

**Project title:**

Assessment of Physico mechanical Properties of four borehole from Pachwara South Coal block of Rajmahal Coalfield, Dumka, Jharkhand

**Project No.:**

SSP/437/2019-20

**Executive Summary:**

M/s Inspectorate Griffith India Pvt. Ltd., P.O. Dhansar, Dhanbad - 826106, Jharkhand contacted CSIR-Central Institute of Mining and Fuel Research, Dhanbad for investigation of physico-Mechanical properties of different formations of rock encountered at Pachwara South Coalblock, Rajmahal coalfield, Dumka District in Jharkhand. M/s Inspectorate Griffith India Pvt. Ltd., P.O. Dhansar, Dhanbad - 826106, Jharkhand has also sent four borehole rock core samples of BH# PSD 35 (P-26), PSD 36 (P-27), PSD 27 (P-38) and PSD 46 (P-46) drilled in the same area for facilitating the study.

The borehole core samples from BH# PSD 35 (P-26), PSD 36 (P-27), PSD 27 (P-38) and PSD 46 (P-46) were used for investigating different physico-mechanical properties of intact rock in dry conditions. A very detailed Laboratory study has been conducted as per standard procedures. The average values for different physico-mechanical properties of rock core samples are presented as Table A hereunder. A detail statistical analysis has been also conducted so as to advice related to intact rock properties within requisite confidence limits. The advice on intact rock properties must be kept in mind for further computation by sponsoring agency.

Table A: Physico-Mechanical properties of the rock from Pachwara South Coalblock, Rajmahal coalfield, Jharkhand

ROCK TYPE	$\rho$	n	$\sigma_c$	$\sigma_t$	C	$\phi$	E	PLI	SDI	
									1 <sup>st</sup> Cycle	2 <sup>nd</sup> Cycle
CGSST	2058	14.56	13.37	0.82	3.03	46.38	4.15	0.64	81.92	72.26
MGSST	2118	14.11	15.24	1.58	3.88	45.61	3.96	1.07	85.44	78.86
FGSST	2251	12.90	25.32	1.96	5.51	45.63	5.95	1.20	94.64	91.52
SANDYSH/SHSST	2396	9.59	35.19	3.80	7.91	51.64	5.57	1.06	94.83	92.02
ICAL	2234	9.21	32.96	3.45	6.34	49.99	4.89	1.11	96.09	94.36
SHALE	2300	7.79	35.20	2.45	8.05	47.72	4.79	0.68	97.68	96.92
SHCOAL/CARBSH	1471	6.56	17.65	1.29	---	---	2.84	0.41	91.92	88.01
COAL	1371	7.28	---	1.61	---	---	1.78	0.49	95.01	91.90
ALL ROCK	2009	10.75	22.52	1.93	4.98	47.28	4.58	0.73	93.32	89.84

Where different parameters are:

$\rho$  : Density (Kg/m<sup>3</sup>)

n : Apparent Porosity (%)

$\sigma_c$  : Compressive Strength (MPa)

C : Apparent Cohesion (MPa)

$\sigma_t$  : Tensile Strength (MPa)

$\phi$  : Angle of internal friction (°)

E : Young's Modulus (GPa)

PLI : Point Load Index (MPa)

SDI : Slake Durability Index (%)