CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 26/08/2012 to 29/08/2012
BORE HOLE NO:	2 KM-6	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 3.00M BGL
CO-ORDINATES:	E 613042;N 2450205	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 6.50M	REDUCED LEVEL:	199.50M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00													
2.00				1.50/ 2.10	SPT 1	4	7	8	11	15			
3.00			Medium to dense yellowish brown silty Sand	3.00/ 3.60	SPT 2	10	13	17	23	30			
4.00	150 MM												
5.00				4.50 5.10	SPT 3	13	18	21	24	39			
6.00			6.00										
7.00			Yellowish brown completely weathered rock	6.00/ 6.40	SPT 4	9	25	51	--	R			
				7.00									
8.00			BORE HOLE IS TERMINATED AT 7.00M BGL										
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 7.00M DEPTH BGL

SCALE : 1:50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO	: 1 OF 1	DATE	: 27/07/2012 to 28/07/2012
BORE HOLE NO.	: 2 KM-7	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.00M BGL
CO-ORDINATES	: E 610247,N 2448729	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NOT ENCOUNTERED	REDUCED LEVEL	: 205.25M

DEPTH (m)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		GM	1.00	DS 1								
2.00			Yellowish brown completely weathered rock	1.50/1.60	SPT 1	51	--	--	--	R			
3.00			GM	3.00/3.08	SPT 2	53	--	--	--	R			
4.00				4.50/4.55	SPT 3	55	--	--	--	R			
5.00			BORE HOLE IS TERMINATED AT 4.50M BGL										
6.00													
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE — CR = CORE RECOVERY

UDS = UNDISTURBED SOIL SAMPLE — RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 4.50M DEPTH BGL.

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

A-8

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	1 OF 1	DATE	30/07/2012 to 01/08/2012
BORE HOLE NO.	2 KM - 8	METHOD	ROTARY DRILLING
LOCATION	Pipeline Corridor	CASING	Up to 2.00M BGL
CO-ORDINATES	E 608789;N 2447815	DIAMETER	150 MM AND NX
GROUND W. T.	2.40M	REDUCED LEVEL	199.58

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UDS (IS:9220M)
1.00	150 MM		Yellowish brown silty sand SM 1.00		DS 1								
2.00			Yellowish brown completely weathered rock 2.00	1.50/ 1.60	SPT 1	51	–	–	–	R			
3.00	NX		Grey fractured BASALT	3.00	CORE						33	NIL	
4.00				4.00	CORE						34	12	
5.00				5.00	CORE						49	38	
6.00			BORE HOLE IS TERMINATED AT 5.00M BGL										
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 5.00M DEPTH BGL

SCALE : 1: 50
JOB NO : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

A-9

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 02/08/2012 to 04/08/2012
BORE HOLE NO.	: 2 KM - 9	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 3.00M BGL
CO-ORDINATES	: E: 607870 , N: 2446458	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 2.50M	REDUCED LEVEL	: 214.00

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT 'N'	CORE RECOVERY (%)	RQD (%)	UCS (Kg/SQCM)
1.00	150 MM		Yellowish brown completely weatherd rock										
2.00				1.50/ 1.60	SPT 1	51	--	--	--	R			
3.00				3.00									
				3.00/ 3.08	SPT 2	53	--	--	--	R			
4.00	NX		Grey fractured BASALT	4.00	CORE						29	14	
5.00				5.00	CORE						36	31	795
6.00				6.00	CORE						43	43	
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N = STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL.

SCALE : 1: 50
JOB NO : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 06/08/2012 to 09/08/2012
BORE HOLE NO.	: 2 KM-10	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.50M BGL
CO-ORDINATES	: E 607148;N 2446458	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.00M	REDUCED LEVEL	: 229.00M

DEPTH (m.)	DIA OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weatherd rock SW	1.50/ 1.55	SPT 1	51	--	--	--	R			
2.00													
3.00			3.00	3.00/ 3.06	SPT 2	53	--	--	--	R			
4.00	NX		Grey BASALT	4.50	CORE						35	27	975
5.00													
6.00				6.00	CORE						50	50	
			BORE HOLE IS TERMINATED AT 6.00M BGL										
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL.

SCALE : 1:50
JOB NO. : 9400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 10/08/2012 to 13/08/2012
BORE HOLE NO.	: 2 KM-11	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.00M BGL
CO-ORDINATES	: E 605683;N 2444303	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NOT ENCOUNTERED	REDUCED LEVEL	: 231.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weatherd rock SW	1.50/ 1.58	SPT 1	51	--	--	--	R			
2.00													
3.00			3.00	3.00/ 3.05	SPT 2	53	--	--	--	R			
4.00	NX		Grey to yellowish grey fractured BASALT	4.50	CORE						18	NIL	
5.00				6.00	CORE						17	NIL	119
6.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL.

SCALE : 1:50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

A-12

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 26/07/2012 to 28/07/2012
BORE HOLE NO.	: 2 KM-13	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.50M BGL
CO-ORDINATES	: E 602186;N 2443706	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NOT ENCOUNTERED	REDUCED LEVEL	: 210.15M

DEPTH (m)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	NX		Grey BASALT	1.50	CORE						56	51	
2.00													
3.00				3.00	CORE						44	36	367
4.00				4.00	CORE						75	75	
5.00			BORE HOLE IS TERMINATED AT 4.00M BGL										
6.00													
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 4.00M DEPTH BGL.

SCALE : 1:50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 30/07/2012 to 01/08/2012
BORE HOLE NO.	: 2 KM-14	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.00M BGL
CO-ORDINATES	: E 599941 N 2443886	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.50M	REDUCED LEVEL	: 198.51M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT 'N'	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00			Black silty Clay CH 1.00										
2.00	150 MM		Yellowish brown completely weathered rock SM	1.50/1.58	SPT 1	51	--	--	--	R			
3.00			3.00	3.00/3.07	SPT 1	51	--	--	--	R			
4.00	NX		Grey BASALT	4.50	CORE						35	27	418
5.00				6.00	CORE						58	58	
6.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 02/08/2012 to 05/08/2012
BORE HOLE NO.	: 2 KM-15	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.50M BGL
CO-ORDINATES	: E 599151;N 2442622	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NOT ENCOUNTERED	REDUCED LEVEL	: 208.01M

DEPTH (m)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown silty sand	1.00									
2.00			SW-SM	1.50 / 1.00	SPT 1	51	--	--	--	R			
3.00			Yellowish brown completely weathered rock	3.00 / 3.05	SPT-2	50	--	--	--	R			
4.00				4.00									
5.00	NX		Yellowish brown weathered BASALT	5.50	CORE						25	8	
6.00				—	CORE						20	NIL	148
7.00				7.00									
8.00			BORE HOLE IS TERMINATED AT 7.00M BGL										
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 7.00M DEPTH BGL

SCALE : 1:50
JOB NO. : 0409

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	1 OF 1	DATE	07/08/2012 to 09/08/2012
BORE HOLE NO.	2 KM-16	METHOD	ROTARY DRILLING
LOCATION	Pipeline Corridor	CASING	Up to 3.00M BGL
CO-ORDINATES	E 597542;N 2441956	DIAMETER	150 MM AND NX
GROUND W. T.	4.05M	REDUCED LEVEL	214.55M

DEPTH (m)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Very stiff yellowish brown sandy silty Clay CH	1.50 2.10	SPT 1	4	7	9	12	16			
2.00													
2.50													
3.00			Yellowish brown Completely weathered rock	3.00/ 3.10	SPT 2	51	--	--	--	R			
3.50													
4.00	NX		Grey BASALT		CORE						25	NIL	
5.00				5.00									
6.00					CORE						40	16	1087
6.50				6.50									
7.00			BORE HOLE IS TERMINATED AT 6.50M BGL										
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.50M DEPTH BGL

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

A-17

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 16/08/2012 to 18/08/2012
BORE HOLE NO.	: 2 KM-17	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.50M BGL
CO-ORDINATES	: E 595381;N 2441652	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NOT ENCOUNTERED	REDUCED LEVEL	: 236.90M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weathered rock	1.50									
2.00				1.50/1.55	SPT 1	53	--	--	--	R			
3.00				3.00	CORE						25	NIL	
4.00	NX		Brown fractured BASALT	4.50	CORE						28	NIL	
5.00					CORE						31	NIL	
6.00				6.00									
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	1 OF 1	DATE	11/05/2012 TO 13/05/2012
BORE HOLE NO.	2KM-18	METHOD	ROTARY DRILLING
LOCATION	Pipeline Corridor	CASING	Up to 0.50M BGL
CO-ORDINATES	E594901,N 2441782	DIAMETER	150 MM AND NX
GROUND W. T.	Not Encountered	REDUCED LEVEL	235.82M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown sandy silty Clay 1.00		DS1								
2.00	NX		Grey BASALT	2.00	CORE						15	NIL	
3.00				3.50	CORE						50	40	
4.00													
5.00				5.00	CORE						73	43	
6.00				6.00	CORE						100	93	
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 6.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 20/08/2012 to 23/08/2012
BORE HOLE NO.	: 2 KM-19	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.00M BGL
CO-ORDINATES	: E 593576;N 2440949	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.45M	REDUCED LEVEL	: 265.49M

DEPTH (m)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
			Black silty Clay 0.40							
1.00	150 MM		Yellowish brown completely weathered rock SP-SM	1.50/1.60	SPT 1	15 15 15 15 (51)	R			
2.00										
3.00			3.00	3.00/3.05	SPT 2	15 15 15 15 (52)	R			
4.00	NX		Yellowish brown to grey weathered BASALT	4.50	CORE			27	NIL	49
5.00										
6.00			—	6.00	CORE			27	8	
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL							
8.00										
9.00										
10.00										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL.

SCALE : 1:50
JOB NO. : 2403

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	1 OF 1	DATE	19/05/2012 to 21/05/2012
BORE HOLE NO.	2 KM-20	METHOD	ROTARY DRILLING
LOCATION	Pipeline Corridor	CASING	Up to 1.00M BGL
CO-ORDINATES	E 592178;N 2440087	DIAMETER	150MM AND NX
GROUND W. T.	NOT ENCOUNTERED	REDUCED LEVEL	275.35M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weathered rock	1.50/1.55	SPT 1	51	--	--	--	R			
2.00													
3.00													
4.00	NX		Grey BASALT	3.00/3.05	SPT 2	53	--	--	--	R			
				4.50	CORE						31	31	1276
5.00				6.00	CORE						33	33	
6.00													
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N = STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL.

SCALE : 1:50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

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CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 04/08/2012 to 06/08/2012
BORE HOLE NO.	: 2 KM-21	METHOD	: ROTARY DRILLING
LOCATION	: Pipeline Corridor	CASING	: Up to 1.50M BGL
CO-ORDINATES	: E 589905;N 2439549	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NOT ENCOUNTERED	REDUCED LEVEL	: 275.35M

DEPTH (m.)	BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weathered rock 1.50										
2.00				1.50 1.60	SPT 1	52	--	--	--	R			
					CORE						17	NIL	
3.00				3.00									
4.00	NX		Grey fractured BASALT		CORE						28	8	82
5.00				4.50									
					CORE						33	19	951
6.00				6.00									
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.00M DEPTH BGL

SCALE : 1:50
JOB NO. : 5403

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

A-22

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	1 OF 1	DATE	15/03/2013 to 17/03/2013
BORE HOLE NO.	BH-2	METHOD	ROTARY DRILLING
LOCATION	PUMP HOUSE	CASING	Up to 1.50M BGL
CO-ORDINATES	E -620471; N- 2458950	DIAMETER	150 MM AND NX
GROUND W. T.	NMW	REDUCED LEVEL	

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	ROD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weathered rock	1.50									
2.00				1.50/1.55	SPT 1	54	--	--	--	R			
3.00				3.00	CORE						18	NIL	
4.00	NX		Greyish Brown Fractured BASALT	4.50	CORE						36	27	
5.00													
6.00				6.00	CORE						40	35	
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 6.0 M DEPTH BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

A-23

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	1 OF 1	DATE	22/03/2013 to 25/03/2013
BORE HOLE NO.	BH-3	METHOD	ROTARY DRILLING
LOCATION	PUMP HOUSE	CASING	Up to 1.50M BGL
CO-ORDINATES	E-620412; N-2458949	DIAMETER	150 MM AND NX
GROUND W. T.	NMW	REDUCED LEVEL	

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG/SQCM)
1.00	150 MM		Yellowish brown completely weathered rock	1.50									
2.00				1.50/ 1.54	SPT 1	50	–	–	–	R			
3.00				3.00	CORE						26	NIL	
4.00	NX		Brownish Grey fractured BASALT	4.50	CORE						38	27	
5.00					CORE						39	30	
6.00				6.00									
7.00			BORE HOLE IS TERMINATED AT 6.00M BGL										
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 600M DEPTH BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

A-24

Bore hole data river area

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 14/07/2012 TO 16/07/2012
BORE HOLE NO.	: BH-1 Bank of Sala Nallah	METHOD	: ROTARY DRILLING
LOCATION	: SALA NAHHAH	CASING	: Up to 7.50 m BGL
CO-ORDINATES	: E 609671;N 2448224	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.00 M	REDUCED LEVEL	: 197.95M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00			SM	1.00	DS1								
2.00				1.50/ 2.10	SPT 1	04	07	08	11	15			
3.00	150 MM		SM	3.00/ 3.60	SPT 2	05	08	12	14	20			
4.00			Medium dense brown silty Sand										
5.00				4.50/ 5.10	SPT 3	05	09	11	14	20			
6.00				6.00/ 6.60	SPT 4	09	11	13	15	24			
7.00				7.50									
8.00					CORE						25	NIL	
9.00	NX		Grey, BASALT	9.00									
10.00					CORE						56	56	1527

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 14/07/2012 TO 16/07/2012
BORE HOLE NO.	: BH-1 Bank of Sala Nallah	METHOD	: ROTARY DRILLING
LOCATION	: SALA NALLAH	CASING	: Up to 7.50 m BGL
CO-ORDINATES	: E 609671;N 2448224	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.00M	REDUCED LEVEL	: 197.95M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
	NX			10.50	CORE			56	56	
11.00			Grey to brown BASALT		CORE			57	54	
12.00				12.00						
13.00			BORE HOLE IS TERMINATED AT 12.00M BGL							
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE | K = INSITU PERMEABILITY | CR = CORE RECOVERY
UDS = UNDISTURBED SOIL SAMPLE | DS = DISTURBED SOIL SAMPLE | RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 18/07/2012 To 22/07/2012
BORE HOLE NO.	: BH-2 Mid way of Sala Nallha	METHOD	: ROTARY DRILLING
LOCATION	: SALA NALLHA	CASING	: Up to 5.00 m BGL
CO-ORDINATES	: E 609687;N 2448234	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 2.2 M BGL	REDUCED LEVEL	: BL 197.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM				DS1					
2.00			SM Brown silty Sand mixed with gravels	1.50/ 2.10	SPT 1	04 05 07 07	12			
3.00										
4.00			SM	3.00 3.60	SPT 2	04 06 08 09	14			
5.00				4.50 4.95	SPT 3	15 15 15 – 07 11 16 –	27			
				5.00						
6.00	NX		Grey BASALT	6.50		CORE		26	07	1079
7.00										
8.00				8.00		CORE		51	51	1160
9.00			Brown BASALT	9.50		CORE		59	59	
10.00										

SPT N = STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 9.50M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 01/06/2012 TO 05/06/2012
BORE HOLE NO.	: BH-1 Bank of Baswa River	METHOD	: ROTARY DRILLING
LOCATION	: BASWA RIVER	CASING	: Up to 9.00 m BGL
CO-ORDINATES	: E 612486;N 2449755	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 2.50 M	REDUCED LEVEL	: 198.45M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Medium dense brown silty Sand		DS1								
2.00		SW		1.50/ 2.10	SPT 1	04	05	07	09	12			
3.00				3.00/ 3.60	SPT 2	04	06	08	09	14			
4.00				4.50/ 5.10	SPT 3	09	12	14	19	26			
5.00													
6.00				6.00/ 6.60	SPT 4	08	15	13	19	28			
7.00		SW-SM		7.50/ 8.10	SPT 5	09	14	17	21	31			
8.00													
9.00				9.00/ 9.60	SPT 6	10	15	19	22	34			
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 01/06/2012 TO 05/06/2012
BORE HOLE NO.	: BH-1 Bank of Baswa River	METHOD	: ROTARY DRILLING
LOCATION	: BASWA RIVER	CASING	: Up to 9.00 m BGL
CO-ORDINATES	: E 612486;N 2449755	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 2.50 M	REDUCED LEVEL	: 198.45 M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	150 MM		Dense brown Silty Sand SW-SM	10.50 11.10	SPT 7	09	14	19	22	33			
12.00				12.00 12.60	SPT 8	10	15	19	22	34			
13.00													
14.00				13.50 14.10	SPT 9	18	22	31	41	53			
15.00													
16.00				15.00 15.60	SPT 10	21	29	30	40	59			
17.00				16.50 17.10	SPT 11	18	17	23	40	40			
18.00													
19.00				18.00 18.60	SPT 12	13	21	26	30	47			
20.00				19.50 20.10	SPT 13	13	19	24	31	43			

SPT N =STANDARD PENETRATION TEST VALUE K = INSITU PERMEABILITY CR = CORE RECOVERY

UDS = UNDISTURBED SOIL SAMPLE DS = DISTURBED SOIL SAMPLE RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 20.10 M BGL

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 24/06/2012 TO 29/06/2012
BORE HOLE NO.	: BH-2 MIDWAY OF BASWA RIVER	METHOD	: ROTARY DRILLING
LOCATION	: BASWA RIVER	CASING	: Up to 8.00M BGL
CO-ORDINATES	: E 612512;N 2449721	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 0.0 M	REDUCED LEVEL	: 191.25 M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
						15	15	15	15				
1.00													
2.00				SC 1.50/ 2.10	SPT 1	03	07	09	11	16			
3.00													
4.00				3.00/ 3.60	SPT 2	04	06	10	14	16			
5.00	150 MM		Mediium dense Yellowish brown clayey Sand	CI 4.50/ 5.05	SPT 3	06	09	13	13	22			
6.00													
7.00				6.00/ 6.60	SPT 4	08	12	16	19	28			
8.00				7.50/ 8.10	SPT 5	08	12	16	19	28			
9.00													
10.00				SC 9.00/ 9.60	SPT 6	08	13	17	18	30			

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO. : 2 OF 2	DATE : 24/06/2012 TO 29/06/2012
BORE HOLE NO: BH-2 MIDWAY OF BASWA RIVER	METHOD : ROTARY DRILLING
LOCATION : BASWA RIVER	CASING : Up to 8.00M BGL
CO-ORDINATES: E 612512;N 2449721	DIAMETER : 150 MM AND NX
GROUND W. T. : 0.0 M	REDUCED LEVEL: 191.25 M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG/SQCM)
11.00	NX		Grey, BASALT	10.00 – 11.00	CORE			58	48	1079
12.00				11.00 – 12.00	CORE			68	51	
13.00				12.00 – 13.00	CORE			56	56	
14.00			BORE HOLE IS TERMINATED AT 13.00M BGL							
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE K = INSITU PERMEABILITY CR = CORE RECOVERY

UDS = UNDISTURBED SOIL SAMPLE DS = DISTURBED SOIL SAMPLE RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 13.00M BGL

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 08/08/2012 TO 11/08/2012
BORE HOLE NO.	: BH-1 BANK OF SELDA NALLAH	METHOD	: ROTARY DRILLING
LOCATION	: SELDA NALLAH	CASING	: 150MM = 4.50M
CO-ORDINATES	: E 590799;N 2439629	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.00 M	REDUCED LEVEL	: 263.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG /SQCM)
			Black cotton soil	0.00/ 0.50	DS								
1.00													
2.00			Loose to Medium dense Brownish yellow Silty Sand SM	1.50/ 2.10	SPT 1	2	3	5	7	8			
3.00	150 MM												
				3.00/ 3.45	SPT 2	4	9	13	--	22			
4.00			4.00										
			Yellowsh brown completely weathered rock	4.50/ 4.58	SPT 3	51	--	--	--	R			
5.00													
6.00				6.00/ 6.05	SPT 4	52	--	--	--	R			
7.00				7.50	CORE						14	NIL	
8.00	NX		Grey BASALT.	8.50	CORE						28	NIL	999
9.00				9.50	CORE						36	10	
10.00					CORE						51	51	1028

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS :

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 08/08/2012 TO 11/08/2012
BORE HOLE NO.	: BH-1 BANK OF SELDA NALLAH	METHOD	: ROTARY DRILLING
LOCATION	: SELDA NALLAH	CASING	: 150MM = 4.50M
CO-ORDINATES	: E 590799;N 2439629	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 3.00 M	REDUCED LEVEL	: 263.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey BASALT.	11.00	CORE						51	51	
12.00				12.50	CORE						52	52	
13.00			BORE HOLE IS TERMINATED AT 12.50 M BGL										
14.00													
15.00													
16.00													
17.00													
18.00													
19.00													
20.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
K = INSITU PERMEABILITY
DS = DISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.50 M BGL

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 16/07/2012 TO 18/07/2012
BORE HOLE NO.	: BH-1 Bank of Canal	METHOD	: ROTARY DRILLING
LOCATION	: CANAL	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: E 607793;N 2446222	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 5.60M	REDUCED LEVEL	: 216.75M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Brown silty sand SM 1.00		DS1					
2.00				1.50/ 1.60	SPT 1	53 – – –	R			
3.00			Brownish yello Completely weathered rock SM	3.00/ 3.08	SPT 2	54 – – –	R			
4.00			4.50							
5.00	NX			4.50/ 4.55	SPT 3	58 – – –	R			
6.00				6.00	CORE			31	07	132
7.00			Grey BASALT	7.50	CORE			52	52	340
8.00										
9.00				9.00	CORE			60	60	402
10.00			BORE HOLE IS TERMINATED AT 9.00M BGL							

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 9.00M BGL

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 30/04/2012 TO 02/05/2012
BORE HOLE NO.	: BH-1 Right Bank of Garodiya Nallah	METHOD	: ROTARY DRILLING
LOCATION	: GARODIYA NALLAH	CASING	: Up to 3.00m BGL
CO-ORDINATES	: N2443856, E 601078	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 1.80 m Below GL.	REDUCED LEVEL	: 198.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Brown silty Sand SM		DS1								
2.00			Yellowish brown Completely weathered rock	1.50/ 1.70	SPT 1	51	–	–	–	R	13	NIL	96
3.00				3.00/ 3.08	SPT 2	58	–	–	–	R			
4.00					CORE						13	NIL	
				4.50									
5.00	NX				CORE						15	NIL	
6.00				6.00									
7.00			Grey BASALT		CORE						60	26	144
				7.50									
8.00					CORE						70	40	
9.00				9.00									
10.00					CORE						65	40	157

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 30/04/2012 TO 02/05/2012
BORE HOLE NO.	: BH-1 Right Bank of Garodiya Nallah	METHOD	: ROTARY DRILLING
LOCATION	: GARODIYA NALLAH	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: N2443856, E 601078	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 1.80m Below GL.	REDUCED LEVEL	: 198.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey BASALT	10.50	CORE			65	40	
12.00				12.00	CORE			76	76	
13.00			BORE HOLE IS TERMINATED AT 12.00M BGL							
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE K = INSITU PERMEABILITY CR = CORE RECOVERY

UDS = UNDISTURBED SOIL SAMPLE DS = DISTURBED SOIL SAMPLE RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.00M BGL

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 28/08/2012 TO 03/09/2012
BORE HOLE NO.	: BH-2 MIDWAY OF GARODIYA NALLAH	METHOD	: ROTARY DRILLING
LOCATION	: GARODIYA NALLAH	CASING	: Up to 1.50 m BGL
CO-ORDINATES	: E 601054;N 2443872	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 0.0 M	REDUCED LEVEL	: 197.60M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		filledup material 1.00							
2.00			Yellowish brown weathered BASALT rock	1.50	CORE			28	NIL	
3.00				3.00	CORE			20	NIL	82
4.00				4.50	CORE			25	8	
5.00			Grey BASALT							
6.00				6.00	CORE			39	13	
7.00	NX		Brown BASALT	7.50	CORE			39	23	143
8.00			Grey BASALT							
9.00				9.00	CORE			41	25	
10.00					CORE			59	57	158

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 28/08/2012 TO 03/09/2012
BORE HOLE NO.	: BH-2 MIDWAY OF GARODIYA NALLAH	METHOD	: ROTARY DRILLING
LOCATION	: GARODIYA NALLAH	CASING	: Up to 1.50 m BGL
CO-ORDINATES	: E 601054;N 2443872	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 0.0 M	REDUCED LEVEL	: 197.60M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey BASALT.	10.50	CORE			59	57	
12.00				12.00	CORE			60	53	
13.00			BORE HOLE IS TERMINATED AT 12.00M BGL							
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
K = INSITU PERMEABILITY
DS = DISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 01/05/2012 TO 04/05/2012
BORE HOLE NO.	: BH-3 Lt Bank of Garodiya Nallah	METHOD	: ROTARY DRILLING
LOCATION	: GARODIYA NALLAH	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: E 601031;N 2443864	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 5.80m Below GL.	REDUCED LEVEL	: 197.92M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD %	UCS (KG/SQCM)
						15	15	15	15				
1.00	150 MM		SM		DS1								
2.00			Yellowish brown silty sand mixed with gravels SM	1.50/ 1.70	SPT 1	09	53	–	–	R			
3.00			3.00										
4.00	NX		Yellowish brown weathered BASALT ROCK	3.00/ 3.06	SPT 2	58	–	–	–	R			
				4.50		CORE					08	NIL	
5.00													
6.00				6.00		CORE					14	NIL	80
7.00													
				7.50		CORE					36	NIL	
8.00													
9.00				9.00		CORE					18	NIL	
10.00			Grey BASALT			CORE					53	35	153

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 01/05/2012 TO 04/05/2012
BORE HOLE NO.	: BH-3 Lt Bank of Garodiya Nallah	METHOD	: ROTARY DRILLING
LOCATION	: GARODIYA NALLAH	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: E 601031;N 2443864	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 5.80m Below GL.	REDUCED LEVEL	: 197.92M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey BASALT	10.50	CORE			53	35	
12.00				12.00	CORE			46	10	
13.00				13.50	CORE			65	30	171
14.00				15.00	CORE			86	86	
15.00										
16.00			BORE HOLE IS TERMINATED AT 15.00M BGL							
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE | K = INSITU PERMEABILITY | CR = CORE RECOVERY

UDS = UNDISTURBED SOIL SAMPLE | DS = DISTURBED SOIL SAMPLE | RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 15.00M BGL

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO. : 1 OF 1	DATE : 07/08/2012 TO 10/08/2012
BORE HOLE NO.: BH-1	METHOD : ROTARY DRILLING
LOCATION : SANAWAD PUNASA ROAD CROSSING	CASING : 150MM = 3.50M
CO-ORDINATES: E 614662 ;N 2451533	DIAMETER : 150 MM AND NX
GROUND W. T. : 7.00M	REDUCED LEVEL: 211.40 M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG /SQCM)
1.00	150 MM												
2.00			Yellowish brown completely weathered rock SM	1.50/ 1.75	SPT 1	18	51	–	--	R			
3.00													
			SM 3.50	3.00/ 3.10	SPT 2	52	–	–	--	R			
4.00													
5.00			Grey Fractured BASALT	5.00	CORE						27	NIL	87
6.00					CORE						30	NIL	
			6.50										
7.00				7.00	CORE						62	NIL	
8.00	NX		Grey BASALT	8.50	CORE						51	51	125
9.00													
10.00				10.00	CORE						67	67	

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BOREHOLE TERMINATED AT 10.00M DEPTH BGL.

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO. : 1 OF 2	DATE : 07/06/2012 TO 09/06/2012
BORE HOLE NO.: BH-1	METHOD : ROTARY DRILLING
LOCATION : KHANDWA INDORE ROAD CROSSING	CASING : Up to 7.00 m BGL
CO-ORDINATES: E 612255;N 2449545	DIAMETER : 150 MM AND NX
GROUND W. T. : 6.70M	REDUCED LEVEL: 199.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM			0.00/ 1.00	DS								
2.00			CI	1.50/ 2.10	SPT 1	04	07	9	12	16			
3.00			Very stiff Yellowish brown sandy silty Clay	3.00/ 3.60	SPT 2	07	09	12	14	21			
4.00													
5.00			SC	4.50/ 5.10	SPT 3	8	14	18	24	32			
6.00													
7.00			CI 7.00	6.00/ 6.60	SPT 4	19	21	29	31	50			
8.00			Medium dense yellowish brown silty Sand	7.50/ 8.10	SPT 5	07	09	12	14	21			
9.00				9.00/ 9.60	SPT 6	08	12	14	16	26			
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 07/06/2012 TO 09/06/2012
BORE HOLE NO.	: BH-1	METHOD	: ROTARY DRILLING
LOCATION	: KHANDWA INDORE ROAD CROSSING	CASING	: Up to 7.00 m BGL
CO-ORDINATES	: E 612255;N 2449545	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 6.70M	REDUCED LEVEL	: 199.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm				SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
						15	15	15	15				
11.00	150 MM		Medium to dense Yellowish brown silty Sand	10.50 11.10	SPT 7	08	12	13	15	25			
12.00				12.00 12.60	SPT 8	09	18	21	25	39			
13.00				SM 13.50/ 13.95	SPT 9	11	19	21	–	40			
14.00													
15.00				15.00/ 15.60	SPT 10	12	22	29	26	51			
16.00													
17.00				16.50/ 17.10	SPT 11	17	21	31	33	52			
18.00													
19.00				18.00/ 18.60	SPT 12	21	27	32	36	59			
20.00				SM 19.50/ 20.10	SPT 13	25	32	38	42	70			

SPT N = STANDARD PENETRATION TEST VALUE K = INSITU PERMEABILITY CR = CORE RECOVERY

UDS = UNDISTURBED SOIL SAMPLE DS = DISTURBED SOIL SAMPLE RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 20.00M BGL

SCALE : 1: 50

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 10/09/2012 TO 13/09/2012
BORE HOLE NO.	: BH-1 BANK OF CANAL	METHOD	: ROTARY DRILLING
LOCATION	: CANAL	CASING	: 150MM = 3.00M
CO-ORDINATES	: E 615963;N 2453219	DIAMETER	: 150 MM AND NX
GROUND W. T.	: NMW	REDUCED LEVEL	: 224.50M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG /SQCM)
1.00	150 MM		Brown silty Sand 1.00		DS								
2.00				1.50/ 1.75	SPT 1	18	51	–	--	R			
					CORE						23	NIL	
3.00				3.00/ 3.05	SPT 2	51	–	–	--	R			
4.00					CORE						18	NIL	99
5.00			Yellowish brown weathered Rock	4.50/ 4.54	SPT 3	53	–	–	–	R			
6.00					CORE						19	NIL	
				6.00/ 6.05	SPT 4	54	–	--	--	R			
7.00				7.50	CORE						24	NIL	
8.00	NX												
9.00				9.00	CORE						18	NIL	
10.00			Grey fractured BASALT		CORE						29	NIL	855

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS :

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 05/07/2012 TO 11/07/2012
BORE HOLE NO.	: BH-1 Bank of Khedi River	METHOD	: ROTARY DRILLING
LOCATION	: KHEDI RIVER	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: E 613034;N 2450251	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 4.50 M BGL	REDUCED LEVEL	: 196.75M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Brown silty Sand SM		DS1					
2.00				1.50/ 2.10	SPT 1	02 03 05 08	08			
3.00				3.00/ 3.60	SPT 2	02 04 07 09	11			
4.00			3.70	4.50	CORE			42	NIL	
5.00				6.00	CORE			23	NIL	
6.00				7.50	CORE			25	NIL	
7.00	NX		Grey fractured BASALT	9.00	CORE			27	NIL	
8.00					CORE			54	51	1337
9.00										
10.00										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 05/07/2012 TO 11/07/2012
BORE HOLE NO.	: BH-1 Bank of Khedi River	METHOD	: ROTARY DRILLING
LOCATION	: KHEDI RIVER	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: E 613034;N 2450251	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 4.50M	REDUCED LEVEL	: 196.75M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey, BASALT	10.50	CORE			54	51	
12.00				12.00	CORE			50	50	1362
13.00			BORE HOLE IS TERMINATED AT 12.00M BGL							
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
K = INSITU PERMEABILITY
DS = DISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 28/06/2012 TO 03/07/2012
BORE HOLE NO.	: BH-2 Midway of Khedi river	METHOD	: ROTARY DRILLING
LOCATION	: KHEDI RIVER	CASING	: Up to 1.50 m BGL
CO-ORDINATES	: E 613063; N 2450265	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 6.0 M	REDUCED LEVEL	: BL 194.75M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Brown silty Sand SM 1.00		DS1								
2.00	NX		Grey fractured BASALT		CORE						10	NIL	
				2.50									
3.00				2.50/ 2.58	SPT 1	51	–	–	–	R			
4.00					CORE						10	NIL	
				4.00									
5.00				4.00/ 4.05	SPT 2	53	–	–	–	R			
					CORE						22	18	280
6.00				5.50									
7.00			7.00		CORE						25	08	
8.00			Grey BASALT		CORE						53	53	1239
9.00				8.50									
					CORE						57	52	
10.00				10.00									

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 10.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 20/04/2012 TO 22/04/2012
BORE HOLE NO.	: BH-1 Right Bank of Sheetal River	METHOD	: ROTARY DRILLING
LOCATION	: SHEETAL RIVER	CASING	: Up to 4.00 m BGL
CO-ORDINATES	: E 600369;N 2443880	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 4.00m Below GL.	REDUCED LEVEL	: 194.91M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Medium dense Yellowish brown silty Sand SM		DS1					
2.00				2.50	SPT 1	04 06 09 11	15			
3.00				3.00						
4.00				4.00						
5.00	NX		Grey, BASALT	5.00	CORE			31	15	596
6.00				6.50	CORE			73	40	
7.00										
8.00				8.00	CORE			60	60	718
9.00				9.00	CORE			70	50	
10.00	BORE HOLE IS TERMINATED AT 9.00M BGL									

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 9.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 27/08/2012 TO 02/09/2012
BORE HOLE NO.	: BH-2 Midway of Sheetal River	METHOD	: ROTARY DRILLING
LOCATION	: SHEETAL RIVER	CASING	: Up to 3.00 m BGL
CO-ORDINATES	: E 600390;N 2443883	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 0.0 m	REDUCED LEVEL	: BL 194.15M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	NX		Grey fractured BASALT	1.50	CORE						22	15	
2.00				1.50/1.55	SPT 1	50	–	–	–	R	23	8	839
3.00				3.00	CORE								
4.00				3.00/3.04	SPT 2	50	–	–	–	R	29	NIL	
5.00				4.50	CORE						27	16	
6.00				6.00	CORE						23	9	
7.00				7.50	CORE						31	14	959
8.00				9.00	CORE						50	50	
9.00													
10.00			Grey BASALT.										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE CONTINUES

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 27/08/2012 TO 29/08/2012
BORE HOLE NO.:	BH-2 MIDWAY OF SHEETAL RIVER	METHOD	: ROTARY DRILLING
LOCATION	: SHEETAL RIVER	CASING	: Up to 3.00 m BGL
CO-ORDINATES:	E 600390;N 2443883	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 0.0 M	REDUCED LEVEL:	BL 194.15M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey BASALT.	10.50	CORE			50	50	
12.00				12.00	CORE			56	56	
13.00			BORE HOLE IS TERMINATED AT 12.00M BGL							
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
K = INSITU PERMEABILITY
DS = DISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 24/04/2012 TO 27/04/2012
BORE HOLE NO.	: BH-3 Left Bank of Sheetal River	METHOD	: ROTARY DRILLING
LOCATION	: SHEETAL RIVER	CASING	: Up to 5.00 m BGL
CO-ORDINATES	: E 600407;N 2443890	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 5.00m Below GL.	REDUCED LEVEL	: 194.49M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	100 MM				DS1					
2.00				1.50/ 2.10	SPT 1	02 04 06 06	10			
3.00			Medium dense Brownish silty sand							
			SM	3.00 3.60	SPT 2	04 08 11 14	19			
4.00										
5.00				4.50 4.70	SPT 3	08 51 – –	R			
			5.00							
6.00	NX		Grey fractured BASALT	6.00		CORE		15	NIL	
7.00			Grey BASALT	7.50		CORE		50	26	760
8.00										
9.00				9.00		CORE		53	28	837
10.00				10.00		CORE		60	50	

SPT N = STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 10.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 07/05/2012 TO 09/05/2012
BORE HOLE NO.	: BH-1 Rt Bank of Canal	METHOD	: ROTARY DRILLING
LOCATION	: CANAL	CASING	: Up to 1.50 m BGL
CO-ORDINATES	: E 596744;N 2441844	DIAMETER	: 150 MM AND NX
GROUND W. T.	: Not Encountered	REDUCED LEVEL	: 227.25M

DEPTH (m.)	DIA. OF BORE HOLE	LOG	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Brown silty Sand (1.50)										
2.00				1.50 / 1.55	SPT 1	58	–	–	–	R	50	30	837
				2.50									
3.00					CORE						53	34	
4.00			Brown to grey BASALT	4.00									
5.00	NX				CORE						55	22	96
				5.50									
6.00					CORE						94	92	
7.00				7.00									
8.00			BORE HOLE IS TERMINATED AT 7.00M BGL										
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 7.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 07/05/2012 TO 09/05/2012
BORE HOLE NO.	: BH-2 Lt Bank of Canal	METHOD	: ROTARY DRILLING
LOCATION	: CANAL	CASING	: Up to 1.00 m BGL
CO-ORDINATES	: E 598517;N 2441788	DIAMETER	: 150 MM AND NX
GROUND W. T.	: Not Encountered	REDUCED LEVEL	: 224.85 M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
1.00	150 MM		Yellowish brown silty Sand 1.00		DS1								
2.00											15	NIL	80
			Yellow fractured BASALT	2.00 2.05	SPT 1	58	–	–	–	R	18	NIL	
3.00				3.00									
4.00			4.00		CORE						15	NIL	
5.00	NX			4.50									
			Grey BASALT		CORE						56	40	534
6.00				6.00									
7.00				7.50	CORE						83	83	
8.00			BORE HOLE IS TERMINATED AT 7.50M BGL										
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 7.50M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 1	DATE	: 11/05/2012 TO 13/05/2012
BORE HOLE NO.	: BH-1	METHOD	: ROTARY DRILLING
LOCATION	: SELDA BEDIA ROAD CROSSING	CASING	: Up to 0.50 m BGL
CO-ORDINATES	: E 595601;N 2441664	DIAMETER	: 150 MM AND NX
GROUND W. T.	: Not Encountered	Reduced Level	: 230.55 M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
	150 MM		Brown silty Sand 0.50		DS1								
1.00			Grey fractured BASALT	1.50	CORE						25	NIL	
2.00	NX		Grey BASALT	2.00	CORE						68	48	396
3.00				3.50	CORE						68	43	
4.00													
5.00				5.00	CORE						94	94	
6.00			BORE HOLE IS TERMINATED AT 5.00M BGL										
7.00													
8.00													
9.00													
10.00													

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 5.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 1 OF 2	DATE	: 20/07/2012 TO 23/07/2012
BORE HOLE NO.	: BH-1 Bank of Canal	METHOD	: ROTARY DRILLING
LOCATION	: CANAL	CASING	: Up to 2.50M BGL
CO-ORDINATES	: E 604871;N 2443521	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 6.50M	REDUCED LEVEL	: 231.35M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15	15	15	15	SPT N	CORE RECOVERY (%)	RQD (%)	UCS (KG /SQCM)
1.00	NX		Yellowish brown weathered basalt rock	1.50	CORE						18	NIL	
2.00				2.50	CORE						22	NIL	
3.00				4.00	CORE						28	NIL	80
4.00				5.50	CORE						28	NIL	
5.00				7.00	CORE						23	NIL	256
6.00				8.50	CORE						23	NIL	
7.00				9.00	CORE						55	NIL	
8.00													
9.00													
10.00			Yellowish brown BASALT		CORE						55	55	355

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS :

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

SCALE : 1: 50
JOB NO. : 0400

CLIENT : NTPC LIMITED

PROJECT : CONSULTANCY WORK FOR PRELIMINARY GEOTECH INVESTIGATION FOR INTAKE WELL LOCATION & MUW PIPE CORRIDOR FOR KHARGONE STPS

SHEET NO.	: 2 OF 2	DATE	: 20/07/2012 TO 23/07/2012
BORE HOLE NO.	: BH-1 Bank of Canal	METHOD	: ROTARY DRILLING
LOCATION	: CANAL	CASING	: Up to 2.50M BGL
CO-ORDINATES	: E 604871;N 2443621	DIAMETER	: 150 MM AND NX
GROUND W. T.	: 6.50M	REDUCED LEVEL	: 231.35M

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE DEPTH (m)	SAMPLE TYPE	BLOWS/15cm 15 15 15 15	SPT N	CORE RECOVERY (%)	RQD %	UCS (KG /SQCM)
11.00	NX		Grey BASALT.	10.50	CORE			55	55	
12.00				12.00	CORE			52	52	
13.00			BORE HOLE IS TERMINATED AT 12.00M BGL							
14.00										
15.00										
16.00										
17.00										
18.00										
19.00										
20.00										

SPT N =STANDARD PENETRATION TEST VALUE
UDS = UNDISTURBED SOIL SAMPLE
K = INSITU PERMEABILITY
DS = DISTURBED SOIL SAMPLE
CR = CORE RECOVERY
RQD = ROCK QUALITY DESIGNATION

REMARKS : BORE HOLE IS TERMINATED AT 12.00M BGL

SCALE : 1: 50
JOB NO. : 0400

PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD.

ANNEXURE- (d)

CRITERIA FOR WIND RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT

All structures shall be designed for wind forces in accordance with IS:875 (Part-3) and as specified in this document. See Annexure – B for site specific information.

Along wind forces shall generally be computed by the Peak (i.e. 3 second gust) Wind Speed method as defined in the standard.

Along wind forces on slender and wind sensitive structures and structural elements shall also be computed, for dynamic effects, using the Gust Factor or Gust Effectiveness Factor Method as defined in the standard. The structures shall be designed for the higher of the forces obtained from Gust Factor method and the Peak Wind Speed method.

Analysis for dynamic effects of wind must be undertaken for any structure which has a height to minimum lateral dimension ratio greater than “5” and/or if the fundamental frequency of the structure is less than 1 Hz.

Susceptibility of structures to across-wind forces, galloping, flutter, ovalling etc. should be examined and designed/detailed accordingly following the recommendations of IS:875(Part-3) and other relevant Indian standards.

It should be estimated if size and relative position of other structures are likely to enhance the wind loading on the structure under consideration. Enhancement factor, if necessary, shall suitably be estimated and applied to the wind loading to account for the interference effects.

Damping in Structures

The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for:

a) Welded steel structures : 1.0%

b) Bolted steel structures : 2.0%

c) Reinforced concrete structures : 1.6%

d) Steel stacks : As per IS:6533 & CICIND Model Code whichever is more critical.

ANNEXURE-D1

SITE SPECIFIC DESIGN PARAMETERS

The various design parameters, as defined in IS: 875 (Part-3), to be adopted for the project site shall be as follows:

a) The basic wind speed "V_b" at ten metres above the mean ground level : 39 metres/second

b) The risk coefficient "K_1" : 1.06

c) Category of terrain : Category-2

Note: Notwithstanding the values of the above mentioned parameters, the design wind pressure so computed at any point shall not be taken less than 1500 N/Sq. metre for all classes of structures, i.e. A, B & C, as defined in IS: 875 (Part-3).

Annexure-(e)

CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT

All structures and equipment shall be designed for seismic forces adopting the site specific seismic information provided in this document and using the other provisions in accordance with IS:1893 (Part 1):2002 and IS:1893 (Part 4):2005. Pending finalisation of Parts 2, 3 and 5 of IS:1893, provisions of part 1 shall be read along with the relevant clauses of IS:1893:1984, for structures other than the buildings and industrial structures including stack-like structures.

A site specific seismic study has been conducted for the project site. The peak ground horizontal acceleration for the project site, the site specific acceleration spectral coefficients (in units of gravity acceleration 'g') in the horizontal direction for the various damping values and the multiplying factor (to be used over the spectral coefficients) for evaluating the design acceleration spectra are as given at Annexure-E1.

Vertical acceleration spectral values shall be taken as 2/3rd of the corresponding horizontal values.

The site specific design acceleration spectra shall be used in place of the response acceleration spectra, given at figure-2 in IS:1893 (Part 1) and Annex B of IS:1893 (Part 4). The site specific acceleration spectra along with multiplying factors specified in Annexure-E1 includes the effect of the seismic environment of the site, the importance factor related to the structures and the response reduction factor. Hence, the design spectra do not require any further consideration of the zone factor (Z), the importance factor (I) and response reduction factor (R) as used in the IS:1893 (Part 1 and Part 4).

Damping in Structures

The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for:

a)	Steel structures	:	2%
b)	Reinforced Concrete structures	:	5%
c)	Reinforced Concrete Stacks	:	3%
d)	Steel stacks	:	2%

Method of Analysis

Since most structures in a power plant are irregular in shape and have irregular distribution of mass and stiffness, dynamic analysis for obtaining the design seismic forces shall be carried out using the response spectrum method. The number of vibration modes used in the analysis should be such that the sum total of modal masses of all modes considered is at least 90 percent of the total seismic mass and shall also meet requirements of IS:1893 (Part 1). Modal combination of the peak response quantities shall be performed as per Complete Quadratic Combination (CQC) method or by an acceptable alternative as per IS:1893 (Part 1).

In general, seismic analysis shall be performed for the three orthogonal (two principal horizontal and one vertical) components of earthquake motion. The seismic response from the three components shall be combined as specified in IS:1893 (Part 1).

For buildings, if the design base shear (V_B) obtained from modal combination is less than the base shear ($\overline{V}_B$) computed using the approximate fundamental period (T_a) given in IS:1893:Part 1 and using site specific acceleration spectra with appropriate multiplying factor, the response quantities (e.g. member forces, displacements, storey forces, storey shears and base reactions) shall be enhanced in the ratio of $\overline{V}_B$/ V_B. However, no reduction is permitted if $\overline{V}_B$ is less than V_B.

For regular buildings less than 12m in height, design seismic base shear and its distribution to different floor levels along the height of the building may be carried out as specified under clause 7.5, 7.6 & 7.7 of IS:1893 (Part 1) and using site specific design acceleration spectra. The design horizontal acceleration spectrum value (Ah) shall be computed for the fundamental natural period as per clause 7.6 of IS:1893 (Part 1) using site specific spectral acceleration coefficients with appropriate multiplying factor given in Annexure-E1. Further, the spectral acceleration coefficient shall get restricted to the peak spectral value if the fundamental natural period of the building falls to the left of the peak in the spectral acceleration curve.

Design/Detailing for Ductility for Structures

The site specific design acceleration spectra is a reduced spectra and has an in-built allowance for ductility. Structures shall be engineered and detailed in accordance with relevant Indian/International standards to achieve ductility.

ANNEXURE – E1

SITE SPECIFIC SEISMIC PARAMETERS FOR DESIGN OF STRUCTURES AND EQUIPMENT

The various site specific seismic parameters for the project site shall be as follows:

1) Peak ground horizontal acceleration (MCE) : 0.16 g

2) Multiplying factor to be applied to the site specific horizontal acceleration spectral coefficients (in units of gravity acceleration 'g') to obtain the design acceleration spectra

   a) for ordinary moment resisting steel frames designed and detailed as per IS:800 : 0.047

   b) for braced steel frames designed and detailed as per IS:800 : 0.035

   c) For special moment resisting RC frames designed and detailed as per IS:456 and IS:13920 : 0.028

   d) for steel chimney : 0.070

   e) for design of structures not covered under 2 (a) to 2 (d) above and under 3 below : 0.047

3) Multiplying factor to be applied to the site specific horizontal acceleration spectral coefficients (in units of gravity acceleration 'g') for design of equipment and structures where inelastic action is not relevant or not permitted : 0.094

Note: g = Acceleration due to gravity

The horizontal seismic acceleration spectral coefficients are furnished in subsequent pages.

HORIZONTAL SEISMIC ACCELERATION SPECTRAL COEFFICIENTS
(In units of 'g')

Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
	2%	3%	5%
0	1	1.00	1.000
0.03	1	1.00	1.000
0.04	1.411	1.328	1.260
0.05	1.842	1.654	1.508
0.06	2.291	1.979	1.746
0.07	2.755	2.304	1.976
0.08	3.232	2.628	2.200
0.089	3.670	2.919	2.397
0.09	3.670	2.950	2.419
0.1	3.670	3.175	2.500
0.11	3.670	3.175	2.500
0.115	3.670	3.175	2.500
0.12	3.670	3.175	2.500
0.125	3.670	3.175	2.500
0.13	3.670	3.175	2.500
0.135	3.670	3.175	2.500
0.14	3.670	3.175	2.500
0.145	3.670	3.175	2.500
0.15	3.670	3.175	2.500
0.2	3.670	3.175	2.500
0.25	3.670	3.175	2.500
0.3	3.670	3.175	2.500
0.33	3.670	3.175	2.500
0.336	3.670	3.175	2.500
0.35	3.670	3.175	2.500
0.36	3.670	3.175	2.500
0.37	3.670	3.175	2.500
0.38	3.670	3.175	2.500
0.39	3.670	3.175	2.500
0.4	3.670	3.175	2.500
0.41	3.415	3.098	2.439
0.43	3.256	2.953	2.326
0.45	3.111	2.822	2.222
0.5	2.800	2.540	2.000
0.55	2.545	2.309	1.818
0.56	2.500	2.268	1.786
0.565	2.478	2.248	1.770

HORIZONTAL SEISMIC ACCELERATION SPECTRAL COEFFICIENTS
(In units of 'g')

Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
	2%	3%	5%
0.57	2.456	2.228	1.754
0.575	2.435	2.209	1.739
0.58	2.414	2.190	1.724
0.585	2.393	2.171	1.709
0.59	2.373	2.153	1.695
0.595	2.353	2.134	1.681
0.6	2.333	2.117	1.667
0.65	2.154	1.954	1.538
0.7	2.000	1.814	1.429
0.75	1.867	1.693	1.333
0.8	1.750	1.588	1.250
0.85	1.647	1.494	1.176
0.9	1.556	1.411	1.111
0.95	1.474	1.337	1.053
1	1.400	1.270	1.000
1.05	1.333	1.210	0.952
1.1	1.273	1.155	0.909
1.15	1.217	1.104	0.870
1.2	1.167	1.058	0.833
1.25	1.120	1.016	0.800
1.3	1.077	0.977	0.769
1.35	1.037	0.941	0.741
1.4	1.000	0.907	0.714
1.45	0.966	0.876	0.690
1.5	0.933	0.847	0.667
1.55	0.903	0.819	0.645
1.6	0.875	0.794	0.625
1.65	0.848	0.770	0.606
1.7	0.824	0.747	0.588
1.75	0.800	0.726	0.571
1.8	0.778	0.706	0.556
1.85	0.757	0.686	0.541
1.9	0.737	0.668	0.526
1.95	0.718	0.651	0.513
2	0.700	0.635	0.500
2.05	0.683	0.620	0.488
2.1	0.667	0.605	0.476
2.15	0.651	0.591	0.465
2.2	0.636	0.577	0.455
2.25	0.622	0.564	0.444

HORIZONTAL SEISMIC ACCELERATION SPECTRAL COEFFICIENTS
(In units of 'g')

Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
	2%	3%	5%
2.3	0.609	0.552	0.435
2.35	0.596	0.540	0.426
2.4	0.583	0.529	0.417
2.45	0.571	0.518	0.408
2.5	0.560	0.508	0.400
2.55	0.549	0.498	0.392
2.6	0.538	0.488	0.385
2.67	0.524	0.476	0.375
2.7	0.519	0.470	0.370
2.75	0.509	0.462	0.364
2.8	0.500	0.454	0.357
2.85	0.491	0.446	0.351
2.9	0.483	0.438	0.345
2.95	0.475	0.431	0.339
3	0.467	0.423	0.333
3.05	0.459	0.416	0.328
3.1	0.452	0.410	0.323
3.15	0.444	0.403	0.317
3.2	0.438	0.397	0.313
3.25	0.431	0.391	0.308
3.3	0.424	0.385	0.303
3.35	0.418	0.379	0.299
3.4	0.412	0.374	0.294
3.45	0.406	0.368	0.290
3.5	0.400	0.363	0.286

Annexure-(f)

QA REQUIREMENT

All Civil, Structural and Architectural construction work at the project shall be executed strictly in accordance with the Quality Assurance guidelines specified in separate part of this Specification.

Annexure-(g)

RAINFALL DATA

Rainfall data by Indian Meteorological Department (IMD) for Khargone (near Selda village & Sanawad town in Barwah tehsil) is attached (from 1969 to 1980) in Project Information part of this specification. For additional data, Bidder has to arrange for necessary input directly from IMD under intimation to the owner.

जलवायवी सारणी
CLIMATOLOGICAL TABLE

स्टेशन : खरगोन STATION :Khargone — अक्षांश LAT 21°49′ N — देशांतर LONG 75°37′ E — समुद्री तल माध्य से ऊँचाई HEIGHT ABOVE M. S. L. 251 मीटर METRES

1969 से 1980 तक के प्रेक्षणों पर आधारित BASED ON OBSERVATIONS FROM 1969 TO 1980

MONTH (माह)		STATION LEVEL PRESSURE	AIR TEMPERATURE — MEAN: DRY BULB	WET BULB	DAILY MAX	DAILY MIN	HIGHEST IN THE MONTH	LOWEST IN THE MONTH	EXTREMES: HIGHEST	DATE AND YEAR	LOWEST	DATE AND YEAR	HUMIDITY: RELATIVE HUMIDITY	VAPOUR PRESSURE	CLOUD AMOUNT: ALL CLOUDS	LOW CLOUDS	RAINFALL: MONTHLY TOTAL	NO. OF RAINY DAYS	TOTAL IN WETTEST MONTH WITH YEAR	TOTAL IN DRIEST MONTH WITH YEAR	HEAVIEST FALL IN 24 HOURS	DATE AND YEAR	MEAN WIND SPEED
		hPa	°C	°C	°C	°C	°C	°C	°C		°C		%	hPa	Oktas of sky		mm		mm	mm	mm		Kmph
जनवरी JAN	I	987.1	15.0	10.7	29.7	11.3	33.4	6.9	36.2	06 1973	4.6	29 1977	56	9.8	1.0	0.2	1.8	0.1	12.5 1979	0.0	10.2	26 1979	2.8
	II	983.3	27.5	17.0									30	11.2	0.7	0.3							
फरवरी FEB	I	985.6	17.6	12.0	32.2	13.4	36.8	7.8	38.2	28 1980	3.5	06 1980	48	9.9	0.8	0.2	2.3	0.4	14.4 1978	0.0	6.8	07 1978	3.4
	II	981.5	30.7	18.3									26	11.3	0.9	0.4							
मार्च MAR	I	983.6	23.1	14.7	37.0	17.8	40.9	12.1	42.7	27 1971	7.6	09 1980	36	10.2	0.8	0.3	2.2	0.6	14.3 1979	0.0	8.7	03 1979	3.9
	II	979.3	35.7	19.9									19	10.8	0.6	0.4							
अप्रैल APR	I	980.5	29.1	18.9	40.9	23.7	44.2	18.9	46.1	26 1970	15.1	01 1980	34	13.6	1.0	0.4	2.2	0.3	12.4 1977	0.0	12.4	25 1977	4.9
	II	975.9	39.5	21.6									16	11.3	1.2	0.7							
मई MAY	I	977.7	30.4	23.1	41.8	26.7	45.0	23.3	47.5	18 1972	20.5	23 1979	52	22.4	1.1	0.4	3.6	0.5	17.0 1971	0.0	11.4	15 1971	7.9
	II	973.3	39.9	23.5									22	15.9	1.5	0.8							
जून JUN	I	974.3	28.4	24.6	36.8	25.3	42.4	22.1	47.4	19 1979	15.1	07 1980	73	27.9	3.3	1.8	138.7	6.8	339.0 1980	14.3 1974	135.4	26 1979	9.0
	II	970.5	34.4	25.4									49	25.2	3.5	1.9							
जुलाई JUL	I	973.8	26.6	24.1	32.2	24.1	36.5	21.9	39.0	15 1977	18.7	02 1980	81	28.1	4.7	2.6	155.9	9.6	363.4 1973	71.9 1980	167.5	15 1973	8.5
	II	971.2	30.0	24.9									66	27.4	3.9	2.3							
अगस्त AUG	I	974.8	25.5	23.7	30.4	23.7	34.0	21.6	36.4	03 1972	20.5	28 1977	85	27.7	5.2	2.8	256.8	12.3	394.5 1978	163.7 1980	127.0	18 1972	6.3
	II	972.3	28.5	24.6									72	27.7	4.4	2.4							
सितम्बर SEP	I	978.9	25.5	23.1	32.5	22.9	35.8	20.8	38.4	26 1980	17.7	19 1979	81	26.4	2.9	1.3	124.5	7.1	376.8 1973	5.8 1980	112.0	27 1973	3.9
	II	975.6	30.1	24.3									62	25.7	3.4	1.6							
अक्तूबर OCT	I	983.0	24.4	19.9	34.8	19.6	37.1	14.9	39.8	09 1976	10.7	12 1979	64	19.9	1.3	0.4	22.0	1.9	64.0 1974	0.0	27.4	21 1974	3.1
	II	979.4	32.0	22.6									43	20.0	1.6	0.6							
नवम्बर NOV	I	985.9	20.4	15.3	32.4	16.0	35.3	11.7	37.4	18 @ 1980	6.5	30 1970	57	13.9	1.0	0.5	15.2	1.0	67.4 1978	0.0	54.6	29 1978	2.8
	II	982.5	29.3	19.3									36	14.5	0.9	0.5							
दिसम्बर DEC	I	987.8	15.6	11.8	29.9	11.1	32.4	7.1	34.7	20 1972	5.2	17 1969	61	11.1	0.8	0.1	2.8	0.4	18.6 1980	0.0	9.2	29 1980	2.5
	II	984.3	26.9	17.5									36	12.6	0.7	0.1							
वार्षिक योग या माध्य ANNUAL TOTAL OR MEAN	I	981.1	23.5	18.5	34.2	19.6	45.3	5.5	47.5		3.5		61	18.4	2.0	0.9	728.0	41.0	1163.3	479.3	167.5		4.9
	II	977.4	32.0	21.6									40	17.8	1.9	1.0			1973	1972			
वर्षों की सं NUMBER OF YEARS	I	12	12	12	12	10	12	10	12		10		12	12	12	12	10	10	10	10	10		12
	II	12	12	12									12	12	12	12							

ANNEXURE – (h)

Specification For High Performance Moisture Compatible Corrosion Resistant Coating System (for Concrete Surfaces of IDCT)

a) The coating system shall be water compatible, compatible for applying in wet conditions also and shall be tolerant to under-prepared surfaces and existing residual tar / paint. The system shall also be quick curing so as to be suitable for application during shut downs.

The coating material shall be stored in the manner as per recommendations of the manufacturer until ready for use. The coating material shall be used within the manufacturer's written recommended shelf life.

b) The coating system shall conform to the following :

PROPERTIES OF PAINT

Coating System	High Performance Moisture Compatible Corrosion Resistant Coating System
Volume Solids	70%
Specific Gravity (ASTM-D-1475)	1.25 ± 0.1
Dry Film Thickness (ASTM-D-1186)	160 ± 10 µm per coat
Coverage	4 - 4.5 sq.m/ ltr
Touch Dry	2 Hours
Recoating	24 Hours

PROPERTIES OF COATING

Salt Spray (ASTM-B 117)	2000 Hour
Resistance to sea water (Carried out up o 6 mont s)	Passes
Coating Resistance (Carried out upto 6 months)	10^9 Ω. cm^2
Ad esion (ASTM-D 4541)	4.5 kN minimu
Flexibility (ASTM-D-522) Elo gation	1/8" passes 33%
Impact (ASTM G 14–04)	45 cm passes

Annexure-(i)

List of tender drawings attached with this specification include

Sl No.	Title	Drg No.
1)	General Layout Plan	9578-999-POC-F-001- Rev. 1
2)	Site Levelling Works	9578-001(R)-POC-A-001- Rev. A
3)	General Arrangement and Detail of WT, S/R & Tunnel.	9578-001(R)-POC-A-003 - Rev. A
4)	Topographical Survey Detail	9578-001(R)-PVC-A-001 – Rev. 0
5)	Hydrographic Survey Details For Intake Water Pump House In Submergence Of Omkareshwar Dam	9578-001(R)-PVC-C-A-003–Rev.01
6)	Preliminary Topographical Survey of the Make Up Water Pipeline Corridor	9578-001(R)-PVC-C-A-004-SHEET -1 TO 12 Rev.01
7)	Make-Up Water Pipe Line Crossings	9578-001(R)-PVC-A-005. Rev. A
8)	Owner's Construction Office – Architectural Details	9578-001(R)-POC-A-006

ELECTRICAL RESISTIVITY DATA **Annexure-(j)**

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

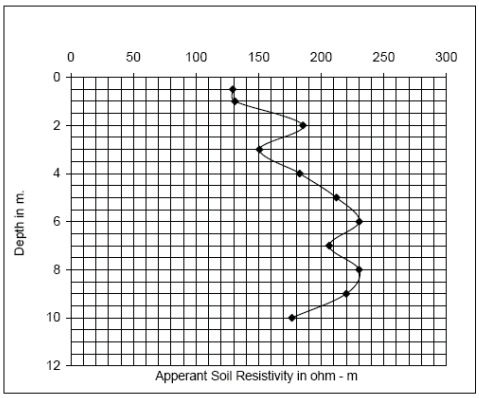
Clients: NTPC Limited

Test No. ERT 1 Date : 12.04.2011

Co - Ordinate E : 587900 N : 2440600 Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	40.800	128.18	41.500	130.38	129.28
2	1	6.283	20.100	126.29	21.600	135.72	131.00
3	2	12.566	15.300	192.27	14.200	178.44	185.35
4	3	18.850	7.810	147.22	8.170	154.00	150.61
5	4	25.133	7.140	179.45	7.400	185.98	182.72
6	5	31.416	6.630	208.29	6.870	215.83	212.06
7	6	37.699	5.960	224.69	6.260	236.00	230.34
8	7	43.982	4.210	185.17	5.170	227.39	206.28
9	8	50.265	4.210	211.62	4.950	248.81	230.22
10	9	56.549	3.730	210.93	4.050	229.02	219.97
11	10	62.832	2.840	178.44	2.780	174.67	176.56



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

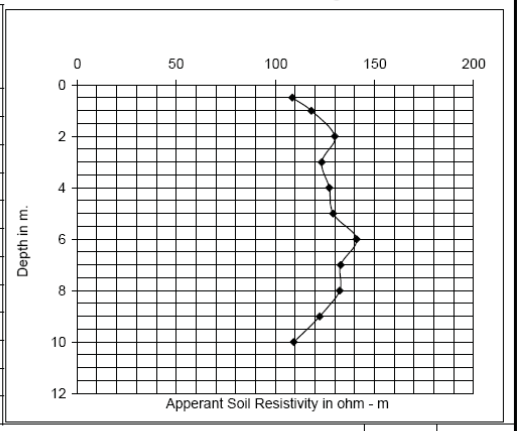
Clients: NTPC Limited

Test No. ERT 2 — Date : 12.04.2011

Co - Ordinate E : 587793 N : 2440400 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	33.400	104.93	35.700	112.15	108.54
2	1	6.283	18.200	114.35	19.400	121.89	118.12
3	2	12.566	10.400	130.69	10.300	129.43	130.06
4	3	18.850	6.000	113.10	7.100	133.83	123.46
5	4	25.133	4.460	112.09	5.660	142.25	127.17
6	5	31.416	3.930	123.46	4.290	134.77	129.12
7	6	37.699	3.380	127.42	4.100	154.57	140.99
8	7	43.982	2.870	126.23	3.180	139.86	133.05
9	8	50.265	2.510	126.17	2.760	138.73	132.45
10	9	56.549	2.200	124.41	2.130	120.45	122.43
11	10	62.832	1.910	120.01	1.570	98.65	109.33



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

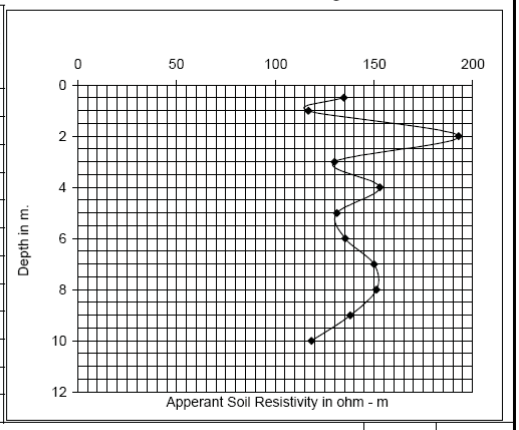
Clients: NTPC Limited

Test No. ERT 3 — Date : 12.04.2011

Co - Ordinate E : 588007 N : 2440400 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	41.100	129.12	44.700	140.43	134.77
2	1	6.283	18.100	113.73	19.100	120.01	116.87
3	2	12.566	14.300	179.70	16.400	206.09	192.89
4	3	18.850	6.330	119.32	7.460	140.62	129.97
5	4	25.133	5.630	141.50	6.540	164.37	152.93
6	5	31.416	3.540	111.21	4.820	151.42	131.32
7	6	37.699	3.540	133.45	3.640	137.22	135.34
8	7	43.982	3.540	155.70	3.280	144.26	149.98
9	8	50.265	3.080	154.82	2.940	147.78	151.30
10	9	56.549	2.710	153.25	2.170	122.71	137.98
11	10	62.832	2.250	141.37	1.520	95.50	118.44



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

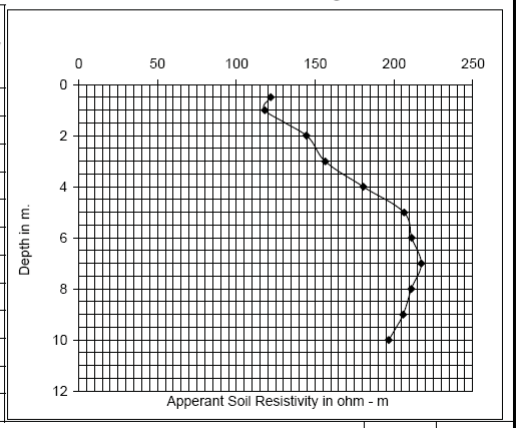
Clients: NTPC Limited

Test No. ERT 4 — Date : 12.04.2011

Co - Ordinate E : 588211 N : 2440408 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	39.100	122.84	38.500	120.95	121.89
2	1	6.283	18.400	115.61	19.200	120.64	118.12
3	2	12.566	10.300	129.43	12.700	159.59	144.51
4	3	18.850	7.850	147.97	8.750	164.93	156.45
5	4	25.133	7.110	178.69	7.260	182.46	180.58
6	5	31.416	6.560	206.09	6.580	206.72	206.40
7	6	37.699	5.720	215.64	5.490	206.97	211.30
8	7	43.982	4.950	217.71	4.930	216.83	217.27
9	8	50.265	4.240	213.13	4.160	209.10	211.12
10	9	56.549	3.760	212.62	3.520	199.05	205.84
11	10	62.832	3.230	202.95	3.030	190.38	196.66



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

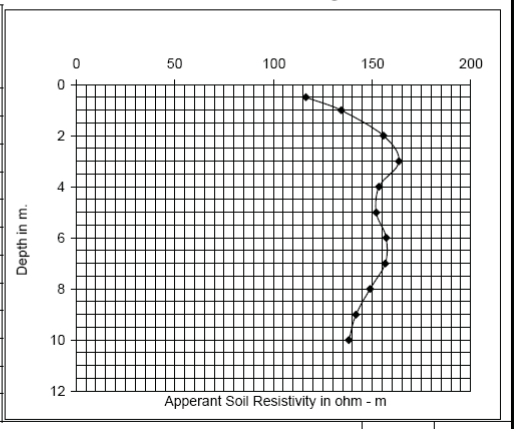
Clients: NTPC Limited

Test No. ERT 5 — Date : 12.04.2011

Co - Ordinate E : 587855 N : 2440179 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, *a*	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	37.300	117.18	36.800	115.61	116.40
2	1	6.283	19.300	121.27	23.500	147.65	134.46
3	2	12.566	11.400	143.26	13.400	168.39	155.82
4	3	18.850	8.100	152.68	9.260	174.55	163.61
5	4	25.133	5.790	145.52	6.430	161.60	153.56
6	5	31.416	4.960	155.82	4.730	148.60	152.21
7	6	37.699	4.240	159.84	4.100	154.57	157.21
8	7	43.982	3.760	165.37	3.360	147.78	156.58
9	8	50.265	3.170	159.34	2.760	138.73	149.04
10	9	56.549	2.840	160.60	2.180	123.28	141.94
11	10	62.832	2.500	157.08	1.900	119.38	138.23



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

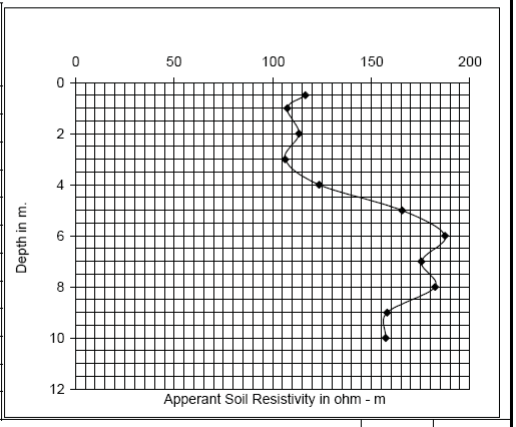
Clients: NTPC Limited

Test No. ERT 6 — Date : 12.04.2011

Co - Ordinate E : 587731 N : 2440114 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, *a*	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	35.600	111.84	38.700	121.58	116.71
2	1	6.283	15.700	98.65	18.500	116.24	107.44
3	2	12.566	8.780	110.33	9.260	116.36	113.35
4	3	18.850	5.500	103.67	5.780	108.95	106.31
5	4	25.133	4.980	125.16	4.860	122.15	123.65
6	5	31.416	5.350	168.08	5.200	163.36	165.72
7	6	37.699	5.050	190.38	4.900	184.73	187.55
8	7	43.982	3.830	168.45	4.150	182.53	175.49
9	8	50.265	3.350	168.39	3.910	196.54	182.46
10	9	56.549	2.730	154.38	2.860	161.73	158.05
11	10	62.832	2.580	162.11	2.430	152.68	157.39



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

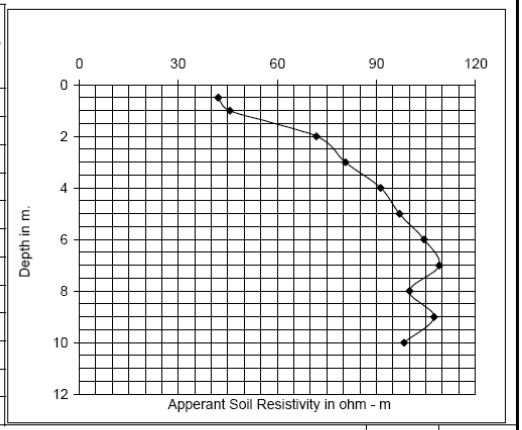
Clients: NTPC Limited

Test No. ERT 7 — Date : 12.04.2011

Co - Ordinate E : 587965 N : 2440106 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, *a*	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	13.200	41.47	13.600	42.73	42.10
2	1	6.283	7.100	44.61	7.420	46.62	45.62
3	2	12.566	5.790	72.76	5.640	70.87	71.82
4	3	18.850	4.180	78.79	4.380	82.56	80.68
5	4	25.133	3.420	85.95	3.840	96.51	91.23
6	5	31.416	3.030	95.19	3.150	98.96	97.08
7	6	37.699	2.720	102.54	2.820	106.31	104.43
8	7	43.982	2.320	102.04	2.640	116.11	109.08
9	8	50.265	1.970	99.02	2.010	101.03	100.03
10	9	56.549	1.820	102.92	1.980	111.97	107.44
11	10	62.832	1.650	103.67	1.480	92.99	98.33



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No.	0300
Checked	KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

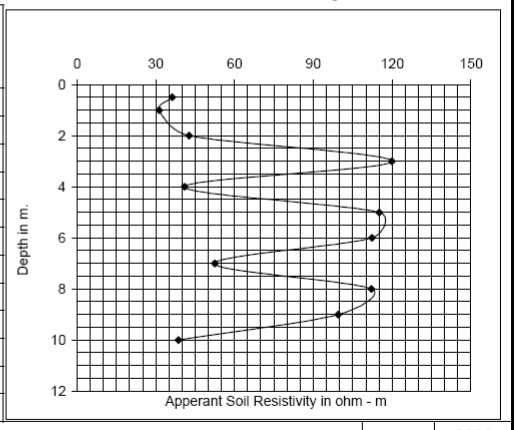
Clients: NTPC Limited

Test No. ERT 8 — Date : 12.04.2011

Co - Ordinate E : 587720 N : 2439830 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, *a*	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	10.300	32.36	12.800	40.21	36.29
2	1	6.283	4.170	26.20	5.810	36.51	31.35
3	2	12.566	2.980	37.45	3.820	48.00	42.73
4	3	18.850	5.970	112.53	6.760	127.42	119.98
5	4	25.133	1.070	26.89	2.190	55.04	40.97
6	5	31.416	3.550	111.53	3.780	118.75	115.14
7	6	37.699	3.070	115.74	2.890	108.95	112.34
8	7	43.982	0.636	27.97	1.750	76.97	52.47
9	8	50.265	2.920	146.78	1.540	77.41	112.09
10	9	56.549	2.230	126.10	1.290	72.95	99.53
11	10	62.832	0.475	29.85	0.756	47.50	38.67



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

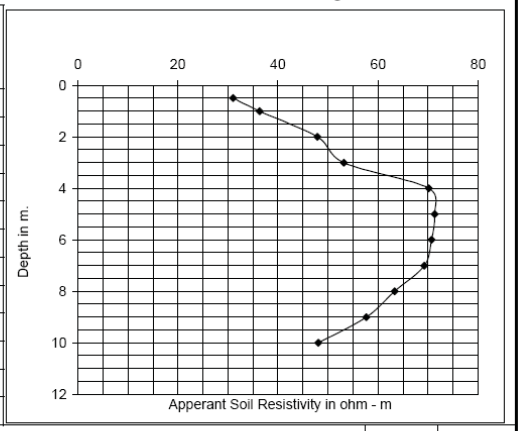
Clients: NTPC Limited

Test No. ERT 9 — Date : 12.04.2011

Co - Ordinate E : 587955 N : 2439834 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	9.240	29.03	10.500	32.99	31.01
2	1	6.283	5.670	35.63	5.890	37.01	36.32
3	2	12.566	3.750	47.12	3.870	48.63	47.88
4	3	18.850	2.710	51.08	2.930	55.23	53.16
5	4	25.133	2.710	68.11	2.870	72.13	70.12
6	5	31.416	2.330	73.20	2.210	69.43	71.31
7	6	37.699	1.900	71.63	1.850	69.74	70.69
8	7	43.982	1.630	71.69	1.520	66.85	69.27
9	8	50.265	1.230	61.83	1.290	64.84	63.33
10	9	56.549	1.030	58.25	1.010	57.11	57.68
11	10	62.832	0.874	54.92	0.657	41.28	48.10



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

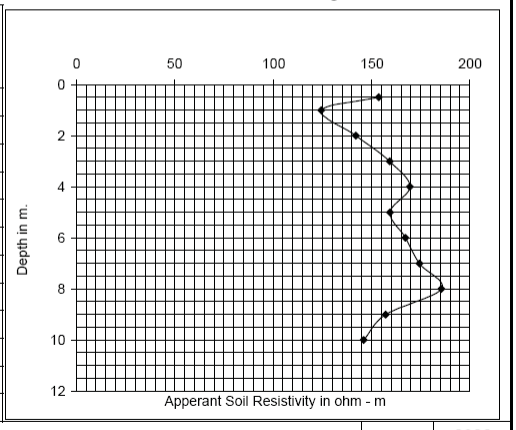
Clients: NTPC Limited

Test No. ERT 10 — Date : 12.04.2011

Co - Ordinate E : 587733 N : 2439609 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, *a*	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	48.100	151.11	49.700	156.14	153.62
2	1	6.283	18.700	117.50	20.900	131.32	124.41
3	2	12.566	10.100	126.92	12.500	157.08	142.00
4	3	18.850	8.130	153.25	8.760	165.12	159.18
5	4	25.133	6.950	174.67	6.540	164.37	169.52
6	5	31.416	5.030	158.02	5.120	160.85	159.44
7	6	37.699	4.340	163.61	4.530	170.78	167.20
8	7	43.982	4.010	176.37	3.920	172.41	174.39
9	8	50.265	3.760	189.00	3.620	181.96	185.48
10	9	56.549	2.810	158.90	2.750	155.51	157.21
11	10	62.832	2.360	148.28	2.290	143.88	146.08



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

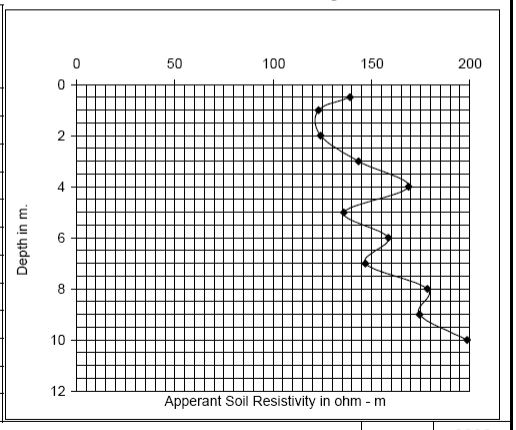
Clients: NTPC Limited

Test No. ERT 11 — Date : 12.04.2011

Co - Ordinate E : 587949 N : 2439610 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	42.800	134.46	45.700	143.57	139.02
2	1	6.283	19.500	122.52	19.700	123.78	123.15
3	2	12.566	9.810	123.28	9.930	124.78	124.03
4	3	18.850	7.590	143.07	7.620	143.63	143.35
5	4	25.133	6.600	165.88	6.840	171.91	168.89
6	5	31.416	4.390	137.92	4.270	134.15	136.03
7	6	37.699	4.700	177.19	3.710	139.86	158.52
8	7	43.982	4.240	186.48	2.440	107.32	146.90
9	8	50.265	3.730	187.49	3.370	169.39	178.44
10	9	56.549	3.280	185.48	2.890	163.43	174.45
11	10	62.832	3.730	234.36	2.590	162.73	198.55



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

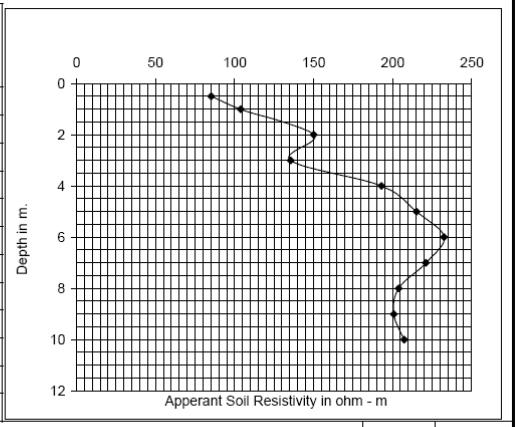
Clients: NTPC Limited

Test No. ERT 12 — Date : 12.04.2011

Co - Ordinate E : 588261 N : 2441221 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	28.500	89.54	25.800	81.05	85.29
2	1	6.283	18.400	115.61	14.700	92.36	103.99
3	2	12.566	11.700	147.03	12.200	153.31	150.17
4	3	18.850	6.820	128.55	7.560	142.50	135.53
5	4	25.133	8.870	222.93	6.480	162.86	192.89
6	5	31.416	7.420	233.11	6.280	197.29	215.20
7	6	37.699	6.700	252.58	5.640	212.62	232.60
8	7	43.982	5.460	240.14	4.590	201.88	221.01
9	8	50.265	4.540	228.21	3.570	179.45	203.83
10	9	56.549	4.040	228.46	3.060	173.04	200.75
11	10	62.832	3.750	235.62	2.850	179.07	207.35



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

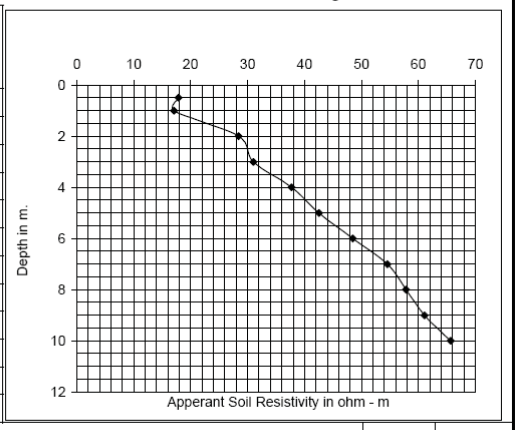
Clients: NTPC Limited

Test No. ERT 13 — Date : 12.04.2011

Co - Ordinate E : 588261 N : 2439800 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, *a*	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	5.210	16.37	6.150	19.32	17.84
2	1	6.283	2.040	12.82	3.400	21.36	17.09
3	2	12.566	1.940	24.38	2.580	32.42	28.40
4	3	18.850	1.430	26.95	1.860	35.06	31.01
5	4	25.133	1.350	33.93	1.650	41.47	37.70
6	5	31.416	1.310	41.15	1.400	43.98	42.57
7	6	37.699	1.190	44.86	1.380	52.02	48.44
8	7	43.982	1.190	52.34	1.290	56.74	54.54
9	8	50.265	1.100	55.29	1.200	60.32	57.81
10	9	56.549	1.050	59.38	1.110	62.77	61.07
11	10	62.832	1.050	65.97	1.040	65.35	65.66



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No.	0300
Checked	KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

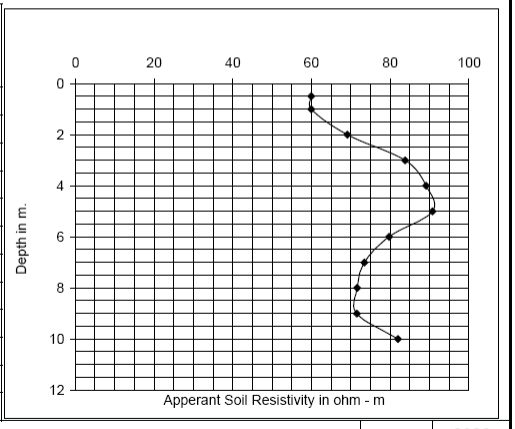
Clients: NTPC Limited

Test No. ERT 14 — Date : 12.04.2011

Co - Ordinate E : 588732 N : 2440008 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	17.400	54.66	20.800	65.35	60.00
2	1	6.283	8.680	54.54	10.400	65.35	59.94
3	2	12.566	4.460	56.05	6.540	82.18	69.12
4	3	18.850	3.040	57.30	5.850	110.27	83.79
5	4	25.133	2.400	60.32	4.690	117.87	89.10
6	5	31.416	2.040	64.09	3.740	117.50	90.79
7	6	37.699	1.710	64.47	2.520	95.00	79.73
8	7	43.982	1.520	66.85	1.820	80.05	73.45
9	8	50.265	1.270	63.84	1.580	79.42	71.63
10	9	56.549	1.190	67.29	1.340	75.78	71.53
11	10	62.832	1.410	88.59	1.200	75.40	82.00



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

ELECTRICAL RESISTIVITY TEST

IS : 1892

Project: Preliminary Geotechnical Investigations for Main Plant, and Alied Areas, for proposed Super Thermal Power Project (2 X 660 MW) in Khargaon Dist. Of MP

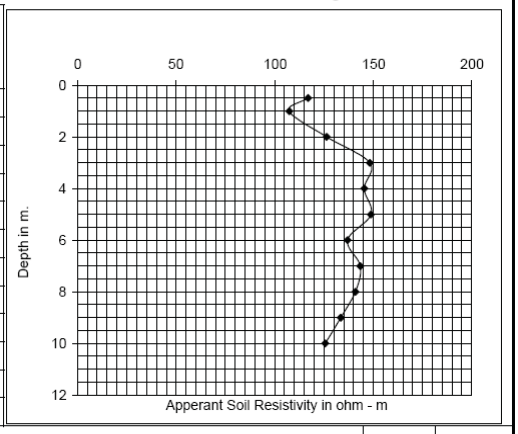
Clients: NTPC Limited

Test No. ERT 15 — Date : 12.04.2011

Co - Ordinate E : 588942 N : 2439808 — Current : 7 Amp.

Survey Method : Wenners Four Pin equal Probe spacing — Voltage : 50

Serial	Electrode spacing, a	K = 2 π a	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Resistance R	Apperant soil Resistivity ρ = 2 π a R	Apperant soil Resistivity ρ = 2 π a R
No.	Mtrs.	Mtrs	ohm	ohm-m	ohm	ohm-m	ohm-m
1	0.5	3.142	36.100	113.41	38.400	120.64	117.02
2	1	6.283	17.400	109.33	16.800	105.56	107.44
3	2	12.566	10.400	130.69	9.700	121.89	126.29
4	3	18.850	7.300	137.60	8.430	158.90	148.25
5	4	25.133	5.320	133.71	6.260	157.33	145.52
6	5	31.416	4.310	135.40	5.160	162.11	148.75
7	6	37.699	3.810	143.63	3.460	130.44	137.04
8	7	43.982	3.310	145.58	3.210	141.18	143.38
9	8	50.265	2.850	143.26	2.760	138.73	140.99
10	9	56.549	2.410	136.28	2.310	130.63	133.45
11	10	62.832	2.100	131.95	1.900	119.38	125.66



PARESH CONSTRUCTIONS AND FOUNDATIONS PVT. LTD., MUMBAI

Job No. 0300

Checked KSP

Annexure (k)

Site management during construction phase till handing over of plant.

Bidder shall ensure that the plant site within the plant boundary is managed in a coordinated and professional way all through the construction phase till handing over of plant, ensuring safe, easy & unhindered working conditions and a healthy & hygienic working environment at site. He shall ensure the following measures at site while executing the project:

a) Unhindered motorable road access to all work area and facilities both during the construction/ erection and as they get completed progressively. Required temporary access roads other than the permanent roads shall also be provided. Bidder shall prioritize the construction of approach roads, roads around the main plant block, roads to office & storage areas and the offsite areas from the start of project itself. He shall finalise and submit the complete road layout plan along with priority and completion schedule immediately after the award for review by the engineer-in-charge. He shall ensure that the roads are promptly repaired and maintained against any damages due to movement of traffic/heavy trailers & cranes/rains etc. providing motorable access at all times. Adequate onsite stock of road metal/materials shall be kept and maintained distributed over the site for repairs especially before the monsoon period. Construction of all village diversion roads shall be undertaken in the first phase.

b) Proper drainage of rain water, ground water from excavations, water flows from batching plant/construction sites etc. He shall priorities the construction of permanent drains from the start of the project itself. Till such time the permanent drainage network is done, he shall construct adequate temporary drains to ensure that there is no accumulation/stagnation of water in the plant site. Bidder may consider providing precast RCC drains for temporary/ permanent drain construction for faster construction of drains. The drain construction shall be matched with progress of road construction for preventing damage to roads. Bidder shall provide and maintain adequate number of drainage pumps (both electrical and diesel operated) of suitable capacity for pumping out accumulated water especially during the monsoon periods. All drain diversions required shall be undertaken at the start of the project itself.

c) The plant site is fully secured against unauthorized access. For the same he shall take up boundary wall construction immediately after award. He may also consider providing temporary fence in full or part as per site requirement.

d) Proper housekeeping by systematic and proper disposal of earth from excavations (separately for usable & surplus earth), muck (from pile bores or otherwise), wastes (from dismantling of pile tops, concrete works etc.), packing & insulation wastes, steel scrap, cable wastes etc. generated during construction / erection works, Suitable disposal sites for each of above shall be identified in the layout and at site in the beginning of the project itself. It shall be ensured that all agencies engaged by the bidder follow the discipline to dispose off of earth spoils and wastes at the designated places. Preferably once in a week suitable time slot will be identified for housekeeping by all agencies and suitable instructions shall be issued in this regard. Bidder may engage a separate agency or identify a gang for collection of wastes and disposal to designated places. Suitable arrangement/tieup will also be made for periodic disposal of wastes/scrap from the designated places.

e) All fabrication area shall be suitably hard crusted to provide a water free and proper working platforms. Suitable sheds preferably pre engineered structures to be provided for paint shops, fabrication workshops etc. for ensuring all weather work conditions for onsite structural works. For the main plant and auxiliary buildings, bidder should preferably plan the works in such a way that structural fabrication in done in suppliers' offsite works/workshops and onsite fabrication works are avoided kept minimum.

f) Suitable onsite maintenance workshop for day to day breakdown maintenance heavy plant and equipment like batching plants, cranes, earth moving equipment, poclains, welding equipment etc. The workshop shall have stock of frequently needed spares and suitable repair facilities with experienced technicians/ mechanics. A central test laboratory equipped with test equipment for routine test like tests on soil, concrete, bricks, aggregates, welds etc with experienced staff shall be established at the start of the project itself.

g) All office and covered store buildings of the bidder and its agencies shall be of prefab/ pre-engineered / porta cabin construction. Shabby semi-finished constructions in brickwork/ GI asbestos roof etc shall not be permitted.

h) First aid facilities and amenities like rest rooms, suitable pre engineered toilets (separate for men and women), drinking water fountains/tanks, canteen, crèche for women workers shall be planned and established at the beginning of the project itself These facilities shall be located distributed over the plant area to enable easy access by the construction workers and staff and shall be marked on the plant layout. Suitable treatment for toilet discharge, like bio digesters etc. shall be planned and conventional septic tanks/ soak pits etc. shall be avoided.

i) Proper lighting of all construction/ erection areas. Bidder shall erect adequate number of high lighting masts in main plant, offsite, office and store areas for lighting during night, DG sets of adequate capacity shall be provided for emergency back up. The street lighting along the roads shall also be prioritized along with road construction. The construction power ring main shall be planned and erected immediately after the award.

j) Well planned and coordinated storage and movement of plant, equipment and construction materials. System wise/ agency wise storage / laydown areas shall be planned and marked on the plant layout at the beginning itself. Bidder shall ensure that all its agencies comply to the areas allocated to them and follow the designated storage and movement plans. Adequate covered storage shall be constructed for storage of critical equipments like switchgears, MCCs, insulation etc.

k) Proper access control for construction workers, staff and visitors. Bidder shall ensure that suitable electronic based gate pass system is in place from start of project itself to keep record and track of all workers, staff and visitors entering / exiting the plant premises shiftwise on daily basis.

l) Compliance to all safety requirements as specified elsewhere in the tender documents. Bidders shall establish a safety centre at the start of the project itself. It shall have a 24X7 manned safety control room in addition to a permanent safety equipment display room, separate training / lecture hall with AV facilities for safety training, store room with adequate stock of specified safety equipment, a first aid room and other amenities. Bidder shall install CCTV cameras at all strategic locations in the plant area which shall be linked to the safety control room.

m) Compliance to all environment and other conditions stipulated by the concerned statutory authorities while according clearance / NOC to the project. Bidder shall ensure adequate sprinkling of water by deploying water tankers to prevent the fugitive dust nuisance during construction.

n) Development of suitable landscape & green belt areas and rainwater harvesting within the plant premises. Bidder shall plan to develop the landscape & green belt areas and rainwater harvesting from the start of the project itself. The landscape and rainwater harvesting plan shall be finalized immediately after award of work and suitable work plan with priority and schedule shall also be finalized thereafter. Top soil before excavation shall be suitably preserved and stacked for landscape and green belt development.

o) Provision of adequate shelters, water supply, sanitation and lighting in construction workers and staff camps. No camps for workers and staff shall be permitted within the plant premises and Bidder shall make separate arrangement outside the plant premises for locating and development of camps for construction workers and staff. The designated areas shall be suitably developed with infrastructure like roads, drains, water supply and sewerage and shall be free from water logging. Suitable low cost shelters will be provided for the workers. Complete area shall be secured by fencing and shall be provided adequate area lighting. Suitable waste disposal, shopping and recreation facilities will be developed in these camps.

Bidder shall ensure that due importance is given to site management as discussed above and a detailed work plan considering the above aspects is finalized immediately after the award. A senior level executive shall be identified who shall be responsible for implementation of the work plan. Suitable format for progress reporting on site management plan shall be developed and made part of the project progress report. The progress on implementation of above work plan shall be reviewed along with project progress in the monthly project review meetings with owner. In case the progress in the monthly project review meetings with owner. In case the progress on site management plan is unsatisfactory Engineer-in-Charge may withhold upto 1% of the monthly running bill (for civil and site erection works) till such time the required progress is demonstrated. In case in the opinion of Engineer- in-charge bidder's response is not adequate despite reminders and the situation warrants immediate action, Engineer-in- charge may get the relevant work executed through a separate agency and deduct the expenses incurred from the Bidder's bill along with overheads @25%.