LIST OF PUBLICATIONS BASED ON THESIS

1. Estimation of rock load height during development operation in bord and pillar coal mine using numerical simulation method (2018). *Modelling C, Vol. 79, (2) pp 24-34.*

2. Support Design during Depillaring Operation in Bord and Pillar Panel Using Numerical Simulation Method (2018), Modelling C, Vol. 78, (3) pp 351-363.

3. Analysis if laminated roof with rock bolt using Numerical Simulation method (2017). The Indian mining & engineering journal Vol. 56No. 10, pp 10-24.

4. Numerical simulation of roof bolt system during depillaring operation in bord and pillar panel (2016). International conference on Recent Advances in Rock Engineering, RARE – 2016, published in Atlantic Press pp 69-73.

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APPENDIX

Observed results in terms of RLH and axial load at two locations have been tabulated below for varying geo mining parameters.

- At Depth of Cover 100 m

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
100	40	5.5	4	1.47	1.18	3.81	3.72
100	50	5.5	4	1.37	1.17	3.40	3.32
100	60	5.5	4	1.29	1.16	3.10	3.02
100	40	6	4	1.52	1.22	4.23	4.13
100	50	6	4	1.42	1.21	3.78	3.68
100	60	6	4	1.34	1.20	3.44	3.36
100	40	6.5	4	1.57	1.26	4.66	4.54
100	50	6.5	4	1.47	1.25	4.16	4.06
100	60	6.5	4	1.38	1.24	3.79	3.69

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
100	40	5.5	2.25	1.33	0.99	3.12	2.95
100	50	5.5	2.25	1.24	0.98	2.78	2.64
100	60	5.5	2.25	1.17	0.98	2.53	2.40
100	40	6	2.25	1.37	1.02	3.46	3.28
100	50	6	2.25	1.28	1.02	3.09	2.93
100	60	6	2.25	1.21	1.01	2.81	2.67
100	40	6.5	2.25	1.42	1.06	3.81	3.61
100	50	6.5	2.25	1.32	1.05	3.40	3.22
100	60	6.5	2.25	1.25	1.04	3.10	2.94

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
100	40	5.5	1.44	1.22	0.86	2.67	2.47
100	50	5.5	1.44	1.14	0.86	2.38	2.21
100	60	5.5	1.44	1.08	0.85	2.17	2.01
100	40	6	1.44	1.27	0.90	2.96	2.74
100	50	6	1.44	1.18	0.89	2.64	2.45
100	60	6	1.44	1.11	0.88	2.41	2.23
100	40	6.5	1.44	1.31	0.92	3.26	3.02
100	50	6.5	1.44	1.22	0.92	2.91	2.69
100	60	6.5	1.44	1.15	0.91	2.65	2.46

- At Depth of Cover 200 m

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
200	40	5.5	4	1.79	1.45	6.64	6.21
200	50	5.5	4	1.66	1.44	5.92	5.54
200	60	5.5	4	1.57	1.43	5.40	5.05
200	40	6	4	1.85	1.50	7.37	6.89
200	50	6	4	1.72	1.49	6.57	6.15
200	60	6	4	1.63	1.48	5.99	5.61
200	40	6.5	4	1.91	1.55	8.11	7.59
200	50	6.5	4	1.78	1.54	7.24	6.77
200	60	6.5	4	1.68	1.53	6.59	6.17

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth(m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
200	40	5.5	2.25	1.61	1.22	5.43	4.93
200	50	5.5	2.25	1.50	1.21	4.84	4.40
200	60	5.5	2.25	1.42	1.20	4.41	4.01
200	40	6	2.25	1.67	1.26	6.02	5.48
200	50	6	2.25	1.55	1.25	5.37	4.89
200	60	6	2.25	1.47	1.25	4.90	4.45
200	40	6.5	2.25	1.72	1.30	6.63	6.03
200	50	6.5	2.25	1.60	1.29	5.92	5.38
200	60	6.5	2.25	1.51	1.29	5.39	4.90

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
200	40	5.5	1.44	1.49	1.06	4.64	4.13
200	50	5.5	1.44	1.38	1.06	4.14	3.68
200	60	5.5	1.44	1.31	1.05	3.77	3.36
200	40	6	1.44	1.54	1.10	5.15	4.58
200	50	6	1.44	1.43	1.10	4.60	4.09
200	60	6	1.44	1.35	1.09	4.19	3.73
200	40	6.5	1.44	1.59	1.14	5.67	5.04
200	50	6.5	1.44	1.48	1.13	5.06	4.50
200	60	6.5	1.44	1.40	1.12	4.61	4.10

- At Depth of Cover 300 m

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
300	40	5.5	4	2.00	1.63	9.18	8.38
300	50	5.5	4	1.86	1.62	8.19	7.48
300	60	5.5	4	1.76	1.61	7.46	6.82
300	40	6	4	2.07	1.69	10.19	9.31
300	50	6	4	1.93	1.68	9.09	8.31
300	60	6	4	1.82	1.67	8.29	7.57
300	40	6.5	4	2.14	1.75	11.22	10.24
300	50	6.5	4	1.99	1.74	10.01	9.14
300	60	6.5	4	1.88	1.73	9.12	8.33

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
300	40	5.5	2.25	1.80	1.37	7.50	6.66
300	50	5.5	2.25	1.68	1.37	6.70	5.94
300	60	5.5	2.25	1.59	1.36	6.10	5.42
300	40	6	2.25	1.87	1.42	8.33	7.39
300	50	6	2.25	1.74	1.41	7.43	6.60
300	60	6	2.25	1.64	1.41	6.77	6.01
300	40	6.5	2.25	1.93	1.47	9.17	8.14
300	50	6.5	2.25	1.80	1.46	8.18	7.26
300	60	6.5	2.25	1.69	1.45	7.46	6.62

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
300	40	5.5	1.44	1.67	1.20	6.42	5.57
300	50	5.5	1.44	1.55	1.19	5.73	4.97
300	60	5.5	1.44	1.46	1.19	5.22	4.53
300	40	6	1.44	1.72	1.25	7.13	6.18
300	50	6	1.44	1.61	1.24	6.36	5.52
300	60	6	1.44	1.51	1.23	5.79	5.03
300	40	6.5	1.44	1.78	1.29	7.84	6.81
300	50	6.5	1.44	1.66	1.28	7.00	6.08
300	60	6.5	1.44	1.56	1.27	6.38	5.54

- At Depth of Cover 400 m

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
400	40	5.5	4	2.17	1.78	11.55	10.37
400	50	5.5	4	2.02	1.77	10.31	9.26
400	60	5.5	4	1.91	1.76	9.40	8.43
400	40	6	4	2.25	1.84	12.83	11.51
400	50	6	4	2.09	1.83	11.45	10.28
400	60	6	4	1.97	1.82	10.43	9.36
400	40	6.5	4	2.32	1.90	14.12	12.67
400	50	6.5	4	2.16	1.89	12.60	11.31
400	60	6.5	4	2.04	1.88	11.48	10.31

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth (m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
400	40	5.5	2.25	1.96	1.50	9.45	8.24
400	50	5.5	2.25	1.82	1.49	8.43	7.35
400	60	5.5	2.25	1.72	1.48	7.68	6.70
400	40	6	2.25	2.03	1.55	10.49	9.15
400	50	6	2.25	1.89	1.54	9.36	8.16
400	60	6	2.25	1.78	1.53	8.53	7.44
400	40	6.5	2.25	2.09	1.60	11.54	10.07
400	50	6.5	2.25	1.95	1.59	10.30	8.99
400	60	6.5	2.25	1.84	1.58	9.39	8.19

Input Parameter				Output observed from simulation			
				RLH in m		Axial Load In tonne	
Depth(m)	RMR	Gallery Size (m)	Bolt Density (m2/bolt)	Location 1	Location 2	Location 1	Location 2
400	40	5.5	1.44	1.81	1.31	8.08	6.89
400	50	5.5	1.44	1.68	1.30	7.21	6.15
400	60	5.5	1.44	1.59	1.30	6.57	5.61
400	40	6	1.44	1.87	1.36	8.97	7.65
400	50	6	1.44	1.74	1.35	8.00	6.83
400	60	6	1.44	1.64	1.34	7.29	6.22
400	40	6.5	1.44	1.93	1.40	9.87	8.42
400	50	6.5	1.44	1.80	1.39	8.81	7.52
400	60	6.5	1.44	1.70	1.38	8.03	6.85