Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

CETEST

Job No. : 3576

Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH01	UDS01	2.00	Deep grey, silty clay with traces of sand mixture, rock dust & kankars etc.	2.11	1.85	2.65	14 S	0.427	TRSH-UU		1.50	8	44	16	9	28	CI		48	39	13	* See the Note
							14 T		3.0	2.224												
							14 C		2.0	2.045												
									1.0	1.874												
BH01	UDS02	5.00	Brownish grey, silty clay with sand mixture & traces of kankars.	2.05	1.77		16 S		TRSH-UU		1.24	19					CI*		3	97 (silt+clay)		Do
							16 T		3.0	3.203												
									2.0	2.721												
									1.0	2.238												
BH01	SPT05	7.00	Brownish grey silty clay with sand mixture & traces of kankar.										52	28		24	CH					Do
BH02	UDS01	2.00	Brownish grey, silty clay with sand mixture, kankars & calcareous nodules.	2.20	1.95	2.62	13 S		UNCONFD		1.08	0	42	15	12	27	SC		62**	27	11	Do
							12 T		0.0	1.157												
									0.0	1.058												
									0.0	1.022												
									REMOULD		0.87	0										
									0.0	0.942												
									0.0	0.844												
									0.0	0.812												
BH02	UDS02	4.00	Brownish grey, silty clay with sand mixture & steel grey patches.	1.99	1.69		18 S		TRSH-UU		0.97	7					CI*	3	36	61 (silt+clay)		Do
							18 T		3.0	1.521												
									2.0	1.400												
									1.0	1.228												
BH02	SPT04	6.00	Brownish grey, silty clay with traces of fine sand mixture.														CI*		5	95 (silt+clay)		Do
BH02	SPT07	9.00	Light brownish grey silty clay with sand mixture.										44	34		10	MI					Do
BH03	UDS01	2.00	Brownish grey, silty clay with sand mixture & traces of kankars.	1.87	1.43		31 S	0.831	TRSH-UU		0.58	0	69	29		40	CH		2	98 (silt+clay)		Do
							31 T		3.0	0.637												
							31 C		2.0	0.614												
									1.0	0.491												
BH03	SPT06	7.00	Brownish grey silty clay with sand mixture.										44	25		19	CI					Do

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BH04	UDS01	2.00	Deep brownish grey, silty clay with sand mixture, calcareous nodules & rock pcs..	2.09	1.92		9 S		TRSH-UU		1.18	16					CI*	3	65**	32 (silt+clay)		Do
							9 T		3.0	2.710												
									2.0	2.318												
									1.0	1.936												
BH04	UDS02	4.00	Brownish grey, silty clay with sand mixture, rock pcs.	1.99	1.76		16 S		TRSH-UU		1.02	8					CI*					Do
							13 T		3.0	1.616												
									2.0	1.497												
									1.0	1.317												
BH04	SPT04	6.00	Greyish brown, silty clay with fine sand mixture.														CI*		9	91 (silt+clay)		Do
BH05	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	1.98	1.82	2.66	9 S	0.396	TRSH-UU		1.05	16	28	10		18	SC		61**	31	8	Do
							9 T		3.0	2.544												
							8 C		2.0	2.148												
									1.0	1.768												
BH05	UDS02	4.00	Brownish grey, silty clay with sand mixture, calcareous nodules & steel grey patches.	2.07	1.86		12 S		TRSH-UU		1.82	0					CI*		70**	30 (silt+clay)		Do
							11 T		3.0	1.861												
									2.0	1.815												
									1.0	1.784												
BH05	SPT03	5.00	Yellowish brown, silty sand with traces of clay binders & mica.										Non Plastic				SM		72	28 (silt+clay)		Do
BH06	UDS01	2.00	Deep grey, silty clay with traces of rock dust, rock pcs & sand mixture.	2.05	1.76	2.63	15 S		UNCONFD		1.28	0	44	16	10	28	CI		49	39	12	Do
							17 T		0.0	1.191												
									0.0	1.346												
									0.0	1.297												
									REMOULD		1.01	0										
									0.0	0.926												
									0.0	1.082												
									0.0	1.015												
BH06	UDS02	4.00	Light grey, silty clayey sand.	1.99	1.82		7 S						Non Plastic				SM*					Do

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BH06	SPT05	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		85	15 (silt+clay)		Do
BH06	SPT07	9.00	Brownish grey silty clay with sand mixture.										60	30		30	CH					Do
BH07	UDS01	2.00	Light grey, silty clay with rock dust, sand, black spot & calcareous nodules.	2.11	1.87	2.65	13 S	0.409	TRSH-UU		1.35	0	43	16	11	27	SC		64**	24	12	Do
							13 T		3.0	1.387												
							13 C		2.0	1.333												
									1.0	1.325												
BH07	UDS02	4.00	Light grey, silty sand.	1.78	1.65		8 S		DRSH-CU		0.04	36					SP	3	90	7 (silt+clay)		Do
							8DR		0.5	0.403												
									1.0	0.770												
									2.0	1.491												
BH07	SPT03	4.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		85	15 (silt+clay)		Do
BH07	SPT05	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		81	19 (silt+clay)		Do
BH07	SPT06	8.00	Brownish grey, silty clay with sand mixture.										56	31	18	25	MH					Do
BH07	SPT09	11.50	Greyish brown, silty clay with fine sand mixture.														CI*		8	92 (silt+clay)		Do
BH08	UDS01	2.00	Deep brownish grey, silty clayey sand / silty sandy clay with traces of rock pieces & calcareous nodules.	1.99	1.87		7 S		TRSH-UU		1.21	8					CI*		73**	27 (silt+clay)		Do
							6 T		3.0	1.873												
									2.0	1.708												
									1.0	1.545												
BH08	SPT06	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		81	19 (silt+clay)		Do

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BH08	DS09	8.50	Brownish grey silty clay with sand mixture & traces of rock dust.										48	24		24	CI					Do
BH09	UDS01	2.00	Light grey, silty clay with sand mixture & calcareous nodules.	2.14	1.85	2.66	16 S	0.471	TRSH-UU		0.84	7	42	14	12	28	SC		51**	38	11	Do
							16 T		3.0	1.372												
							16 C		2.0	1.185												
									1.0	1.105												
BH09	UDS02	4.00	Yellowish brown, clayey compacted silt.	1.94	1.64		20 S		UNCONFD		1.06	0	51	25	22	26	CH					Do
							18 T		0.0	1.049												
									0.0	1.084												
									0.0	1.055												
									REMOULD		0.76	0										
									0.0	0.744												
									0.0	0.782												
									0.0	0.763												
BH09	DS08	7.70	Brownish grey, silty sand with traces of mica.														SP		98	2 (silt+clay)		Do
BH10	UDS01	2.00	Brownish grey, silty clay with calcareous nodules & traces of sand mixture.	2.12	1.85	2.66	24 S						41	14	12	27	SC		55**	35	10	Do
BH10	UDS02	4.00	Yellowish grey, silty clay with sand mixture, steel grey patches & calcareous nodules.	1.91	1.54		22 S		UNCONFD		0.88	0					CI*	4	24	72 (silt+clay)		Do
							23 T		0.0	0.876												
									0.0	0.959												
									0.0	0.816												
									REOMULD		0.71	0										
									0.0	0.701												
									0.0	0.775												
									0.0	0.652												
BH10	SPT05	7.00	Greyish brown, silty sand with traces of mica.										Non Plastic				SM		80	20 (silt+clay)		Do
BH11	UDS01	2.00	Brownish grey, silty clay with sand mixture, calcareous nodules & kankars.	2.12	1.79	2.66	18 S	0.487	TRSH-UU		0.82	0	57	12		45	SC		51**	36	13	Do
							18 T		3.0	0.869												
							17 C		2.0	0.809												
									1.0	0.788												

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BH11	UDS02	4.00	Yellowish brown, silty clay with sand mixture & calcareous nodules.	2.05	1.79		14 S		TRSH-UU		1.30	0							66**	34 (silt+clay)		Do
							15 T		3.0	1.321												
									2.0	1.302												
									1.0	1.264												
BH11	SPT08	10.00	Yellowish grey, silty sand with traces of mica.										Non Plastic				SM		83	17 (silt+clay)		Do
BH12	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.12	1.84	2.64	17 S						58	16		42	SC		54**	33	13	Do
BH12	UDS02	4.00	Yellowish grey, silty clay with sand mixture & calcareous nodules.	2.06	1.81	2.64	15 S		TRSH-UU		0.57	8							71**	22	7	Do
							14 T		3.0	1.095												
									2.0	1.022												
									1.0	0.790												
BH13	DS01	0.50	Deep grey, silty clay with traces of sand mixture.										47	16		31	CI					Do
BH13	DS03	2.60	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		87	13 (silt+clay)		Do
BH13	SPT05	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		73	27 (silt+clay)		Do
BH14	UDS01	2.00	Brownish grey, silty clay with sand mixture, traces of rock dust, calcareous nodules & steel grey patches.	1.93	1.69	2.66	16 S	0.514	TRSH-UU		0.42	15	42	13	10	29	SC		73**	21	6	Do
							14 T		3.0	1.612												
							14 C		2.0	1.238												
									1.0	0.905												
BH14	SPT03	4.00	Brownish grey, silty sand.										Non Plastic				SM		84	16 (silt+clay)		Do
BH15	UDS01	2.00	Brownish grey, silty clay with traces of sand mixture, calcareous nodules & kankars.	2.00	1.68	2.65	18 S						32	13	11	19	SC		52**	35	13	Do

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BH15	DS05	4.70	Brownish grey, silty sand with rock dust & traces of mica.										Non Plastic				SM	1	84	15 (silt+clay)		Do
BH16	UDS01	2.00	Deep brownish grey, silty clay with sand mixture & calcareous nodules.	1.99	1.79	2.69	12 S	0.437	UNCONFD		0.63	0	29	14		15	SC		66**	25	9	Do
							11 T		0.0	0.471												
							9 C		0.0	0.703												
									0.0	0.703												
									REMOULD		0.45	0										
									0.0	0.321												
									0.0	0.511												
									0.0	0.511												
BH16	SPT03	5.00	Yellowish brown, silty sand with traces of kankars.										Non Plastic				SM		74	26 (silt+clay)		Do
BH16	DS10	9.60	Brownish grey, silty sand with traces of kankars.										Non Plastic				SM		86	14 (silt+clay)		Do
BH17	UDS01	2.00	Brownish grey, silty clay.	2.11	1.90		16 S		UNCONFD		1.40	0	44	16		28	CI		44	56 (silt+clay)		Do
							11 T		0.0	1.666												
									0.0	1.263												
									0.0	1.263												
									REMOULD		1.13	0										
									0.0	1.338												
									0.0	1.020												
									0.0	1.020												
BH17	SPT06	8.00	Brownish grey, silty clay with rock dust & traces of sand mixture.														CI*		16	84 (silt+clay)		Do
BH18	UDS01	2.00	Brownish grey, silty clay with traces of rock dust & sand mixture.	1.95	1.59	2.69	24 S		UNCONFD		0.87	0	41	14		27	CI		33	49	18	Do
							23 T		0.0	0.754												
									0.0	0.932												
									0.0	0.932												
									REMOULD		0.68	0										
									0.0	0.554												
									0.0	0.742												
									0.0	0.742												

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BH18	SPT05	6.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		70	30 (silt+clay)		Do
BH18	SPT07	8.00	Brownish grey silty clay.										49	23		26	CI					Do
BH19	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.04	1.72	2.66	17 S	0.671	TRSH-UU		0.52	0	62	16	10	46	SC		56**	33	11	Do
							19 T		3.0	0.569												
							22 C		2.0	0.516												
									1.0	0.488												
BH19	DS03	4.80	Brownish grey, silty sand.										Non Plastic				SM		72	28 (silt+clay)		Do
BH20	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.04	1.73	2.66	18 S	0.388	TRSH-UU		0.81	5	31	12		19	SC		72**	22	6	Do
							18 T		3.0	1.169												
							14 C		2.0	1.074												
									1.0	0.978												
BH20	SPT03	4.60	Greyish brown, silty clay with sand mixture.														CI*		15	85 (silt+clay)		Do
BH20	SPT07	9.00	Brownish grey, silty clay with sand mixture & mica.														CI*		32	68 (silt+clay)		Do
BH21	UDS01	2.00	Brownish grey, silty clay with steel grey patches, rock pcs, calcareous nodules & sand mixture.	2.02	1.71	2.63	18 S		UNCONFD		0.43	0	38	14	12	24	SC		62**	29	9	Do
							18 T		0.0	0.429												
									0.0	0.453												
									0.0	0.412												
									REMOULD		0.29	0										
									0.0	0.290												
									0.0	0.308												
									0.0	0.282												
BH21	SPT04	5.00	Brownish grey, silty sand with clay binders & traces of kankars.										Non Plastic				SM		58	42 (silt+clay)		Do

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BH22	UDS01	2.00	Deep grey, silty clay with sand mixture.	1.95	1.57	2.65	22 S	0.523	TRSH-UU		0.94	0	40	13		27	CI		38	42	20	Do
							24 T		3.0	0.963												
							18 C		2.0	0.940												
									1.0	0.917												
BH22	DS04	3.60	Brownish grey, silty clay with sand mixture, rust spots & mica.														CI*	7	40	53 (silt+clay)		Do
BH23	SPT01	1.00	Brownish grey silty sand with traces of mica.														SM-SP		91	9 (silt+clay)		Do
BH23	SPT03	4.50	Brownish grey silty clay with traces of fine sand mixture.			2.69											CI*		8	72	20	Do
BH23	SPT06	7.50	Brownish grey silty clay with traces of sand mixture.										45	20		25	CI					Do
BH24	UDS01	2.00	Brownish grey, silty clay / clayey silt with sand mixture & calcareous nodules.	2.08	1.78	2.64	16 S		TRSH-UU		0.68	10	40	20	15	20	SC		52**	38	10	Do
							17 T		3.0	1.450												
									2.0	1.228												
									1.0	1.024												
BH24	UDS02	4.00	Brownish grey, silty clay with kankars & sand mixture.	2.07	1.79	2.64	15 S		UNCONFD		1.08	0	42	18		24	CI		36	51	13	Do
							16 T		0.0	1.130												
									0.0	1.060												
									0.0	1.060												
									REMOULD		0.85	0										
									0.0	0.900												
									0.0	0.824												
									0.0	0.824												
BH24	SPT08	10.00	Brownish grey silty clay.										45	19		26	CI					Do
BH25	UDS01	2.00	Brownish grey, silty clay with calcareous nodules & sand mixture.	2.10	1.86		14 S						37	13		24	SC		70**	30 (silt+clay)		Do

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BH25	SPT03	4.50	Brownish grey silty clay with sand mixture.										49	23		26	CI					Do
BH26	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.05	1.77	2.66	16 S		TRSH-UU		0.23	6	36	14		22	SC		59**	30	11	Do
							16 T		3.0	0.584												
									2.0	0.459												
									1.0	0.369												
BH26	SPT02	3.00	Brownish grey silty clay.										51	26		25	CH					Do
BH26	SPT03	4.50	Yellowish grey silty clay with sand mixtures & mica.														CI*		42	58 (silt+clay)		Do
BH26	DS07	7.00	Brownish grey silty clay with traces of sand mixture.										46	20	12	26	CI					Do
BH27	SPT02	3.00	Brownish grey silty sand with traces of mica.														SM-SP		91	9 (silt+clay)		Do
BH27	SPT03	5.50	Brownish grey silty sand with calcareous nodules, traces of clay binders & mica.														CI*		56**	44 (silt+clay)		Do
BH27	DS05	7.00	Brownish grey silty clay with traces of sand mixture.										45	20	17	25	CI					Do
BH28	UDS01	2.00	Greyish brown, silty clay with traces of rock dust & rock pcs.	1.98	1.61	2.66	22 S	0.574	TRSH-UU		0.93	11	72	23	13	49	CH		22	57	21	Do
							23 T		3.0	1.816												
							19 C		2.0	1.602												
									1.0	1.347												
BH28	SPT02	3.00	Brownish grey silty clay with sand mixture.										44	14		30	CI					Do

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Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH29	UDS01	2.00	Deep grey, silty clay with	2.13	1.90		12 S		TRSH-UU		0.51	12							65**	35 (silt+clay)		Do
			traces of sand, kankars,				12 T		3.0	1.425												
			black spot & calcareous						2.0	1.180												
			nodules.						1.0	0.904												
BH29	SPT03	4.00	Greyish brown, silty										Non Plastic				SM		58	42 (silt+clay)		Do
			sand with traces of clay																			
			binders.																			
BH30	UDS01	2.00	Light grey, silty sand.	1.78	1.64		9 S		DRSH-CU		0.10	30					SM-SP		90	10 (silt+clay)		Do
			(decomposed rock dust).				8DR		0.5	0.380												
									1.0	0.684												
									2.0	1.255												
BH30	SPT03	4.00	Greyish brown, silty										Non Plastic				SM		84	16 (silt+clay)		Do
			sand.																			
BH31	DS03	2.60	Brownish grey, silty										Non Plastic				SM		72	28 (silt+clay)		Do
			sand.																			
BH31	SPT03	4.50	Brownish grey, silty										Non Plastic				SM	12	43	45 (silt+clay)		Do
			clayey sand with																			
			calcareous nodules.																			
BH32	UDS01	2.00	Brownish grey, silty sand	1.76	1.72		3 S		DRSH-CU		0.10	32					SW	2	90	8 (silt+clay)		Do
			with traces of kankars.				2DR		0.5	0.402												
									1.0	0.734												
									2.0	1.348												
BH32	SPT03	5.00	Brownish grey, silty										Non Plastic				SM	1	70	29 (silt+clay)		Do
			sand. Obs. silt stone.																			
BH32	SPT05	7.00	Brownish grey silty clay										59	26		33	CH					Do
			with sand mixture.																			
BH33	UDS01	2.00	Yellowish brown, silty	2.11	1.88	2.67	13 S	0.418	TRSH-UU		1.46	0	52	15	14	37	SC		56**	36	8	Do
			clay with steel grey				12 T		3.0	1.492												
			patches & calcareous				12 C		2.0	1.482												
			nodules.						1.0	1.414												

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH33	DS05	4.60	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		87	13 (silt+clay)		Do
BH33	SPT04	6.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		78	22 (silt+clay)		Do
BH34	UDS01	2.00	Yellowish grey, silty clay with calcareous nodules & sand mixture.	2.15	1.89	2.65	14 S						42	13		29	SC		65**	29	6	Do
BH34	SPT03	4.00	Yellowish brown, silty sand with traces of moorum & kankars.										Non Plastic				SM	3	70	27 (silt+clay)		Do
BH35	UDS01	2.00	Deep brownish grey, silty clay with traces of sand mixture, rusty spots & calcareous nodules.	2.06	1.76	2.68	17 S		UNCONFD		0.37	0	31	12		19	SC		58**	33	9	Do
							17 T		0.0	0.373												
									0.0	0.395												
									0.0	0.347												
									REMOULD		0.25	0										
									0.0	0.251												
									0.0	0.256												
									0.0	0.229												
BH35	SPT02	3.00	Brownish grey, silty sand with clay binders & traces of rock dust.										Non Plastic				SM		65	35 (silt+clay)		Do
BH35	DS05	4.60	Yellowish grey, silty clay with traces of sand mixture.										51	27	20	24	CH					Do
BH36	UDS01	2.00	Brownishh grey, silty clay with sand mixture.	2.01	1.64	2.65	29 S	0.714	TRSH-UU		0.75	0					CI*		36	37	27	Do
							22 T		3.0	0.777												
							28 C		2.0	0.739												
									1.0	0.728												
BH36	UDS02	4.00	Yellowish brown, silty clay with sand mixture.	2.01	1.72		16 S										CI*					Do

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH36	SPT05	7.00	Greyish brown, silty clay with sand mixture & mica.														CI*		12	88 (silt+clay)		Do
BH37	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.13	1.81		18 S		UNCONFD		0.34	0	31	12		19	SC		62**	38 (silt+clay)		Do
							18 T		0.0	0.363												
									0.0	0.339												
									0.0	0.331												
									REMOULD		0.22	0										
									0.0	0.239												
									0.0	0.221												
									0.0	0.208												
BH37	UDS02	4.00	Brownish grey, silty clay with traces of kankars.	2.04	1.70	2.63	20 S						40	14		26	CI		35	50	15	Do
BH37	SPT05	7.00	Yellowish grey silty clay with sand mixture.										42	17		25	CI					Do
BH38	UDS01	2.00	Yellowish grey, silty sand.	1.77	1.71		3 S		DRSH-CU		0.15	32					SM-SP		89	11 (silt+clay)		Do
							3DR		0.5	0.452												
									1.0	0.784												
									2.0	1.401												
BH38	UDS02	4.00	Light grey, silty clay with sand mixture & calcareous nodules.	2.03	1.78		14 S		TRSH-UU		0.69	6						5	66**	29 (silt+clay)		Do
							14 T		3.0	1.121												
									2.0	1.008												
									1.0	0.878												
BH38	SPT06	8.00	Brownish grey, silty clay with decomposed rock dust & traces of sand mixture.														CI*	7	31	62 (silt+clay)		Do
BH39	UDS01	2.00	Deep brownish grey, silty clay with traces of sand mixture & calcareous nodules.	2.12	1.85	2.65	14 S	0.467	TRSH-UU		0.51	13	34	14	11	20	SC		51**	37	12	Do
							15 T		3.0	1.521												
							15 C		2.0	1.223												
									1.0	0.936												
BH39	DS05	4.70	Brownish grey, silty sand with traces of mica.														SW		93	7 (silt+clay)		Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH39	SPT04	6.00	Brownish grey silty clay with traces of rock dust.										46	25		21	CI					Do
BH40	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.16	1.87	2.66	15 S						36	12		24	SC		55**	37	8	Do
BH40	DS05	4.75	Brownish grey, silty sand with traces of clay binders.										Non Plastic				SM		63	37 (silt+clay)		Do
BH40	SPT04	6.00	Brownish grey, silty clay with sand mixture & calcareous nodules.														SC*		22	78 (silt+clay)		Do
BH41	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.14	1.87	2.65	15 S						34	13		21	SC		63**	32	5	Do
BH41	SPT03	5.00	Brownish grey, silty clay with traces of rock dust.										51	25	16	26	CH					
BH42	UDS01	2.00	Deep brownish grey, silty clay with sand mixture & calcareous nodules.	1.92	1.71	2.63	13 S		UNCONFD		0.82	0	32	13		19	SC		61**	31	8	Do
							12 T		0.0	0.904												
									0.0	0.814												
									0.0	0.746												
									REMOULD		0.65	0										
									0.0	0.708												
									0.0	0.657												
									0.0	0.598												
BH42	SPT03	5.00	Brownish grey, silty sand.										Non Plastic				SM		65	35 (silt+clay)		Do
BH43	UDS01	2.00	Brownish grey, silty clay with traces of sand mixture & kankars.	2.15	1.87	2.68	16 S	0.400	TRSH-UU		1.43	0	41	14	11	27	CI		44	46	10	Do
							15 T		3.0	1.482												
							15 C		2.0	1.454												
									1.0	1.368												

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH43	SPT04	5.50	Greyish brown, silty clay with sand mixture. Obs. rock dust.														CI*		19	81 (silt+clay)		Do
BH43	SPT06	7.50	Brownish grey silty clay with traces of fine sand.										51	23		28	CH					Do
BH44	UDS01	2.00	Deep brownish grey, silty clay with traces of sand mixture & calcareous nodules.	2.09	1.84	2.65	14 S		UNCONFD		0.82	0	30	12		18	SC		60**	30	10	Do
							14 T		0.0	0.910												
									0.0	0.774												
									0.0	0.774												
									REMOULD		0.64	0										
									0.0	0.712												
									0.0	0.606												
									0.0	0.606												
BH44	SPT03	4.50	Greyish brown, silty sand with traces of mica.										Non Plastic				SM		78	22 (silt+clay)		Do
BH44	SPT05	7.00	Brownish grey silty clay.										48	24		24	CI					Do
BH45	UDS01	2.00	Deep brownish grey, silty clay with sand mixture & calcareous nodules.	2.11	1.85	2.65	14 S		UNCONFD		0.61	0	27	15	11	12	SC		61**	31	8	Do
							14 T		0.0	0.696												
									0.0	0.534												
									0.0	0.613												
									REMOULD		0.43	0										
									0.0	0.512												
									0.0	0.353												
									0.0	0.434												
BH45	SPT03	4.50	Greyish brown, silty clay with sand mixture & decomposed rock dust.														CI*		25	75 (silt+clay)		Do
BH46	UDS01	2.00	Light grey, silty clay with traces of sand mixture & kankars.	2.06	1.74	2.61	19 S						48	18		30	CI		33	52	15	Do

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH46	UDS02	4.00	Brownish grey, silty clay with traces of sand mixture.	2.01	1.66		21 S		UNCONFD		0.63	0	49	18	11	31	CI					Do
							21 T		0.0	0.558												
									0.0	0.739												
									0.0	0.597												
									REMOULD		0.45	0										
									0.0	0.373												
									0.0	0.557												
									0.0	0.428												
BH46	SPT04	6.50	Brownish grey, silty sand with decomposed rock dust & traces of mica.										Non Plastic				SM		53	47 (silt+clay)		Do
BH47	UDS01	2.00	Brownish grey, silty sand with traces of clay binders.	1.78	1.70		4 S		DRSH-CU		0.00	34					SM-SP		88	12 (silt+clay)		Do
							4DR		0.5	0.327												
									1.0	0.684												
									2.0	1.351												
BH47	UDS02	4.00	Brownish grey, silty sand.	1.75	1.66		5 S		DRSH-CU		0.02	32					SM-SP		89	11 (silt+clay)		Do
							6DR		0.5	0.322												
									1.0	0.654												
									2.0	1.270												
BH47	SPT04	6.00	Brownish grey, silty clay with traces of rock dust.										45	23	18	22	CI					Do
BH48	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	1.91	1.77		7 S		TRSH-UU		0.96	0						2	81**	17 (silt+clay)		Do
							8 T		3.0	0.977												
									2.0	0.977												
									1.0	0.921												
BH48	UDS02	4.00	Brownish grey, silty clay with rock dust, rock pcs & sand mixture.	2.03	1.76	2.71	17 S		UNCONFD		0.57	0	45	17		28	CI		48	40	12	Do
							15 T		0.0	0.562												
									0.0	0.587												
									0.0	0.561												
									REMOULD		0.40	0										
									0.0	0.395												
									0.0	0.404												
									0.0	0.395												

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
BH48	SPT05	7.00	Brownish grey, silty clay with traces of rock dust.										51	25	16	26	CH					Do
BH49	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.14	1.89	2.69	12 S		TRSH-UU		0.59	5	34	12		22	SC		64**	31	5	Do
							13 T		3.0	0.944												
									2.0	0.828												
									1.0	0.740												
BH49	UDS02	4.00	Reddish brown, clayey silt with traces of rock pcs.	2.02	1.74	2.69	14 S		UNCONFD		1.83	0	38	16		22	CI		6	83	11	Do
							16 T		0.0	1.567												
									0.0	2.096												
									0.0	1.815												
									REMOULD		1.62	0										
									0.0	1.431												
									0.0	1.809												
									0.0	1.633												
BH49	DS05	6.70	Yellowish grey silty clay.										42	15		27	CI					Do
BH50	UDS01	2.00	Yellowish grey, silty clay with sand mixture, steel grey patches & calcareous nodules.	2.15	1.90	2.64	13 S						35	13	10	22	SC		58**	33	9	Do
BH50	SPT02	3.00	Yellowish grey silty sand with traces of mica & clay binder.										Non Plastic				SM		83	17 (silt+clay)		Do
BH50	SPT04	5.50	Yellowish grey silty sand with traces of mica & clay binder.										Non Plastic				SM		82	18 (silt+clay)		Do

* Classification is based on average subsoil properties.

** - The apparent high percentage of sand content is due to presence of calcareous nodules & rock pieces.

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)	Test Method
				Bulk	Dry	(%)			In-Situ	Saturated							
1	8	13.50 - 14.25	Highly weathered, yellowish grey, medium grained, rock.	--	--	--	--	--	--	--	--	0.88	--	--	93.50	--	* See the Note
1	23	24.75 - 25.50	Highly weathered, brownish grey, coarse grained, highly fractured rock.	2.205	2.178	1.244	2.709	2.660	55	--	--	--	5.15	3	--	7939	Do
2	1	10.25 - 11.00	Moderately weathered, brownish grey, medium grained rock.	--	--	--	--	--	--	--	--	0.93	--	--	--	--	Do
2	17	22.50 - 23.25	Moderately weathered, brownish grey, coarse grained rock.	--	--	--	--	--	--	--	--	0.88	--	3	--	--	Do
3	10	15.25 - 16.00	Moderately weathered, brownish grey, fine to medium grained, fractured rock.	2.297	2.182	5.270	11.470	2.710	--	12	--	--	0.00	--	--	--	Do
4	2	8.00 - 8.75	Highly weathered, brownish grey, medium grained, rock.	--	--	--	--	--	--	--	--	1.68	--	3	--	--	Do
4	16	18.50 - 19.25	Moderately weathered, whitish grey, coarse grained rock.	2.076	2.036	1.974	4.020	2.121	43	10	0.233	--	2.22	--	--	--	Do
5	4	10.25 - 11.00	Highly weathered, brownish grey, highly fractured rock.	--	--	--	--	--	--	--	--	0.92	--	--	90.00	--	Do
5	23	24.50 - 25.25	Moderately weathered, brownish grey, highly fractured rock.	--	--	--	--	--	51	--	--	--	--	3.5	--	--	Do
6	9	17.00 - 17.45	Moderately weathered, brownish grey, coarse grained rock.	1.935	1.920	0.781	1.499	1.949	20	5	0.253	0.90	5.00	--	--	--	Do
6	18	23.75 - 24.50	Moderately weathered, yellowish grey, coarse grained rock.	2.111	2.078	1.592	3.307	2.660	77	12	0.156	--	36.74	3.5	--	4046	Do
7	2	12.75 - 13.50	Highly weathered, blackish grey, highly fractured rock.	--	--	--	--	--	--	--	--	0.88	--	--	--	--	Do
7	14	21.75 - 22.50	Moderately weathered, greyish brown medium to coarse grained fractured rock.	--	--	--	--	--	181	--	--	--	90.09	4	--	10321	Do
8	7	13.75 - 14.50	Highly weathered, brownish grey, fine grained, fractured rock.	2.433	2.411	0.912	2.112	2.660	--	--	--	1.02	0.00	3	82.50	--	Do
9	3	10.50 - 11.25	Moderately weathered, yellowish grey, medium to fine grained rock.	1.871	1.861	0.528	0.983	2.660	18	5	0.271	--	--	--	--	--	Do
10	2	13.00 - 13.75	Highly weathered, brownish grey, medium to coarse grained rock.	1.969	1.954	0.788	1.540	2.660	34	--	--	--	1.68	--	--	--	Do
11	18	23.75 - 24.50	Highly weathered, brownish grey, highly fractured rock.	1.971	1.961	0.510	1.021	2.670	--	--	--	--	--	4.5	--	--	Do
12	8	13.25 - 14.00	Completely weathered, greyish brown, medium grained, rock.	1.913	1.900	0.684	1.273	2.710	--	--	--	0.90	0.25	--	--	--	Do

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Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)	Test Method
				Bulk	Dry	(%)			In-Situ	Saturated							
13	2	8.75 - 9.50	Moderately weathered, greyish yellow, fine to medium grained, highly fractured rock.	2.332	2.309	0.996	2.312	2.682	85	19	0.224	--	6.5	--	52.90	3082	Do
14	10	15.75 - 16.50	Moderately weathered, light yellow, fine grained, highly fractured rock.	2.299	2.234	2.910	6.524	2.730	--	14	--	--	--	--	--	--	Do
15	1	10.00 - 10.75	Highly weathered, yellowish brown, medium grained, rock.	2.139	2.084	2.620	5.461	2.680	--	11	--	--	5.5	2.5	--	--	Do
16	25	29.00 - 29.75	Slightly weathered, deep grey, completely fractured decomposed rock.	--	--	--	--	--	--	--	--	0.96	--	--	--	--	Do
17	1	11.00 - 11.75	Highly weathered, greyish yellow, fine grained, highly fractured rock.	2.193	2.096	4.628	9.692	2.710	--	--	--	--	0.00	3	--	--	Do
18	9	15.00 - 15.75	Moderately weathered, yellowish grey, fine grained, completely fractured rock.	2.122	2.101	1.000	2.287	2.655	--	--	--	1.02	0.00	--	--	--	Do
19	10	17.75 - 18.50	Moderately weathered, yellowish grey, fine grained, fractured rock.	1.955	1.909	2.410	4.587	2.730	--	--	--	0.98	--	--	63.45	--	Do
20	4	13.25 - 14.00	Moderately weathered, yellowish grey, fine grained, fractured rock.	2.080	2.031	2.435	4.945	2.710	20	--	--	--	0.00	--	--	--	Do
21	13	16.00 - 16.75	Moderately weathered, greyish yellow, fine grained, highly fractured rock.	2.067	2.030	1.817	3.688	2.660	--	--	--	0.96	0.00	3	--	--	Do
22	2	5.35 - 6.10	Moderately weathered, greyish brown, fine grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.92	--	--	--	--	Do
23	5	13.00 - 13.75	Moderately weathered, brownish grey, medium grained, fractured rock.	2.351	2.312	1.687	2.712	2.680	--	--	--	1.01	--	--	--	--	Do
24	2	11.75 - 12.50	Moderately weathered, brownish grey, medium grained, fractured rock.	2.282	2.221	2.747	4.506	2.850	--	35	--	--	0.00	--	--	2996	Do
25	10	12.00 - 12.45	Moderately weathered, light yellowish grey, medium to fine grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.94	--	--	--	--	Do
26	10	14.25 - 15.00	Moderately weathered, brownish grey, medium to coarse grained, moderately fractured rock.	2.464	2.412	2.156	3.022	2.630	--	--	--	0.94	--	4	90.6	--	Do
27	19	21.00 - 21.75	Moderately weathered, brownish grey, fine grained, fractured rock.	--	--	--	--	--	--	--	--	0.98	0.00	--	--	--	Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

Job No. : 3576

Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)	Test Method
				Bulk	Dry	(%)			In-Situ	Saturated							
28	3	6.00 - 6.75	Highly weathered, yellowish brown, coarse to medium grained, highly fractured rock.	2.481	2.459	0.900	2.212	2.670	--	237	--	--	22.22	--	--	22201	Do
29	25	23.00 - 23.75	Moderately weathered, yellowish brown, medium to fine grained rock.	2.035	2.004	1.572	3.150	2.069	18	5	0.278	--	0.00	--	--	--	Do
30	20	18.75 - 19.50	Moderately weathered, brownish grey, medium to fine grained, highly fractured rock.	2.374	2.329	1.928	4.489	2.670	19	7	0.368	--	--	3.5	--	--	Do
31	5	8.25 - 9.00	Highly weathered, brownish yellow, medium grained highly fractured rock.	1.916	1.907	0.434	0.829	2.640	40	--	--	--	1.25	--	--	--	Do
32	13	21.00 - 21.75	Moderately weathered, deep grey, completely fractured decomposed rock.	2.068	1.997	3.523	7.036	2.710	19	--	--	--	0.00	--	--	--	Do
33	9	13.00 - 13.75	Moderately weathered, brownish yellow, medium to fine grained, highly fractured rock.	2.163	2.093	3.384	7.082	2.720	--	--	--	4.66	--	--	--	--	Do
34	8	13.25 - 14.00	Moderately weathered, brownish yellow, medium to fine grained, moderately fractured rock.	--	--	--	--	--	--	--	--	4.32	--	3.5	--	--	Do
35	13	16.00 - 16.75	Moderately weathered, brownish yellow, medium to fine grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.85	--	--	--	--	Do
37	15	18.75 - 19.50	Slightly weathered, light yellowish grey, medium to fine grained, moderately fractured rock.	2.277	2.230	2.108	4.641	2.710	105	25	0.238	--	0.26	--	50.25	2160	Do
38	2	9.75 - 10.50	Highly weathered, deep grey, medium grained highly fractured rock.	--	--	--	--	--	--	--	--	5.66	--	--	--	--	Do
38	14	18.75 - 19.50	Moderately weathered, deep grey, medium grained highly fractured rock.	2.190	2.078	5.403	11.229	2.341	83	11	0.133	3.77	24.77	4	79.00	--	Do
39	26	25.75 - 26.50	Slightly weathered, whitish grey, highly fractured rock.	2.163	2.073	4.300	8.916	2.680	28	8	0.290	--	--	--	--	11285	Do
40	6	11.00 - 11.75	Moderately weathered, yellowish grey, medium grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.91	--	3	--	--	Do
40	13	16.25 - 17.00	Moderately weathered, yellowish grey, medium grained, moderately fractured rock.	--	--	--	--	--	18	--	--	--	--	--	--	--	Do
41	7	11.00 - 11.75	Highly weathered, reddish brown, fine to medium grained, moderately fractured rock.	--	--	--	--	--	--	--	--	0.88	--	--	--	--	Do

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)	Test Method
				Bulk	Dry	(%)			In-Situ	Saturated							
42	6	10.00 - 10.75	Moderately weathered, reddish grey, fine grained, highly fractured rock.	2.175	2.102	3.473	7.297	2.710	--	--	--	0.82	4.25	3	--	--	Do
42	29	27.25 - 28.00	Highly weathered, brownish grey, fine grained, moderately fractured rock.	--	--	--	--	--	39	--	--	--	--	--	--	--	Do
43	7	13.00 - 13.75	Highly weathered, whitish grey, medium grained, highly fractured rock.	2.453	2.425	1.143	2.773	2.660	--	--	--	5.27	--	4	--	--	Do
43	12	16.75 - 17.50	Highly weathered, deep grey, medium to fine grained, highly fractured rock.	--	--	--	--	--	--	21	--	0.94	0.00	--	--	2365	Do
44	6	11.00 - 11.75	Highly weathered, reddish grey, medium grained, highly fractured rock.	2.113	2.024	4.397	10.907	2.710	--	--	--	0.98	--	3	--	--	Do
44	12	15.50 - 16.25	Highly weathered, whitsih grey, medium grained, moderately fractured rock.	--	--	--	--	--	--	106	--	--	--	4	48.25	7447	Do
45	6	10.00 - 10.45	Moderately weathered, deep grey, medium grained, fractured rock.	2.554	2.532	0.869	2.235	2.730	--	--	--	0.84	--	--	--	--	Do
46	18	22.75 - 23.50	Slightly weathered, deep grey, medium to fine grained, moderately fractured rock.	2.326	2.104	10.564	22.228	2.700	23	6	0.260	--	0.00	--	83.33	--	Do
47	2	8.75 - 9.50	Highly weathered, brownish grey, fine grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.92	--	3	--	--	Do
48	3	10.50 - 11.25	Moderately weathered, light dark grey, medium to coarse grained rock.	1.989	1.932	2.950	5.734	2.050	--	--	--	--	0.00	--	--	--	Do
49	17	19.00 - 19.75	Highly weathered, blackish grey, fine grained, fractured rock.	2.243	2.150	4.327	9.301	2.650	--	--	--	1.73	--	4	--	--	Do
50	8	11.50 - 12.25	Highly weathered, greyish brown, medium to coarse grained, fractured rock.	2.599	2.573	1.031	2.653	2.690	240	112	0.467	--	82.63	--	75.25	7834	Do

Note: coefficient of softening = UCS (saturated) / UCS (In-situ)

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

Job No. : 3576I

Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH01	UDS01	2.00	Yellowish grey, silty clay with sand mixture.	1.89	1.55	2.63	22 S	0.621	TRSH-UU		0.30	8	44	21	11	23	CI		35	61	4	* See the Note
							22 T		3.0	0.835												
							20 C		2.0	0.668												
									1.0	0.501												
IBH01	UDS02	4.00	Brownish grey, silty clay with sand mixture.	2.10	1.79	2.63	19 S		UNCONFD		0.22	0	32	14		18	SC		52*	44	4	Do
							17 T		0.0	0.219												
									0.0	0.202												
									0.0	0.234												
									REMOULD		0.13	0										
									0.0	0.130												
									0.0	0.121												
									0.0	0.146												
IBH01	UDS03	6.00	Brownish grey, silty clay with sand mixtures.	2.17	1.88	2.66	15 S		TRSH-UU		0.40	5					CI*		69*	27	4	Do
							15 T		3.0	0.697												
									2.0	0.607												
									1.0	0.527												
IBH02	UDS01	2.00	Yellowish grey, clayey sandy silt with steel grey patches.	1.98	1.69		17 S						33	19	18	14	SC		67*	33 (silt+clay)		Do
IBH02	UDS02	4.00	Brownish grey, silty clay with sand mixture and traces of calcareous nodules.	2.05	1.74	2.62	18 S						35	14		21	CI		46	49	5	Do
IBH03	UDS01	2.00	Yellowish grey, silty clay with sand mixture and calcareous nodules.	1.89	1.51	2.62	24 S		UNCONFD		0.34	0	49	21		28	CI		17	67	16	Do
							25 T		0.0	0.401												
									0.0	0.253												
									0.0	0.361												
									REMOULD		0.22	0										
									0.0	0.258												
									0.0	0.167												
									0.0	0.232												
IBH03	UDS02	4.00	Brownish grey, silty clay with rusty spots, traces of kankars and rock dust	1.84	1.51	2.62	22 S						45	17	11	28	CI		21	66	13	Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH03	SPT04	6.00	Brownish grey, silty clay.										50	19		31	CH					Do
IBH03	SPT06	8.00	Brownish grey, silty clayey sand (decomposed rock dust & rock pcs).										Non Plastic				SM	8	42	50 (silt+clay)		Do
IBH04	UDS01	2.00	Brownish grey, silty clay with traces of sand mixture and rock dust.	1.91	1.54	2.65	24 S						40	15	11	25	CI		41	51	8	Do
IBH04	UDS02	4.00	Brownish grey, silty clay with sand mixture and calcareous nodules.	2.07	1.82		14 S						40	16		24	SC	5	79*	16 (silt+clay)		Do
IBH04	UDS03	6.00	Brownish grey, silty clay with calcareous nodules.	2.07	1.83	2.68	13 S		UNCONFD		0.98	0	38	15		23	SC		58*	36	6	Do
							13 T		0.0	1.210												
									0.0	0.705												
									0.0	1.037												
									REMOULD		0.74	0										
									0.0	0.929												
									0.0	0.713												
									0.0	0.443												
IBH06	UDS01	2.00	Brownish grey,silty clay with traces of calcareous nodules and kankars.	1.90	1.54	2.63	23 S	0.600	TRSH-UU		0.42	7	49	20	12	29	CI		13	73	14	Do
							23 T		3.0	0.835												
							20 C		2.0	0.788												
									1.0	0.578												
IBH06	DS05	4.70	Yellowish grey, silty sand with traces of kankars and mica.										Non Plastic				SM		81	19 (silt+clay)		Do
IBH06	SPT03	5.00	Yellowish grey, silty clay with calcareous nodules														CI*	5	65*	30 (silt+clay)		Do
IBH06	DS07	6.60	Yellowish brown, silty clay with sand mixture.										53	13		40	CH					Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH07	UDS01	2.00	Yellowish grey, silty clay with sand mixtures and traces of calcareous nodules.	2.10	1.79	2.71	18 S		UNCONFD		0.83	0	63	17		46	SC		53*	35	12	Do
							18 T		0.0	0.610												
									0.0	0.937												
									0.0	0.937												
									REMOULD		0.66	0										
									0.0	0.445												
									0.0	0.767												
									0.0	0.767												
IBH07	DS05	4.60	Yellowish grey, silty clay with sand mixture.										41	14		27	CI					Do
IBH08	UDS01	2.00	Brownish grey, silty clay with sand mixture.	1.92	1.63	2.62	17 S	0.487	TRSH-UU		0.44	0	43	16	16	27	SC		51*	41	8	Do
							18 T		3.0	0.470												
							17 C		2.0	0.439												
									1.0	0.400												
IBH08	SPT02	3.00	Yellowish grey, silty clay with sand mixture.										42	18		24	CI					Do
IBH08	SPT06	7.00	Yellowish grey, silty sand with clay binders and traces of mica.										Non Plastic				SM		59	41 (silt+clay)		Do
IBH09	UDS01	2.00	Brownish grey silty clay.	1.91	1.63	2.68	16 S		UNCONFD		0.95	0	49	18		31	SC		52*	31	17	Do
							17 T		0.0	0.973												
									0.0	0.950												
									0.0	0.927												
									REMOULD		0.75	0										
									0.0	0.773												
									0.0	0.755												
									0.0	0.722												
IBH09	SPT03	5.00	Brownish grey, silty clay with traces of calcareous nodules and kankars.														CI*		69*	31 (silt+clay)		Do
IBH09	SPT04	6.00	Yellowish grey, silty sand with traces of mica.										Non Plastic				SM		78	22 (silt+clay)		Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH10	UDS01	2.00	Brownish grey, silty clay with calcareous nodules.	1.88	1.55	2.63	21 S						44	19	11	25	CI		36	52	12	Do
IBH10	UDS02	4.00	Brownish grey silty clay.										42	15		27	CI		48	52 (silt+clay)		Do
IBH10	UDS03	6.00	Brownish grey silty sand.	1.75	1.52		14 S		DRSH-CU		0.12	33	Non Plastic				SM		85	15 (silt+clay)		Do
							15DR		0.5	0.444												
									1.0	0.769												
									2.0	1.418												
IBH10	SPT04	7.00	Brownish grey, silty clay.										47	22		25	CI					Do
IBH11	UDS01	2.00	Brownish grey,silty clay with traces of calcareous nodules and sand mixture.	2.07	1.72	2.65	19 S		UNCONFD		0.33	0	40	16		24	CI		46	46	8	Do
							20 T		0.0	0.272												
									0.0	0.363												
									0.0	0.363												
									REMOULD		0.22	0										
									0.0	0.176												
									0.0	0.236												
									0.0	0.236												
IBH11	UDS02	4.00	Brownish grey, silty clay with sand mixture and calcareous nodules.	2.05	1.86	2.65	11 S	0.605	TRSH-UU		0.78	15	32	10		22	SC		59*	37	4	Do
							10 T		3.0	2.082												
							11 C		2.0	1.734												
									1.0	1.379												
IBH11	DS06	6.75	Yellowish grey, silty clay with sand mixture.										41	14		27	CI					Do
IBH12	UDS01	2.00	Light grey, silty clay with sand mixture. (decomposed rock pcs.)	2.12	1.89	2.65	12 S	0.440	TRSH-UU		1.00	15	40	14	12	26	SC		56*	35	9	Do
							12 T		3.0	2.374												
							11 C		2.0	2.033												
									1.0	1.667												
IBH12	DS03	4.50	Brownish grey silty sand with traces of clay binders & rock dust.										Non Plastic				SM		63	37 (silt+clay)		Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH13	UDS01	2.00	Brownish grey, silty clay with sand mixture.	1.92	1.70	2.63	12 S		UNCONFD		0.50	0	31	12		19	SC		56*	36	8	Do
							13 T		0.0	0.733												
									0.0	0.201												
									0.0	0.517												
									REMOULD		0.34	0										
									0.0	0.531												
									0.0	0.108												
									0.0	0.390												
IBH13	SPT02	3.00	Yellowish grey silty sand with traces of rock dust & clay binders.										Non Plastic				SM		72	28 (silt+clay)		Do
IBH13	SPT05	6.00	Greyish brown silty sand with traces of mica.														SP		88	12 (silt+clay)		Do
IBH14	UDS01	2.00	Brownish grey, silty clay with calcareous nodules, sand mixture and rock pcs.	2.03	1.74	2.67	17 S						42	15		27	CI		41	49	10	Do
IBH14	SPT03	5.00	Brownish grey, silty sand with traces of kankars.										Non Plastic				SM		77	23 (silt+clay)		Do
IBH15	UDS01	2.00	Brownish grey, silty clay with traces of sand mixture.	2.01	1.74	2.65	15 S						40	17		23	SC		55*	38	7	Do
IBH15	UDS02	4.00	Brownish grey, silty clay with calcareous nodules and sand mixture.	2.04	1.81		13 S		TRSH-UU		0.91	4	30	13		17	SC	2	67*	31 (silt+clay)		Do
							13 T		3.0	1.190												
									2.0	1.115												
									1.0	1.034												
IBH15	SPT05	7.00	Brownish grey, silty sand with traces of rock pcs.														SW	33	55	12 (silt+clay)		Do
IBH16	UDS01	2.00	Brownish grey, silty clay with traces of sand mixture and kankars.	1.97	1.66	2.67	19 S						42	14		28	SC		51*	41	8	Do

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Sheet No.

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IBH16	UDS02	4.00	Brownish grey silty clay with sand mixture.	1.91	1.59	2.64	21 S		UNCONFD		0.37	0	40	20	16	20	CI		31	62	7	Do
							21 T		0.0	0.321												
									0.0	0.392												
									0.0	0.392												
									REMOULD		0.22	0										
									0.0	0.200												
									0.0	0.229												
									0.0	0.229												
IBH16	SPT04	6.00	Yellowish brown, silty clay with traces of rock pieces and sand mixture.										57	13		44	CH					Do
IBH17	SPT01	1.00	Yellowish grey, silty clay with calcareous nodules, kankars and sand mixture.														CI*	7	59*	34 (silt+clay)		Do
IBH17	SPT04	5.00	Brownish grey, silty clay with traces of sand mixture and kankars.										43	15		28	CI					Do
IBH17	DS07	6.50	Brownish grey, silty clay with calcareous nodules.														CI*		63*	37 (silt+clay)		Do
IBH17	SPT07	8.00	Brownish grey, silty sand with traces of mica.														SP		92	8 (silt+clay)		Do
IBH19	UDS01	2.00	Brownish grey silty clay with kankars and sand mixtures.	2.18	1.89	2.67	14 S		TRSH-UU		1.04	18					CI*		59*	33	8	Do
							13 T		3.0	2.714												
									2.0	2.294												
									1.0	1.855												
IBH19	SPT02	3.00	Reddish brown, silty clay with calcareous nodules and mica.														CI*		66*	34 (silt+clay)		Do
IBH19	SPT05	6.00	Brownish grey, silty clay with traces of rock pieces and sand mixture.										57	11		46	CH					Do

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH21	UDS01	2.00	Yellowish grey silty clay.	1.98	1.66	2.61	21 S	0.521	TRSH-UU		0.68	18	50	28	15	22	CH		14	79	7	Do
							19 T		3.0	2.244												
							19 C		2.0	1.808												
									1.0	1.372												
IBH21	UDS02	4.00	Yellowish grey silty clay.										49	22		27	CI		20	80 (silt+clay)		Do
IBH21	SPT04	6.00	Yellowish grey silty clay.										50	21		29	CH					Do
IBH21	DS08	7.70	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		81	19 (silt+clay)		Do
IBH22	UDS01	2.00	Yellowish grey, silty clay with rock pcs & sand mixture.	2.00	1.77	2.66	15 S	0.394	TRSH-UU		0.28	15	62	19	15	43	SC		61*	34	5	Do
							13 T		3.0	1.414												
							11 C		2.0	1.045												
									1.0	0.730												
IBH22	SPT02	3.00	Yellowish grey silty clay with sand mixture.										47	18		29	CI					Do
IBH22	SPT04	5.00	Yellowish grey silty sand with traces of mica.														SM-SP		88	12 (silt+clay)		Do
IBH22	SPT05	6.00	Greyish brown silty clay with traces of fine sand mixture.														CI*		9	91 (silt+clay)		Do
IBH23	UDS01	2.00	Brownish grey, silty clay with sand mixture and traces of rock pieces.	2.06	1.76		17 S						48	20		28	SC		62*	38 (silt+clay)		Do
IBH23	UDS02	4.00	Brownish grey, silty clay with calcareous nodules and mica.			2.67											CI*		63*	33	4	Do

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Sheet No.

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IBH23	SPT04	6.40	Yellowish brown, silty clay with traces of calcareous nodules.										59	24		35	CH					Do
IBH25	UDS01	2.00	Ligth grey, sandy clayey silt.	2.10	1.82	2.66	13 S		UNCONFD		0.28	0	23	13		10	SC		61*	30	9	Do
							15 T		0.0	0.148												
									0.0	0.345												
									0.0	0.345												
									REMOULD		0.19	0										
									0.0	0.088												
									0.0	0.234												
									0.0	0.234												
IBH25	SPT03	4.50	Brownish grey, silty clay with traces of rock pieces and sand mixture.										69	19		50	CH					Do
IBH25	DS06	6.75	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		71	29 (silt+clay)		Do
IBH26	SPT01	1.00	Brownish grey, silty clay.										50	22		28	CH					Do
IBH26	UDS01	2.00	Yellowish grey,silty clay with sand mixture and mica.			2.66	21 S	0.701					51	18	11	33	CH		42	50	8	Do
							24 C															
IBH26	SPT03	5.00	Yellowish grey, silty sand with traces of mica.										Non Plastic				SM		81	19 (silt+clay)		Do
IBH27	UDS01	2.00	Light grey, silty clay with traces of calcareous nodules.	1.98	1.63	2.62	21 S						48	20	11	28	CI		15	71	14	Do
IBH27	DS05	4.50	Brownish grey, silty sand with traces of kankars & mica.														SP		92	8 (silt+clay)		Do

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Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH28	SPT01	1.00	Brownish grey, silty clay.										49	20		29	CI					Do
IBH28	UDS01	2.00	Brownish grey, silty clay with traces of kankars.	2.02	1.68	2.61	20 S	0.541	TRSH-UU		0.55	10	43	21		22	CI		19	76	5	Do
							20 T		3.0	1.320												
							18 C		2.0	1.105												
									1.0	0.878												
IBH28	UDS02	4.00	Brownish grey silty clay with sand mixture and calcareous nodules.	1.98	1.78	2.67	13 S		TRSH-UU		0.67	9	32	14		18	SC		60*	37	3	Do
							11 T		3.0	1.343												
									2.0	1.148												
									1.0	0.966												
IBH28	SPT03	5.00	Brownish grey, silty sand.										Non Plastic				SM		83	17 (silt+clay)		Do
IBH28	SPT04	6.00	Brownish grey, silty sand with traces of kankars & mica.										Non Plastic				SM		86	14 (silt+clay)		Do
IBH29	UDS01	2.00	Brownish grey silty clay with traces of calcareous nodules and sand mixture.	1.95	1.59	2.64	23 S						51	17	15	34	CH		35	52	13	Do
IBH29	UDS02	4.00	Brownish grey silty clay with traces of sand.			2.68			TRSH-UU		0.44	0	50	19		31	CH		30	70 (silt+clay)		Do
									3.0	0.463												
									2.0	0.452												
									1.0	0.405												
IBH29	SPT04	6.00	Brownish grey, silty clay with sand mixture, decomposed rock dust & rock pieces.														CI*	18	29	53 (silt+clay)		Do
IBH29	DS07	7.70	Brownish grey, silty sand with traces of mica.														SP		89	11 (silt+clay)		Do
IBH30	UDS01	2.00	Brownish grey, silty clay with sand mixture.	2.06	1.83	2.64	11 S						34	13		21	CL		47	43	10	Do

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IBH30	UDS02	4.00	Brownish grey, silty clay with calcareous nodules.										27	11		16	SC	12	65*	23 (silt+clay)		Do
IBH30	UDS03	6.00	Brownish grey, silty clay with traces of sand mixture.	2.05	1.80	2.65	15 S		UNCONFD		1.38	0	27	14	12	13	SC		64*	32	4	Do
							14 T		0.0	1.384												
									0.0	1.366												
									0.0	1.378												
									REMOULD		1.26	0										
									0.0	1.264												
									0.0	1.256												
									0.0	1.255												
IBH30	SPT05	8.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		84	16 (silt+clay)		Do
IBH31	UDS01	2.00	Brownish grey silty clay with sand mixture and traces of calcareous nodules.	2.00	1.89	2.67	13 S	0.423	TRSH-UU		1.19	13	43	14		29	SC		57*	38	5	Do
							13 T		3.0	2.374												
							14 C		2.0	2.096												
									1.0	1.785												
IBH31	UDS02	4.00	Brownish grey, silty clay with calcareous nodules and mica.	2.07	1.85	2.65	13 S		TRSH-UU		1.25	8	Non Plastic				SM		62*	32	6	Do
							12 T		3.0	1.931												
									2.0	1.768												
									1.0	1.612												
IBH31	SPT03	5.00	Brownish grey, silty sand.										Non Plastic				SM		66	34 (silt+clay)		Do
IBH32	SPT01	1.00	Brownish grey, silty sand with traces of kankars.										Non Plastic				SM		85	15 (silt+clay)		Do
IBH32	UDS02	4.00	Light grey, silty sand / sandy silt.	2.13	1.84	2.65	16 S		DRSH-CU		0.10	39	Non Plastic				SM		73	20	7	Do
							16DR		0.5	0.510												
									1.0	0.874												
									2.0	1.698												
IBH32	SPT04	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		86	14 (silt+clay)		Do

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IBH33	UDS01	2.00	Brownish grey, silty sand with traces of clay binders and mica.	2.03	1.78	2.65	14 S		UNCONFD		0.30	0	48	20	11	28	SC		66*	29	5	Do
							14 T		0.0	0.300												
									0.0	0.334												
									0.0	0.273												
									REMOULD		0.19	0										
									0.0	0.188												
									0.0	0.225												
									0.0	0.165												
IBH33	SPT02	3.00	Brownish grey, silty sand.										Non Plastic				SM		78	22 (silt+clay)		Do
IBH33	SPT04	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		78	22 (silt+clay)		Do
IBH34	UDS01	2.00	Brownish grey, silty clay with calcareous nodules.	1.95	1.55	2.65	26 S						48	19		29	SC		56*	35	9	Do
IBH34	UDS02	4.00	Yellowish brown, silty clay with traces of mica and kankars.	2.04	1.67	2.65	19 S		TRSH-UU		0.23	0					SC*		48	45	7	Do
							22 T		3.0	0.301												
									2.0	0.210												
									1.0	0.187												
IBH34	SPT03	5.00	Brownish grey, silty clay with sand mixture.										25	19	13	6	CL-ML					Do
IBH34	SPT04	7.00	Brownish grey, silty sand with traces of mica.										Non Plastic				SM		64	36 (silt+clay)		Do
IBH34	SPT06	9.00	Yellowish brown, silty clay with traces of calcareous nodules.										58	24		34	CH					Do
IBH35	UDS01	2.00	Brownish grey, silty clay with rock pcs & rock dust.	2.15	1.93	2.65	10 S		TRSH-UU		0.46	14	39	14		25	SC		59*	32	9	Do
							11 T		3.0	1.551												
									2.0	1.216												
									1.0	0.908												

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IBH35	UDS02	4.00	Yellowish grey, silty clay with sand mixture & traces of kankar.	2.15	1.91	2.65	13 S		UNCONFD		0.65	0	54	15	14	39	SC		64*	27	9	Do
							13 T		0.0	0.419												
									0.0	0.765												
									0.0	0.769												
									REMOULD		0.51	0										
									0.0	0.306												
									0.0	0.612												
									0.0	0.623												
IBH38	UDS01	2.00	Yellowish brown, silty clay with calcareous nodules & traces of kankars.	2.05	1.76	2.68	18 S		TRSH-UU		1.34	0					CI*		65*	25	10	Do
							17 T		3.0	1.425												
									2.0	1.318												
									1.0	1.289												
IBH38	SPT03	4.00	Brownish grey, silty sand.										Non Plastic				SM		74	26 (silt+clay)		Do
IBH39	UDS01	2.00	Light yellowish grey, silty clay with traces of kankars & calcareous nodules.	1.93	1.55	2.66	26 S	0.616	TRSH-UU		1.19	7	54	15		39	CH		14	69	17	Do
							24 T		3.0	1.722												
							24 C		2.0	1.612												
									1.0	1.468												
IBH40	UDS01	2.00	Brownish grey, silty sand.	1.89	1.78		7 S		DRSH-CU		0.08	34					SP		94	6 (silt+clay)		Do
							6DR		0.5	0.407												
									1.0	0.764												
									2.0	1.430												
IBH40	DS02	4.80	Brownish grey silty sand with traces of rock dust & mica.										Non Plastic				SM		78	22 (silt+clay)		Do
IBH41	UDS01	2.00	Brownish grey, silty clay with sand mixture & traces of kankars.	2.05	1.80	2.63	17 S		UNCONFD		0.75	0	46	16	15	30	SC		58*	33	9	Do
							14 T		0.0	0.831												
									0.0	0.709												
									0.0	0.709												
									REMOULD		0.55	0										
									0.0	0.607												
									0.0	0.526												
									0.0	0.526												

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IBH41	DS02	4.60	Brownish grey silty clay with traces of sand mixture.										42	18		24	CI					Do
IBH41	SPT04	6.50	Brownish grey silty sand with traces of mica.										Non Plastic				SM		64	36 (silt+clay)		Do
IBH42	UDS01	2.00	Brownish grey, silty clay with sand mixture & calcareous nodules.	2.10	1.81	2.66	15 S	0.532	TRSH-UU		0.77	11	44	16		28	SC		53*	37	10	Do
							16 T		3.0	1.658												
							13 C		2.0	1.425												
									1.0	1.177												
IBH42	DS03	4.50	Yellowish grey silty sand with traces of mica.										Non Plastic				SM		82	18 (silt+clay)		Do
IBH42	SPT05	7.00	Brownish grey silty sand with traces of mica.										Non Plastic				SM		73	27 (silt+clay)		Do
IBH43	UDS01	2.50	Brownish grey, silty clay with sand mixture & rock pcs.	2.17	1.96	2.61	13 S		UNCONFD		0.81	0	32	13	11	19	SC		58*	36	6	Do
							11 T		0.0	0.874												
									0.0	0.775												
									0.0	0.775												
									REMOULD		0.56	0										
									0.0	0.605												
									0.0	0.531												
									0.0	0.531												
IBH43	SPT03	5.50	Greyish brown silty clay with sand mixture & traces of rock dust.														CI*		30	70 (silt+clay)		Do
IBH43	SPT04	6.50	Yellowish grey silty clay with traces of sand mixture.										43	23		20	CI					Do
IBH45	SPT01	1.00	Brownish grey silty clay.										33	12	9	21	CL					Do

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IBH45	SPT02	3.00	Brownish grey silty sand with traces of kankar & clay binders.										Non Plastic				SM		71	29 (silt+clay)		Do
IBH45	DS04	5.75	Yellowish grey silty sand with traces of mica.										Non Plastic				SM		84	16 (silt+clay)		Do
IBH48	UDS01	2.00	Brownish grey, silty clay with sand mixture.	2.09	1.84	2.62	15 S		TRSH-UU		0.69	6	36	15	11	21	CI		48	43	9	Do
							13 T		3.0	1.107												
									2.0	0.997												
									1.0	0.882												
IBH48	SPT03	5.00	Brownish grey silty sand with traces of mica.										Non Plastic				SM		62	38 (silt+clay)		Do
IBH51	UDS01	2.00	Brownish grey, silty clay with sand mixture.	1.96	1.70	2.66	13 S		TRSH-UU		0.62	6	33	12	10	21			46	42	12	Do
							15 T		3.0	1.039												
									2.0	0.918												
									1.0	0.804												
IBH51	UDS02	4.00	Yellowish grey, silty sand.	1.80	1.55	2.65	15 S		DRSH-CU		0.10	34	Non Plastic				SM		83	17 (silt+clay)		Do
							16 DR		0.5	0.435												
									1.0	0.780												
									2.0	1.448												
IBH51	DS07	6.70	Brownish grey silty clay with sand mixture.										34	15		19	CI					Do
IBH52	UDS01	2.00	Brownish grey, silty clay with sand mixture.	1.93	1.65	2.64	14 S	0.538	TRSH-UU		0.79	5	31	13		18	SC		51	38	11	Do
							17 T		3.0	1.184												
							11 C		2.0	1.092												
									1.0	0.980												
IBH52	UDS02	4.00	Yellowish grey, silty clay with steel grey patches.	1.95	1.61	2.65	22 S		UNCONFD		0.50	0	43	23		20	CI		9	78	13	Do
							21 T		0.0	0.498												
									0.0	0.480												
									0.0	0.535												
									REMOULD		0.40	0										
									0.0	0.398												
									0.0	0.372												
									0.0	0.428												

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Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH52	SPT04	6.00	Yellowish grey silty clay with fine sand mixture.														CI*		16	84 (silt+clay)		Do
IBH52	SPT06	40.00	Yellowish grey silty clay with traces of sand mixture.										43	23	17	20	CI					Do
IBH53	UDS01	2.00	Brownish grey silty clay with traces of fine sand mixture.	1.81	1.45	2.56	26 S		UNCONFD		0.65	0	53	27		26	CH		11	80	9	Do
							24 T		0.0	0.669												
									0.0	0.539												
									0.0	0.775												
									REMOULD		0.47	0										
									0.0	0.486												
									0.0	0.389												
									0.0	0.550												
IBH53	SPT04	5.00	Greyish brown silty clay with fine sand mixture.														CI*		13	87 (silt+clay)		Do
IBH53	SPT06	7.00	Brownish grey silty clay.										51	26		25	CH					Do
IBH57	UDS01	2.00	Brownish grey, silty clay with fine sand mixture and traces of kankars.	1.99	1.62	2.65	26 S		UNCONFD		1.36	0	56	23		33	CH		21	73	6	Do
							23 T		0.0	1.318												
									0.0	1.374												
									0.0	1.376												
									REMOULD		1.24	0										
									0.0	1.205												
									0.0	1.249												
									0.0	1.256												
IBH57	DS05	4.60	Brownish grey, silty clay with sand mixture & mica.														CI*		14	86 (silt+clay)		Do
IBH57	SPT04	5.00	Brownish grey, silty clay.										45	22		23	CI					Do

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Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH58	SPT01	1.00	Brownish grey, silty clay.										49	21	18	28	CI					Do
IBH58	UDS01	2.00	Brownish grey,silty clay with traces of fine sand mixture.	1.84	1.53	2.62	20 S	0.741	TRSH-UU		0.40	23	55	30		25	MH		9	81	10	Do
							20 T		3.0	2.524												
							20 C		2.0	1.876												
									1.0	1.260												
IBH58	DS04	4.50	Brownish grey, silty sand with traces of kankars.										Non Plastic				SM		70	30 (silt+clay)		Do
IBH59	SPT01	1.00	Brownish grey, silty clay with calcareous nodules.			2.66											CI*		50*	42	8	Do
IBH60	UDS01	2.00	Deep brownish grey, silty clay with traces of calcareous nodules and sand mixture.	1.98	1.60	2.62	22 S	0.657	TRSH-UU		0.50	0	47	18		29	CI		38	50	12	Do
							24 T		3.0	0.539												
							24 C		2.0	0.491												
									1.0	0.482												
IBH60	UDS02	4.00	Light yellowish grey, silty clay.	1.82	1.51	2.62	20 S		UNCONFD		0.36	0	53	28		25	CH		7	92	1	Do
									0.0	0.364												
									0.0	0.294												
									0.0	0.449												
									REMOULD		0.23	0										
									0.0	0.230												
									0.0	0.175												
									0.0	0.287												
IBH61	UDS01	2.00	Dark grey, silty clay with traces of calcareous nodules and sand mixtures.	1.96	1.60	2.60	23 S	0.494	TRSH-UU		0.11	6	46	20	16	26	CI		41	48	11	Do
							23 T		3.0	0.471												
							18 C		2.0	0.354												
									1.0	0.255												
IBH61	UDS02	4.00	Light grey, silty clay with traces of calcareous nodules and sand mixture.	1.78	1.40	2.58	27 S		TRSH-UU		0.38	0					CI*		17	81	2	Do
							27 T		3.0	0.398												
									2.0	0.380												
									1.0	0.384												
IBH62	UDS01	2.00	Dark grey, silty clay with traces of sand mixtures and kankars.	2.02	1.74	2.63	16 S		TRSH-UU		0.29	6					CI*		64*	27	9	Do
							16 T		3.0	0.675												
									2.0	0.566												
									1.0	0.425												

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

Job No. : 3576I

Sheet No.

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	PI %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %	Test Method
IBH72	DS01	0.50	Brownish grey, silty clay with decomposed rock dust.										44	14		30	CI					Do
IBH72	DS02	1.60	Brownish grey, silty clay with sand mixture.														CI*		40	60 (silt+clay)		Do
IBH74	UDS01	2.00	Brownish grey, silty clay with sand mixture.	2.08	1.91	2.67	9 S	0.375	TRSH-UU		0.64	23	26	15	11	11	SC		52	41	7	Do
							9 T		3.0	2.852												
							8 C		2.0	2.227												
									1.0	1.594												
IBH74	SPT02	3.00	Brownish grey silty clay with calcareous nodules.														CI*		53*	47 (silt+clay)		Do
IBH74	SPT04	6.50	Brownish grey silty clay with traces of sand mixture.										42	19		23	CI					Do
IBH75	UDS01	2.00	Light brownish grey, silty clay with calcareous nodules and traces of sand	2.10	1.83	2.62	15 S						54	17		37	CH		44	43	13	Do
IBH75	SPT02	3.00	Yellowish grey, silty clay with calcareous nodules.										37	13		24	CI					Do

* Classification is based on average subsoil properties.

** - The apparent high percentage of sand content is due to presence of calcareous nodules & rock pieces.

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

Job No. : 35761

Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content (%)	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)
				Bulk	Dry				In-Situ	Saturated						
IBH-01	2	8.75 - 9.50	Highly weathered, brownish yellow, fine to medium grained, fractured rock.	--	--	--	--	2.704	--	--	--	0.91	0.00	2.5	--	--
IBH-01	4	10.25 - 11.00	Highly weathered, yellowish brown, fine to medium grained, fractured rock.	1.996	1.953	2.170	4.238	--	--	--	--	0.92	4.25	--	--	--
IBH-02	6	12.25 - 13.00	Highly weathered, light yellowish brown, medium to coarse grained rock.	2.101	2.047	2.633	5.391	2.708	--	--	--	0.95	--	--	--	--
IBH-03	11	17.00 - 17.75	Highly weathered, light brownish yellow, medium to coarse grained rock.	1.982	1.954	1.435	2.804	--	--	42	--	--	36.85	2.5	--	--
IBH-04	2	8.75 - 9.50	Highly weathered, yellowish brown, fine to medium grained, fractured rock.	2.021	1.979	2.121	4.197	2.682	--	18	--	--	--	3	--	--
IBH-06	7	11.50 - 12.25	Highly weathered, brownish yellow, fine to medium grained, highly fractured rock.	2.379	2.341	1.610	3.771	2.760	--	--	--	0.94	88.23	--	--	--
IBH-07	18	20.50 - 21.25	Moderately weathered, brownish grey, medium to coarse grained rock.	2.037	1.975	3.105	6.134	2.760	196	20	0.10	--	86.52	--	--	--
IBH-08	8	13.25 - 14.00	Highly weathered, light brownish yellow, medium to fine grained, highly fractured rock.	--	--	--	--	--	--	47	--	--	--	--	--	6245
IBH-09	28	27.25 - 28.00	Moderately weathered, light brownish yellow, coarse grained, slightly fractured rock.	2.557	2.536	0.822	2.085	2.704	101	95	0.94	--	95.37	3	10.25	7489
IBH-10	1	8.50 - 9.25	Highly weathered, brownish yellow, fine to medium grained rock.	1.984	1.915	3.606	6.906	2.696	120	18	0.15	--	10.56	--	--	--
IBH-11	25	25.50 - 26.25	Moderately weathered, brownish grey, medium to fine grained fractured rock.	1.943	1.827	6.387	11.667	2.665	--	22	--	--	4.44	3	--	--
IBH-12	9	15.50 - 16.50	Highly weathered, brownish grey, medium grained rock.	2.087	2.046	2.034	4.161	2.680	32	--	--	--	--	--	--	--
IBH-13	6	12.50 - 13.25	Highly weathered, brownish grey, medium to coarse grained rock.	1.948	1.875	3.894	7.300	2.650	--	--	--	0.87	--	--	--	--
IBH-13	26	26.00 - 26.75	Moderately weathered, brownish grey, medium to coarse grained fractured rock.	2.337	2.277	2.666	6.069	2.640	--	20	--	--		--	--	--

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)
				Bulk	Dry	(%)			In-Situ	Saturated						
IBH-14	3	8.00 - 8.75	Highly weathered, brownish grey, medium to coarse grained highly fractured rock.	1.805	1.799	0.317	0.570	2.659	--	22	--	--	13.57	3	--	--
IBH-15	29	29.00 - 30.00	Moderately weathered, yellowish brown, medium to fine grained highly fractured rock.	--	--	--	--	--	--	--	--	1.69	--	--	--	--
IBH-16	22	24.75 - 25.50	Moderately weathered, brownish grey, medium to coarse grained rock.	2.059	2.034	1.215	2.471	2.673	--	--	--	0.92	--	--	--	--
IBH-17	26	28.75 - 29.50	Moderately weathered, light yellowish brown, medium to fine grained highly fractured rock.	2.067	2.056	0.577	1.185	2.663	--	--	--	1.82	60.48	2.5	--	--
IBH-19	6	12.00 - 12.75	Moderately weathered, brownish yellow, medium to coarse grained rock.	2.032	1.961	3.633	7.123	--	--	--	--	0.92	--	--	--	--
IBH-19	22	24.00 - 24.75	Highly weathered, brownish yellow, medium to coarse grained rock.	--	--	--	--	2.611	88	20	0.23	--	9.31	--	--	--
IBH-21	20	22.50 - 23.25	Highly weathered, brownish grey, medium to coarse grained rock.	2.236	2.202	1.543	3.398	--	--	22	--	--	--	--	--	--
IBH-22	5	11.50 - 12.25	Highly weathered, brownish grey, medium grained rock.	2.371	2.356	0.617	1.453	2.680	--	--	--	0.96	--	--	--	--
IBH-22	19	22.00 - 22.75	Moderately weathered, brownish grey, medium to fine grained, rock.	--	--	--	--	--	87	20	0.23	--	--	3	22.36	--
IBH-23	7	12.50 - 13.25	Highly weathered, light brownish yellow, medium to fine grained highly fractured rock.	--	--	--	--	2.668	--	--	--	1.04	--	--	--	--
IBH-23	19	21.50 - 22.25	Moderately weathered, light brownish yellow, medium to fine grained, moderately fractured rock.	2.017	2.001	0.817	1.636	2.534	91	20	0.22	--	74.02	--	--	--
IBH-25	26	26.75 - 27.50	Highly weathered, yellowish brown, medium grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.93	--	--	--	--
IBH-26	6	10.75 - 11.50	Highly weathered, light brownish yellow, medium to fine grained, highly fractured rock.	2.144	1.913	12.067	23.090	2.682	--	20	--	--	14.25	--	--	--
IBH-26	17	19.00 - 19.75	Highly weathered, brownish yellow, medium grained, highly fractured rock.	--	--	--	--	--	--	--	--	1.89	--	3	--	--

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

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Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)
				Bulk	Dry	(%)			In-Situ	Saturated						
IBH-27	5	9.50 - 10.25	Highly weathered, brownish grey, fine to medium grained, highly fractured rock.	2.188	1.942	12.648	24.563	2.723	--	--	--	0.81	0.00	--	--	--
IBH-28	12	15.25 - 16.00	Moderately weathered, brownish grey, medium grained, medium fractured rock.	2.360	2.337	1.013	2.366	2.393	--	57	--	--	81.59	3	--	--
IBH-29	14	18.25 - 19.00	Moderately weathered, greyish yellow, medium to coarse grained, highly fractured rock.	2.042	1.967	3.785	7.447	2.673	--	--	--	1.99	--	--	--	--
IBH-29	24	25.75 - 26.50	Moderately weathered, greyish yellow, medium to coarse grained, highly fractured rock.	--	--	--	--	--	79	23	0.29	--	3.71	3.5	--	--
IBH-30	23	26.75 - 27.50	Slightly weathered, brownish yellow, medium to coarse grained, moderately fractured rock.	2.149	2.116	1.551	3.281	2.675	68	17	0.25	--	--	--	--	--
IBH-31	8	12.50 - 13.25	Moderately weathered, brownish yellow, fine grained, slightly fractured rock.	--	--	--	--	--	55	18	0.33	--	12.56	4	--	--
IBH-32	7	13.50 - 14.25	Highly weathered, light brownish yellow, fine to medium grained, highly fractured rock.	--	--	--	--	--	--	--	--	1.73	18.42	--	--	--
IBH-33	5	11.25 - 12.00	Highly weathered, brownish yellow, fine to medium grained, highly fractured rock.	2.226	2.170	2.569	5.577	2.667	--	37	--	--	--	--	--	--
IBH-34	6	13.00 - 13.75	Highly weathered, brownish yellow, medium to coarse grained, highly fractured rock.	2.011	1.998	0.624	1.246	2.667	--	25	--	--	4.66	3.5	--	--
IBH-35	27	25.00 - 25.75	Moderately weathered, yellowish brown, medium to fine grained, highly fractured rock.	2.570	2.560	0.416	1.065	2.690	--	292	--	--	98.00	--	6.93	15852
IBH-38	8	11.00 - 11.75	Highly weathered, brownish yellow, medium to fine grained, highly fractured rock.	2.190	2.115	3.530	7.467	2.695	--	--	--	0.95	--	--	--	--
IBH-39	30	26.25 - 27.00	Highly weathered, yellowish grey, coarse grained, fractured rock.	--	--	--	--	--	54	--	--	--	--	3	--	--
IBH-40	2	6.15 - 6.90	Moderately weathered, brownish grey, medium to coarse grained fractured rock.	2.157	2.102	2.649	5.567	2.660	--	42	--	--	5.55	--	--	--

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

Job No. : 3576I

Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content (%)	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)
				Bulk	Dry				In-Situ	Saturated						
IBH-40	31	27.00 - 27.75	Moderately weathered, blackish grey, medium to coarse grained fractured rock.	--	--	--	--	--	--	--	--	0.93	--	--	--	--
IBH-41	3	9.50 - 10.25	Highly weathered, brownish yellow, medium to coarse grained rock.	--	--	--	--	--	--	--	--	0.89	--	--	--	--
IBH-41	12	16.25 - 17.00	Highly weathered, yellowish brown, medium to coarse grained rock.	2.201	2.090	5.314	11.105	2.690	103	22	0.21	--	55.56	--	--	--
IBH-42	18	20.75 - 21.50	Highly weathered, brownish grey, medium to coarse grained, partly fractured rock.	2.248	2.166	3.778	8.184	2.650	--	18	--	--	--	--	--	--
IBH-43	31	29.00 - 30.00	Highly weathered, brownish grey, medium grained rock.	--	--	--	--	--	93	17	--	--	52.95	--	--	--
IBH-48	3	7.50 - 8.25	Highly weathered, brownish grey, medium to fine grained rock.	--	--	--	--	--	--	--	--	0.91	0.00	--	68.9	--
IBH-48	27	25.50 - 26.50	Moderately weathered, brownish grey, medium to coarse grained rock.	--	--	--	--	--	--	--	--	1.69	--	--	--	--
IBH-52	8	14.25 - 15.00	Moderately weathered, light yellowish grey, fine grained, highly fractured rock.	2.045	2.000	2.243	4.486	2.660	--	--	--	0.94	--	--	--	--
IBH-53	9	14.00 - 15.00	Moderately weathered, light greyish yellow, fine grained, highly to moderately fractured rock.	--	--	--	--	--	--	58	--	--	62.00	--	--	3521
IBH-55	10	9.75 - 10.50	Highly weathered, light brownish yellow, medium to fine grained highly fractured rock.	2.219	2.157	2.908	6.272	2.757	--	--	--	0.94	83.37	--	--	--
IBH-58	9	11.25 - 12.00	Highly weathered, deep yellowish brown, medium grained, highly fractured rock.	1.982	1.975	0.320	0.633	2.682	--	18	--	--	12.37	2.5	--	--
IBH-59	6	6.00 - 6.75	Highly weathered, brownish grey, medium to coarse grained, highly fractured rock.	--	--	--	--	--	--	50	--	--	--		--	--
IBH-60	10	13.00 - 13.75	Moderately weathered, light yellowish grey, medium grained, highly fractured rock.	2.256	2.204	2.367	5.217	2.326	--	--	--	1.71	--	3.5	--	--
IBH-61	10	13.00 - 13.75	Highly weathered, yellowish brown, medium to fine grained, highly fractured rock.	2.200	2.101	4.707	9.890	2.332	24	--	--	--	0.08		--	--

Project: Geotech. Inv. work for Prop. 1 x 600MW STPP at Singareni, Adilabad, Telengana

Job No. : 35761

Sheet No.

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)
				Bulk	Dry	(%)			In-Situ	Saturated						
IBH-61	27	25.75 - 26.50	Highly weathered, brownish grey, fine grained, highly fractured rock.	--	--	--	--	--	--	--	--	0.96	--	3.5	--	--
IBH-62	11	13.00 - 13.75	Highly weathered, brownish grey, medium grained, fractured rock.	2.028	2.009	0.929	1.866	2.518	--	--	--	1.89	74.96		88.2	--
IBH-63	10	9.25 - 10.00	Highly weathered, light yellowish brown, medium to fine grained, highly fractured rock.	2.081	2.067	0.674	1.393	2.596	--	21	--	--	--	3.5	--	--
IBH-63	35	28.00 - 28.75	Moderately weathered, whitish grey to brownish grey, medium to coarse grained, highly fractured rock.	--	--	--	--	--	--	48	--	--	--	3	--	--
IBH-64	30	26.25 - 27.00	Moderately weathered, brownish grey, medium grained, medium fractured rock.	2.044	2.021	1.127	2.279	2.568	--	22	--	2.67	19.04	3	--	--
IBH-65	23	19.00 - 19.75	Moderately weathered, yellowish brown, medium grained, medium fractured rock.	--	--	--	--	--	--	32	--	--	41.32		--	--
IBH-66	3	7.75 - 8.50	Moderately weathered, brownish yellow, medium grained, highly fractured rock.	2.095	2.066	1.418	2.929	2.628	--	19	--	--	55.71		--	--
IBH-67	19	18.50 - 19.25	Moderately weathered, blackish grey, medium grained, medium fractured rock.	2.136	2.051	4.124	8.460	2.541	171	--	--	--	--		--	--
IBH-68	20	17.50 - 18.25	Highly weathered, whitsh grey, medium to coarse grained, highly fractured rock.	--	--	--	--	--	--	--	--	1.19	50.55	3.5	--	--
IBH-69	30	27.25 - 28.00	Highly weathered, light grey, coarse grained, fractured rock.	2.206	2.187	0.874	1.911	2.629	--	--	--	0.86	--		--	--
IBH-71	34	28.75 - 29.50	Highly weathered, brownish grey, fine grained, highly fractured rock.	2.137	2.055	3.991	8.200	2.238	--	--	--	15.37	85.91		--	--
IBH-72	30	24.75 - 25.50	Moderately weathered, reddish brown, medium to coarse grained, fractured rock.	--	--	--	--	--	--	--	--	0.84	--	4	--	--
IBH-74	4	9.50 - 10.25	Highly weathered, brownish grey, fine grained, fractured rock.	1.974	1.953	1.081	2.111	2.630	--	--	--	0.88	--	--	--	--
IBH-74	21	22.25 - 23.00	Moderately weathered, reddish brown, fine grained rock.	--	--	--	--	--	112	19	0.17	--	64.36	--	--	--

LABORATORY ROCK TEST RESULTS

BH No.	Run No.	Depth (M)	Description	Density (gm/cc)		Water Content	Porosity %	Specific Gravity	Unconfined Compressive Strength (kg/sqcm)		Coefficient of softening	Point Load Strength Index (kg/sqcm)	Slake Durability Index (%)	Hardness (based on Mohs' Scale)	Soundness* (% Loss)	E (Kg/sqcm)
				Bulk	Dry	(%)			In-Situ	Saturated						
IBH-75	6	7.25 - 8.00	Highly weathered, yellowish brown, medium grained, fractured rock.	2.073	2.045	1.361	2.783	2.604	--	15	--	--	0.72		--	--
IPMT-01	5	12.50 - 13.50	Moderately weathered, light brownish yellow, medium to fine grained, highly fractured rock.	1.964	1.954	0.509	0.994	2.687	--	--	--	0.98	6.30	--	92.6	--
IPMT-02	14	20.75 - 21.50	Highly weathered, light brownish yellow, medium to fine grained, highly fractured rock.	2.0877	2.000	4.391	8.782	2.734	--	--	--	1.02	0.00	--	--	--
ICST-01	4	9.75 - 10.50	Highly weathered, light brownish yellow, medium to fine grained, highly fractured rock.	1.958	1.908	2.612	4.983	2.640	--	20	--	--	--	--	--	--
ICST-02	8	13.25 - 14.00	Highly weathered, brownish grey, fine grained, rock.	--	--	--	--	2.649	--	--	--	1.03	10.00	--	--	

Note: coefficient of softening = UCS (saturated) / UCS (In-situ)

ERT	Co-ordinate (M)		G.L. in metre	ERT	Co-ordinate (M)		G.L. in metre
	E	N			E	N	
1	(-) 72	(-) 233	142.171	11	180	(-) 156	143.873
2	(-) 67	(-) 164	142.128	12	194	(-) 267	144.755
3	(-) 40	(-) 246	141.005	13	246	(-) 176	144.151
4	(-) 26	(-) 207	141.943	14	351	(-) 192	144.817
5	(-) 58	(-) 302	140.752	15	477	(-) 245	145.366
6	(-) 49	(-) 150	140.064	16	(-) 443	(-) 702	142.796
7	21	(-) 281	142.729	17	(-) 518	(-) 235	139.766
8	5	(-) 186	142.005	18	349	(-) 283	144.506
9	58	(-) 208	142.802	19	(-) 98	(-) 273	141.965
10	86	(-) 181	144.524	20	66	(-) 128	142.614

APPARENT RESISTIVITY VALUES

ERT No. 01

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	6.86	8.18	7.61	6.92	7.39
2	2	8.17	10.06	7.16	7.79	8.30
3	3	7.92	12.07	8.11	11.13	9.81
4	4	7.04	10.06	7.79	7.79	8.17
5	5	6.60	9.74	8.17	7.23	7.94
6	8	10.06	14.58	9.56	10.06	11.07
7	10	13.20	16.34	9.43	11.94	12.73
8	15	16.97	19.80	12.26	14.14	15.79

Mean Resistivity at ERT-01 is 10.15 Ohm - m.

ERT No. 02

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	5.79	12.52	7.80	6.42	8.13
2	2	10.43	13.07	9.55	10.68	10.93
3	3	10.56	15.47	11.13	11.50	12.17
4	4	10.31	14.33	9.05	13.83	11.88
5	5	8.49	12.57	8.48	10.06	9.90
6	8	13.08	19.11	11.56	14.08	14.46
7	10	13.20	13.83	13.83	13.83	13.67
8	15	16.97	18.86	17.92	16.03	17.45

Mean Resistivity at ERT-02 is 12.32 Ohm - m.

ERT No. 03

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	8.62	9.37	7.23	8.81	8.51
2	2	10.30	8.04	9.80	10.43	9.64
3	3	11.50	10.37	10.18	12.26	11.08
4	4	10.81	9.80	10.56	10.31	10.37
5	5	11.63	8.80	9.74	9.43	9.90
6	8	11.06	11.57	13.08	13.58	12.32
7	10	11.94	11.31	15.09	15.09	13.36
8	15	15.09	14.14	16.03	17.92	15.80

Mean Resistivity at ERT-03 is 11.37 Ohm - m.

ERT No. 04

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	8.93	8.30	8.05	7.86	8.29
2	2	7.04	7.92	6.66	6.54	7.04
3	3	7.54	7.54	5.85	7.36	7.07
4	4	7.29	7.29	6.54	7.04	7.04
5	5	5.34	7.54	6.29	5.97	6.29
6	8	7.54	9.56	9.05	8.55	8.68
7	10	8.17	10.69	8.80	9.43	9.27
8	15	11.37	13.20	11.31	12.26	12.04

Mean Resistivity at ERT-04 is 8.21 Ohm - m.

ERT No. 05

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	7.36	7.55	8.30	8.43	7.91
2	2	9.80	8.67	8.80	11.31	9.65
3	3	9.81	10.37	12.26	10.94	10.85
4	4	11.56	10.81	12.07	10.81	11.31
5	5	11.00	10.06	11.31	11.63	11.00
6	8	17.10	14.53	17.60	17.60	16.71
7	10	18.86	16.97	24.52	20.12	20.12
8	15	24.52	22.63	28.29	26.40	25.46

Mean Resistivity at ERT-05 is 14.12 Ohm - m.

ERT No. 06

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	10.06	13.21	12.52	20.13	13.98
2	2	8.04	14.08	7.54	14.33	11.00
3	3	10.94	11.69	10.37	11.88	11.22
4	4	8.04	8.80	10.31	9.55	9.18
5	5	6.60	7.29	9.11	9.43	8.11
6	8	12.57	9.56	11.06	9.56	10.69
7	10	13.83	9.43	10.06	10.06	10.85
8	15	17.92	9.43	12.26	13.20	13.20

Mean Resistivity at ERT-06 is 11.03 Ohm - m.

ERT No. 07

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	6.67	6.67	5.66	5.47	6.12
2	2	5.53	5.53	5.78	5.91	5.69
3	3	5.66	5.85	6.22	6.41	6.04
4	4	5.78	6.29	7.04	5.78	6.22
5	5	6.29	6.60	6.60	6.29	6.45
6	8	9.56	9.05	8.55	8.05	8.80
7	10	10.59	8.80	8.80	10.69	9.72
8	15	13.20	11.31	10.37	12.26	11.79

Mean Resistivity at ERT-07 is 7.60 Ohm - m.

ERT No. 08

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	3.21	3.40	3.52	3.27	3.35
2	2	3.65	3.27	3.39	3.14	3.36
3	3	3.96	4.15	4.15	3.96	4.06
4	4	5.03	5.78	5.28	5.03	5.28
5	5	5.66	6.29	5.66	6.60	6.05
6	8	8.05	9.56	8.05	9.56	8.81
7	10	9.43	10.69	9.43	10.69	10.06
8	15	12.26	13.20	11.31	14.14	12.73

Mean Resistivity at ERT-08 is 6.71 Ohm - m.

ERT No. 09

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	2.77	3.96	3.08	3.15	3.24
2	2	3.65	4.15	3.90	3.77	3.87
3	3	4.53	4.34	4.72	4.15	4.44
4	4	5.53	5.53	5.28	5.03	5.34
5	5	5.66	5.66	6.29	5.97	5.90
6	8	8.05	10.06	9.05	8.55	8.93
7	10	9.43	13.20	10.06	10.06	10.69
8	15	12.26	16.03	12.26	13.20	13.44

Mean Resistivity at ERT-09 is 6.98 Ohm - m.

ERT No. 10

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	4.03	3.40	3.52	3.15	3.53
2	2	3.52	2.89	3.65	2.77	3.21
3	3	4.15	3.58	3.77	2.83	3.58
4	4	3.77	4.53	4.27	4.02	4.15
5	5	5.97	5.34	5.66	4.40	5.34
6	8	8.55	7.54	8.05	7.54	7.92
7	10	10.06	8.80	8.80	10.06	9.43
8	15	14.14	11.31	12.26	13.20	12.73

Mean Resistivity at ERT-10 is 6.24 Ohm - m.

APPARENT RESISTIVITY VALUES

IERT No. 01 692 W 910 S

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	13.33	13.33	13.52	13.21	13.35
2	2	8.67	9.30	8.80	9.05	8.96
3	3	8.80	8.68	8.86	12.45	9.70
4	4	8.80	8.04	9.80	10.31	9.24
5	5	8.49	8.80	9.74	9.74	9.19
6	8	9.56	9.56	13.58	10.06	10.69
7	10	10.69	10.06	11.31	10.69	10.69
8	15	13.20	12.26	12.26	14.14	12.97
9	20	13.83	12.57	12.57	15.09	13.52

Mean Resistivity at ERT-01 is 10.92 Ohm - m.

IERT No. 02 517 W 855 S

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	9.62	6.54	7.93	8.18	8.07
2	2	7.16	7.42	7.54	6.91	7.26
3	3	6.60	6.22	5.85	6.04	6.18
4	4	6.54	5.78	6.29	6.03	6.16
5	5	5.97	5.97	5.97	5.97	5.97
6	8	6.03	5.53	6.03	8.05	6.41
7	10	6.29	5.66	6.23	6.29	6.12
8	15	8.49	6.60	7.54	7.54	7.54
9	20	8.80	7.54	7.54	7.54	7.86

Mean Resistivity at ERT-02 is 6.84 Ohm - m.

IERT No. 03 669 W 954 S

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	9.94	10.13	9.81	9.56	9.86
2	2	8.30	9.68	8.92	7.80	8.68
3	3	7.92	8.30	7.92	7.54	7.92
4	4	7.29	8.04	7.29	7.79	7.60
5	5	6.91	7.23	6.60	8.49	7.31
6	8	9.05	9.05	8.55	11.06	9.43
7	10	10.06	10.06	8.80	11.31	10.06
8	15	12.26	13.20	12.26	14.14	12.97
9	20	12.57	13.83	13.83	15.09	13.83

Mean Resistivity at ERT-03 is 9.74 Ohm - m.

IERT No. 04 132 E 371 S

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	27.05	24.53	20.69	24.78	24.26
2	2	25.77	24.13	17.47	27.03	23.60
3	3	22.63	19.24	18.11	21.88	20.47
4	4	7.54	11.31	19.36	13.58	12.95
5	5	7.23	9.11	17.60	10.06	11.00
6	8	9.56	7.54	17.10	13.58	11.95
7	10	7.54	5.66	16.34	12.57	10.53
8	15	6.60	6.60	16.03	10.37	9.90
9	20	6.29	6.29	11.27	10.06	8.48

Mean Resistivity at ERT-04 is 14.79 Ohm - m.

IERT No. 05 462 E 132 S

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	1	5.28	5.54	6.35	10.06	6.81
2	2	6.54	8.17	6.54	6.79	7.01
3	3	8.86	8.86	8.49	7.17	8.35
4	4	9.05	7.54	6.79	8.04	7.86
5	5	9.11	7.86	5.66	8.80	7.86
6	8	9.56	8.55	7.04	9.56	8.68
7	10	8.80	8.80	7.54	10.06	8.80
8	15	10.37	11.31	10.37	12.26	11.08
9	20	11.31	11.31	11.31	12.57	11.63

Mean Resistivity at ERT-05 is 8.67 Ohm - m.

Cross Hole Shear Test: CST-1
Calculated Values of Dynamic Parameters

Depth (M) BGL	V_p (m/s)	V_s (m/s)	Mass Density ($kN.s^2/m^4$)	m = V_p/V_s	Poisson Ratio, σ	Young's Modulus (kN/m^2)	Young's Modulus (MPa)	Shear Modulus (kN/m^2)	Shear Modulus (MPa)
2.0	523	275	1.94	1.9018	0.309	383441	383.4	146470	146.5
4.0	752	410	1.94	1.8341	0.289	839011	839.0	325576	325.6
6.0	851	452	2.04	1.8827	0.304	1085885	1085.9	416522	416.5
8.0	970	515	2.04	1.8835	0.304	1409919	1409.9	540724	540.7
10.0	1105	585	2.04	1.8889	0.305	1821416	1821.4	697706	697.7
12.0	1175	640	2.04	1.8359	0.289	2152949	2152.9	835066	835.1
15.0	1244	700	2.04	1.7771	0.268	2534073	2534.1	998981	999.0
18.0	1410	754	2.04	1.8700	0.300	3012983	3013.0	1159054	1159.1
21.0	1803	995	2.04	1.8121	0.281	5171317	5171.3	2018400	2018.4
23.0	2050	1185	2.04	1.7300	0.249	7151905	7151.9	2862844	2862.8
26.0	2173	1260	2.04	1.7246	0.247	8070640	8070.6	3236697	3236.7
30.0	2256	1335	2.04	1.6899	0.231	8942466	8942.5	3633486	3633.5

Cross Hole Shear Test: CST-2
Calculated Values of Dynamic Parameters

Depth (M) BGL	V_p (m/s)	V_s (m/s)	Mass Density ($kN.s^2/m^4$)	m = V_p/V_s	Poisson Ratio, σ	Young's Modulus (kN/m^2)	Young's Modulus (MPa)	Shear Modulus (kN/m^2)	Shear Modulus (MPa)
2.0	372	190	1.94	1.9579	0.324	185078	185.1	69918	69.9
4.0	455	245	1.94	1.8571	0.296	301298	301.3	116256	116.3
6.0	800	440	2.04	1.8182	0.283	1012920	1012.9	394699	394.7
8.0	970	545	2.04	1.7798	0.269	1537319	1537.3	605556	605.6
10.0	1100	600	2.04	1.8333	0.288	1890988	1891.0	733945	733.9
12.0	1235	715	2.04	1.7273	0.248	2601289	2601.3	1042253	1042.3
15.0	1305	764	2.04	1.7081	0.239	2949456	2949.5	1190002	1190.0
18.0	1500	850	2.04	1.7647	0.264	3722245	3722.2	1472987	1473.0
21.0	1844	1050	2.04	1.7562	0.260	5664671	5664.7	2247706	2247.7
23.0	2040	1240	2.04	1.6452	0.207	7567388	7567.4	3134760	3134.8
26.0	2205	1310	2.04	1.6832	0.227	8587500	8587.5	3498675	3498.7
30.0	2300	1448	2.04	1.5884	0.172	10017177	10017.2	4274626	4274.6

D-1-12(D)

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 – I 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/ RCC structures : 2.0%

c) Prestressed concrete structures : 1.6%

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

ANNEXURE-I

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 : 44 metres/second

b) The risk coefficient "K_1" : 1.07

c) Category of terrain : Category-2

D-1-12(E)

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 to Part 4). Pending finalization of Part 5 of IS:1893, provisions of part 1 shall be read along with the relevant clauses of IS:1893:1984, for embankments.

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 Appendix-I.

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 Appendix-I 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 to 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.

The spectral acceleration coefficient shall get restricted to the peak spectral value if the fundamental natural period of the structure falls to the left of the peak in the spectral acceleration curve.

For buildings, if the design base shear (V_B) obtained from modal combination is less than the base shear ($\bar{V}_B$) 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 $\bar{V}_B$/ V_B. However, no reduction is permitted if $\bar{V}_B$ is less than V_B.

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.

APPENDIX-I

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 special moment resisting steel frames designed and detailed as per IS:800 : 0.04

   b) for special concentrically braced steel frames designed and detailed as per IS:800 : 0.03

   c) For special moment resisting RC frames designed and detailed as per IS:456 and IS:13920 : 0.024

   d) for RCC chimney, RCC Natural Draft Cooling Tower : 0.08

   e) for liquid retaining tanks : 0.048

   f) for Steel chimney, Absorber tower, Vessels : 0.06

   g) for design of structures not covered under 2 (a) to 2 (f) above and under 3 below, in general (excluding special structure/configuration/ materials) : 0.04

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 : 0.08

Note: g = acceleration due to gravity

The horizontal seismic acceleration spectral coefficients are furnished as **Annexure – S** in subsequent pages.

ANNEXURE - S

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

Time Period	Damping Factor (as a percentage of critical damping)		
(Sec)	2%	3%	5%
0	1	1	1
0.03	1	1	1
0.04	1.285	1.224	1.179
0.05	1.561	1.431	1.339
0.06	1.830	1.627	1.487
0.07	2.094	1.813	1.624
0.08	2.352	1.991	1.752
0.09	2.606	2.162	1.875
0.1	2.857	2.328	1.991
0.104	2.957	2.393	2.036
0.107	3.031	2.442	2.070
0.108	3.056	2.458	2.081
0.11	3.105	2.490	2.103
0.115	3.228	2.568	2.157
0.12	3.350	2.646	2.210
0.125	3.471	2.723	2.262
0.13	3.592	2.799	2.313
0.135	3.712	2.874	2.364
0.14	3.832	2.949	2.414
0.145	3.951	3.022	2.463
0.15	4.070	3.095	2.511
0.16	4.070	3.240	2.605
0.167	4.070	3.240	2.670
0.2	4.070	3.240	2.670
0.25	4.070	3.240	2.670
0.3	4.070	3.240	2.670
0.35	4.070	3.240	2.670
0.36	4.070	3.240	2.670
0.37	4.070	3.240	2.670
0.38	4.070	3.240	2.670
0.39	4.070	3.240	2.670
0.4	4.070	3.240	2.670
0.43	4.070	3.240	2.670
0.44	4.070	3.240	2.670
0.46	3.893	3.240	2.670
0.47	3.811	3.170	2.670

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

Time Period	Damping Factor (as a percentage of critical damping)		
(Sec)	2%	3%	5%
0.52	3.444	2.865	2.465
0.555	3.227	2.685	2.310
0.56	3.198	2.661	2.289
0.565	3.170	2.637	2.269
0.57	3.142	2.614	2.249
0.575	3.115	2.591	2.230
0.58	3.088	2.569	2.210
0.585	3.062	2.547	2.191
0.59	3.036	2.525	2.173
0.595	3.010	2.504	2.155
0.6	2.985	2.483	2.137
0.65	2.755	2.292	1.972
0.7	2.559	2.129	1.831
0.75	2.388	1.987	1.709
0.8	2.239	1.863	1.603
0.85	2.107	1.753	1.508
0.9	1.990	1.656	1.424
0.95	1.885	1.568	1.349
1	1.791	1.490	1.282
1.05	1.706	1.419	1.221
1.1	1.628	1.355	1.165
1.15	1.557	1.296	1.115
1.2	1.493	1.242	1.068
1.25	1.433	1.192	1.026
1.3	1.378	1.146	0.986
1.35	1.327	1.104	0.950
1.4	1.279	1.064	0.916
1.45	1.235	1.028	0.884
1.5	1.194	0.993	0.855
1.55	1.155	0.961	0.827
1.6	1.119	0.931	0.801
1.65	1.085	0.903	0.777
1.7	1.054	0.876	0.754
1.75	1.023	0.851	0.733
1.8	0.995	0.828	0.712
1.85	0.968	0.805	0.693
1.9	0.943	0.784	0.675

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

Time Period	Damping Factor (as a percentage of critical damping)		
(Sec)	2%	3%	5%
1.95	0.918	0.764	0.657
2	0.896	0.745	0.641
2.05	0.874	0.727	0.625
2.1	0.853	0.710	0.610
2.15	0.833	0.693	0.596
2.2	0.814	0.677	0.583
2.25	0.796	0.662	0.570
2.3	0.779	0.648	0.557
2.35	0.762	0.634	0.546
2.4	0.746	0.621	0.534
2.45	0.731	0.608	0.523
2.5	0.716	0.596	0.513
2.55	0.702	0.584	0.503
2.6	0.689	0.573	0.493
2.65	0.676	0.562	0.484
2.7	0.663	0.552	0.475
2.75	0.651	0.542	0.466
2.8	0.640	0.532	0.458
2.85	0.628	0.523	0.450
2.9	0.618	0.514	0.442
2.95	0.607	0.505	0.435
3	0.597	0.497	0.427
3.05	0.587	0.489	0.420
3.1	0.578	0.481	0.414
3.15	0.569	0.473	0.407
3.2	0.560	0.466	0.401
3.25	0.551	0.458	0.394
3.3	0.543	0.452	0.388
3.35	0.535	0.445	0.383
3.4	0.527	0.438	0.377
3.45	0.519	0.432	0.372
3.5	0.512	0.426	0.366
3.55	0.512	0.420	0.361
3.6	0.497	0.414	0.356
3.65	0.484	0.408	0.351
3.7	0.471	0.403	0.346
3.75	0.458	0.397	0.342

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

Time Period	Damping Factor (as a percentage of critical damping)		
(Sec)	2%	3%	5%
3.8	0.446	0.392	0.337
3.9	0.424	0.372	0.329
4	0.403	0.354	0.321

D-1-12(F)

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 the Specification.

D-1-12(G)

ANNEXURE – G

Specification For High Performance Moisture Compatible Corrosion Resistant Coating System

a) Providing & applying High Performance Moisture Compatible Corrosion Resistant Coating System manufactured as per technical specifications of Central Electrochemical Research Institute, Karaikudi, (C.S.R.I. affiliate Institute), Tamil Nadu, Pin - 630 006.

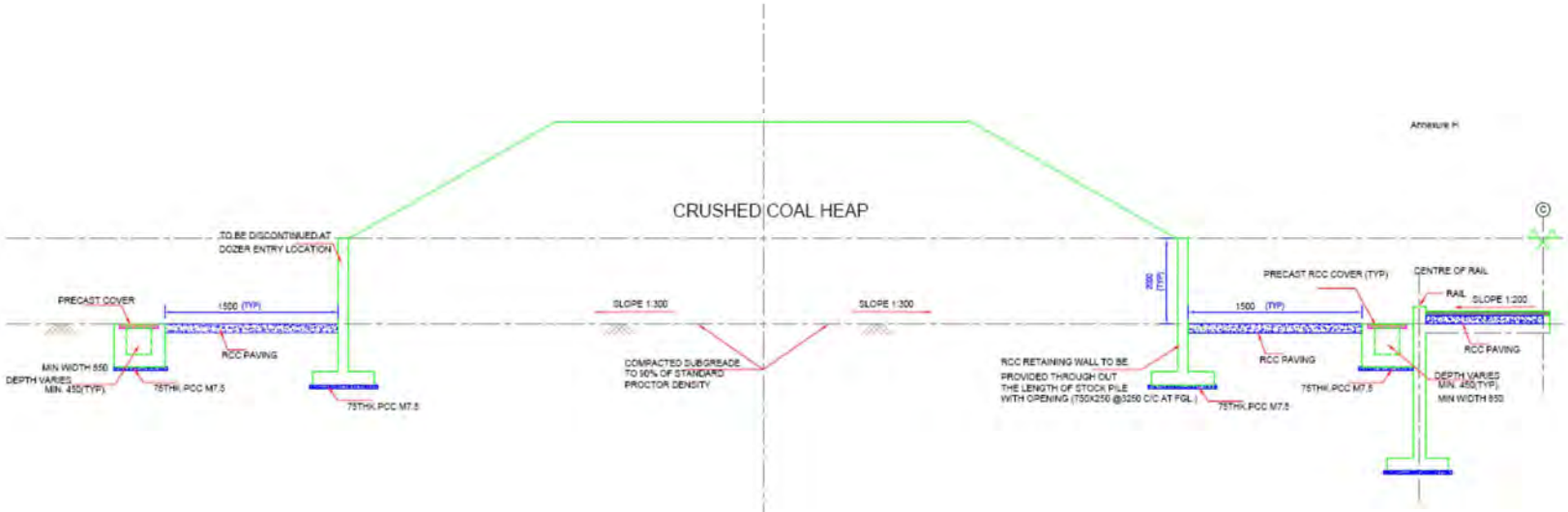
b) The coating system shall be water compatible, compatible for applying in wet conditions also and shall be tolerant to under-prepared surfaces and existing residual tar / paint. The system shall also be quick curing so as to be suitable for application during shut downs.

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.

c) The coating system shall conform to the following :

PROPERTIES OF PAINT

Base	High Performance Moisture Compatible Corrosion Resistant Coating System CECRI know-how 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



INDICATIVE ARRANDEMENT OF COAL STOCK PILE
ALL DIMENSIONS ARE IN MM

D-1-12(I)

ANNEXURE – I

SPECIFICATIONS FOR 100% SOLIDS , HIGH BUILD, ELASTOMERIC POLYURETHANE COATING FOR CONCRETE

1.00.00 The coating shall meet minimum requirements for materials, equipment, application, inspection, repair and handling aspects associated with the coating of Concrete applications using 100% Solids (Solventless) Two Component, Fast Curing Elastomeric Polyurethane Coating classified under ASTM D -16, Type V.

1.01.00 The polyurethane on the external / internal surface of the Concrete shall provide a hard yet flexible, impermeable barrier with outstanding adhesion impact and abrasion resistance as well as crack spanning capability to protect the Concrete from corrosion and abrasion. It shall cover all variations associated with operating conditions of NDCT.

1.02.00 Supplier or his licensed applicator shall obtain prior written approval from the Owner for any deviations from the requirements of this specification and / or the standard referred herein.

1.03.00 The work shall conform to following documents (latest revision or as specified) and as referred in this specification.

a) SSPC-PS Guide 17.00, 1 Aug, 1991	Guide for Selecting Urethane Painting System
b) RP 0892-92	NACE International Linings Over Concrete For Immersion Service
c) RP 0187-96	NACE International Design Considerations For Corrosion Control of Reinforcing Steel In Concrete.
d) ASTM D 4541	Method for Pull Off Strength of Coatings Using Portable Adhesion Testers

2.00.00 **GENERAL REQUIREMENT**

2.01.00 The bidder shall perform all work in accordance with this specification and other requirements noted herein.

Bidder shall submit a detailed written description in the form of a manual covering coating equipment, procedure, materials, inspection, tests and repair etc, for Owner's approval.

2.02.00 The bidder shall also supply copies of test reports conducted by in internationally reputed test agencies evidencing that materials conform to minimum performance requirements. The bidder shall also supply certificates from coating manufacturer as under.

- That the materials (with batch numbers, dates of manufacture and shelf life) are free from all manufacturing defects.
- That the materials will meet performance criteria as given below when applied.
- That the bidder or his applicator possesses the necessary technical skills and equipment to apply these materials and is authorized by the manufacturer for this purpose.

100% Solids, Two Component Polyurethane are specialized coatings characterized by very short pot lives. The coating shall be applied either by the coating material manufacturer himself

or by his authorized applicator. The authorized applicator should have been trained and certified by the coating manufacturer and shall possess the necessary specialized equipment, trained crew and experience in spraying fast setting plural component polyurethane coatings. Contractor shall provide, for the owner's approval, details of coating manufacturer's authorized applicator including details of equipment, experience in spraying fast setting 100% Solids Polyurethane Coatings and client references for verification. In no case shall coating application be undertaken by coating contractors without prior track record of applying these materials. In addition, contractor shall provide certificate from coating materials manufacturers that the applicator possesses the necessary technical skills and equipment to apply these materials and is authorized by the manufacturer for this purpose.

2.03.00 Applied coating will be tested for dry film thickness and adhesion and hardness.

All coating operations shall be performed under the supervision of, and performed by, personnel skilled in the application of the coating system.

2.04.00 The bidder shall provide access, during all phases of work, to the Owner and their representatives.

2.05.00 All cleaning, priming and coating machines shall be equipped with rubber or wheels overlaid with hard fiber to prevent damaging the concrete surface.

2.06.00 The materials shall be applied by Airless Spray System, as per the standards specified by the material manufacturer.

2.07.00 100% Solids Polyurethane systems are solvent free eliminating solvent health hazards and flammability concerns All safety precautions warranted by good industrial hygiene practices and regulated by local, state or central laws must be taken into consideration while applying these coatings.

3.00.00 MATERIAL SPECIFICATIONS

3.01.00 ELASTOMERIC POLYURETHANE COATING :

Spray applied, Impermeable, 100% Solids, Elastomeric Aromatic Polyurethane Coating (Non Tar Extended), as per ASTM D-16, Type V (Two Component, Chemical Cure). Shall meet following criteria. All tests at ambient (25 C) unless otherwise specified.

• NOMINAL THICKNESS	2,000 Microns
• TENSILE STRENGTH ASTM D-638	17 N / mm^2
• ADHESION ASTM D-4541 (Elcometer Pull Off)	2 N / mm^2
• RECOVERABLE ELONGATION ASTM D-638	50% Min.
• SURFACE HARDNESS ASTM D 2240 (Cured Film - Shore D)	50 Min.
• WATER VAPOUR PERMEABILITY ASTM E - 96 / F-1249-90	0.3 gms. / 24 Hour / M2 Max.
• RESISTANCE TEMPERATURES	0° C to 60^oC

- FLEXIBILITY — Pass over 12 mm Mandrel
  180° Bend -1.0 mm thick ASTM D 1737
- ACCELERATED WEATHERING — Excellent. Some Discoloration.
  ASTM G – 154 53 / BS 3800 2,000 Hours
- ABRASION RESISTANCE — Weight Loss 0.05 gms. Max
  ASTM D 4060 /FTMS 141 Taber Abraser H - 10 Wheel 1,000 gms., 1,000 cycles
- CHEMICAL RESISTANCE Immersion of 30 days in sea water followed by
  (%) Weight Change < 1.0 %
  (%) Hardness (Shore D) Change < 5.0 %
  (%) Tensile Strength Change < 5.0 %

3.02.00 **PRIMER**

Primer shall be used on new concrete surfaces before application of PU coating.

Damp tolerant, penetrating, sealing primer shall be applied at 100-125 Microns Wet Film Thickness in accordance with the recommendation of the Polyurethane Coating manufacturer.

4.00.00 **SURFACE PREPARATION**

4.01.00 The bidder shall be responsible for the structural integrity of the concrete.

The use of form release agents shall be compatible to the coating. Contractor shall take measures in concrete casting to provide a suitable surface finish that shall be compatible with subsequent application of coating. The measures shall include providing well compacted, dense concrete with minimal air entrainment and a relatively smooth surface finish. Pond floor shall be vacuum dewatered.
Remove any fins or protrusions using power grinding. These may also be required to be removed for applications requiring an even finish.

Residual bug – holes beneath the surface of the coating shall be opened by sweep blasting and flooded with Polyurethane coating during spray application. Any larger voids shall be filled with Elastomeric Polyurethane hand mix material or compatible grout. Active cracks shall be bridged by using Elastomeric Polyurethane over Industrial Nylon / Polyester Fabric. Any exposed steel surfaces shall be wire brush cleaned and primed before coating application.

4.02.00 Exterior waterproofing shall be applied to the structure below the finished ground level and upto atleast 300 mm above it. The structure shall be sealed from the exterior (soil side) to block capillary action of moisture through the concrete. Leaks from groundwater can permeate the entire concrete thickness. The exterior waterproofing system must be suitable for the expected exposure condition.

4.03.00 Before general surface preparation, surface contaminants (if any) shall be removed. Oil and Grease shall be removed by multiple detergent wash, preferably using steam. (Solvents shall not be used as they will cause the petroleum products to penetrate the concrete surface). Chemically contaminated concrete shall be neutralized prior to complete surface preparation. Acidic surfaces shall be neutralized using an alkaline cleaner and rinsed with fresh water and then cleaned with steam and detergent. After chemical cleaning, surface will be tested for residual chemicals. pH shall be tested using ASTM D - 4262 using pH test paper on rinse water . Concrete shall be dried thoroughly thereafter.

4.04.00	Sweep blast the concrete surface using expendable abrasive. The blast nozzle should be kept at sufficient distance to avoid over blast and exposing of aggregate. Following blasting remove dust using air jet (with the abrasive turned off) .
4.05.00	Any of the following methods of surface preparation may be used to achieve a near white blast cleaned surface : a) Dry abrasive blasting using compressed air, blast nozzles and abrasive. b) Dry abrasive blasting using a dosed cycle, re-circulating abrasive system, with compressed air, blast nozzle, and abrasive, with or without vacuum for dust and abrasive recovery. c) Dry abrasive blasting using a dosed cycle, re-circulating abrasive system with centrifugal, wheels and abrasive (such as Wheelabrator).
4.06.00	Compressed air used for blast cleaning shall be dean, dry and free of moisture and oil. Moisture separators, oil separators, traps or other equipment may be necessary to achieve dean, dry air.
4.07.00	Blast cleaning operations shall be done in such a manner that no damage is done to partially or entirely completed portions of the work.
4.08.00	Dry blast cleaning shall not be concluded during times when the surface will become wet after blast cleaning.
4.09.00	Non-metallic disposable mineral abrasive such as silica sand shall be the chosen abrasive for open blasting operations Steel grit and shot are approved abrasive media for blast cleaning in closed cycle, recirculating abrasive systems (compressed air, vacuum and centrifugal wheel) . No other abrasive media shall be used without prior approval.
4.10.00	The cleanliness and size of recycled abrasive shall be maintained to ensure compliance with this standard.
4.11.00	The blast cleaning abrasive shall be dry and free of oil, grease and other contaminants. Applicator shall use abrasive media of size that will ensure the necessary roughness desired.
4.12.00	Dust and residues shall be removed from prepared surface by brushing, blowing off with dean , dry air or vacuum cleaning. Moisture separators, oil separators, traps or other equipment may be necessary to achieve clean, dry air.
4.13.00	Prior to the application of Elastomeric Urethane on new concrete surface, sufficient time must pass to allow the excess moisture to evaporate. This time will vary on conditions and is normally 14-28 days. After the curing period has elapsed, concrete must be checked for the presence of excess moisture on and beneath the surface using a Delmhorst BD-8 Moisture Detector. A reading of 2% and under indicates that the concrete is ready to be coated. The moisture content must not only be checked on the surface but beneath it by driving nails 6-12 mm into the concrete and placing the probes on the nail - heads. Alternatively the moisture may be tested by the Plastic Sheet Test ASTM D-4263 . The test involves taping a 450 mm X 450 mm , 0.1 mm thick dear plastic sheet to the surface of the concrete for a duration of 16 hours. Absence of any droplets of moisture underneath the plastic sheet indicates that the concrete is ready for coating. In cases of continued ingress of moisture from localised areas of concrete, apply propane blow torch to ensure that the moisture content as specified above is achieved.
5.00.00	PRIMING
5.01.00	Before beginning priming and coating, measure the humidity using a sling psychrometer and calculate the dew point. The relative humidity must be lower than 85%. Temperature of concrete surface must be at least 3°C higher than the dew point. Under controlled conditions, it is possible to heat the concrete surface to eliminate condensation problems.

5.02.00	The type of primer used shall be as described in the coating specification 3.02.00.
5.03.00	Primer shall be sprayed onto the cleaned surface with a wet film thickness of 75-125 Microns. Since the primer penetrates into the concrete surface, no DFT measurements will be taken and estimation shall be on volumetric basis. The primer on application shall be free from runs or drips or areas of excessive thickness.
5.04.00	The primed surface shall be protected so that it will not come into contact with rain, dust or other substances until completely hardened and coated with the Elastomeric Polyurethane Top Coat.
5.05.00	Primed surface should be over coated within the time recommended for the approved type of primer. In the event that the re-coat interval of primed surface is exceeded without top-coating with the Elastomeric Polyurethane, the surface must be re-primed.
6.00.00	COATING
6.01.00	Nominal thickness of the Elastomeric Polyurethane shall be 2,000 Microns, measured in accordance with 7.02.02. Being a thixotropic, high build, non-levelling coating, the Elastomeric Polyurethane coating shall take the contour / profile of the substrate. Coating shall be done only at times when the substrates temperature is at least 3oC over the dew point. Hourly measurements of dew point and surface temperatures shall be made prior to and when coating is under progress. Surface temperature should be minimum 5oC and should not exceed 70oC.
6.02.00	Equipment for the spray application shall be in conformity with system specification, meeting minimum specified by the coating manufacturer. Equipment shall consist of Material Feed Pumps, Purge Pump, Proportioning Pump, Mix Manifold, Static Mixer, Interconnecting Hoses etc.
6.03.00	Partially used and unused material drums must be tightly sealed and contain a blanket of nitrogen to prevent moisture contamination when not in use.
6.04.00	Before application on the substrate apply a test patch for runs or drips and gel time as well as tack free time.
6.05.00	The proportioning pump shall be fitted with a numeric counter to keep track of the volume while spraying.
6.06.00	Entire thickness shall be built up in a single application (with a number of passes) . If the surface is large enough to require more than one day for the coating, the edges of the coated areas shall be feathered and roughened with a grinding too) prior to beginning priming and coating.
6.07.00	Areas not to be coated shall be masked with disposable plastic sheets, cardboard etc.
6.08.00	Visual inspection shall be made for film discontinuities such as air bubbles, blowholes, skips, shadows. Such defects will be marked and repaired with Elastomeric Polyurethane hand mix kit with slower pot life after roughening the edges.
7.00.00	INSPECTION
7.01.00	All work under this specification shall be subject to inspection by the owner or his representative. All parts of work shall be accessible. The applicator shall correct such work as is found defective and not as per the specifications.

7.02.00 The following tests shall be made :

During coating application the wet film thickness will be measured using Nordson wet Film Gauge as per ASTM D 4414.

7.02.01 Adhesion

Pull Off adhesion to Concrete measured using an portable adhesion tester such as Positest AT-CM Elcometer or equivalent as per ASTM D4541 on fully cured (7 days) concrete. Frequency shall be 3 readings per 1,000 Sq.M of coated area. The average of readings from three five randomly selected areas shall constitute the adhesion and shall be minimum 2 N/mm2 (see below). Test area to be flat (without curvature). The following method will be used to determine whether coating meets adhesion requirements

Elcometer Reading	Type of Failure		Result / Conclusion
> 2 N / mm2	T1	90% or more of break at coating - concrete interface	Coating meets adhesion criteria. Take actual reading of bond strength.
	T2	90% of more of break within the concrete	Concrete Failure. Coating adhesion exceeds 2N/mm2
< 2 N / mm 2	T1	90% or more of break at coating - concrete interface	Coating does not meet adhesion criteria. Take actual reading of bond strength achieved.
	T2	90% of more of break within the concrete	Concrete lacks sufficient strength to provide necessary adhesion figure. Coating adhesion accepted.

7.02.02 Film Thickness (DFT)

The film thickness shall be determined from the thickness of the coating detached along with the Elcometer dollies of the adhesion test and the readings shall be recorded. Frequency shall be identical to adhesion test. Average of 3 reading shall constitute the film thickness and shall be al least 2,000 Microns. Minimum spot reading shall be 1,800 Microns. Recommended spread rate by the manufacturer for the specified thickness of the PU coating shall be ascertained and adhered to during the coating process.

7.02.03 Hardness (Durometer)

Cured films (7 days) shall be tested for hardness using Durometer (Shore D) as per ASTM D 2240.