

	1x800 MW NTPC SIPAT Stage-III TPS – SPECIFIC TECHNICAL REQUIREMENTS FOR IDCT	SPECIFICATION NO. PE-DC-520-IDCT	
		VOLUME – II B	
		SECTION - C	SUB-SECTION -
		REV.0	DATE 23.10.2024
		SHEET 1 OF 1	

3.00.00	GEO-TECHNICAL INVESTIGATION & FOUNDATION SYSTEM
3.01.01	Customer (NTPC) has carried out detailed Soil investigation report of the proposed site. Bore logs data and bearing capacity for design of foundations are given in tender specification. The geotechnical data attached in tender specification shall be solely for the purpose of guidance to the bidder. BHEL/owner does not take any responsibility about the accuracy and applicability of the geo-technical data furnished herewith. The onus of correct assessment/interpretation and understanding of the existing sub-strata conditions is on the bidder. Any variation in the data between the one furnished and to that found during execution of the work at site shall not constitute a valid reason in affecting the terms & conditions of this bid and the bidder shall note that nothing extra will be payable on this account. The bidder shall fully satisfy himself about the nature of sub-strata expected to be encountered including the type of foundation, ground water table and construction methodology to be adopted etc prior to the submission of the bid.
3.01.02	Detailed geo-technical Investigation report shall be made available to the successful bidder during contract engineering stage. If the bidder desires to carry out additional geo-technical investigation he/she may do so with prior information/permission of BHEL/owner at no extra cost to BHEL/owner. No extension in time schedule shall be permitted on this account. The bidder shall obtain approval on the agency for conducting geo-technical investigation work, field and laboratory testing schedule proposed by the bidder etc from BHEL/owner before undertaking the geo-technical investigation work. However, the net safe bearing capacity (SBC) of shallow foundation to be adopted for the design of foundations during detailed engineering shall be limited to the values mentioned elsewhere in the specification and any value of net SBC higher than the one indicated shall not be accepted. However, bidder shall note that the net safe bearing capacity and foundation depth to be adopted for design during detailed engineering stage shall be got approved by BHEL/owner.
3.02.00	Foundation System Suitable foundation system shall be adopted as per tender specification.



Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh. **CETEST**

Job No : 4157 Created by : T.SAHA Created on : 24/07/2018 Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.22

Co-ordinates E=(-)763.000
N=1162.000

Field Test	Nos	Samples	Nos	Commencement Date : 01/07/2018
Penetrometer (SPT)	1	Undisturbed (UDS)	0	Completion Date : 02/07/2018
Cone (Pc)		Penetrometer (SPT)	1	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	1	Level Of Ground : 282.400 M.
		Water Sample (WS)	0	Water Struck At :
				Standing Water Level : 1.40 m.

DESCRIPTION	SYMBOL	N-VALUE						SAMPLES		
		EACH DIVN=15CM						Ref. No	Depth (m)	
0.00m Filled up soil consist of reddish brown, clayey silt to silty clay with decomposed rock.								DS-1	0.50	
0.60m	100							*SPT-1	0.60-0.62	0.60
								R1	CR=26% RQD=NIL	1.25
								R2	CR=32% RQD=NIL	2.00
								R3	CR=36% RQD=NIL	2.75
								R4	CR=29% RQD=NIL	3.50
								R5	CR=40% RQD=NIL	4.25
								R6	CR=34% RQD=NIL	5.00
								R7	CR=50% RQD=NIL	5.75
								R8	CR=45% RQD=NIL	6.50
								R9	CR=44% RQD=NIL	7.25
								R10	CR=41% RQD=NIL	8.00
8.50m								R11	CR=50% RQD=NIL	

Refusal

2.0 cm Penetr.
NX. drilling from
0.60m to 15.00m

Highly to modeartely weathered, reddish brown, fine grained, fractured shale.



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BORE HOLE NO.22

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N=1162.000

Field Test	Nos	Samples	Nos	Commencement Date : 01/07/2018
Penetrometer (SPT)	1	Undisturbed (UDS)	0	Completion Date : 02/07/2018
Cone (Pc)		Penetrometer (SPT)	1	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	1	Level Of Ground : 282.400 M.
		Water Sample (WS)	0	Water Struck At :
				Standing Water Level : 1.40 m.

DESCRIPTION	SYMBOL	N-VALUE						SAMPLES	
		EACH DIVN=15CM						Ref. No	Depth (m)
Highly to modeartely weathered, reddish brown, fine grained, fractured shale.									8.50m 8.75m
Modeartely weathered, reddish brown, fine grained, fractured shale.								R12	CR=53% RQD=16% 8.75m
									9.50m
								R13	CR=52% RQD=15% 10.25m
									11.00m
Modeartely weathered, reddish brown, fine grained, fractured shale.								R14	CR=54% RQD=19% 11.75m
									12.50m
								R15	CR=48% RQD=20% 13.25m
									14.00m
Moderately weathered, reddish brown, fine grained, fractured shale.								R16	CR=40% RQD=15% 14.50m
									15.00m
								R17	CR=45% RQD=16% 15.00m
									
Moderately weathered, reddish brown, fine grained, fractured shale.								R18	CR=47% RQD=21% 15.00m
									
								R19	CR=54% RQD=NIL 15.00m
									
Moderately weathered, reddish brown, fine grained, fractured shale.								R20	CR=56% RQD=52% 15.00m
									
N.B. - '*' means sample could not be recovered.									





Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh. **CETEST**

Job No : 4157 Created by : T.SAHA Created on : 24/07/2018 Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.27

Co-ordinates E=(-)815.000
N=1104.000

Field Test	Nos	Samples	Nos	Commencement Date : 29/06/2018
Penetrometer (SPT)	1	Undisturbed (UDS)	0	Completion Date : 30/06/2018
Cone (Pc)		Penetrometer (SPT)	1	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	1	Level Of Ground : 284.440 M.
		Water Sample (WS)	0	Water Struck At :
				Standing Water Level : 2.30 m.

DESCRIPTION	SYMBOL	N-VALUE						SAMPLES	
		EACH DIVN=15CM						Ref. No	Depth (m)
0.00m Filled up soil consist of reddish brown, fine grained, clayey silt to silty clay with decomposed rock fragments.								DS-1	0.50
0.90m Highly weathered, reddish brown, fine grained, fractured shale.								*SPT-1	0.90-0.92
								R1	CR=21% RQD=NIL
								R2	CR=23% RQD=NIL
								R3	CR=41% RQD=NIL
								R4	CR=45% RQD=NIL
								R5	CR=48% RQD=NIL
								R6	CR=41% RQD=NIL
								R7	CR=47% RQD=NIL
								R8	CR=53% RQD=NIL
								R9	CR=58% RQD=NIL
								R10	CR=60% RQD=NIL
								R11	CR=61% RQD=16%
								R12	CR=62% RQD=NIL
								R13	CR=61% RQD=37%
10.50m Moderately / slightly weathered, reddish brown, fine grained fractured shale.									10.50

Refusal

2.0 cm Pentn.
NX. drilling from
0.90m to 20.00m



Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh. **CETEST**

Job No : 4157 Created by : T.SAHA Created on : 24/07/2018 Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.27

Co-ordinates E=(-)815.000
N=1104.000

Field Test	Nos	Samples	Nos	Commencement Date : 29/06/2018
Penetrometer (SPT)	1	Undisturbed (UDS)	0	Completion Date : 30/06/2018
Cone (Pc)		Penetrometer (SPT)	1	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	1	Level Of Ground : 284.440 M.
		Water Sample (WS)	0	Water Struck At :
				Standing Water Level : 2.30 m.

DESCRIPTION	SYMBOL	N-VALUE						SAMPLES	
		EACH DIVN=15CM						Ref. No	Depth (m)
10.50m								R14	CR=65% RQD=53%
									11.25
								R15	CR=58% RQD=54%
									12.00
								R16	CR=60% RQD=49%
									12.75
Moderately / slightly weathered, reddish brown, fine grained fractured shale.								R17	CR=65% RQD=54%
									13.50
								R18	CR=53% RQD=NIL
									14.25
								R19	CR=52% RQD=37%
									15.00
								R20	CR=48% RQD=42%
									15.75
15.75m								R21	CR=61% RQD=30%
									16.50
								R22	CR=56% RQD=53%
									17.25
								R23	CR=60% RQD=40%
									18.00
								R24	CR=57% RQD=38%
									18.75
								R25	CR=60% RQD=33%
									19.50
19.50m								R26	CR=42% RQD=NIL
Moderately weathered, reddish brown, fine grained, fractured shale.									20.00
20.00m									
N.B. - '*' means sample could not be recovered.									





Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh. **CETEST**

Job No : 4157 Created by : T.SAHA Created on : 13/08/2018 Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.28

Co-ordinates E=(-)879.000
N=1167.000

Field Test	Nos	Samples	Nos	Commencement Date : 06/08/2018
Penetrometer (SPT)	2	Undisturbed (UDS)	0	Completion Date : 06/08/2018
Cone (Pc)		Penetrometer (SPT)	2	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	2	Level Of Ground : 284.482 M.
		Water Sample (WS)	0	Water Struck At :
				Standing Water Level : 2.20 m.

DESCRIPTION	SYMBOL	N-VALUE						SAMPLES	
		EACH DIVN=15CM						Ref. No	Depth (m)
0.00m									
Filled up soil consists of reddish brown, clayey silt to silty clay with decomposed rock fragments.								DS-1	0.50
								DS-2	1.00
								*SPT-1	1.50-1.54
1.70m									
Highly weathered, reddish brown, fine grained, fractured shale.									
6.20m									
Highly weathered, reddish brown, fine grained, fractured shale.									
8.00m									

Refusal

4.0 cm Pentn.

Refusal

2.0 cm Pentn.

NX. drilling from
1.70m to 14.20m

2.45

3.20

3.95

4.70

5.45

6.20

6.95

7.70

7.70

7.70

7.70

7.70

7.70

7.70

7.70

7.70

7.70

7.70

BH-28/Sheet-1



Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh. **CETEST**

Job No : 4157 Created by : T.SAHA Created on : 13/08/2018 Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.28

Co-ordinates E=(-)879.000
N=1167.000

Field Test	Nos	Samples	Nos	Commencement Date : 06/08/2018
Penetrometer (SPT)	2	Undisturbed (UDS)	0	Completion Date : 06/08/2018
Cone (Pc)		Penetrometer (SPT)	2	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	2	Level Of Ground : 284.482 M.
		Water Sample (WS)	0	Water Struck At :
				Standing Water Level : 2.20 m.

DESCRIPTION	SYMBOL	N-VALUE						SAMPLES	
		EACH DIVN=15CM						Ref. No	Depth (m)
8.00m Highly weathered, reddish brown, fine grained, fractured shale.								R9	CR=25% RQD=NIL 8.45
								R10	CR=38% RQD=NIL 9.20
9.20m								R11	CR=65% RQD=61% 9.95
								R12	CR=62% RQD=58% 10.70
								R13	CR=58% RQD=56% 11.45
Moderately / slightly weathered, reddish brown, fine grained, fractured shale.								R14	CR=56% RQD=51% 12.20
								R15	CR=56% RQD=53% 12.95
								R16	CR=67% RQD=64% 13.70
14.20m								R17	CR=64% RQD=54% 14.20
N.B. - '*' means sample could not be recovered.									



Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh.

Job No : 4157

Created by : T.SAHA

Created on : 13/08/2018

Sheet No:

CETEST

Co-ordinates

E=(-)1106.000

N=1164.000

BORE LOG DATA SHEET

BORE HOLE NO.33

Field Test

Nos

Samples

Nos

Commencement Date : 03/08/2018

Completion Date : 04/08/2018

Bore Hole Diameter : 150 mm./ N.X

Level Of Ground : 282.300 M.

Water Struck At :

Standing Water Level : 2.70 m.

Penetrometer (SPT)

3

Undisturbed (UDS)

0

Cone (Pc)

Penetrometer (SPT)

3

Disturbed (DS)

2

Vane (V)

Water Sample (WS)

0

DESCRIPTION

SYMBOL

N-VALUE

EACH DIVN=15CM

SAMPLES

Ref. No

Depth (m)

0.00m

Very dense, reddish brown, silty sand with decomposed rock fragments.(SM)

12

20

32

52

Refusal

100

4.0 cm Pentn.

Refusal

100

2.0 cm Pentn.

NX. drilling from 2.50m to 15.00m

2.50m

Highly weathered, reddish brown, fine grained, fractured shale.

3.25m

Highly weathered, reddish brown, fine grained, fractured shale.

8.50m

DS-1

0.50

DS-2

1.00

SPT-1

1.50-1.95

*SPT-2

2.20-2.24

*SPT-3

2.50-2.52

2.50

R1

CR=24%

RQD=NIL

3.25

R2

CR=28%

RQD=NIL

4.00

R3

CR=28%

RQD=NIL

4.75

R4

CR=26%

RQD=NIL

5.50

R5

CR=30%

RQD=NIL

6.25

R6

CR=36%

RQD=NIL

7.00

R7

CR=32%

RQD=NIL

7.75

R8

CR=35%

RQD=NIL

8.50

Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh. **CETEST**

Job No : 4157 Created by : T.SAHA Created on : 13/08/2018 Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.33

Co-ordinates E=(-)1106.000
N=1164.000

Field Test	Nos	Samples	Nos	Commencement Date : 03/08/2018
Penetrometer (SPT)	3	Undisturbed (UDS)	0	Completion Date : 04/08/2018
Cone (Pc)		Penetrometer (SPT)	3	Bore Hole Diameter : 150 mm./ N.X
Vane (V)		Disturbed (DS)	2	Level Of Ground : 282.300 M.
		Water Sample (WS)	0	Water Struck At : Standing Water Level : 2.70 m.

DESCRIPTION	SYMBOL	N—VALUE							SAMPLES		
		EACH DIVN=15CM							Ref. No	Depth (m)	
8.50m Highly weathered, reddish brown, fine grained, fractured shale.									R9	CR=40% RQD=NIL 9.25	
11.50m Highly weathered, light grey, fine grained, fractured shale.									R10	CR=32% RQD=NIL 10.00	
										R11	CR=36% RQD=NIL 10.75
										R12	CR=29% RQD=NIL 11.50
										R13	CR=36% RQD=NIL 12.25
										R14	CR=38% RQD=NIL 13.00
										R15	CR=40% RQD=NIL 13.75
										R16	CR=40% RQD=13% 14.50
										R17	CR=40% RQD=26% 15.00
		15.00m									
N.B. — ‘*’ means sample could not be recovered.											

Project : Geotechnical Inv. Work for 1x800MW Sipat STPP at Sipat, Chhattisgarh.

Job No : 4157

Created by : T.SAHA

Created on : 13/08/2018

Sheet No:

CETEST

E=(-)1123.000

N=1123.000

BORE LOG DATA SHEET

BORE HOLE NO.34

Field Test

Nos

Samples

Nos

Commencement Date : 05/08/2018

Completion Date : 05/08/2018

Bore Hole Diameter : 150 mm./ N.X

Level Of Ground : 284.478 M.

Water Struck At :

Standing Water Level : 3.50 m.

Penetrometer (SPT)

3

Undisturbed (UDS)

0

Cone (Pc)

Penetrometer (SPT)

3

Disturbed (DS)

2

Vane (V)

Water Sample (WS)

0

DESCRIPTION

SYMBOL

N-VALUE

EACH DIVN=15CM

SAMPLES

Ref. No

Depth (m)

8.50m

Highly weathered, reddish brown, fine grained, fractured shale.

10.25m

Highly weathered, light grey, fine grained, fractured shale.

15.00m

R9

CR=38%

RQD=NIL

R10

CR=28%

RQD=NIL

R11

CR=28%

RQD=NIL

R12

CR=31%

RQD=NIL

R13

CR=35%

RQD=NIL

R14

CR=36%

RQD=NIL

R15

CR=37%

RQD=NIL

R16

CR=24%

RQD=NIL

R17

CR=28%

RQD=NIL

N.B. - '*' means sample could not be recovered.

BORE LOG OF DRILL HOLE DBH - 09

PROJECT: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED SIPAT STPP STAGE-III, BILASPUR, CHATTISGARH.

CLIENT: NTPC LIMITED

CO-ORDINATES : N -1220, W-880

GROUND LEVEL (m) : 282.463

LOCATION: SIPAT, CHATTISGARH.

CASING DEPTH (m) : 1.50

DRILLING METHOD: ROTARY DRILLING

TERMINATION DEPTH BGL (m) : 15.00

GROUND W.L BGL (m) : 1.60 M

DRILLING ORIENTATION: VERTICAL

STARTED: 03.04.2023

CORE DIAMETER (mm) : 54

COMPLETED: 04.04.2023

DEPTH (m)		DESCRIPTION OF STRATA	LITHOLOGY	TYPE OF SAMPLE	SERIAL NO OF CORE'S	SPT				ROCK DETAILS	LAB TEST ON SOIL				LAB TEST ON ROCK																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
FROM	TO					NO. OF BLOWS					"SPT N" VALUE	TCR %	RQD %	WEATHERING GRADE	GRAIN SIZE ANALYSIS				SPECIFIC GRAVITY	IS CLASSIFICATION	SPECIFIC GRAVITY	DRY DENSITY g/cc	BULK DENSITY g/cc	WATER ABSORPTION %	POROSITY %	UNCONFINED COMPRESSIVE STRENGTH Kg/cm2	POINT LOAD INDEX Kg/cm2	MODULUS OF ELASTICITY	POISSON'S RATIO (μ)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
						15 cm	30 cm	45 cm	60 cm	GRAVELS %					SAND %	SILT %	CLAY %																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

ABBREVIATION

SPT : STANDARD PENETRATION TEST
UDS : UNDISTURB SAMPLE
DS : DISTURB SAMPLE
RQD : ROCK QUALITY DESIGNATION
TCR : TOTAL CORE RECOVERY
SCR : SOLID CORE RECOVERY
R : SPT REFUSAL
WL : WATER LOSS

LEGEND : LITHOLOGY

	FILL		CLAY
	SAND		SHALE
	BASALT		CLAYSTONE
	GRAVELS		SILT

Site Engineer - Ramkaran

Prepared By- Ajinkya K

Checked By - Rupa Jagdale

BORE LOG OF DRILL HOLE DBH - 10



PROJECT: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED SIPAT STPP STAGE-III, BILASPUR, CHATTISGARH.

CLIENT: NTPC LIMITED

LOCATION: SIPAT, CHATTISGARH.

TERMINATION DEPTH BGL (m) : 10.00

STARTED: 05.04.2023

CO-ORDINATES : N - 19° 12' 35.4"

CASING DEPTH (m) : 1.00 M

GROUND W.L BGL (m) : 1.20 M

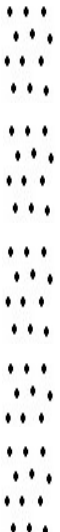
CORE DIAMETER (mm) : 54

GROUND LEVEL (m) : 282.409

DRILLING METHOD: ROTARY DRILLING

DRILLING ORIENTATION: VERTICAL

COMPLETED: 06.04.2023

DEPTH (m)		DESCRIPTION OF STRATA	LITHOLOGY	TYPE OF SAMPLE	SERIAL NO OF CORE'S	SPT					ROCK DETAILS			LAB TEST ON SOIL				LAB TEST ON ROCK										
FROM	TO					NO. OF BLOWS				"SPT N" VALUE	TCR %	RQD %	WEATHERING GRADE	GRAIN SIZE ANALYSIS				SPECIFIC GRAVITY	IS CLASSIFICATION	SPECIFIC GRAVITY	DRY DENSITY g/cc	BULK DENSITY g/cc	WATER ABSORPTION %	POROSITY %	UNCONFINED COMPRESSIVE STRENGTH kg/cm2	POINT LOAD INDEX kg/cm2	MODULUS OF ELASTICITY	POISSON'S RATIO (μ)
						15 cm	30 cm	45 cm	60 cm					GRAVELS %	SAND %	SILT %	CLAY %											
0.00	0.75	Filling with Clayey Silty Sand.																										
0.75	1.50				1-5						15	Nil	W ₂															
1.50	1.95	Hard, Brownish, Inorganic Clay of low to Medium Plasticity.		SPT	1	10	14	19	-	33				19.07	10.76	55.81	14.36	2.4	CL									
1.95	3.00	Completely Weathered, Brownish, Argillaceous Shale.		CORE	6-24						85	Nil	W ₅							2.68	2.58	2.62	1.46	3.77	-	2.91	-	
3.00	4.50	Moderately Weathered, Brownish, Argillaceous Shale.		CORE	25-55						97	27	W ₅							2.74	2.68	2.7	0.89	2.38	200.54	-	-	-
4.50	6.00	Completely Weathered, Brownish, Argillaceous Shale.		CORE	56-87						99	Nil	W ₅															
6.00	7.50	Slightly Weathered, Brownish, Argillaceous Shale.		CORE	88-110						100	32	W ₂															
7.50	9.00			CORE	111-135						95	22	W ₂															
9.00	10.00			CORE	136-146						100	72	W ₂															

ABBREVIATION														LEGEND : LITHOLOGY			
SPT : STANDARD PENETRATION TEST															FILL		CLAY
UDS : UNDISTURB SAMPLE															SAND		SANDSTONE
DS : DISTURB SAMPLE															BASALT		CLAYSTONE
RQD : ROCK QUALITY DESIGNATION															GRAVELS		SILT
TCR : TOTAL CORE RECOVERY																	
SCR : SOLID CORE RECOVERY																	
R : SPT REFUSAL																	
WL : WATER LOSS																	

Site Engineer - Ramkaran

Prepared By- Ajinkya Kadam

Checked By - Rupa Jagdale

BORE LOG OF DRILL HOLE DBH - 34

PROJECT: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED SIPAT STPP STAGE-III, BILASPUR, CHATTISGARH.

CLIENT: NTPC LIMITED

LOCATION: SIPAT, CHATTISGARH.

TERMINATION DEPTH BGL (m) : 10.00

STARTED: 15.04.2023

CO-ORDINATES : N -1210, W-787

CASING DEPTH (m) : N.A

GROUND W.L BGL (m) : 1.10 M

CORE DIAMETER (mm) : 54

GROUND LEVEL (m) : 282.156

DRILLING METHOD: ROTARY DRILLING

DRILLING ORIENTATION: VERTICAL

COMPLETED: 15.04.2023

DEPTH (m)		DESCRIPTION OF STRATA	LITHOLOGY	TYPE OF SAMPLE	SERIAL NO OF CORE'S	SPT					ROCK DETAILS			LAB TEST ON SOIL				LAB TEST ON ROCK										
FROM	TO					NO. OF BLOWS				"SPT N" VALUE	TCR %	RQD %	WEATHERING GRADE	GRAIN SIZE ANALYSIS				SPECIFIC GRAVITY	IS CLASSIFICATION	SPECIFIC GRAVITY	DRY DENSITY g/cc	BULK DENSITY g/cc	WATER ABSORPTION %	POROSITY %	UNCONFINED COMPRESSIVE STRENGTH kg/cm2	POINT LOAD INDEX kg/cm2	MODULUS OF ELASTICITY	POISSON'S RATIO (μ)
						15 cm	30 cm	45 cm	60 cm					GRAVELS %	SAND %	SILT %	CLAY %											
0.00	1.50	Moderately Weathered, Brown-White, Shale		CORE	1-5						60	28	W ₃															
1.50	3.00	Fresh, Brown-White, Shale.		CORE	6-15							99	87	W ₁														
3.00	4.50			CORE	16-28								99	81	W ₁													
4.50	6.00			CORE	29-42								96	75	W ₁													
6.00	7.50	Moderately Weathered, Brown-White, Shale		CORE	43-60						95	35	W ₃															
7.50	9.00	Fresh, Brown-White, Shale.		CORE	61-73						96	75	W ₁															
9.00	10.00			CORE	74-82							98	82	W ₁														

ABBREVIATION				LEGEND : LITHOLOGY			
SPT : STANDARD PENETRATION TEST					FILL		CLAY
UDS : UNDISTURB SAMPLE					SAND		SHALE
DS : DISTURB SAMPLE					BASALT		CLAYSTONE
RQD : ROCK QUALITY DESIGNATION					GRAVELS		SILT
TCR : TOTAL CORE RECOVERY							
SCR : SOLID CORE RECOVERY							
R : SPT REFUSAL							
WL : WATER LOSS							

Site Engineer - Ramkaran

Prepared By- Ajinkya K

Checked By - Rupa Jagdale

BORE LOG OF DRILL HOLE DBH - 36

PROJECT: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED SIPAT STPP STAGE-III, BILASPUR, CHATTISGARH.

CLIENT: NTPC LIMITED

CO-ORDINATES : N -1177, W-987

GROUND LEVEL (m) : 282.860

LOCATION: SIPAT, CHATTISGARH.

CASING DEPTH (m) : 1.50

DRILLING METHOD: ROTARY DRILLING

TERMINATION DEPTH BGL (m) : 10.00

GROUND W.L BGL (m) : 2.20

DRILLING ORIENTATION: VERTICAL

STARTED: 17.04.2023

CORE DIAMETER (mm) : 54

COMPLETED: 18.04.2023

DEPTH (m)		DESCRIPTION OF STRATA	LITHOLOGY	TYPE OF SAMPLE	SERIAL NO OF CORE'S	SPT					ROCK DETAILS			LAB TEST ON SOIL					LAB TEST ON ROCK									
FROM	TO					NO. OF BLOWS				"SPT N" VALUE	TCR %	RQD %	WEATHERING GRADE	GRAIN SIZE ANALYSIS				SPECIFIC GRAVITY	IS CLASSIFICATION	SPECIFIC GRAVITY	DRY DENSITY g/cc	BULK DENSITY g/cc	WATER ABSORPTION %	POROSITY %	UNCONFINED COMPRESSIVE STRENGTH Kg/cm2	POINT LOAD INDEX Kg/cm2	MODULUS OF ELASTICITY	POISSON'S RATIO (μ)
						15 cm	30 cm	45 cm	60 cm					GRAVELS %	SAND %	SILT %	CLAY %											
0.00	0.50	Brownish Silty Soil With Filling Bolder			DS1																							
0.50	1.50	Moderately Weathered, Brown-White, Shale		CORE	1-5						77	19	W ₃						-	-	-	-	-	1775.54	-	-	-	
1.50	3.00	Slightly Weathered, Brown-White, Shale.		CORE	6-15						76	51	W ₂						2.68	2.67	2.68	0.15	0.39	1422.62	-	-	-	
3.00	4.50			CORE	16-23						88	74	W ₂						-	-	-	-	-	393.53	-	-	-	
4.50	6.00	Fresh, Brown-White, Shale.		CORE	24-36						99	77	W ₁															
6.00	7.50			CORE	37-48						97	81	W ₁															-
7.50	9.00	Slightly Weathered, Brown-White, Shale.		CORE	49-63						93	49	W ₂															-
9.00	10.00	Fresh, Brown-White, Shale.		CORE	64-72						98	79	W ₁															

ABBREVIATION

SPT : STANDARD PENETRATION TEST
UDS : UNDISTURB SAMPLE
DS : DISTURB SAMPLE
RQD : ROCK QUALITY DESIGNATION
TCR : TOTAL CORE RECOVERY
SCR : SOLID CORE RECOVERY
R : SPT REFUSAL
WL : WATER LOSS

LEGEND : LITHOLOGY

	FILL		CLAY
	SAND		SHALE
	BASALT		CLAYSTONE
	GRAVELS		SILT

Site Engineer - Ramkaran

Prepared By- Ajinkya K

Checked By - Rupa Jagdale

2.10. ELECTRICAL RESISTIVITY TEST:

Twenty three (23) nos. Electrical Resistivity Tests were carried out at the following locations around Plant Area. The test procedure and results are presented under Section-8.

ERT No.	Co-ordinates		Reduced Level (M)	ERT No.	Co-ordinates		Reduced Level (M)
	Easting	Northing			Easting	Northing	
ERT-1	(-)879.00	1630	282.655	ERT-13	(-)755.00	868	282.780
ERT-2	(-)488.00	1466	282.315	ERT-14	(-)688.00	781	282.480
ERT-3	(-)471.000	1341	282.200	ERT-15	(-)824.00	720	282.265
ERT-4	(-)721.000	1326	284.510	ERT-16	(-)511.00	694	282.112
ERT-5	(-)643.000	1338	282.560	ERT-17	(-)926.00	571	282.719
ERT-6	(-)529.000	1284	282.360	ERT-18	(-)1035.00	362	282.670
ERT-7	(-)869.000	1296	282.570	ERT-19	(-)1532.00	945	283.170
ERT-8	(-)575.000	1200	282.460	ERT-20	(-)460.00	1666	282.218
ERT-9	(-)769.000	1125	282.290	ERT-21	148.00	1814	282.454
ERT-10	(-)772.000	1018	282.820	ERT-22	36.00	1620	282.110
ERT-11	(-)669.000	1008	282.482	ERT-23	(-)607.00	1514	283.072
ERT-12	(-)605.000	969	282.920				

2.11. CROSS HOLE SHEAR TEST:

Five (05) nos. Cross Hole Shear Test were carried out to determine the dynamic properties of the layer for the construction of machine foundations at the following locations. The test procedure and results are presented and discussed under Section-9.

GEOLOGY:

The study area belongs to the Chhattisgarh Basin. The succession of the basin (~2500 m thick) comprises dominantly of sandstones, shale, and carbonates with subordinate conglomerate and tuffs at different stratigraphic levels. The succession is designated as Chhattisgarh Supergroup, which is further classified into different groups. Shale is the only rock type encountered in the study area. The color of the shale varies from reddish brown to olive green depending on degree of weathering. The upper reaches of the rock layer is weathered and fractured. This rock layer is conformably underlies by filled up soil or clayey soil.

Summarized result of the resistivity measurements at different locations in the area are given in the following tables.

It may be indicated here that in case of highly resistive formations, current penetrates much deeper into the earth than when the subsurface formations are conducting. Further, in the present investigation only apparent resistivity is measured which may be taken (as a first approximation) as the weighted average of the true resistivity of the subsurface formations in which current lines flow.

APPARENT RESISTIVITY VALUES

ERT No. 01						
SI No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				Mean
		(N - S)	(E - W)	(NE - SW)	(NW-SE)	
1	0.5	85.59	85.75	85.44	85.75	85.63
2	1	49.01	49.95	49.64	49.95	49.64
3	2	35.06	35.18	35.18	35.18	35.15
4	3	31.10	31.01	30.82	31.10	31.01
5	4	31.79	31.79	32.04	31.92	31.89
6	5	35.18	35.66	35.03	35.66	35.38
7	6	39.39	39.77	39.96	39.77	39.72
8	7	45.74	46.18	46.18	45.52	45.91
9	8	49.01	49.01	48.76	49.76	49.13
10	10	59.06	59.06	58.75	60.00	59.22

Mean Resistivity at ERT-01 is 46.27 Ohm - m.

ERT No. 08

SI No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				Mean
		(N - S)	(E - W)	(NE - SW)	(NW-SE)	
1	0.5	28.94	28.93	28.96	29.04	28.97
2	1	26.39	26.48	26.51	26.48	26.47
3	2	37.82	37.70	37.89	37.63	37.76
4	3	41.47	42.03	42.03	42.03	41.89
5	4	51.52	51.77	51.52	51.65	51.61
6	5	56.86	56.86	57.02	57.02	56.94
7	6	62.77	62.77	62.96	63.33	62.96
8	7	71.00	71.03	69.93	71.25	70.80
9	8	79.42	80.17	79.17	79.67	79.61
10	10	96.13	95.19	96.13	96.76	96.05

Mean Resistivity at ERT-08 is 55.31 Ohm - m.

ERT No. 09

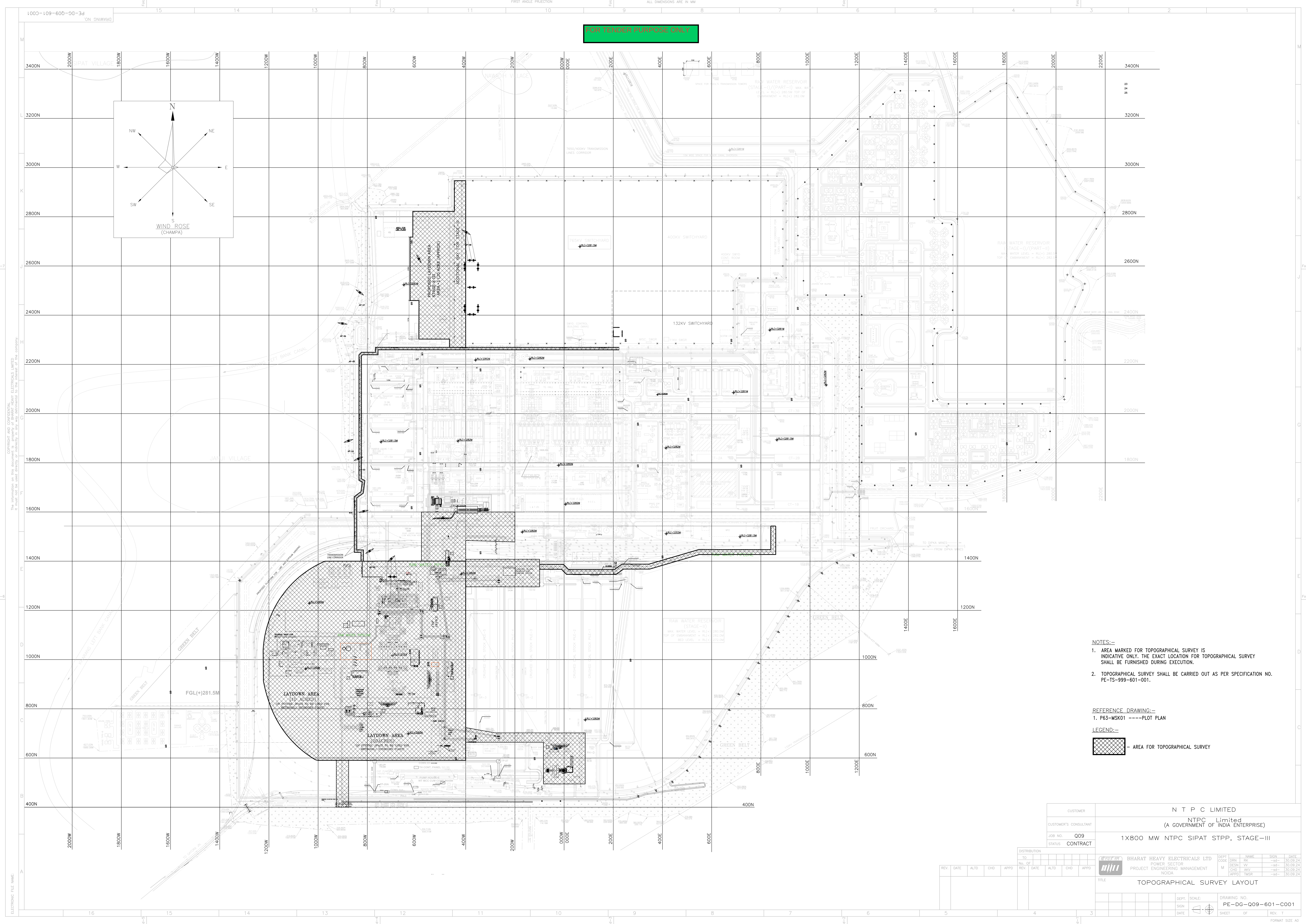
SI No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				Mean
		(N - S)	(E - W)	(NE - SW)	(NW-SE)	
1	0.5	30.07	30.06	30.07	30.06	30.07
2	1	23.75	23.81	23.84	23.91	23.83
3	2	30.03	30.03	30.16	30.28	30.13
4	3	39.30	38.82	39.02	39.30	39.11
5	4	47.50	47.88	47.25	47.37	47.50
6	5	58.59	58.43	57.18	57.02	57.80
7	6	65.97	66.54	66.54	66.35	66.35
8	7	67.73	66.85	67.73	67.73	67.51
9	8	72.38	72.13	72.13	72.13	72.19
10	10	87.33	87.02	87.96	87.65	87.49

Mean Resistivity at ERT-09 is 52.20 Ohm - m.

ERT No. 10

SI No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				Mean
		(N - S)	(E - W)	(NE - SW)	(NW-SE)	
1	0.5	22.93	22.98	22.93	22.94	22.94
2	1	27.14	27.08	27.14	27.11	27.12
3	2	35.25	35.25	35.25	35.31	35.26
4	3	47.88	47.40	47.97	47.22	47.62
5	4	52.02	52.02	52.65	52.02	52.18
6	5	62.83	62.67	62.52	62.52	62.63
7	6	72.01	72.19	72.01	71.25	71.86
8	7	73.45	73.23	73.67	73.23	73.39
9	8	75.40	76.40	76.15	75.90	75.96
10	10	92.05	92.99	92.05	94.25	92.83

Mean Resistivity at ERT-10 is 56.18 Ohm - m.

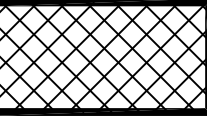


- NOTES:-
1. AREA MARKED FOR TOPOGRAPHICAL SURVEY IS INDICATIVE ONLY. THE EXACT LOCATION FOR TOPOGRAPHICAL SURVEY SHALL BE FURNISHED DURING EXECUTION.
 2. TOPOGRAPHICAL SURVEY SHALL BE CARRIED OUT AS PER SPECIFICATION NO. PE-TS-999-601-001.

REFERENCE DRAWING:-

1. P63-MSK01 -----PLOT PLAN

LEGEND:-

 - AREA FOR TOPOGRAPHICAL SURVEY

										CUSTOMER		N T P C LIMITED									
										CUSTOMER'S CONSULTANT		NTPC Limited (A GOVERNMENT OF INDIA ENTERPRISE)									
										JOB NO.		Q09									
										STATUS		CONTRACT									
										DISTRIBUTION		1X800 MW NTPC SIPAT STPP, STAGE-III									
										TO											
										No. OF											
REV.		DATE		ALTD		CHD		APPD		REV.		DATE		ALTD		CHD		APPD			
TITLE																					
TOPOGRAPHICAL SURVEY LAYOUT																					

Project	Subject	Doc. No.	Rev	Section
1X800 MW Sipat TPP (Stage-III)	GEOTECHNICAL INVESTIGATION REPORT	PE-DC-520-600-C001	00	Sheet No. 1 of

	OWNER & CONSULTANT:	NTPC LIMITED
	EPC CONTRACTOR:	BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR – EASTERN REGION

SIPAT THERMAL POWER PROJECT STAGE-III (1 X 800 MW)

GEOTECHNICAL INVESTIGATION REPORT

BHEL DOCUMENT NUMBER: PE-DC-520-600-C001-R0
NTPC DOCUMENT NUMBER: 8003-001-301-PVC-C-008

00	07/11/2024	VV	-Sd-	AKV	-Sd-	TMS RAO	-Sd-	FOR APPROVAL
REV	DATE	INITIALS	SIGN	INITIALS	SIGN	INITIALS	SIGN	DETAILS OF REVISION
		PREPARED		CHECKED		APPROVED		

1x800 MW SIPAT STPP STAGE- III

Geotechnical Report

References:

- 1 Plot plan Drg No. PE-DG-520-100-M001 dated 25.10.2024
- 2 Technical Specification, Section-VI, Part-B, Annexure-C - Geotechnical data

1 AREA : Chimney, FGD duct, Absorber, RC Pump house, Oxidation blower, FGD tanks

FGL in RL = 282.0 M

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
Chimney, FGD duct, Absorber, RC Pump house, Oxidation blower, FGD tanks	1	BH-3	281.62	281.32	281.32	277.54
	2	BH-6	281.88	281.48	281.48	278.86
	3	BH-7	281.84	281.44	281.44	278.57
	4	BH-8	282.06	281.26	281.26	277.92
	5	DBH-27	282.4	282.28	282.28	280.8
	6	DBH-28	282.3	281.8	281.8	281.1
		Lowest RL	281.62	281.26	281.26	
		Round off	281.60	281.20	281.20	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)		Raft foundation	Founding strata
						Isolated & strip foundation			
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Chimney, FGD duct, Absorber, RC Pump house, Oxidation blower, FGD tanks	281.20	280.90	282	1.10	0.30	25	25	25	rock
		280.60		1.40	0.60	30	30	30	rock
		280.20		1.80	1.00	35	35	35	rock
		279.70		2.30	1.50	40	40	40	rock
		279.20		2.80	2.00	45	45	45	rock
		278.70		3.30	2.50	50	50	50	rock
		277.70		4.30	3.50	55	55	55	rock

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2 AREA :

ESP

FGL in RL =

282 M

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
ESP	1	BH-36	282.7	281.9	281.9	279.7
	2	BH-37	281.6	281.1	281.1	279.02
	3	BH-38	281.77	281.77	281.47	279.79
	5	BH-42	282.6	282.6	281.9	277.4
	6	BH-43	281.73	281.33	281.33	278.68
	9	DBH-44	282.75	281.25	280.2	280.75
		Lowest RL	281.60	281.10	280.20	
		Round off	281.60	281.10	280.20	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)		Raft foundation	Founding strata
						Isolated & strip foundation			
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
ESP	281.10	280.10	282	1.90	1.00	12	12	12	Soil
		279.90		2.10	1.20	25	25	25	rock
		279.60		2.40	1.50	30	30	30	rock
		279.20		2.80	1.90	35	35	35	rock
		278.70		3.30	2.40	40	40	40	rock
		278.20		3.80	2.90	45	45	45	rock

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(BHEL)

3 AREA : ESP cum FGD control room, ID Fan, Duct
FGL in RL = 282 M

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
ESP cum FGD control room, ID Fan, Duct	1	BH-36	282.7	281.9	281.9	279.7
	2	BH-37	281.6	281.1	281.1	279.02
	3	BH-38	281.77	281.77	281.47	279.79
	4	BH-39	282.79	282.79	282.09	280.59
	5	BH-42	282.6	282.6	281.9	277.4
	6	BH-43	281.73	281.33	281.33	278.68
	7	BH-44	283.5	283.5	282	280.4
	8	DBH-43	283.5	283	283	281.9
		Lowest RL	281.60	281.10	281.10	
		Round off	281.60	281.10	281.10	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)		Raft foundation	Founding strata
						Isolated & strip foundation			
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
ESP cum FGD control room, ID Fan, Duct	281.10	280.80	282	1.20	0.30	25	25	25	rock
		280.50		1.50	0.60	30	30	30	rock
		280.10		1.90	1.00	35	35	35	rock
		279.60		2.40	1.50	40	40	40	rock
		279.10		2.90	2.00	45	45	45	rock

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4 AREA : Power house, TG, Transformer yard

FGL in RL =

282 M

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
Power house, TG, Transformer yard	1	BH-12	283.33	283.33	281.83	280.33
	2	BH-13	282.16	281.66	281.66	280.46
	3	BH-14	282.38	281.88	281.88	279.38
	4	BH-15	282.72	282.22	282.22	281.46
	5	BH-18	282.43	282.03	282.03	280.85
	6	BH-19	283	283	282.30	282.18
	7	DBH-21	282.73	281.23	280.78	280.63
	8	DBH-22	282.95	282.35	282.35	281.35
	9	DBH-23	282.34	281.64	281.64	281.14
		Lowest RL	282.16	281.23	280.78	
		Round off	282.10	281.20	280.70	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m ²)		Raft foundation	Founding strata
						Isolated & strip foundation			
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Power house, TG, Transformer yard	281.20	280.40	282	1.60	0.80	25	25	25	rock
		280.10		1.90	1.10	30	30	30	rock
		279.70		2.30	1.50	35	35	35	rock
		279.20		2.80	2.00	40	40	40	rock
		278.70		3.30	2.50	45	45	45	rock
		278.20		3.80	3.00	50	50	50	rock
		277.20		4.80	4.00	55	55	55	rock

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(BHEL) 6/11/24

5 AREA : Boiler, Mill Bunker, Fans, Duct

FGL in RL = 282 M

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
Boiler, Mill Bunker, Fans, Duct	1	BH-18	282.4	282	282	280.82
	2	BH-19	283	282.3	282.3	282.18
	3	BH-20	282.3	281.9	281.9	279.50
	4	BH-22	282.4	281.8	281.8	281.00
	5	BH-23	282.3	281.9	281.9	279.90
	6	BH-24	282.2	281.8	281.8	279.40
	7	BH-25	282	281.5	281.5	279.50
	8	DBH-22	283	282.4	282.40	281.40
	9	DBH-23	282.34	281.64	281.64	281.14
	11	DBH-25	282.05	281.6	281.60	280.45
		Lowest RL	282.00	281.50	281.50	
Round off			282.00	281.50	281.50	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)		Raft foundation	Founding strata
						Isolated & strip foundation			
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Boiler, Mill Bunker, Fans, Duct	281.50	281.20	282	0.80	0.30	25	25	25	rock
		280.90		1.10	0.60	30	30	30	rock
		280.50		1.50	1.00	35	35	35	rock
		280.00		2.00	1.50	40	40	40	rock
		279.50		2.50	2.00	45	45	45	rock
		279.00		3.00	2.50	50	50	50	rock
		278.00		4.00	3.50	55	55	55	rock

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6 AREA :

IDCT area

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
IDCT area	1	BH-27	284.4	283.5	283.5	282.1
	2	BH-28	284.5	282.8	282.8	282.3
	3	BH-34	284.5	281.7	281.7	281
	4	DBH-10	282.4	280.9	280.4	281.2
	5	DBH-36	282.9	282.4	282.4	280.7
		Lowest RL	282.40	280.90	280.40	
Round off			282.40	280.90	280.40	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m ²)			Founding strata
						Isolated & strip foundation	Raft foundation		
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
IDCT area	280.90	280.10	282	1.90	0.80	25	25	25	rock
		279.80		2.20	1.10	30	30	30	rock
		279.40		2.60	1.50	35	35	35	rock
		278.90		3.10	2.00	40	40	40	rock

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7 AREA :

CW Pump house, Fore bay, Channel, ClO2 system, CW treatment & ETP

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)
CW Pump house, Fore bay, Channel, ClO2 system, CW treatment & ETP	1	DBH-9	282.46	281.91	281.91	280.86
	2	DBH-34	282.16	282.16	282.16	281.06
	3	DBH-35	283.26	282.76	282.76	281.76
	4	DBH-36	282.86	282.86	282.36	280.66
		Lowest RL	282.16	281.91	281.91	
Round off			282.10	281.90	281.90	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
CW Pump house, Fore bay, Channel, ClO2 system, CW treatment & ETP	281.90	281.00	282	1.00	0.90	30	30	30	rock
		280.90		1.10	1.00	35	35	35	rock
		280.40		1.60	1.50	40	40	40	rock
		279.90		2.10	2.00	45	45	45	rock

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8 Area :

PT Plant, Service water tank, Clarified and service water pump house, Ash slurry pump house, settling & surge tank, IM silo, Ash water pump house

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
PT Plant, Service water tank, Clarified and service water pump house, Ash slurry pump house, settling & surge tank, IM silo, Ash water pump house	1	DBH-12	282.17	281.67	281.67	280.67	
	2	DBH-13	282	282	282	280.8	
	3	DBH-15	282.42	282.42	280.42	280.77	
	4	DBH-37	282.3	281.8	281.8	280.8	
		Lowest RL	282.00	281.67	280.42		
		Round off	282.00	281.60	280.40		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m ²)			Founding strata
						Isolated & strip foundation	Raft foundation		
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
PT Plant, Service water tank, Clarified and service water pump house, Ash slurry pump house, settling & surge tank, IM silo, Ash water pump house	281.60	280.60	282	1.40	1.00	12	12	12	Soil
		280.10		1.90	1.50	25	25	25	rock
		279.80		2.20	1.80	30	30	30	rock
		279.40		2.60	2.20	35	35	35	rock
		278.90		3.10	2.70	40	40	40	rock

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9 Area :

DM Plant, DM pump house, CPU Regeneration building

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
DM Plant, DM pump house, CPU Regeneration building	1	DBH-11	282.1	281.5	281.5	281.1	
		Lowest RL	282.10	281.50	281.50		
		Round off	282.10	281.50	281.50		

Net SBC Recommendations (as per technical specification)

Net SBC Recommendations (as per technical specification)									
						Net SBC (in T/m2)			
Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Isolated & strip foundation		Raft foundation	Founding strata
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
DM Plant, DM pump house, CPU Regeneration building	281.50	281.00	282	1.00	0.50	25	25	25	rock
		280.90		1.10	0.60	30	30	30	rock
		280.50		1.50	1.00	35	35	35	rock

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10 Area :

Settling & surge tank for Dewatering bins, Dewatering bin, AHP MCC Room-1

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Settling & surge tank for Dewatering bins, Dewatering bin, AHP MCC Room-1	1	BH-35	283	283	281.3	280.65	
	2	DBH-16	282.1	282.1	278.65	280.1	
	3	DBH-29	282.2	282.2	281.5	281.2	
		Lowest RL	282.10	282.10	278.65		
		Round off	282.10	282.10	278.60		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Settling & surge tank for Dewatering bins, Dewatering bin, AHP MCC Room-1	282.00	281.00	282	1.00	1.00	12	12	12	Soil
		280.00		2.00	2.00	15	15	15	Soil
		279.00		3.00	3.00	25	25	25	Soil
		278.00		4.00	4.00	30	30	30	rock

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11 Area :

Ash Silo Stage-III, Silo utility building, Ash Silo MCC

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Ash Silo Stage-III, Silo utility building, Ash Silo MCC	1	DBH-47	282.86	282.36	282.36	281.86	
	2	BH68	282.2	281.2	281.2	279.35	
	3	BH67	282.54	281.04	281.04	280.24	
		Lowest RL	282.20	281.04	281.04		
		Round off	282.20	281.00	281.00		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Ash Silo Stage-III, Silo utility building, Ash Silo MCC	281.00	280.70	282	1.30	0.30	25	25	25	rock
		280.40		1.60	0.60	30	30	30	rock
		280.00		2.00	1.00	35	35	35	rock
		279.50		2.50	1.50	40	40	40	rock

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12 Area :

Gypsum dewatering building, STP, Compressor house, AHP Compressor house, Classifier system, CHP Bunker MCC

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Gypsum dewatering building, STP, Compressor house, AHP Compressor house, Classifier system, CHP Bunker MCC room	1	BH-17	282.38	281.78	281.78	280.36	
	2	BH-41	281.5	281.5	281.5	279.4	
	3	DBH-07	281.7	281.2	281.2	280.1	
	4	DBH-20	282.29	281.79	281.79	280.69	
		Lowest RL	281.50	281.20	281.20		
		Round off	281.50	281.20	281.20		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Gypsum dewatering building, STP, Compressor house, AHP Compressor house, Classifier system,	281.20	280.90	282	1.10	0.30	25	25	25	rock
		280.60		1.40	0.60	30	30	30	rock
		280.20		1.80	1.00	35	35	35	rock
		279.70		2.30	1.50	40	40	40	rock

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13 Area :

Conveyor 28, 30, 34A, 34B, 35A/B (Stretch-1 refer Annexure-III), 37A, 37B, 38A/B, TP-18, TP-29, TP-30

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Conveyor 28, 30, 34A, 34B, 35A/B (Stretch-1 refer Annexure-III), 37A, 37B, 38A/B, TP-18, TP-29, TP-30	1	BH-2	282.23	280.73	280.73	278.73	
	2	BH-16	281.98	281.48	281.48	280.36	
	3	BH-21	282.42	281.92	281.92	281.17	
	4	BH-26	282.44	281.74	281.74	279.24	
	5	BH-30	284.05	284.05	283.45	281.4	
	6	BH-40	282.59	282.59	282.59	279.49	
	7	BH-44	283.5	283.5	282	280.4	
	8	BH-56	282.1	282.1	281.4	279	
	9	DBH-7	281.73	281.23	281.23	280.13	
	10	DBH-32	287.38	286.88	286.88	286.18	
	11	DBH-39	282.93	282.43	282.43	281.33	
	12	DBH-40	282.44	281.94	281.94	280.84	
	13	DBH-46	282.31	281.81	281.81	280.71	
		Lowest RL	281.73	280.73	280.73		
		Round off	281.70	280.70	280.70		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m ²)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Conveyor 28, 30, 34A, 34B, 35A/B (Stretch-1 refer Annexure-III), 37A, 37B, 38A/B, TP-18, TP-29, TP-30	280.70	280.40	282	1.60	0.30	25	25	25	rock
		280.10		1.90	0.60	30	30	30	rock
		279.70		2.30	1.00	35	35	35	rock
		279.20		2.80	1.50	40	40	40	rock
		278.70		3.30	2.00	45	45	45	rock
		278.20		3.80	2.50	50	50	50	rock
		277.20		4.80	3.50	55	55	55	rock

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14 Area : Conveyor 35A/B (Stretch-2 - refer Annexure-III), TP-25, Ball mill building

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Conveyor 35A/B (Stretch-2 - refer Annexure-III), TP-25, Ball mill building	1	BH-48	282.21	282.21	279.81	279.31	
	2	BH-55	282.48	282.48	280.98	280.58	
		Lowest RL	282.21	282.21	279.81		
		Round off	282.20	282.20	279.80		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Conveyor 35A/B (Stretch-2 - refer Annexure-III), TP-25, Ball mill building	282.00	281.00	282	1.00	1.00	12	12	12	Soil
		280.00		2.00	2.00	15	15	15	Soil
		279.50		2.50	2.50	25	25	25	rock
		279.20		2.80	2.80	30	30	30	rock
		278.80		3.20	3.20	35	35	35	rock
		278.30		3.70	3.70	40	40	40	rock
		277.80		4.20	4.20	45	45	45	rock
		277.30		4.70	4.70	50	50	50	rock
		276.30		5.70	5.70	55	55	55	rock

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15 Area :

Limestone handling system & Weigh bridge

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Limestone handling system & Weigh bridge	1	DBH-17	282.6	281.85	279.15	279.6	
	2	DBH-30	282	281.25	279	279.5	
		Lowest RL	282	281.25	279		
		Round off	282.00	281.20	279.00		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Limestone handling system & Weigh bridge	281.20	279.70	282	2.30	1.50	12	12	12	Soil
		279.20		2.80	2.00	15	15	15	Soil
		278.70		3.30	2.50	25	25	25	rock
		278.40		3.60	2.80	30	30	30	rock
		278.00		4.00	3.20	35	35	35	rock

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16 Area :

STP near Limestone handling system

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
STP near Limestone handling system	1	BH-9	282.1	281.6	281.6	277.76	

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)		Founding strata
						Isolated & strip foundation	Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock
STP near Limestone handling system	281.60	281.00	282	1.00	0.60	30	30	30
		280.60		1.40	1.00	35	35	35

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17 Area :

CHP Water treatment system, Reactor clarifier, Safety control room

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
CHP Water treatment system, Reactor clarifier, Safety control room	1	DBH-06	282.5	281	279.15	280.1	
	2	BH-11	282.6	281.6	281.6	279.7	
		Lowest RL	282.5	281	279.15		
		Round off	282.50	281.00	279.10		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
CHP Water treatment system, Reactor clarifier, Safety control room	281.00	280.00	282	2.00	1.00	12	12	12	Soil
		279.00		3.00	2.00	15	15	15	Soil
		278.80		3.20	2.20	25	25	25	rock
		278.50		3.50	2.50	30	30	30	rock
		278.10		3.90	2.90	35	35	35	rock

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18 Area :

Additional bay for Switchyard Stage-III

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Additional bay for Switchyard Stage-III	1	DBH-1	281.9	280.4	278.7	280.2	
	2	DBH-2	281.8	280.3	279.85	280.2	
		Lowest RL	281.8	280.3	278.7		
		Round off	281.80	280.30	278.70		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Additional bay for Switchyard Stage-III	280.30	279.30	282	2.70	1.00	12	12	12	Soil
		278.40		3.60	1.90	15	15	15	rock
		278.10		3.90	2.20	25	25	25	rock
		277.70		4.30	2.60	30	30	30	rock

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19 Area :

Weigh bridge near Gypsum handling area, AHP MCC Room 2

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
Weigh bridge near Gypsum handling area, AHP MCC Room 2	1	BH-45	281.6	280.2	278.7	278.7	
	2	BH-46	281.5	280	278.7	278.7	
	3	DBH-41	282.1	281.35	279.8	280.9	
		Lowest RL	281.5	280	278.7		
		Round off	281.50	280.00	278.70		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation		Raft foundation	
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Weigh bridge near Gypsum handling area, AHP MCC Room 2	280.00	279.00	282	3.00	1.00	12	12	12	Soil
		278.40		3.60	1.60	25	25	25	rock
		278.10		3.90	1.90	30	30	30	rock
		277.70		4.30	2.30	35	35	35	rock

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20 Area :

CHP Pump house, CHP MCC-2

Area	S. No.	Bore hole No.	EGL in RL (m)	NGL in RL (m)	Rock level in RL (m)	GWT in RL (m)	
CHP Pump house, CHP MCC-2	1	DBH-18	282.1	281.6	276	275.9	
	2	DBH-19	281.9	280.4	275.8	275.9	
		Lowest RL	281.9	280.4	275.8		
		Round off	281.90	280.40	275.80		

Net SBC Recommendations (as per technical specification)

Area	Lowest NGL (m)	Founding level in RL (m)	FGL in RL (m)	Founding depth from FGL (m)	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding strata
						Isolated & strip foundation	Raft foundation		
						25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
CHP Pump house, CHP MCC-2	280.40	279.40	282	2.60	1.00	12	12	12	Soil
		278.40		3.60	2.00	15	15	15	Soil
		277.40		4.60	3.00	25	25	25	Soil

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21 Area : Bio mass storage silo, Bio mass MCC, Bio mass TP1, STP, Weigh bridge and any strucure/building not specified above

Net SBC Recommendations (restricted as per technical specification)

Area	Founding depth from NGL (m)	Net SBC (in T/m2)			Founding
		Isolated & strip	Raft		
		25 mm in soil/12 mm in rock	40 mm in soil/12 mm in rock	75 mm in soil/12 mm in rock	
Bio mass storage silo, Bio mass MCC, Bio mass TP1, STP, Weigh bridge and any strucure/building not specified above	1.0m in soil	12	12	12	soil
	2.0m in soil	15	15	15	soil
	3.0m in soil	25	25	25	soil
	0.3 m embedment inside rock	25	25	25	rock
	0.6 m embedment inside rock	30	30	30	rock
	1 m embedment inside rock	35	35	35	rock
	1.5 m embedment inside rock	40	40	40	rock

General Notes: (As per technical specification)

- 1 The roads, ground floor slabs, trenches, pipe pedestals (except thrust blocks), channels/drains and staircase foundation with foundation loading intensity less than 4 T / M2 may be supported on open / shallow foundations resting on virgin /controlled compacted filled up soil. Wherever the intended bearing sub-strata is virgin soil stratum but the actual stratum encountered during foundation excavation consists of
- 2 filled up soil at founding level, under such cases either the foundation shall be lowered completely into the virgin stratum or the filled up soil upto the virgin layers shall be removed and built up through PCC M7.5 up to designed foundation level. Wherever the intended bearing stratum is weathered rock, but the actual strata encountered during excavation consists of both overburden soil and weathered rock at founding level, under such cases, the overburden upto the weathered rock level, including minimum embedment as per
- 3 Annexure-C into the rock, shall be removed and built up through PCC M10 upto the designed bottom level of the foundation. The founding level for all the open foundations shall be kept at same level for a structure.
- 4 The last layer of about 300 mm before reaching the founding level shall be excavated carefully by such equipment so that soil / rock at the required level will be left in its natural condition.

Mam
(NTPC)

(21/21)

Amir V
6/11/24
(BHEL)

