NEPAL	
MANGDECHHU H.E PROJECT (BHUTAN)			
TAIL RACE TUNNEL BRANCH TUNNELS SETTING OUT PLAN			
SHEET 1 OF 2			
DATE	BY	CHECKED	APPROVED
18.12.2018	DR. J. K. SHARMA	DR. J. K. SHARMA	DR. J. K. SHARMA
NO.	REVISION	NO.	REVISION
001	01	001	01

DRG NO. 4DC3-002