ISO 9001 : 2008 (Excl.Design)
ISO 14001 2004
OHSAS 18001 : 2007
SA 8000 : 2008
BUREAU VERITAS Certification

PRISM PLUS CHAMPION CEMENT

दूर की सोच®

Through Regd. AD

MIN / 2021 –210297

Date: 01.12.2021

To,
Director
Ministry of Environment & Forests
Regional Office, Western Region
Kendriya Parayavaran Bhavan
Link Road No. 3
E - 5 Ravishankar Nagar,
Bhopal – 462 016

Sub: - Six monthly compliance report of environmental clearance over 1143.41 hect. area in Sijahatta - Hinauti Limestone Mine of M/s Prism Johnson Ltd.

Ref.:- Your letter No. J-11015/37/96-IA.II (M) dated 31.12.96.

Dear Sir,

This is reference to the above we are enclosing herewith the six monthly compliance report (period April, 2021 to September, 2021) with necessary enclosures of the environmental clearance granted over 1143.41 Hect. Mining Lease areas of M/s Prism Johnson Limited (Formerly Prism Cement Ltd) Satna (M. P.)

We hope you will find the same in order.

Thanking you.

Yours faithfully,
For, Prism Johnson Limited

Mines Manager
Prism Cement Limestone Mines

PRISM JOHNSON LIMITED
(FORMERLY PRISM CEMENT LIMITED)
(Cement Division - Unit II)
Works: Village Mankahari, P.O.-Bathia, Dist. Satna - 485 111 (M.P.) India T: +91-07672-275301 / 302600
Corres. Add.: 'Rajdeep', Rewa Road, Satna - 485 001 (M.P.) India. T: +91-07672-402726
Registered Office: Prism Johnson Limited, 305, Laxmi Niwas Apartments, Ameerpet. Hyderabad - 500 016, India.
w: www.prismjohnson.in, www.cement.prismjohnson.in, E: info@prismjohnson.in
CIN: L26942TG1992PLC014033

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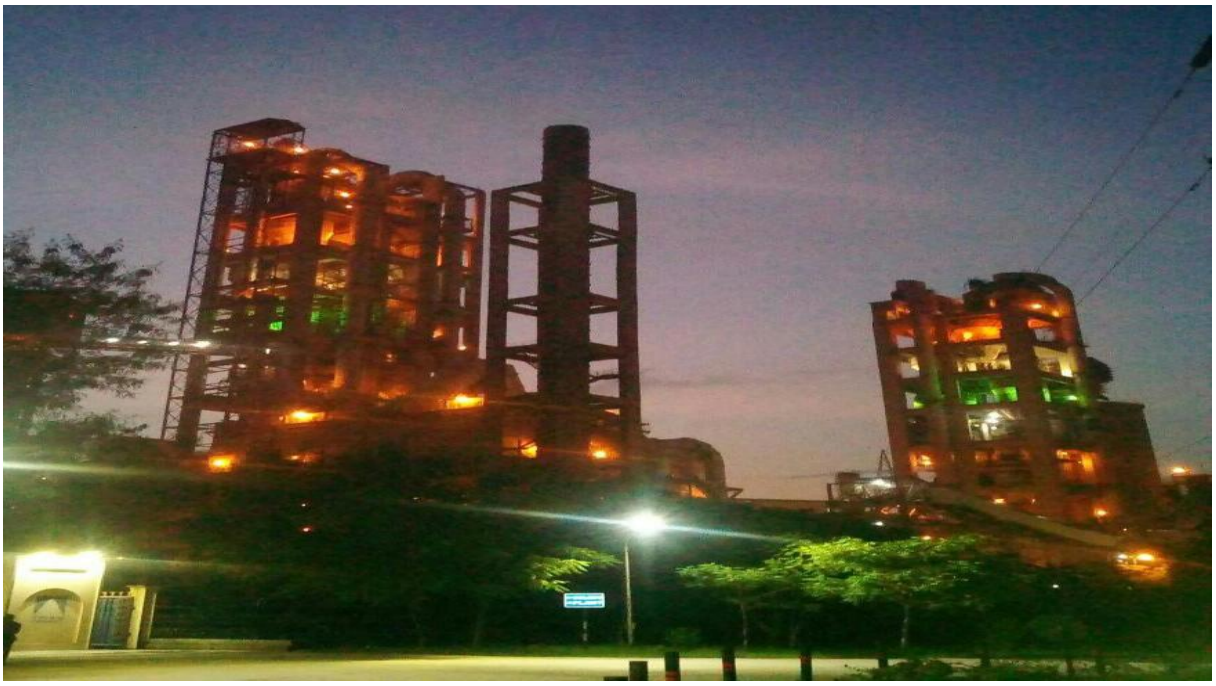
COMPLIANCE REPORT

For

Environmental Clearance over 1143.41 Ha area in Village - Sijahata -Hinoti Limestone Mine of M/S Prism Johnson Ltd

(Period : April, 2021 - September, 2021)



OF

PRISM CEMENT

दूर की सोच

M/s Prism Johnson Limited.

(Formerly Prism Cement Limited)

Village—Mankahari, P.O.-Bhatila

Distt., - Satna (M.P.)

The environmental clearance would be applicable to 1143.41 Ha.	⇨	Initial grant of 1143.41 ha Environment Clearance comprised of mining lease of 791.004 ha + 253.326 ha. + 42.798 ha + 56.282 ha. (PL). Subsequently PL was not converted into ML. Later, 791.004 ha + 42.798 ha were amalgamated and after leaving some restricted area, mining lease was granted for an area of 772.067 ha only.772.067 ha ML was granted EC vide MoEF letter No. J-11011/949/2007-IA-II (I) dated 22.09.2008. Now the said EC 1996 pertains to only 253.326 ha ML area out of 1143.41 ha for compliances. The copy of the approval letter is enclosed as **Annexure 1**

No change in the calendar plan including excavation, quantum of limestone and waste rock /O.B. dumps should be made.		Mining is carried out as per the approved Scheme of Mining vide IBM letter no MP/Satna/Limestone/MPLN/MOD-81/2017-18/ Jabalpur Dtd23.03.2018. The copy of the approval letter is enclosed as **Annexure 2**

Production Plan for last five years for 253.326 ha.

Sl no.	FY	Production as per SoM	Production as per EC limit	Actual production	Production within EC limits.
1.	2016-17	3000000	2175000	2166122	
2.	2017-18	3000000	2175000	2174813	
3.	2018-19	3000000	2175000	2173643	
4.	2019-20	3000000	2175000	2174244	
5.	2020-21	2175000	2175000	2174769	
6.	2021-22	2175000	2175000	1033204 (till Sept)	

Development Plan for last five years for 253.326 ha.

Sl no.	FY	Waste rock as per SoM	Soil as per SoM	Actual W/R	Actual Soil
		Cu M	Cu M	Cu M	Cu M
1.	2016-17	76575	343506	38102	343373
2.	2017-18	1596848	624564	1854829	83094
3.	2018-19	162891	1904952	829504	16837
4.	2019-20	2819104	140545	103409	95661
5.	2020-21	2749264	57454	1388869	0
6.	2021-22	1748132	0	748145	0

The topsoil and O.B. dumps should be stacked in earmarked dump sites.		Waste rock generated during the course of mining is used for concurrent backfilling of the mined out area. Top soil is spread over the backfilled area for carrying out plantation. Soil and OB dumps are maintained separately at earmarked locations as per the scheme of mining approved by the Indian Bureau of Mines.

		 Soil Dump Located in Area 253.326 ha  Overburden Dump Located in Area 253.326 ha Top soil generated is stored and later spread over backfilled area which is used for plantation. All dumps are temporary in nature and placed within excavated area which will be used for backfilling in future. The relevant pages of the approved mining scheme is enclosed as **Annexure No. 4**
Garland drains should be constructed downstream to the existing nala system to safeguard the mine faces.		Garland drain having dimension of cumulative length of 1.2 Km, a width of 2.0 to 3 meters and depth of 0.75 to 1.2 meter already exists. The drain system is continuously developed to safe guard the mine faces. Catch drains around the old OB dumps have been constructed. Picture of the same is displayed.
 Garland Drain		 Settling Pond

The levels of SPM should not exceed 500 $\mu g/m^3$ at any station within the leasehold. Emission of SO_2, NOx and CO should be maintained below the levels prescribed by the competent authority. Control measures suggested in the EMP in this regard should		The SPM, SO_2, NOx and RPM are well within the prescribed limits. Ambient air quality monitoring reports of different locations from

be strictly implemented. The dust pollution in the limestone mine needs to be further controlled by incorporating additional mitigative measures at the sources itself.		April 21 to Sep 21 are given in **Annexure 5.**
		Pollution control measures are strictly implemented. Water spraying is done on the entire haul roads from water tanker. Atomized water spraying arrangement exists at the crusher hopper.  Water spraying System in Crusher Hopper Environment Protection Measures are mentioned in EMP, salient features are as mentioned below:- **POLLUTION CONTROL MEASURES** The mining operations are not anticipated to raise the concentration of the pollutants any more. However, following measures have been/would be adopted to mitigate the SPM levels in ambient air: **i) *Measures to prevent Generation and Dispersal of Dust*** Dust particles, which are normally generated during mining operations become air borne, thus leading to increase in SPM level in the ambient air. Another source of dust generation is the transport of the material by trucks. Adequate control measures are therefore taken by PCL during both mining operations as well as transportation/dumping of Limestone/OB which shall be extended to proposed additional mining area also : • Dust suppression systems (water spray) are/would be adopted at loading faces. –fully implements and complied. • Dust generation is/would be reduced by using sharp tooth for shovels. –fully implements and complied • Dust suppression system. (Water spraying) have been/would be adopted on roads which are used for transportation and plying of vehicles -– fully implements and complied ***ii) Measures to Control Air Pollution due to Airborne Dust*** In addition to control measures during mining and transport

		operations, following steps have been/would be taken to prevent air pollution duo *to* air borne dust: • More trees have been/would be planted around the dust generation points—fully implemented/complied. • More trees have been/would be planted on both sides of the roads along slopes etc. -—fully implemented/complied. • Afforestation around the mine to filter out the dust and preventing it from reaching the residential areas has been / would be undertaken-—fully implemented/complied. • Dust masks have been provided to workers, engaged at dust generation points like loading, dumping points etc. -—fully implemented/complied. • Afforestation already mined out areas would be done as per schedule with minimum gap between excavation and afforestation to fix the dust and prevent it getting airborne -—fully implemented/complied..

Minimum, Maximum & Average Ambient Air Quality Monitoring Report

S. No.	Date	SW (BP No. 18)					Near Western side ML boundary (Pillar No. 14) of ML area					Wind Direction
		$PM_{2.5}$	PM_{10}	SO_2	NOx	CO	$PM_{2.5}$	PM_{10}	SO_2	NOx	CO	
		$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	
1	6/9/2021	28.4	63.11	42.53	46.92	BDL	27.39	60.04	39.77	42.47	BDL	E
2	20/09/21	30.92	62.08	38.19	43.14	BDL	29.23	59.12	37.56	38.83	BDL	SE
3	8/8/2021	30.27	59.3	40.5	44.94	BDL	29.76	56.25	38.19	41.18	BDL	S
4	22/08/21	31.58	59.43	41.68	41.68	BDL	28.79	57.05	37.56	42.07	BDL	SE
5	6/7/2021	33.55	61.38	43.74	50.34	BDL	31.19	64.28	42.53	47.07	BDL	S
6	21/07/21	29.14	55.6	41.31	46.92	BDL	27.85	55.52	39.31	44.49	BDL	SE
7	7/6/2021	31.78	55.47	51.4	55.73	BDL	30.83	66.31	53.03	53.39	BDL	SW
8	21/06/21	28.03	62.17	42.53	45.6	BDL	27.27	53.79	43.74	43.14	BDL	SW
9	9/5/2021	33.26	70.88	48.61	53.93	BDL	30.7	62.93	44.19	50.01	BDL	SE
10	24/05/21	31.64	62.86	43.2	48.54	BDL	28.54	58.07	41.98	45.84	BDL	W
11	5/4/2021	31.41	70.74	33.42	37.21	BDL	34.44	63.25	31.24	35.3	BDL	SE
12	20/04/21	31.9	68.16	34.02	38.83	BDL	31.25	67.72	29.7	34.38	BDL	SE
13	Maximum	33.55	70.88	51.4	55.73		34.44	67.72	53.03	53.39		
14	Minimum	28.03	55.47	33.42	37.21		27.27	53.79	29.7	34.38		
15	Average	30.99	62.60	41.76	46.15		29.77	60.36	39.90	43.18		

S. No.	Date	Near Mankahari Village					Near Hinouti Village					Wind Direction
		$PM_{2.5}$	PM_{10}	SO_2	NOx	CO	$PM_{2.5}$	PM_{10}	SO_2	NOx	CO	
		$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	$\mu g/M^3$	
1	6/9/2021	23.62	51.41	35.1	38.24	BDL	26.61	53.8	36.45	39.29	BDL	E
2	20/09/21	24.87	54.82	34.72	36.77	BDL	25.06	61.17	36.45	37.75	BDL	SE
3	8/8/2021	26.43	49.4	34.04	35.05	BDL	27.24	50.58	35.35	38.83	BDL	S
4	22/08/21	25.06	49.27	35.1	33.71	BDL	26.08	52.23	36.45	37.75	BDL	SE
5	6/7/2021	27.39	53.46	37.56	38.83	BDL	29.46	56.14	38.19	40.45	BDL	S
6	21/07/19	21.92	48.04	34.43	33.83	BDL	23.02	53.05	36.45	37.75	BDL	SE
7	7/6/2021	31.78	55.47	51.04	55.73	BDL	30.09	55.13	42.53	42.53	BDL	SW
8	21/06/21	28.03	62.17	42.53	45.6	BDL	25.87	50.09	35.35	37.21	BDL	SW
9	9/5/2021	26.01	54.1	38.19	36.4	BDL	27.34	56.93	40.5	40.45	BDL	SE
10	24/05/21	25.38	56.16	34.72	35.59	BDL	27.11	60.79	36.45	38.43	BDL	W
11	5/4/2021	28.32	59.66	26.51	32.36	BDL	29.09	64.63	27.01	33.83	BDL	SE

12	20/04/21	25.72	57.61	24.3	27.94	BDL	26.34	62.86	26.73	30.33	BDL	SE
13	Maximum	31.78	62.17	51.04	55.73		30.09	64.63	42.53	42.53		
14	Minimum	21.92	48.04	24.3	27.94		23.02	50.09	26.73	30.33		
15	Average	26.21083	54.30	35.69	37.50		26.9425	56.45	35.66	37.88		

GROUND WATER QUALITY REPORT

Sl No	Tests	Results Mines Site office Hinauti Sijahata	Results Sijahata Village Bore well	Detection Range
1	**Colour**	<5.0	<5	**5-100**
2	**Odour**	Agreeable	Agreeable	**Qualitative**
3	**Taste**	Agreeable	Agreeable	**Qualitative**
4	**Turbidity as (NTU)**	1.10	1.20	**1.0-100**
5	**pH**	7.59	7.21	**2.0-13.9**
6	**Total Dissolved Solid as TDS(mg/l)**	478.0	378.0	**10-1000**
7	**Alkalinity (mg/l)**	176.0	180.0	**10-500**
8	**Total Hardness as $CaCO_3$ (mg/l)**	208.0	220.0	**10-1000**
9	**Calcium as Ca (mg/l)**	60.80	52.80	**10-1500**
10	**Magnesium as Mg (mg/l)**	13.60	21.38	**5-1500**
11	**Chloride as Cl(mg/l)**	28.0	62.0	**10-1000**
12	**Fluoride as F(mg/l)**	0.32	0.36	**0.02-10**
13	**Sulphate as SO_4(mg/l)**	46.50	91.50	**1.0-200**
14	**Nitrate Nitrogen as NO_3(mg/l)**	13.68	14.50	**5.0-100**
15	**Manganese as Mn(mg/l)**	BDL	BDL	**0.05-5**
16	**Zinc as Zn (mg/l)**	BDL	0.19	**0.02-100**
17	**Lead As Pb (mg/l)**	BDL	BDL	**0.005-1**
18	**Cadmium as Cd (mg/l)**	BDL	BDL	**0.002-2**
19	**Nickel as Ni (mg/l)**	BDL	BDL	**0.001-5**
20	**Arsenic as As(mg/l)**	BDL	BDL	**0.008-2**
21	**Total Chromium as Cr (mg/l)**	BDL	BDL	**0.04-10**
22	**Mercury as Hg (mg/l)**	BDL	BDL	**0.001-1**
23	**Copper as Cu(mg/l)**	BDL	BDL	**0.04-5**
24	**Boron as B (mg/l)**	0.22	0.20	**0.02-2**
25	**Aluminum as Al (mg/l)**	BDL	BDL	**1.0-100**
26	**Free residual Chlorine (mg/l)**	BDL	BDL	**0.1-5**
27	**Sulphide as H_2s (mg/l)**	BDL	BDL	**0.04-10**
28	**Iodide as I (mg/l)**	BDL	BDL	**0.1-10**
29	**Iron as Fe(mg/l)**	0.14	0.14	**0.05-100**
30	**Total Coliforms (MPN/100 ml)**	BDL	BDL	**1.8**
31	**E Coli (Nos/100 ml)**	BDL	BDL	**1.8**

The quality of effluents finally discharged should conform to the standards prescribed under GSR 422(E) dated 19.5.1993 and 31.12.1993.

No industrial wastewater is generated as the cement plant is operated on dry process.

For domestic wastewater, there is a sewage treatment plant of the state-of-art technology. It has the capacity to treat domestic

		wastewater of 600 KLPD. Contaminated water generated due to washing of equipment is passed though grease and oil trap tank having separation chambers and pumping arrangement. For separation of oil and grease particles from water, prime mover has been provided. The oil and grease is skimmed and kept in sealed barrels for further disposal to authorized vendors. The strained out water left in the tank is stored in tanks, and is re-used for washing of HEMM. Detailed Report of treated effluent attached as **-Annexure No- 10.**
		
		

Regular monitoring of air, water and noise should be made in and around the core-zone. Recorded data should be furnished to this Ministry (Regional Office, Bhopal) and the State Pollution Control Board six monthly. Noise levels should not exceed the limit of 85 dB. Ear plugs/ear muffs, may be provided to the workers engaged in the noisy atmosphere.		Regular monitoring of ambient air quality, water quality and noise level are done at different locations in and around the core zone. Recorded data is submitted to relevant authorities as per schedule. Monitoring reports of the ambient air quality, water quality and noise level are given in **Annexure 5, 10** and **7 respectively**. The noise level is well within acceptable limits.

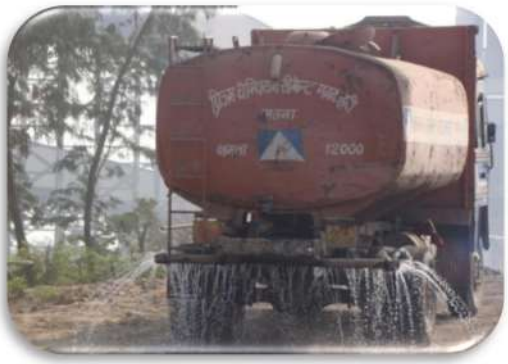
Noise Monitoring Report

S. No	Date of monitoring	SW (BP No. 18)		Near Western side ML boundary (Pillar No. 14) of ML area	
		Noise level in dB(A)	**Noise Level in dB(A)**	**Noise level in dB(A)**	**Noise Level in dB(A)**
		(Day Time)	**(Night Time)**	**(Day Time)**	**(Night Time)**
1	20/09/21	60.8	52.25	58.17	51.52
2	18/08/21	60.6	53.12	59.12	52.67
3	14/07/21	60.67	53.9	59.05	53.17
4	20/06/21	61.62	54.82	59.67	53.87
5	14/05/21	63.15	55.52	61.05	54.8
6	19/04/21	61.57	54.85	58.4	53.4
	Maximum	63.15	55.52	61.05	54.80
	Minimum	60.60	52.25	58.17	51.52
	Average	61.40	54.08	59.24	53.24

S. No	Date of monitoring	Mankahari Village		Hinouti village	
		Noise level in dB(A)	**Noise Level in dB(A)**	**Noise level in dB(A)**	**Noise Level in dB(A)**
		(Day Time)	**(Night Time)**	**(Day Time)**	**(Night Time)**
7	20/09/21	54.87	48.45	56.5	49.92
8	18/08/21	54.32	47.3	55.92	49.72
9	14/07/21	53.7	48.22	55.17	48.9
10	20/06/21	54.97	46.35	56.5	48.55
11	14/05/21	54.85	48.87	57	50.62
12	19/04/21	53.2	49.25	56.97	51.5
	Maximum	54.97	49.25	57.00	51.50
	Minimum	53.20	46.35	55.17	48.55
	Average	54.32	48.07	56.34	49.87

		Ear plugs, dust masks are provided to workmen working in noisy atmosphere.

Total PPE's April 21 to Sep 21		
Material	**Qty.**	**Amount in Rs.**
Dust Mask	352	7263
Goggle Safety Glass PVC,	91	3185
Hand Gloves	35	2821
Helmet Industrial Safety	67	7051
Jacket fluorescent High Visibility Wear	35	9906
Plug Ear muff	100	800
Safety Shoes	618	496079
TOTAL	**1263**	**517199**

The anti-pollution measures with regard to environment quality prescribed in the EMP should be implemented schedule in a time bound programme.		The anti-pollution measures with regard to environment quality prescribed in the EMP have already been implemented. Water spraying is done on the entire haul roads round the clock by water tanker.  Water spraying arrangement has been made at the crusher hopper. Permanent sprinkler arrangement along the haul road area 

EMP Compliance Report is summarized below:

A] POLLUTION CONTROL MEASURES

i) Measures to prevent Generation and Dispersal of Dust

- ❑ Dust suppression systems (water spray) are/would be adopted at loading faces-fully implemented and complied.
- ❑ Dust generation Is/would be reduced by using sharp tooth for shovels -fully implemented and complied.
- ❑ Dust suppression system (Water spraying) have been/would be adopted on roads which are used for transportation and plying of vehicles -fully implemented and complied.

ii) Measures to Control Air Pollution due to Airborne Dust

In addition to control measures during mining and transport operations, following steps have been/would be taken to prevent air pollution due *to* air borne dust: -fully implemented and complied.

- ❑ More trees have been/would be planted around the dust generation points -fully implemented/complied.
- ❑ More trees have been/would be planted on both sides of the roads along slopes etc. -fully implemented/complied.
- ❑ Afforestation around the mine to filter out the dust and preventing it from reaching the residential areas has been / would be undertaken-fully implemented/complied.
- ❑ Dust masks have been provided to workers, engaged at dust generation points like loading, dumping points etc. -fully implemented/complied.
- ❑ Afforestation already mined out areas would be done as per schedule with minimum gap between excavation and

afforestation to fix the dust and prevent it getting airborne -fully implemented/complied.

iii) Surface Water Pollution Control Measures

No surface water bodies are likely to get adversely affected by mining operations. No contamination of surface water source is anticipated as there are no toxic or chemical materials either in the mineral or the top soil cover.
Rain water which is accumulated shall be guided down to suitable drains after passing through reservoirs used as settling tanks--fully implemented/complied.

iv) Ground Water Pollution Control Measures

- ❑ The ground water table in the mine area is not likely to be affected. No control measures to prevent ground water have, therefore been recommended. -Agreed

v) Noise Pollution Control Measures

The noise level monitoring carried out in area has indicated the present noise levels are generally below 65(average) dB(A) which also includes impact of noise of deployment of various machines for excavation, transport, dumping, other auxiliary operations and plant operation. The following measures have been/would be taken to keep the noise levels well below the limits:

- ❑ A thick green belt has been/would be provided around the periphery of the mine to screen the noise. -fully implemented/complied.
- ❑ Trees are/would be planted on both sides of roads used for transportation vehicles. -fully implemented/complied.
- ❑ Proper maintenance of noise generating machinery including the transport vehicles. -fully implemented/complied.
- ❑ Provision of silencers to modulate the noise generated by machines. -fully implemented/complied.
- ❑ Provision of protective device like ear muffs/plugs. -fully implemented/complied.
- ❑ Provision of sound Insulated chambers for the workers deployed on machines producing higher level of noise like bulldozers, drills etc., --fully implemented/complied.
- ❑ Confining the noise levels by isolating the source of noise. -fully implemented/complied..
- ❑ Reducing the exposure time of workers to higher noise levels -fully implemented/complied.

vi) Measures To Reduce Ground Vibrations

- ❑ Peak particle velocity or Ground Vibrations for safety of nearby structures and residential buildings is well within 12.5mm/sec. -fully implemented/complied.
- ❑ For safe permissible charges per delay initially guidance was taken from the empirical propagation equation V=313.22(D/Q1/2).1.67 but now it is firmed up by monitoring studies during the development stage for existing mines--fully implemented/complied.
- ❑ Use of short delay detonators and non-electric detonators -fully implemented/complied.
- ❑ To contain fly rocks, stemming column shall not be less than burden of hole. -fully implemented/complied.
- ❑ As per the practice, each blast is carefully planned, checked, executed and monitored. Charge sheets and blasting data is recorded. -fully implemented/complied.
- ❑ Electric detonators are used. Covering the detonating fuse Blasting is carried out in daylight hours only. -fully implemented/complied.
- ❑ Care is taken to ensure that the effective burden is not excessive -fully implemented/complied.
- ❑ Number of blasts per delay are kept to the minimum. -fully implemented/complied.
- ❑ To adopt multi row blasting & "V" pattern of firing. -fully implemented/complied.

B] MEASURES TO IMPROVE SOCIO-ECONOMIC CONDITIONS

After Commissioning of Existing Project

- ❑ 2.5 km WBM road to connect the villages -fully implemented/complied.
- ❑ Repair of existing connecting roads in villages -fully implemented/complied.
- ❑ Repair of drainage system in Hinouti village -fully implemented/complied.
- ❑ PCL has constructed 1.6 km long & 10 m wide WBM road connecting plant to State Highway. Construction cost was Rs. 12.0 lacs and annual maintenance cost is Rs. 3.0 lacs per annum. -fully implemented/complied. The road is now fully concreted.

- ❑ PCL is contributing an amount of Rs. 13000/- per annum towards sports in the surrounding villages. -fully implemented/complied.
- ❑ Provide drinking water to villagers in any social & religious gathering, -fully implemented/complied..

Proposed Welfare Measures

In addition to welfare measures carried out, PCL shall continue the efforts to improve the socio-economic status of the local habitants, PCL shall review the various welfare schemes going on in the area from time to time and take decisions of modification/addition of welfare schemes as per the requirement of local habitants,

Medical facility

- ❑ A dispensary has been provided in the township area for the employees and same service is extended to local populations. A mobile clinic for rural medical health care has already been provided which visit the nearby villages twice every week. -fully implemented/complied.
- ❑ Medical Centre is well equipped with all types of emergency medical equipment's e.g. emergency medicines, oxygen cylinder, electrically and manually operated suction pumps, statures etc. one well equipped ambulance containing arrangements for carrying 3 patients at a time is also provided to deal with emergencies. -fully implemented/complied.
- ❑ Medical Centre is provided full time medical officer, three nursing assistants, three helpers, & other staff. Special arrangements have been made for regular visits of child specialists and gynecologist from Satna. -fully implemented/complied.
- ❑ PCL is planning to provide pathological facility for testing of blood and urine at Medical Centre in coming year. -fully implemented/complied.

Bank & Police Station

- ❑ PCL-has-provided land & building and requisite facility to -a Nationalize (Bank & Police Station at village Mankahari. -fully implemented/complied.

Employment: most of the workers belong to the local area**. In addition to this most of the local people are engaged in indirect employment like casual labour, dhaba, supply of local items, local mechanical works-** -fully implemented/complied..

Communication

- ❑ PCL has also provided land & building to telephone exchange at village Mankahari. With the establishment of Telephone Exchange, other business opportunity for local population is widened. -fully implemented and complied.

A green belt around the dust generation points and the lease area should be provided. The density of the trees should be at least 1600 sapling/ha. Mixed species of sapling should be selected for enhancing the bio diversity programme in the lease hold area as mentioned in EMP and supplementary note should be implemented phase wise as envisaged.		Extensive plantation has been taken up covering the areas on either side of the crusher ramp, haul roads, sides of reservoir, dump slopes and in non- mineralized areas etc. as well as some part along the lease boundary. Plantation is going on in the backfilled areas cumulative plantation(Nos.) till September 2021 is **108,268** covering 38.54 Ha

Plantation 253.326 Ha for the last 8 years

Sl. No.	Year	Total No. of Plants
1	2014-15	2500
2	2015-16	9000
3	2016-17	10000
4	2017-18	6000
5	2018-19	6000
6	2019-20	9073
7	2020-21	11190
8	2021-22	2800

108,268 since inception

The socio-economic / community development measures including health care need to be augmented. A detailed annual action plan / time bound scheme for the socio-economic development should be submitted to the Ministry within three months.		A note on Socio economic development action plan has already been submitted to MoEF, Delhi / Bhopal vide our letter no. MIN / 0701 / 990628 dated 03.2.2000.**–Annexure no. 09** The CSR programme is common for PCL. Expenditure made during 2021-22 (April to September) for socio – economic / community development has been given in **Annexure No. 3.**

		
Uniform distribution at School Village ,Hinauti		Renovation of Hr. Sec. School at Sijahata
		
Cataract Operation		Toilet - Swachha Bharat
		
Pickle & Papad Making Training		
Mining operations should be carried out in such a manner that inhabitants of the villages Sijhata and Hinouti should not be shifted and adequate measures for socio-economic development be carried out.		Mining operations are carried out taking utmost care as per Scheme of Mining approved by Indian Bureau of Mines. All blasting operations are carried out as per permissions by the DGMS and guidelines of CMFRI. Report attached as-**Annexure no. 8**
		The habitation of Hinauti and Sijhata villages are not affected. Adequate measures for socio-economic development are carried out as per details in sl no. 9

CSR ACTIVITIES ROADMAP FY 2020-21

S.N.	Particulars/Activity	Expense (In Lacs)	Till Date
A.	Availability of Safe Drinking Water	8.43	31.09.2021
B.	Disaster Management & Social Welfare	24.65	31.09.2021
C.	Environment, water Conservation and Promoting renewable energy	71.81	31.09.2021
D.	Health & Hygiene	21.40	31.09.2021
E.	Promoting Education	20.86	31.09.2021

F.	Promotion of Sports	16.23	31.09.2021
G.	Rural Infrastructure Development	13.65	31.09.2021
H.	Vocational Skill Development	1.29	31.09.2021
Grand Total		**178.32**	31.09.2021

Environmental Management Cell has to be established to carry out functions relating to environmental management action plans. The Head of the Cell should directly report to the Chief Executive.		Environmental Management Cell is functioning effectively, **Annexure 11**
Adequate fund provision (capital and recurring expenditure) should be provided for implementation of all safeguards including socio-economic programme as above. The funds should not be diverted for any other purpose (an amount of 1062.0 lakhs earmarked for pollution control measures and afforestation). Separate account would be kept for implementation of *EMP measures.*		Adequate fund provision has been made for implementation of socio-economic programs and environment management plan and accordingly spent. The fund for pollution control measures has not been diverted to any other purposes.

2020-21 Expenses for Environment Management (Common for the plant)	
	Year
Heads	2020-21(Rs in Lacs) (Till Sep)
Maintenance of APCEs	21.15
Env. Monitoring, STP Operation & Maintenance, Plantation Etc.	52.27
APCE Power Consumption	579.30
Total (Rs in Lacks)	**652.73**

13	*The Ministry reserves the right to stipulate any other conditions, as may be required based on feedback etc. in the interest of environmental protection*		Agreed. The Ministry may provide, as it may see fit, additional conditions for protection of environment.
14	*The project would be monitored by the regional office of this Ministry, Bhopal / the Central Pollution Control Board / the State Pollution Control Board. The project authorities should extend full cooperation to the officers of the Regional Office by furnishing the requisite data / information / monitoring report and all provide full access to the works / records etc.*		Full coordination is provided to the officers of Regional Office in furnishing the requisite data/ information/ monitoring report and all access to the works/ records etc.
15	*Environmental compliance status vis-à-vis project implementation report specifically giving the progress of the implementation of afforestation programme, social welfare activities, including health care facilities should be submitted for the scrutiny of this Ministry and Regional Office once in 6 months regularly for regular monitoring purpose.*		Six monthly compliance report is submitted to RO MoEF, Bhopal and respective authorities regularly. The details are as given below:

Year	Lease 253.326 ha.	
	Dispatch no.	**Date**
2010	MIN / 2010 – 10137	26.07.2010
	MIN / 2010 – 10246	20.12.2010
2011	MIN / 2011 – 11193B	20.07.2011
	MIN / 2011 – 11413	31.12.2011
2012	MIN / 2012 – 12186	20.07.2012
	MIN / 2013 – 13033	15.01.2013
2013	MIN / 2013 – 13260	18.07.2013
	MIN / 2014 – 14011	10.01.2014
2015	MIN / 2014 – 14202	10.07.2014
	MIN / 2015 – 15017	10.01.2015
2016	MIN / 2016 – 16226	29.09.2016
	MIN / 2017 – 17052	07.02.2017
2017	MIN / 2017 – 17192	09.08.2017
	MIN / 2018 – 18071	09.03.2018
2018	MIN / 2018 – 18209	16.08.2018
	MIN / 2018 – 19019	22.01.2019
2019	MIN / 2019 – 19125A	01.06.2019
	MIN / 2019-19277	05.12.2019
2020	MIN / 2020-20112	01.06.2020
	MIN / 2020-20241	02.12.2020
2021	MIN / 2021-210197	01.06.2021

16.	*The implementation of these conditions and safeguards will be enforced inter alia under the water (Prevention and Control of Pollution) Act, 1974 and the Environment (Protection) Act 1986 and the Public Liability Insurance Act 1991.*		All these conditions as prescribed in the water (Prevention and Control of Pollution) Act, 1974 and the Environment (Protection) Act 1986 and the Public Liability Insurance Act 1991 are complied. **Annexure 4 to 6.**

253.326

3/9/96

मध्य प्रदेश शासन
खनिज साधन विभाग
"मंत्रालय"

—

क्रमांक 3-29/95/12/ भोपाल, दिनांक

प्रति,

कलेक्टर,
जिला- सतना (म0प्र0)

विषय:- जिला सतना के ग्राम हिनौती , तिजहटा के रकबा 309.608 हेक्टर क्षेत्र पर लाईम स्टोन खनिज हेतु मेसर्स प्रिज्म सीमेंट लि.

संदर्भ:- आपका ज्ञा.क्र. 11एम/30/एमएल/94 दिनांक 9.3.95

—

मेसर्स प्रिज्म सीमेंट लि0 ने जिला सतना के ग्राम हिनौती -तिजहटा के 309.608 हेक्टर क्षेत्र पर लाईम स्टोन खनिज के लिये खनिपट्टा आवेदन पत्र प्रस्तुत किया ।

2. आवेदन पत्र का परीक्षण करने पर पाया गया कि मेसर्स प्रिज्म सीमेंट लिमि. द्वारा आवेदित 309.608 हेक्टर क्षेत्रमें 56.282 हेक्टर क्षेत्र ऐसा नया क्षेत्र है जो कि आवेदक को पूर्वेक्षण अनुज्ञप्ति में स्वीकृत नहीं था अतः खान एवं खनिज (विनियमन एवं विकास) अधिनियम 1957 की धारा 5(2) के अन्तर्गत ऐसा क्षेत्र जोपूर्वेक्षण में स्वीकृत न हो खनिपट्टे में स्वीकृत नहीं किया जा सकता अतः आवेदक को ग्राम हिनौती का 240.746 हेक्टर एवं तिजहटा का 12.580 हेक्टर कुल 253.326 हेक्टर क्षेत्र खनिपट्टे में स्वीकृत हेतु उपलब्ध पाया गया ।

3. आवेदित खनिज अनुसूची"एक" का खनिज होने से खान एवं खनिज (विनियमन एवं विकास) अधिनियम 1957 की धारा 5(1) के अनुसार स्वीकृति के पूर्व केन्द्रीय शासन से उसके पत्र क्रमांक 4/97/95/एम-4 दिनांक 8.8.95 द्वारा उनका अनुमोदन प्राप्त किया गया ।

4. अतः राज्य शासन द्वारा आवेदक को नीचे बताई शर्तों पर खनिपट्टा स्वीकृत किया जाता है :-

(1) आवेदक का नाम मेसर्स प्रिज्म सीमेंट लिमिटेड

...2...

(2) स्वीकृत क्षेत्र का विवरण - ग्राम हिनौती 240.746 हेक्टर
ग्राम सिजहटा 12.580 हेक्टर

कुल - 253.326 हेक्टर

(3) खनिज का नाम लाईम स्टोन

(4) स्वीकृति की अवधि 20वर्ष (बीस वर्ष) बिना नवकरण कण्डिका के (5)

(5) आवेदक कंपनी द्वारा स्थानीय क्षेत्रीय विकास कार्य हेतु स्वेच्छिक योगदान दिये जाने के संबंध में अपने पत्र दिनांक 22.7.96 से दी गई अंडरटेकिंग के अनुसार जिस प्रकार अन्य पट्टेधारियों से लिया जावेगा, आवेदक कंपनी को देय होगा ।

(6) रायल्टी /डेडरेंट अधिनियम अंतर्गत निर्धारित दर से ।

(7) थियोडोलाईट सर्वे आदि आवश्यक हो तो किया जावे ।

(8) चूनापत्थर (मार्बल) डोलोमाईट की स्थिति में :-
खनिज रियायत नियमावली 1960 के अन्तर्गत निर्धारित अनुबंध पत्र "के" खंड सात में शर्त क्रमांक 21 के बाद मध्यप्रदेश शासन, नैसर्गिक साधन विभाग के पृ.क्र. 8814-6384/12 दिनांक 24.11.1962 द्वारा सूचित शर्त "क्र 21 "क" जोड़ी जावे ।

(9) आवेदक खनन किये गये चूनापत्थर का उपयोग स्थापित सीमेंट संयंत्र में करेगा।

5/- यदि आवेदक को उपरोक्त शर्तें मान्य हो तो नियमानुसार जमानत राशि जमा कराकर आदेश प्राप्त होने के 6 माह के भीतर अनुबंध का निष्पादन किया जाकर अनुबंध की एक प्रति भेजी जावे ।

कृपया अनुबंध निष्पादन के पूर्व यह सुनिश्चित कर लें कि आवेदक के ऊपर किसी प्रकार का खनिज राजस्व की राशि बकाया तो नहीं है ।

मध्यप्रदेश के राज्यपाल के नाम से तथा
आदेशानुसार,

(ए.के. त्रिवेदी)
अवर सचिव
मध्यप्रदेश शासन, खनिज साधन विभाग

..3..

क्र0प्र0 3-29/95/12/1 भोपाल, दिनांक 3/9/96

प्रतिलिपि:-

(1) सचिव, भारत सरकार, खान मंत्रालय, शास्त्री भवन नई दिल्ली ।
(2) संचालक, भौमिकी तथा खनिकर्म, रायपुर ।
(3) डायरेक्टर जनरल आफ माइन्स सेफ्टी धनबाद (बिहार)
(4) कन्ट्रोलर जनरल इण्डियन ब्यूरो आफ माइन्स नागपुर ।
(5) क्षेत्रीय खान नियंत्रक भारतीय खान ब्यूरो जबलपुर ।
(6) मेसर्स प्रिज्म सीमेंट लि. राजेन्द्र नगर सतना

की ओर सूचनार्थ एवं आवश्यककार्यवाही हेतु अग्रेषित ।

(ए. के. त्रिवेदी)
अवर सचिव

मध्यप्रदेश शासन, खनिज साधन विभाग

श्रीवास्तव

कार्यालय कलेक्टर (खनिज–शाखा) जिला, सतना (म.प्र.)

E-mail modgmsat@mp.gov.in

पत्र क्रमांक 233/खनिज/2016 सतना दिनांक 23/1/2016

प्रति,

मेसर्स प्रिज्म सीमेंट लिमि0,
तहसील रामपुर बघेलान
जिला–सतना (म0प्र0)

विषय :– खनिपट्टा ग्राम हिनौती, सिजहटा तहसील रामपुर बघेलान, जिला सतना के रकबा 253.326 हेक्टेयर क्षेत्र पर खनिज चूनापत्थर खनिपट्टा में समय वृद्धि।

संदर्भ :– आपका आवेदन पत्र दिनांक 22.01.2016 कार्यालयीन पत्र पृ0 पत्र क्रमांक 1750/खनिज/2015 दिनांक 26.10.2015।

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विषयांतर्गत आपके पक्ष में जिला सतना अंतर्गत तहसील रामपुर बघेलान के ग्राम हिनौती, सिजहटा में रकबा 253.326 हे0 पर चूनापत्थर खनिपट्टा अवधि 28.09.1996 से 27.09.2016 तक स्वीकृत है। खान एवं खनिज (विकास तथा विनियमन) अधिनियम 1957 में हुए संशोधन 2015 व राज्य शासन के पत्र दिनांक 12.03.2015 के पालन में मूल स्वीकृति दिनांक से 50 वर्ष अथवा कैप्टिव माइंस हेतु 31.03.2030 समय वृद्धि का प्रावधान किया गया है। उक्त खनिपट्टे का अनुबंध निष्पादन 28.09.1996 को किया गया था जिसका एम.एम.डी.आर. 2015 के अंतर्गत अवधि 27.09.2046 तक प्रस्तावित है एवं अनुबंध निष्पादन की कार्यवाही प्रचलन में है।

उपरोक्त बावत् आपको सूचित किया जाता है कि संशोधित खनिज नियम 2015 व म0प्र0 शासन खनिज साधन विभाग भोपाल के पत्र दिनांक 12.03.2015 व चेकलिस्ट अनुसार माईनिंग प्लान/माईनिंग स्कीम व अन्य समस्त आवश्यक औपचारिकताऐ पूर्ति करावे, जिससे शासन आदेशानुसार आवश्यक कार्यवाही की जा सके।

सहायक खनि अधिकारी 23/01/16
कृते कलेक्टर जिला–सतना (म0प्र0)

रजिस्टर्ड पार्सल द्वारा

भारत सरकार
खान मंत्रालय
भारतीय खान ब्यूरो
क्षेत्रीय खान नियंत्रक का कार्यालय

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
O/O THE REGIONAL CONTROLLER OF MINES

फा0 सं0 - **MP/Satna/Limestone/RMP-10/2021-22** 5578

जबलपुर, दिनांक : 28 / 07 / 2021

प्रति,

M/s Prism Johnson Ltd.,
Rajdeep, Rewa Road,
District – Satna (M.P.) – 485 001
E-mail – regdofficeprismcement@gmail.com

विषयः– म0प्र0 राज्य के **सतना** जिले में स्थित आपकी **प्रिज्म सीमेंट लाइमस्टोन खान (क्षेत्र 253.326 हे0)** के एमसीआर–2016 के नियम 17 (1) के अंतर्गत जमा किए गए खनन् योजना के पुनर्विलोकन का अनुमोदन।

संदर्भ :–1) आपका पत्र क्रमांक – PJL/MIN/2021/210183, दि0 **28 / 04 / 2021,** कार्यालय में प्राप्ति दि0– **29 / 04 / 2021,** भारतकोष द्वारा जमा प्रक्रिया शुल्क की रसीद संख्या 2704210002919, दि0 **27 / 04 / 2021**
2) इस कार्यालय का समसंख्यक संवीक्षा–पत्र दि0– **09 / 07 / 2021**
3) आपका / क्यू पी0 का पत्र क्रमांक – PJL/MIN/2021/210225, दि0 **16 / 07 / 2021 (प्राप्ति दि 19 / 07 / 2021)**

महोदय,

In exercise of the powers conferred under Clause (b) of Sub-section (2) of Section 5 of Mines and Minerals (Development and Regulation) Amendment Act, 2015 read with Government of India Order no. S.O.1857(E),dated 18/05/2016, I hereby **Approve** the above said Review of Mining Plan submitted under Rule 17(1) of Minerals (Other than Atomic and Hydrocarbons Energy Minerals) Concession Rules, 2016. This approval is subject to the following conditions:

1 The Review of Mining Plan is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.

2 The proposals shown on the plates and /or given in the document is based on the lease map /sketch submitted by the lessee and is applicable from the date of approval.

3 It is clarified that the approval of aforesaid Review of Mining Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Amendment Act, 2015, or the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under, Mines Act, 1952 and Rule & Regulations made there under.

4 Indian Bureau of mines has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the boundaries of the leasehold shown on the ground with reference to lease map & other plans furnished by the lessee.

5 At any stage, if it is observed that the information furnished, data incorporated in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

6 The Financial Assurance furnished by you for **Rs. 6,83,84,100/- (Rs. Six Crore Eighty Three Lakh Eighty Four Thousand One Hundred only)** is valid up to **31/03/2026** and next Financial Assurance shall be submitted on or before **31/03/2026.**

7 This approval is restricted in respect of proposals given in the document for the period **2021-22 to 2025-26** with validity up to **31/03/2026 from the date of approval**, subject to all other statutory clearances.

P.T.O.

8 If the approval conflicts with any other law or court order/direction under any statute, it shall be revoked immediately.

9 The next Review of Mining Plan will be due for submission on **01/10/2025.**

10 As per Madhya Pradesh State Government's order dated 10/08/2011 if there is enhancement of production proposed from that in the approved review of mining plan under such circumstances additional stamp duty has to be paid by the lessee for the enhances quantum of production and also a supplementary agreement has to be made by the lessee.

संलग्नः–अनुमोदित पुनर्विलोकन खनन् योजना की एक प्रति के साथ।

भवदीय,

(पुखराज नेणिवाल)
क्षेत्रीय खान नियंत्रक
भारतीय खान ब्यूरो, जबलपुर

पता : योजनाकमांक 11, कमलानेहरू नगर, जबलपुर 482002 (म0प्र0)/फोन2416780 / 2416589 / 2416231 फैक्स0761- 2416780
Address : Scheme No 11, Kamla Nehru Nagar, Jabalpur 482002 (M.P) Phone 2416780 / 2416589 241631 Fax : (0761) 2416780
E Mail : ro.jabalpur@ibm.gov.in

PRISM JOHNSON LIMITED CEMENT & TILES DIVISION

CSR ACTIVITIES ACTION PLAN AND EXPENSE SUMMARY FY 2021-22

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
Availability of Safe Drinking Water						
1	Providing water Tankers for drinking purpose as required by villagers	Availability of Safe Drinking Water Schedule VII (i)	Demand & Supply in summer and other season	6.15	**Work in progress** 08 water tanker provided. Aper from this also used for irrigation of plants in nearby villages	2.37
2	Installation of new Hand pump with bore well at Chormari (02 Nos)	Availability of Safe Drinking Water Schedule VII (i)	Selection of area in association with panchayats	1.34	**Completed.** 02 handpump installed in June 21	1.32
3	Installation of new Hand pump with bore well at Bairiha (02 Nos)	Availability of Safe Drinking Water Schedule VII (i)	Selection of area in association with panchayats	1.34	**Completed.** 02 handpump installed in June 21	1.28
4	Installation of new Hand pump with bore well at Bathiya village (01 Nos)	Availability of Safe Drinking Water Schedule VII (i)	Selection of area in association with panchayats	1.34	**Completed.** 02 handpump installed in June 21	0.94
5	Installation of new Hand pump with bore well Mahurachh (02 Nos)	Availability of Safe Drinking Water Schedule VII (i)	Selection of area in association with panchayats	1.34	**Completed.** 02 handpump installed in June 21	1.31
6	Installation of new Hand pump with bore well Pithaipur Hinauti (01)	Availability of Safe Drinking Water Schedule VII (i)	Selection of area in association with panchayats	0.67	**Completed.** 01 handpump installed in June 21	0.60
7	Installation of new Hand pump with bore well Sijahata (01 Nos)	Availability of Safe Drinking Water Schedule VII (i)	Selection of area in association with panchayats	0.67	**Completed.** 01 handpump installed in June 21	0.62
8	Synthetic Water storage Tank - Govt H.S. School Bawadia - Dewas	Availability of Safe Drinking Water Schedule VII (i)		0.10		
9	Water Cooler nearby village Bilawali - Dewas	Availability of Safe Drinking Water Schedule VII (i)		0.75		
10	2 Ro water Plant for Government schools-(chebrolu high school & Nachugunta High school) -Silica	Availability of Safe Drinking Water Schedule VII (i)		3.00		
			Sub Total	**16.70**		**8.43**
Disaster Management & Social Welfare						
11	Disaster Management - Covid Care	Disaster Management Schedule VII (xii)	14 oxygen concentrator: Community health center Rampur Baghelan , Satna and Bhopal	34.00	**14 nos received.** 04 nos. provided at Government Community Health Center Rampur Baghelan on 25.06.2021 05. nos at Sardar Vallabhbhai Patel District Hospital Satna 05 At Bhopal	14.53
			Medicine Kit to Public Administration Rampur Baghelan Block (1000 kit)		1000 kits provided on 22.05.2021 at Government Community Health Center Rampur Baghelan	1.55
			Jumbo Cylinder to Public administration		06 Jumbo cylinders provided (05 at CHC Rampur Baghelan and 01 at MPPCB Office Satna)	0.00
			Financial assistance to SP office Kurnool AP		**Completed** Provided through Cheque	2.50
			Oxygen Concentrator to GM DIC, Kurnool District Andra Pradesh		**Completed** 04 nos provided	2.35
12	Support to Dr. Lalta Prasad Khare Charitable Trust for operating social welfare and Old Age Home	Social Welfare Schedule VII (iii)	Support by providing financial assistance	7.00	**Continous activity**	3.50

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
13	Measures for development of societies, war widows, social weaker section of society, promoting art and culture etc.	Social Welfare Schedule VII (iii)	Support by providing financial assistance	2.00	Will be provided as and when needed	0.00
			Financial assistance to Amalgamated fund through District Industry Center Satna		Provided on 12.07.2021	0.21
14	Supporting measures for animal Welfare - Fodder for Gaushala	Animal Welfare Schedule VII (iV)	Support by providing financial assistance	2.00	Will be provided as and when needed	0.00
15	Measures for development of societies, war widows, social weaker section of society, Freedom fighters and their family on the occasion of Republic Day & Independence Day - Karaikal	Social Welfare Schedule VII (Vi)		0.40		
16	Distribution of Blankets to orphans Dewas.	Measures for socially & Economically backward group Schedule VII (iii)		1.00		
17	Donation to Orphanage home nearby village - Karaikal	Measures for socially & Economically backward group Schedule VII (iii)		0.15		
			Sub Total	**46.55**		**24.65**
Environment, water Conservation and Promoting renewable energy						
18	Road side plantation with honey comb structure (100 Nos)	Plantation for Environment Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	3.60	**Completed** Honeybee structures completed. Saplings planted - Aug 21	3.31
19	Construction of gate (53000 plants) at forest land 03 Nos	Plantation for Environment Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	14.30	**Completed.** 03 gate constructed July-21	1.77
	Survival & Maintenance of plantation at Forest Land Khamhariya (53000 plants)				Continous activity	5.38
20	Development of social forestry by Distribution/plantation of hybrid fruits/plants saplings to villagers and gram panchayats (83000) and irrigation of plants	Plantation for Environment Conservation Schedule VII (iv)	Nos. of beneficiaries	15.80	**Completed** 82200 saplings distributed in Aug-21	10.52
21	Development and plantation at Satari village	Plantation for Environment Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	0.71	**Completed** in Apr-21	0.71
22	Plantation of saplings in forest land at Khamhariya	Plantation for Environment Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	2.04	**Completed** in Apr-21	2.04
23	Pond deepening at Chormari (6000 M3)	Conservation of Natural Resources Schedule VII (iv)	Close monitoring of project cost, time limit, MIS, surface area de-silted	8.25	**Completed** in June-21	8.26
24	Pond deepening at Badhaura (4850 M3)	Conservation of Natural Resources Schedule VII (iv)	Close monitoring of project cost, time limit, MIS, surface area de-silted	7.30	**Completed** in June-21	7.29
25	Pond deepening at Ghunghunchihai (2500 M3) with Hume pipe at Malgaon pond	Conservation of Natural Resources Schedule VII (iv)	Close monitoring of project cost, time limit, MIS, surface area de-silted	3.90	**Completed** in June-21	3.81
26	Pond deepening at Baghai (2500 M3)	Conservation of Natural Resources Schedule VII (iv)	Close monitoring of project cost, time limit, MIS, surface area de-silted	3.80	**Completed** in June-21	3.28
27	De-silting of pond at Malgaon and construction of single bore shaft at Malgaon	Conservation of Natural Resources Schedule VII (iv)		1.12	**Completed** in Apr-21	1.12
28	Construction of single bore recharge system in ponds at Chormari-1, Ghunchihai-1, Badhuara-1	Water Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	4.00	**Completed** 1. Chormari - Completed in June 2. Badhaura - Completed in Jun 3. Ghunghunchihari - Completed in July	3.68

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
29	Construction of double bore recharge system in ponds Chormari-1, Ghunchihai-1, Badhaura-1	Water Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	6.00	**Completed** 1. Chormari - Completed in June 2. Badhaura - Completed in Jun 3. Ghunghunchihari - Completed in July	5.65
30	Construction of Single Bore shaft structures at Sharman Dongari Jamuniya			1.58	**Completed** in Apr-21	1.58
31	Construction of drum based Water Harvesting Structure200 no's at Bathiya and Bamhauri	Water Conservation Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	9.60	**Completed** 1. Bathiya - 100 Nos. in Jun 2. Bamhauri - 100 Nos. in Jun	9.47
32	Installation of solar street lights in villages Narsinghpur - 10 Nos	Promoting renewable energy for environment Sustainability Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	1.65	**Installaed** in July 21	1.49
33	Installation of solar street lights in villages Bairiha - 10 Nos.	Promoting renewable energy for environment Sustainability Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	1.65	**Installaed** in July 21	1.49
34	Installation of solar street lights Mahurachh Mod - 06 Nos.	Promoting renewable energy for environment Sustainability Schedule VII (iv)	Close monitoring of project cost, time limit, MIS	0.95	**Installed** on April 21	0.98
35	To develop green park in Industrial area no. II - Dewas	Environment Conservation Schedule VII (iv)		10.00		0.00
36	Grow trees in Himachal Prad - annexure Village panchayat proposed project (due to lock down unaccessible) School water filters and bilding exam hall (unaccessible due to Covid) - BADDI/ SAMBA	Environment Conservation Schedule VII (iv)		10.00		0.00
37	Desilting project at KKL - Karaikal	Conservation of Natural Resources Schedule VII (iv)		1.25		0.00
			Sub Total	**107.50**		**71.81**
Health & Hygiene						
38	Providing free medical services to OPD patients from nearby villages (Approx. 20000 patients)	Health & Hygiene Schedule VII (i)	Nos. patients attended, registered	4.00	Attended 1024 patients in Jul-21. Cumulative for FY 2021-22 = 3362	2.93
39	Providing free ambulance services to villagers on 24X7 basis (Approx. 2000 patients)	Health & Hygiene Schedule VII (i)	Nos. patients attended, registered	6.70	Attended 88 patients in Jul-21 Cumulative for FY 2021-22 = 370	2.42
40	Construction of ODF Toilets at Village Malgaon Chulhi (10 no's)	Health & Hygiene Schedule VII (i)	Nos. patients attended, registered	2.80	Brick work in 06 toilets in progress	0.00
41	Construction of ODF Toilets at Village Bairiha (10 no's)	Hygiene & Sanitation Schedule VII (i)	Selection of beneficiaries, project cost, time limit,	2.80	Brick work in 08 toilets completed. Plaster in progress	2.21
42	Construction of ODF Toilets at Village Bamhauri (20 no's)	Hygiene & Sanitation Schedule VII (i)	Selection of beneficiaries, project cost, time limit,	5.60	Civil work of 9 toilets completed. Brickwork and plaster for rest in progress	0.00
43	Construction of ODF Toilets at Village Dafai Basti Hinauta (15 no's)	Hygiene & Sanitation Schedule VII (i)	Selection of beneficiaries, project cost, time limit,	4.20	12 pit excavated. Plinth brick completed in 04 toilets. Brick work is in progress	0.00
44	Maintenance of Sulabh Complex at Mahurachh Turning (12 months)	Hygiene & Sanitation Schedule VII (i)	Selection of beneficiaries, project cost, time limit,	0.41	Continuous activity	0.19
45	Providing of nutritional food to malnutrition children in Rampur Baghelan Block (113 Children)	Hygiene & Sanitation Schedule VII (i)	Project cost, time line, nos of beneficiaries	1.30	06 months material provided to WCD, Rampur Baghelan on 05.08.2021	1.39
46	Renovation of Community Health Center at Rampur Baghelan	Health & Hygiene Schedule VII (i)	Close monitoring of project cost, time limit, MIS	25.00	Excavation, plinth, column and brickwork up to door level completed. Casting of door level beam is in progress	0.00

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
47	Organisation eye Camp for cataract patients from nearby villages (20 Nos.)	Health & Hygiene Schedule VII (i)	Close monitoring of project cost, time limit, MIS	1.76	**Completed** in Apr-21	1.76

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
48	Accessibility Equipment's for Physically Challenged People in Gadab Village - Pen	Health & Hygiene Schedule VII (i)		2.00		
49	Constructing Toilets for Girls and Boys students at GKBMS Govt. Schools, Kunigal established in 1930 - Kunigal	Hygiene & Sanitation Schedule VII (i)		8.00		
50	Donating free food to Primary Health Centre, nearby village in view of Pulse Polio camp - Karaikal	Eradicating Hunger & Malnutrition Schedule VII (I)		0.15		
51	Financial Assistance to Government Sponsored ADIP Scheme for providing 25 motorised tricycle to Handicapped in Madhya Pradesh in association with Artificial Limbs Manufacturing Corporation of India (A Govt. Of India Undertaking)	Health & Hygiene Schedule VII (i)			Provided in Sep-21	10.50
			Sub Total	**64.72**		**21.40**
Promoting Education						
51	Renovation of Government Girls Middle School Sijahata	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	6.00	PO released work in progress	0.00
52	Repairing/extension of Government Higher Secondary School, Sijahata	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	11.30	**Completed** in Sep-21	7.09
53	Renovation of Government Middle School Malgaon	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	4.00	PO released work in progress	0.00
54	Renovation of Government Primary School Chormari	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	7.00	Will be completed by Dec-21	0.00
55	Renovation of Government Primary School Adiwasi basti Chulhi	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	0.20	**Completed** in Apr-21	0.20
56	Renovation of Govt Higher Sec School Bamhauri	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	6.78	**Completed** in Apr-21	6.78
57	Construction of boundary wall at Government Primary Vaikalpik Shala Sijahata	Health & Hygiene Schedule VII (i)	Close monitoring of project cost, time limit, MIS	6.43	**Completed in Apr-21** 132 meter boundary wall constructed	6.08
58	wall painting for promoting education by wayd of Slogan writing to create awareness and motivation amongst the local villagers (200 nos.)	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	0.72	**Completed** in June-21	0.72
59	Installation of smart class at Government Higher Secondary School Sijahata	Promoting Education Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	5.00	PO released work in progress	0.00
60	Books distribution to deaf and dump children, Government School - Dewas	Promoting Education Schedule VII (ii)		0.20		0.00
			Sub Total	**47.63**		**20.86**
Promotion of Sports						
61	Playground pavilion at Mankahari	Promotion of Sports Schedule VII (vii)	Close monitoring of project cost, time limit, MIS	15.40	**Completed** 18.6 m stairs completed in Aug-21	0.77
62	Playground mini gallery development at Mankahari	Promotion of Sports Schedule VII (vii)	Close monitoring of project cost, time limit, MIS		Plater work is in progress	2.26
63	Construction of main gate at playground Mankahari		Close monitoring of project cost, time limit, MIS	4.22	**Completed** in Apr-21	4.22
64	Construction of covered Pavilion at playground Mankahari		Close monitoring of project cost, time limit, MIS	8.98	**Completed** in Apr-21	8.98
			Sub Total	**28.60**		**16.23**
Rural Infrastructure Development						
65	Construction of 2.5 kilometre WBM road at Tapa	Rural Infrastructure Development Schedule VII (X)	Close monitoring of project cost, time limit, MIS	8.25	**Completed** in July - 21	9.56

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
66	Construction of bus shelter at Sajjanpur Ramvan	Rural Infrastructure Development Schedule VII (X)	Close monitoring of project cost, time limit, MIS	2.50	Excavation and plinth beam completed. Brick work is in progress	0.00

Sl. No.	CSR Project Name	Category under Schedule VII	Monitoring & Reporting Mechanism	Project Outlay (in Lakh)	Current Status	Expense Till 30.09.2021
67	Construction of bus shelter at Baghai	Rural Infrastructure Development Schedule VII (X)	Close monitoring of project cost, time limit, MIS	2.50	Layout work done. Excavation and plinth is in progress	0.00
68	Renovation of cremation sheds at and Hinauti, Bamhauri, Bathiya & Tapa	Rural Infrastructure Development Schedule VII (X)	Close monitoring of project cost, time limit, MIS	3.70	Will be completed by Dec-21	0.00
	Renovation of existing infrastructure - Cleaning and Maintenance of Solar lights at Baghai	Rural Infrastructure Development Schedule VII (X)	Close monitoring of project cost, time limit, MIS		**Completed** in Sep-21	1.02
69	Construction of 125 meter drainage Bamhauri	Rural Infrastructure Development Schedule VII (X)	Close monitoring of project cost, time limit, MIS	3.10	**Completed** 125 drain constructed in Aug-21	3.08
70	High Mast Lamps in Gadab & Karavi Village - Pen	Rural Infrastructure Development Schedule VII (X)		5.00		0.00
71	Civil work- flooring (30 thousand SFT)(for various colleges, in Narayanapuram & Chebrolu panchayat area) - Silica	Rural Infrastructure Development Schedule VII (X)		3.00		0.00
72	Community Health Centre Shade for Karavi Village - Pen	Rural Infrastructure Development Schedule VII (X)		4.00		0.00
			Sub Total	***32.05***		***13.65***
Vocational Skill Development						
73	Driving training with license making to villagers/youth (150 persons)	Vocational Skill Development Schedule VII (ii)	Close monitoring of project cost, time limit, MIS	3.45	Training started from 13.07.2021	0.00
74	Training program for driver with license making for trainees		Close monitoring of project cost, time limit, MIS	1.30	SPR raised. Purchase department working for engagement of vendor	1.29
75	Bag making training to women / villagers (25 Persons)	Vocational Skill Development Schedule VII (ii)	Selection of beneficiaries, Attendance, time limit, MIS	5.00	SPR raised. Purchase department working for engagement of vendor	0.00
76	Stitching and embroidery training to women / villagers (50 Persons)	Vocational Skill Development Schedule VII (ii)	Selection of beneficiaries, Attendance, time limit, MIS	4.25	SPR raised. Purchase department working for engagement of vendor	0.00
77	Cotton wick making training to villagers (25 Persons)	Vocational Skill Development Schedule VII (ii)	Selection of beneficiaries, Attendance, time limit, MIS	1.25	SPR raised. Purchase department working for engagement of vendor	0.00
78	Sewing Machine Distribution Gadab Village - Pen	livelihood enhancement projects Schedule VII (ii)		1.00		
			Sub Total	**16.25**		**1.29**
	Grand Total			**360.00**		**178.32**

exploration activities have been completed for the second band due to which the reserves have increased to 48.719 million tones. As on 31.03.21.

Annual requirement of Limestone is about 9.0 million tonnes. It is proposed to mine about 2.175 million tonnes of Limestone every year from this ML area. Remaining quantity will be met from other leases of the Company. Based on the proposed production capacity, the life of the mine is about 22 years.

Conceptual Exploration:

The first phase of exploration was carried out by Prism Cement took up prospecting operations through G E M division of ACC in the year 1993 - 94. The total nos of 59 boreholes completed in 985.5 m drilled of the exploration for established of first band of Limestone in the mining lease area. The second phase and third phase of exploration was carried out by Prism Johnson limited who drilled 71 boreholes 3813 meters in grid interval (200X200) meters and a second band of limestone was fully established and no conceptual exploration to be proposed in the mining lease area.

Table No. 2.14

As on Date			During Proposal Period			During Conceptual Period		
Type	Quantum No. / Size	Area Covered (Ha.)	Type	Quantum No. / Size	Area Covered (Ha.)	Type	Quantum No. / Size	Area Covered (Ha.)
Pits	--	--	Pits	-	-	Pits	-	-
Trench	--	--	Trench	-	-	Trench	-	-
BH	130 Nos 4798.5 m	253.236 (200X200)	Core BH	19 No 1200m	25.7 (200X200)	Core BH	3 No 180m	12 (200X200)
Other	--	--	--	--	--	--	-	-

All exploration activity completed as per MEMC rules 2015 in the previous plan period there is no proposal to extended activities into the proposal & conceptual period and boreholes are completed. They are shown in the Surface Geological Plan. The exploratory boreholes are drilled to a depth for the continuation of the mineral according to the rules.

Surface Geological Plan and Sections have been given in the Plate No. - IV and Plate No. - V respectively showing the locations of the boreholes drilled and ultimate pit limit.

Conceptual development:

Following Pits will be available at the end of Conceptual Period:

Table No. 2.15

S. No.	Pit Name/ No.	Broken Area (Ha)	Pit Bottom Area (Ha)	Surface Rl. (Range)	Pit Bottom Rl. (Lowest)	Maximum No. of Benches on any side of Pit			Overall Slope
						Type	Bench No.	Avg. Height	
1	Pit-1	138.66	130.42	288-295	249	Soil	1	2	45°
						Limestone	2	6	
						Waste Rock	3	8	
						Limestone	2	6	
Total		138.66	130.42						

Ore to be generated during conceptual period = **31,403,337 Tonnes**
Waste Rock to be generated during conceptual period = **32,718,618 (Cum)**
OBS to be generated during conceptual period = **813,000 M3 (Cum)**
Top soil to be generated during conceptual period = **94,923 M3 (Cum)**

Plan period 2026-2031:

The opening balance reserve for this period (2026-2031) is proposed to be at 32.71 million tons after generating 10.875 million tons for the plan period of 2021 to 26. The ore proposed to be exploited in the period 2026-31 is 10.875 Million tons. The working is proposed to be between pit located between N -285 to -1644 and E 488 to 1264, occupying an area of 48.25 ha. The working will be limited to two benches in first band of Limestone and two benches in Second band of Limestone.

Table No. – 2.16.1

S. No.	Pit Name / No.	Broken Area (Ha)	Pit Bottom Area (Ha)	Surface RL (Range)	Pit Bottom RL (Lowest)	Maximum No. of Benches on any side of Pit			Overall Slope
						Type	Bench No.	Avg. Height	
1	PCL Mine 253.326 Hect.	43.75	43.0	290-287	248	Soil	01	4-6	45º
						Limestone	02	06	
						Waste Rock	03	6-8	
						Limestone	02	06	

Ore to be generated during conceptual period = **10,467,779 Tones**

OB to be generated during conceptual period = **11008847 M³ (Cum)**

Plan period 2031-2036 of plan period:

The opening balance reserve for this period (2031-2036) is proposed to be at 21.835 million tons after generating 10.875 million tons for the plan period of 2026 to 2031. The ore proposed to be exploited in the period 2031-36 is 10.875 Million tons. The working is proposed to be between pit located between N 238 to -1390 and E 1264 to E1912, occupying an area of 52.32 ha. The working will be limited to two benches in first band of Limestone and two benches in Second band of Limestone.

Table No. – 2.16.1

S. No.	Pit Name / No.	Broken Area (Ha)	Pit Bottom Area (Ha)	Surface RL (Range)	Pit Bottom RL (Lowest)	Maximum No. of Benches on any side of Pit			Overall Slope
						Type	Bench No.	Avg. Height	
1	PCL Mine 253.326 Hect.	52.32	41.85	290-287	248	Soil	01	4-6	45°
						Limestone	02	06	
						Waste Rock	03	6-8	
						Limestone	02	06	

Ore to be generated during conceptual period = **10,467,779 Tones**

OB to be generated during conceptual period = **11008847 M³ (Cum)**

Plan period 2036 to 2041 of plan period:

The opening balance reserve for this period (2036-2041) is proposed to be at 10.96 million tons after generating 10.875 million tons for the plan period of 2031 to 2036. The ore proposed to be exploited in the period 2036-41 is 10.875 Million tons. The working is proposed to be between pit located between N -570 to N-1966 and E1261 to E2992, occupying an area of 51.75 ha. The working will be limited to two benches in first band of Limestone and two benches in Second band of Limestone.

Table No. – 2.16.1

S. No.	Pit Name / No.	Broken Area (Ha)	Pit Bottom Area (Ha)	Surface RL (Range)	Pit Bottom RL (Lowest)	Maximum No. of Benches on any side of Pit			Overall Slope
						Type	Bench No.	Avg. Height	
1	PCL Mine 253.326 Hect.	51.75	41.40	290-287	248	Soil	01	4-6	45°
						Limestone	02	06	
						Waste Rock	03	6-8	
						Limestone	02	06	

Ore to be generated during conceptual period = **10,467,779 Tones**

OB to be generated during conceptual period = **11008847 M³ (Cum)**

Conceptual OB Dump Management:

The inter burden of shally limestone ranges from 16 to 26 mts thin soil cover of 1 to 6 mts covers the area left out of current mining activities. It is proposed to utilize the Waste rock in backfilling the mined out area. Plantation will be carried out over it after spreading 0.5 mtr. thick soil cover. No external dumping will be done during rest of life of the mine. Entire quantity of soil and waste rock to be generated will be utilized in backfilling purpose in mined out area.

(A) Present Position

a) Following Soil dumps will be available at at present.

TABLE NO. 2.16

Dump No.	Type Active/ Inactive	Quantity (M³)	Quantity (Tonnes)	Base Area (M²)	Base Area (Ha.)	Avg. Height (M)	Area stabilized	Location
S1	Inactive	97281	155649	29366	2.93	3	Terracing & Gentle slope	1241E to 1528E and -86N to -351N
S2	Inactive	144105	230568	13410	1.4	13	Temporary in pit Soil Storage	1315E to 1447E & -271N to -411N
Total		241386	386217	41776	4.17			

b) **Following Waste dumps are available in the area at present:**

Dump No.	Type Active/ Inactive	Quantity (M^3)	Quantity (Tonnes)	Base Area (M^2)	Base Area (Ha.)	Avg. Height (M)	Area stabilized	Location
D1	Active	4091680	10229201	97800	9.78	25	Temporary in pit Dumping	621E to 850E and -1205N to -1517N
Total		**4091680**	**10229201**	**97800**	**9.78**	**25**		

(B) Proposal Period Position

a) **Following Soil dumps will be available at the end of Proposal Period:**

Table No. 2.17

Dump No.	Type Active/ Inactive	Quantity (M^3)	Quantity (Tonnes)	Base Area (M^2)	Base Area (Ha.)	Avg. Height (M)	Area stabilized	Location
S1	Inactive	28331	45329	28366	2.83	1	Terracing & Gentle slope	1241E to 1528E and -86N to -351N
S2	Inactive	144105	230568	13410	1.34	13	Temporary in pit Soil Storage	1315E to 1447E & -271N to -411N
Total		**1,72,436**	**275897**	**41776**	**4.17**			

b) **Following Waste dumps will be available at the end of Proposal Period:**

No any waste dumps are available at the end of proposal period. Waste dump will be used for backfilling.

(C) Conceptual Period Position

a) **Following dumps will be available at the end of Conceptual Period:**

No dumps (soil & Waste Rock) will be available at the conceptual period. Entire soil and waste rock will be used for backfilling.

4.5 Conceptual Reclamation & Rehabilitation:

The mining lease is about 230Ha. Area will be disturbed by overall mining activity out of which 114.46 Ha mined out area will be reclaimed and rehabilitated by way of backfilling and plantation at the end of life of the mines and rest of the area i.e. 115.54 Ha. will be developed as water reservoir for recharging the water table of the area.

Table No. 2.19

Status	Mined Out Area (Ha)	Reclamation by Backfilling (Ha)	Rehabilitation (Ha)			Rehabilitation of Dump by Comp. & Afforestation	Protective measures for dumdum (GD/RW/ST)
			By Plantation on Backfilled area	By Water Reservoir	Total		
At Present*	9.72	4.315	0	0	0	--	--
At the end of Scheme Period	50.11	27.058	13.79	0	13.99	--	--
At the end of Conceptual Period	230.0	114.46	114.46	115.54	230	--	--

* Exploration in the lease for the second band of limestone is completed. In the present case, we are working in the second band of limestone so that the backfilling operation and mined out are temporary due to the exploitation of the second band of limestone.

The ultimate area (size) of the pit will be around 230 Ha. Whereas, ultimate depth of the pit will be about 60 m and ultimate pit slope will be 45°. The main minable block of the lease is block 1 covering 242.720 Ha area. The conceptual pit position will cover 230 ha of this pit and the LxWxD of this pit at the conceptual stage will be 2400x1300x60 M

Pit position as on date, proposed pit position at the end of scheme period and ultimate pit size at the end of life of the mine will be as shown in Conceptual Plan in Plate No. – XIII and in section along with proposed Conceptual Plan is given in Plate No. – XIV.

B. UNDERGROUND MINING:

NOT APPLICABLE

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FORMAT NO. ECO/QS/FORMAT/12

TEST REPORT NO: ECO LAB/AAQ1/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT AIR*

Name of the Company	:	M/s Prism Johnson Ltd.
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Sampling Method	:	IS: 5182
Date of Monitoring	:	18.08.2021
Date of Testing	:	19.08.2021 to 24.08.2021
Environmental Condition	:	Temp (^{0}C) 32, Humidity (%) 64, Weather Condition – Partially Cloudy
Instrument Name & Lab ID	:	ECO/HO/FDS/02 &ECO/HO/RDS/02

Sl. No.	*Tests Conducted*	Method	Result				*Limit as per National Ambient Air Quality Standards*
			L1	L2	L3	L4	
			18.08.2021	18.08.2021	18.08.2021	18.08.2021	
1	Particulate Matter ($PM_{2.5}$) ($\mu g/m^3$)	IS 5182 : Part 24 : 2019	28.40	31.50	38.97	34.18	60
2	Particulate Matter (PM_{10}) ($\mu g/m^3$)	IS 5182 : Part 23 : 2006(Reaffirmed Year : 2017)	58.94	62.38	71.05	66.40	100
3	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	IS 5182:Part 2:2001(Reaffirmed Year:2017)	11.45	10.24	11.15	10.86	80
4	Oxides of Nitrogen (NOx) ($\mu g/m^3$)	IS 5182:Part 6:2006(Reaffirmed Year:2017)	12.65	14.10	16.90	14.20	80
5	CO (mg/m3)	IS:5182 (Part-10)	0.46	0.51	0.48	0.52	02

Note-*The results are related only to item tested.

Note:

L1= Near PCL Colony L2=Near Guest House.
L3= Near Crusher Unit-II L4= Near Admin. Building

Standards:

Ambient Air Quality Standard for Residual, Industrial, Rural & Other Area based on 24 hours sampling except Ozone.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/10 TEST REPORT NO: ECO LAB/AAQ2/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT AIR

Name of the Company	:	M/s Prism Johnson Ltd.
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Sampling Method	:	IS: 5182
Date of Monitoring	:	18.08.2021
Date of Testing	:	19.08.2021 to 24.08.2021
Environmental Condition	:	Temp (^{0}C) 31, Humidity (%) 65, Weather Condition – Partially Cloudy
Instrument Name & Lab ID	:	ECO/HO/FDS/03 &ECO/HO/RDS/03

Sl. No.	*Tests Conducted*	Method	Result				*Limit as per National Ambient Air Quality Standards*
			L1	L2	L3	L4	
			18.08.2021	18.08.2021	18.08.2021	18.08.2021	
1	Particulate Matter ($PM_{2.5}$) ($\mu g/m^3$)	IS 5182 : Part 24 : 2019	42.18	36.05	28.60	27.15	60
2	Particulate Matter (PM_{10}) ($\mu g/m^3$)	IS 5182 : Part 23 : 2006(Reaffirmed Year : 2017)	67.60	58.72	48.32	49.68	100
3	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	IS 5182:Part 2:2001(Reaffirmed Year:2017)	9.85	10.47	11.15	12.16	80
4	Oxides of Nitrogen (NOx) ($\mu g/m^3$)	IS 5182:Part 6:2006(Reaffirmed Year:2017)	12.68	11.20	12.76	14.80	80
5	CO (mg/m3)	IS:5182 (Part-10)	0.51	0.42	0.34	0.30	02

Note-*The results are related only to item tested.

Note:

L1= Nr Mines Site Office
L2= Near Western Block Garden,
L3= Hinauti Village
L4= Sijahata Village

Standards:

Ambient Air Quality Standard for Residual, Industrial, Rural & Other Area based on 24 hours sampling except Ozone.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/10 TEST REPORT NO: ECO LAB/AAQ3/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT AIR

Name of the Company	:	M/s Prism Johnson Ltd.
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Sampling Method	:	IS: 5182
Date of Monitoring	:	19.08.2021
Date of Testing	:	19.08.2021 to 24.08.2021
Environmental Condition	:	Temp (^{0}C) 35, Humidity (%) 68, Weather Condition – Partially Cloudy
Instrument Name & Lab ID	:	ECO/HO/FDS/02 &ECO/HO/RDS/02

Sl. No.	*Tests Conducted*	Method	Result				*Limit as per National Ambient Air Quality Standards*
			L1	L2	L3	L4	
			19.08.2021	19.08.2021	19.08.2021	19.08.2021	
1	Particulate Matter ($PM_{2.5}$) ($\mu g/m^3$)	IS 5182 : Part 24 : 2019	27.18	32.46	38.94	36.90	60
2	Particulate Matter (PM_{10}) ($\mu g/m^3$)	IS 5182 : Part 23 : 2006(Reaffirmed Year : 2017)	49.75	51.34	51.95	52.64	100
3	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	IS 5182:Part 2:2001(Reaffirmed Year:2017)	11.05	11.15	12.15	11.85	80
4	Oxides of Nitrogen (NOx) ($\mu g/m^3$)	IS 5182:Part 6:2006(Reaffirmed Year:2017)	13.05	12.25	15.46	16.05	80
5	CO (mg/m3)	IS:5182 (Part-10)	0.38	0.32	0.42	0.48	02

Note-*The results are related only to item tested.

Note:
L1= Adiwasi Tola (Nr Bagahai ML Area) L2= At Baisan Tola (Nr. Bagahai ML Area),
L3=South Side of Working Pit (Bagahai Mines) L4= Near Boundary Pillar No.64 Bagahai

Standards:
Ambient Air Quality Standard for Residual, Industrial, Rural & Other Area based on 24 hours sampling except Ozone.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF WORK PLACE AIR MONITORING

Name of the Company	:	M/s Prism Johnson Ltd.
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Sampling Method	:	IS: 5182
Date of Monitoring	:	19.08.2021
Date of Testing	:	19.08.2021 to 24.08.2021
Environmental Condition	:	Temp (^{0}C) 32, Humidity (%) 64, Weather Condition – Partially Cloudy
Instrument Name & Lab ID	:	ECO/HO/FDS/03 &ECO/HO/RDS/03

Sl. No.	*Tests Conducted*	Method	Result				*Limit as per National Ambient Air Quality Standards*
			L1	L2	L3	L4	
			19.08.2021	19.08.2021	19.08.2021	19.08.2021	
1	Particulate Matter ($PM_{2.5}$) ($\mu g/m^3$)	IS 5182 : Part 24 : 2019	49.68	42.34	48.16	44.15	60
2	Particulate Matter (PM_{10}) ($\mu g/m^3$)	IS 5182 : Part 23 : 2006(Reaffirmed Year : 2017)	74.18	77.18	76.28	77.88	100
3	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	IS 5182:Part 2:2001(Reaffirmed Year:2017)	16.05	11.15	12.70	11.05	80
4	Oxides of Nitrogen (NO_x) ($\mu g/m^3$)	IS 5182:Part 6:2006(Reaffirmed Year:2017)	17.94	15.34	16.86	16.15	80
5	CO (mg/m3)	IS:5182 (Part-10)	0.56	0.48	0.54	0.48	02

Note-*The results are related only to item tested.

Note:

L1= Near Cement Mill Unit –II
L2= Near Railway Yard,
L3= Near Packing Plant
L4= Kiln Unit-II

Standards:

Ambient Air Quality Standard for Residual, Industrial, Rural & Other Area based on 24 hours sampling except Ozone.

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...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/10 TEST REPORT NO: ECO LAB/AAQ5/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT AIR

Name of the Company	:	M/s Prism Johnson Ltd.
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Sampling Method	:	IS: 5182
Date of Monitoring	:	20.08.2021
Date of Testing	:	20.08.2021 to 24.08.2021
Environmental Condition	:	Temp (^{0}C) 34, Humidity (%) 67, Weather Condition – Partially Cloudy
Instrument Name & Lab ID	:	ECO/HO/FDS/02 &ECO/HO/RDS/02

Sl. No.	*Tests Conducted*	Method	Result				*Limit as per National Ambient Air Quality Standards*
			L1	L2	L3	L4	
			20.08.2021	20.08.2021	20.08.2021	20.08.2021	
1	Particulate Matter ($PM_{2.5}$) ($\mu g/m^3$)	IS 5182 : Part 24 : 2019	28.90	32.16	32.10	29.64	60
2	Particulate Matter (PM_{10}) ($\mu g/m^3$)	IS 5182 : Part 23 : 2006(Reaffirmed Year : 2017)	57.10	68.94	60.16	50.20	100
3	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	IS 5182:Part 2:2001(Reaffirmed Year:2017)	9.40	11.26	12.06	12.20	80
4	Oxides of Nitrogen (NOx) ($\mu g/m^3$)	IS 5182:Part 6:2006(Reaffirmed Year:2017)	13.45	14.05	18.49	17.16	80
5	CO (mg/m3)	IS:5182 (Part-10)	0.48	0.48	0.44	0.42	02

Note-*The results are related only to item tested.

Note:
L1=Nr. Nar Nala Bridge, L2= Nr. Medhi Mines Boundary Pillar No 28
L3=Nr. Medhi Mines Boundary Pillar No.23 L4= Malgaon Village

Standards:
Ambient Air Quality Standard for Residual, Industrial, Rural & Other Area based on 24 hours sampling except Ozone.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ6/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT AIR

Name of the Customer	:	M/s Prism Johnson Ltd.
Address of the Customer	:	Village Mankahari Tehsil Rampur Baghelan District Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Sampling Method	:	IS: 5182
Date of Monitoring	:	20.08.2021
Date of Testing	:	20.08.2021 to 24.08.2021
Environmental Condition	:	Temp (^{0}C) 33, Humidity (%) 66, Weather Condition –Partially Cloudy
Instrument Name & Lab ID	:	ECO/HO/FDS/03 &ECO/HO/RDS/03

Sl. No.	*Tests Conducted*	Method	Result				*Limit as per National Ambient Air Quality Standards*
			L1	L2	L3	L4	
			20.08.2021	20.08.2021	20.08.2021	20.08.2021	
1	Particulate Matter ($PM_{2.5}$) ($\mu g/m^3$)	IS 5182 : Part 24 : 2019	28.05	26.18	28.24	31.08	60
2	Particulate Matter (PM_{10}) ($\mu g/m^3$)	IS 5182 : Part 23 : 2006(Reaffirmed Year : 2017)	44.18	52.62	48.06	56.42	100
3	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	IS 5182:Part 2:2001(Reaffirmed Year:2017)	9.98	11.08	12.16	11.98	80
4	Oxides of Nitrogen (NOx) ($\mu g/m^3$)	IS 5182:Part 6:2006(Reaffirmed Year:2017)	12.04	16.40	16.04	17.98	80
5	CO (mg/m3)	IS:5182 (Part-10)	0.28	0.43	0.38	0.28	02

Note-*The results are related only to item tested.

Note:

L1= Badarkha Village L2= Hinauta Village
L3= Chulhi Village L4= Kulhari Village

Standards:

Ambient Air Quality Standard for Residual, Industrial, Rural & Other Area based on 24 hours sampling except Ozone.

End of the Report...

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FORMAT NO. ECO/QS/FORMAT/09 TEST REPORT NO: ECO LAB/DW/1444/08/21
TEST REPORT ISSUE DATE: 03.09.2021

TEST REPORT OF DRINKING WATER*

Name of the Company : M/s. Prism Johnson Ltd.
Address of the Company : Village Mankahari,Tehsil Rampur Baghelan Distt.Satna (M.P.)
Sampling Method : APHA/ IS: 3025
Sample Collected by : Mr.Maan Singh
Sample Quantity : As per requirement.
Date of Sampling : 21.08.2021
Date of Receiving : 24.08.2021
Date of Analysis : 25.08.2021 to 02.09.2021
Source of Sample : Mines Site Office HinautiSijatah
Sample ID Code : ELW-14725

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	1.10	1 - 100	1.0	5.0
5.	pH	APHA. 23rd Ed. 2017. 4500H+ A+B	7.59	2.0 -12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	478.0	5 - 5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	176.0	5-1500	200	600
8.	Total Hardness as $CaCO_3$ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	208.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	60.80	5 – 1000	75.0	200.0
10.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	13.60	5-1000	30.0	100.0
11.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	28.0	5-1000	250.0	1000.0
12.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.52	0.05-10	1.0	1.5
13.	Sulfate as SO_4 (mg/l)	APHA, 23rd Ed. 2017, 4500-SO_4^{2-} E	46.50	1.0 -250	200.0	400.0
14.	Nitrate Nitrogen as NO_3 (mg/l)	APHA, 23rd Ed. 2017, 4500-NO_3^- B	13.68	5.0 - 100	45.0	No Relax.
15.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
16.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-50	5.0	15
17.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2	0.01	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
19.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-5	0.02	No Relax
20.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
21.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 – A +B	BDL	0.04-10	0.05	No Relax
22.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
23	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
24.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.22	0.2 – 10	0.5	1.0
25.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017 (3111-A+B)	BDL	1.0-100	0.03	0.2
26.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
27.	Sulphide as H_2S (mg/l)	APHA, 23rd Ed. 2017, Reprint 2007	BDL	0.04-10	0.05	No Relax
28.	Iodide as I (mg/l)	APHA, 23rd Ed. 2017, 4500 – IB	BDL	0.1-10	-	-
29.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.14	0.02-50	0.3	No Relax.
30.	Total coliform (MPN/100 ml)	APHA, 23rd Ed. 2017, 9221 B+C	Absent	1.8	Absent	Absent
31.	*E.coli (Nos/100)*	APHA, 23rd Ed. 2017, 9221B+E	Absent	1.8	Absent	Absent

*The result are related only to item tested.
BDL = Below Detection Limit

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/09 TEST REPORT NO: ECO LAB/DW/1444/08/21
TEST REPORT ISSUE DATE: 03.09.2021

TEST REPORT OF DRINKING WATER*

Name of the Company : M/s. Prism Johnson Ltd.
Address of the Company : Village Mankahari,Tehsil Rampur Baghelan Distt.Satna (M.P.)
Sampling Method : APHA/ IS: 3025
Sample Collected by : Mr.Maan Singh
Sample Quantity : As per requirement.
Date of Sampling : 21.08.2021
Date of Receiving : 24.08.2021
Date of Analysis : 25.08.2021 to 02.09.2021
Source of Sample : Sijhata Village – Bore Well
Sample ID Code : ELW-14735

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	1.20	1 - 100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.21	2.0 -12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	378.0	5 - 5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	180.0	5-1500	200	600
8.	Total Hardness as $CaCO_3$ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	220.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.80	5 – 1000	75.0	200.0
10.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	21.38	5-1000	30.0	100.0
11.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	62.0	5-1000	250.0	1000.0
12.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.36	0.05-10	1.0	1.5
13.	Sulfate as SO_4 (mg/l)	APHA, 23rd Ed. 2017, 4500-SO_4^{2-} E	91.50	1.0 -250	200.0	400.0
14.	Nitrate Nitrogen as NO_3 (mg/l)	APHA, 23rd Ed. 2017, 4500-NO_3^- B	14.50	5.0 - 100	45.0	No Relax.
15.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
16.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.19	0.02-50	5.0	15
17.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2	0.01	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
19.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-5	0.02	No Relax
20.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
21.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 – A +B	BDL	0.04-10	0.05	No Relax
22.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
23	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
24.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.20	0.2 – 10	0.5	1.0
25.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017 (3111-A+B)	BDL	1.0-100	0.03	0.2
26.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
27.	Sulphide as H_2S (mg/l)	APHA, 23rd Ed. 2017, Reprint 2007	BDL	0.04-10	0.05	No Relax
28.	Iodide as I (mg/l)	APHA, 23rd Ed. 2017, 4500 – IB	BDL	0.1-10	-	-
29.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.14	0.02-50	0.3	No Relax.
30.	Total coliform (MPN/100 ml)	APHA, 23rd Ed. 2017, 9221 B+C	Absent	1.8	Absent	Absent
31.	*E.coli (Nos/100)*	APHA, 23rd Ed. 2017, 9221B+E	Absent	1.8	Absent	Absent

*The result are related only to item tested.
BDL = Below Detection Limit

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/09

TEST REPORT NO: ECO LAB/DW/1444/08/21
TEST REPORT ISSUE DATE: 03.09.2021

TEST REPORT OF DRINKING WATER*

Name of the Company : M/s. Prism Johnson Ltd.
Address of the Company : Village Mankahari,Tehsil Rampur Baghelan Distt.Satna (M.P.)
Sampling Method : APHA/ IS: 3025
Sample Collected by : Mr.Maan Singh
Sample Quantity : As per requirement.
Date of Sampling : 21.08.2021
Date of Receiving : 24.08.2021
Date of Analysis : 25.08.2021 to 02.09.2021
Source of Sample : Plant Site – Bore Well
Sample ID Code : ELW-14726

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	1.06	1 - 100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.45	2.0 -12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	345.0	5 - 5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	168.0	5-1500	200	600
8.	Total Hardness as $CaCO_3$(mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	59.20	5 – 1000	75.0	200.0
10.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	15.55	5-1000	30.0	100.0
11.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	56.0	5-1000	250.0	1000.0
12.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.34	0.05-10	1.0	1.5
13.	Sulfate as SO_4 (mg/l)	APHA, 23rd Ed. 2017, 4500-SO_4^{2-} E	82.50	1.0 -250	200.0	400.0
14.	Nitrate Nitrogen as NO_3 (mg/l)	APHA, 23rd Ed. 2017, 4500-NO_3^- B	15.45	5.0 - 100	45.0	No Relax.
15.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
16.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.21	0.02-50	5.0	15
17.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2	0.01	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
19.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-5	0.02	No Relax
20.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
21.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 – A +B	BDL	0.04-10	0.05	No Relax
22.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
23	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
24.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.23	0.2 – 10	0.5	1.0
25.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017 (3111-A+B)	BDL	1.0-100	0.03	0.2
26.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
27.	Sulphide as H_2S (mg/l)	APHA, 23rd Ed. 2017, Reprint 2007	BDL	0.04-10	0.05	No Relax
28.	Iodide as I (mg/l)	APHA, 23rd Ed. 2017, 4500 – IB	BDL	0.1-10	-	-
29.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.
30.	Total coliform (MPN/100 ml)	APHA, 23rd Ed. 2017, 9221 B+C	Absent	1.8	Absent	Absent
31.	*E.coli (Nos/100)*	APHA, 23rd Ed. 2017, 9221B+E	Absent	1.8	Absent	Absent

*The result are related only to item tested.
BDL = Below Detection Limit

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/23 REPORT NO: ECO LAB/Piezo/GW/08/21
TEST REPORT ISSUE DATE: 30.08.2021

REPORT OF WATER LEVEL MEASUREMENT

Name of the Customer : M/s. Prism Johnson Ltd.
Address of the Customer : Village - Mankahari,
Tehsil - Rampur Baghelan
Distt.Satna (M.P.)
Measurement by : Mr. Maan Singh
Date of Measurement : August 20th, 2021

Sl. No.	Piezometer Name.	Water Level (meter)
1.	Colony Gate	6.14
2.	Behind B Block	2.93
3.	Behind C Block	1.06
4.	Auto Work Shop	9.70
5.	In Front Den	2.10
6.	Rose Garden near boundary	5.90
7.	Rose Garden	4.28
8.	Western Block Mines	9.50
9.	Near New Magzine Mines	10.60
10.	Mankahari Mines	13.50
11.	Mines near Ramprasan	11.50
12.	Side Office Mines	Block

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN1/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.**
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District- Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make:HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Day Time Leq Value in dB(A)	Night Time Leq Value in dB(A)
1.	Near PCL Colony	43.2	39.95
2.	Near Guest House	45.36	41.86
3.	Near Crusher Unit-II	61.80	53.80
4.	Near Admin. Building	52.34	48.05

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned categories by the competent authority and the corresponding standard shall apply.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN2/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.**
Address of the Company	:	Hinauti- Sijahata& Mankahari Limestone mines Village Mankahari Tehsil Rampur Baghelan District- Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make-HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Day Time Leq Value in dB(A)	Night Time Leq Value in dB(A)
1.	At Mines site Office	58.92	51.85
2.	Near Western Block Garden	54.28	52.16
3.	Village Hinauti	43.98	38.98
4.	Village Sijahata	45.23	37.42

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned categories by the competent authority and the corresponding standard shall apply.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN3/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.** Medhi Limestone mines
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District- Satna(M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	;	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make-HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Day Time Leq Value in dB(A)	Night Time Leq Value in dB(A)
1.	Near Nar Nala Bridge	45.8	39.4
2.	Near Medhi Mines Boundary Pillar No28	51.2	42.05
3.	Near Medhi Mines Boundary Pillar No23	53.4	47.48
4.	Village Malgaon	44.6	43.15

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned categories by the competent authority and the corresponding standard shall apply.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN4/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.**
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District- Satna(M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make:HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Day Time Leq Value in dB(A)	Night Time Leq Value in dB(A)
1.	At AdiwasiTola	48.68	42.9
2.	At BaisanTola	46.05	42.6
3.	South Site of Working Pit	56.6	51.3
4.	Near Boundary Pillar No.64	54.8	48.6

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned categories by the competent authority and the corresponding standard shall apply.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN5/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.**
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District- Satna(M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make:HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Day Time Leq Value in dB(A)	Night Time Leq Value in dB(A)
1.	Village Badarkha	46.20	38.40
2.	Village Hinauta	47.95	37.20
3.	Village Chulhi	45.60	38.80
4.	Village Kulhari	45.28	37.60

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned categories by the competent authority and the corresponding standard shall apply.

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN6/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF WORK PLACE NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.**
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District- Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make:HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Noise Level dB(A)
1.	Kiln Unit-II	78.15
2.	Cement Mill Unit -II	73.05
3.	Near Railway Yard,	77.84
4.	Near Packing Plant	78.65

...End of the Report...

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FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN7/08/21
TEST REPORT ISSUE DATE: 28/08/2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Company	:	**M/s Prism Johnson Ltd.**
Address of the Company	:	Village Mankahari Tehsil Rampur Baghelan District- Satna(M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Make:HTC)
Test Method	:	IS: 4412, Part-1 & 2, 1991

Sl. No.	Locations	Day Time Leq Value in dB(A)	Night Time Leq Value in dB(A)
1.	Near Site Office	54.80	43.05
2.	North side of mines pit	53.15	46.58
3.	South side of pit	48.15	44.96
4.	East side of pit.	45.92	41.08

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/13

TEST REPORT NO: ECO LAB/AN1/08/21
TEST REPORT ISSUE DATE: 28.08.2021

TEST REPORT OF NOISE LEVEL SURVEY

Name of the Customer	:	**M/s Prism Johnson Ltd.**
Address of the Customer	:	Village Mankahari Tehsil Rampur Baghelan District- Satna (M.P.)
Sample Collected by	:	Mr. Maan Singh
Date of Monitoring	:	18.08.2021 to 20.08.2021
Instrument Description	:	Noise Meter (Maske:HTC)

Sl. No.	Locations	Leq Value in dB(A)	Protective Measures Adopted
Dozer-155 A			
1	Operator's cabin idle running	65.6	Ear muff provided
2	Operator's Cabin running on load	82.1	Ear muff provided
Poclain 300 CK			
3	Operator's cabin idle running	72.9	Ear muff provided
4	Operator's Cabin while loading	75.8	Ear muff provided
HAULPAK-PH 40			
5	Operator's Cabin while being loaded	72.9	Ear muff provided
6	Operator's Cabin while hauling	73.8	Ear muff provided
7	Operator's Cabin unloading in the hopper of crusher	88.2 (For 20 Second)	Ear muff provided
8	Alarm (while Reversing of dumper)	104.0	Short Duration
ATLASCOPCODRILL			
9	Operator's point while drilling	82.4	Ear muff provided
ROCKBREAKER			
10	Operator's Cabin	73.2	Ear muff provided
HEAVY BLASTING (INSTANTANEOUS)			
11	Blasting shelter	102.8	Momentary
12	At safe zone	83.8	
AMBIENT NOISE LEVEL DURING WORKING HOURS			
13	Office Campus, Mines workshop, Outfield (Haul Road)	73.8	-
14	Office Campus, Mines Workshop, Outfield (Haul Road) (at Night)	61.1	-

End of the Report...

Archana
Analyst

Authorized Signatory
Ecomen Laboratories Pvt. Ltd.
Second Floor Hall, House No. B-1/8,
Sector-H, Aliganj, Lucknow-226024

Quality Manager

Confidential

CSIR - CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad – 826 015

Report on

Study and advice for optimization of blast design parameters at Prism Cement Limestone Mine of M/s Prism Cement Limited to control ground vibration, air overpressure/noise and flyrocks within safe limits for the safety of houses/structures in the periphery of the mine when blasting is to be performed at 50 m and beyond

PROJECT NO.: CNP/4491/2016-17 **FEBRUARY 2017**

CSIR - CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
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REPORT ON

Study and advice for optimization of blast design parameters at Prism Cement Limestone Mine of M/s Prism Cement Limited to control ground vibration, air overpressure/noise and flyrocks within safe limits for the safety of houses/structures in the periphery of the mine when blasting is to be performed at 50 m and beyond

BY

Dr. M. P. Roy,	**Principal Scientist & Project Leader**
Dr. C. Sawmliana,	**Principal Scientist**
Shri Vivek K Himanshu,	**Scientist**
Shri R. S. Yadav,	**Sr.Technical Officer**
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Dr. P. Pal Roy,	**Outstanding Scientist & HORG**
Dr. P. K. Singh,	**Director**

PROJECT NO.: CNP/4491/2016-17 **FEBRUARY 2017**

NOTE

This report is meant for internal use of the sponsor of the study and it should not be published in full or part by the sponsor. It should not be communicated or circulated to outside parties except concern departments. However, CSIR-CIMFR reserves the right to publish the results of investigation for the benefit of the mining industry.

The recommendations are based on the results of investigation carried out at Prism Cement Limestone Mine of M/s Prism cement Limited. It is hoped that the recommendations will be implemented to get optimum results without hampering production, productivity and safety of the mine. The recommendations are guidelines, which should be implemented in letter and spirit.

Since, the day-to-day blasting operations are not in the control of CSIR-CIMFR, the research team will not be held responsible for any untoward incident caused due to blasting.

SIGNATURE OF THE PROJECT PROPONENTS

Mura R Roy 09/02/17

(Dr. M. P. Roy)
Principal Scientist
Project Leader

9/2/2017

(Dr. P. Pal Roy)
Outstanding Scientist & HORG
Project Co-ordinator

CSIR-CIMFR AUTHORISED SIGNATORIES

9/2/17

(Dr. V. K. Kalyani)
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09/02/2017

(Dr. R. V. K. Singh)
Chief Scientist & HORG
Business Development & industrial Liaison

Contents

EXECUTIVE SUMMARY

This report relates to the study conducted by CSIR-Central Institute of Mining & Fuel Research (CIMFR), Dhanbad to study and advice for optimization of blast design parameters at Prism Cement Limestone Mine of M/s Prism Cement Limited, Satna to control ground vibration within safe limits for the safety of structures in the periphery of the mine with improved production and productivity. The study involved trials with varying blast designs and charging patterns, monitoring of ground vibration, air over-pressure/noise at various locations in the periphery of the mines. The ejections of flyrock from blasting operations were also monitored. The results of investigation, analyses of data and recommendations, made thereof, are summarised below:

- Fifteen blasts were conducted at different benches of the Prism Cement Limestone Mine of M/s Prism Cement Limited, Satna and 60 blast induced ground vibration data were recorded in the periphery of the mine.

- Maximum vibration recorded from production hole blast was 31.0 mm/s at 50 m. The blast was conducted at 15 no. Goyal face of Prism Cement Limestone Mine. The total explosive weight and explosive weight per delay were 710 kg and 50 kg respectively.

- The maximum air over-pressure was recorded from the blast conducted at 15 no. Goyal face on 26.12.16. The recorded air over-pressure was 137.8 dB(L) at 100 m distance from face. In this blast, explosives detonated in a blasting round and explosives weights per delay were 1125 and 75 kg respectively.

- There was no ejection of flyrock in any of the blast. The blasts were initiated with Nonel initiating system and electronic initiation system from the bottom of the hole and experimented blast designs ensured non-ejection of flyrocks.

- All the recorded vibration data were well within the safe limit at the houses/structures concerned. The dominant peak frequencies of ground vibrations were in the range of 11.4 to 129 Hz. FFT analysis of blast vibration frequencies confirmed that concentration of frequencies is in band of 13.3 - 40.3 Hz. So, the safe level of vibration has been taken as 10 mm/s for the safety of houses/structures of the surrounding villages as per DGMS standard.

- Propagation equation for the prediction of blast vibration has been established and is given as Equation 1. The permissible explosive weight per delay may be computed from the Equation to maintain vibration within safe limit for distances of houses/structures concerned. For convenience, the recommended explosive weight per delay has been computed and is given in Table A3.

- Attempts were made to record the vibration from 50 to 250 m in most of the blasts and accordingly the explosives to be detonated in the delay and total amount of explosives to be fired has been computed and is given in the text in view of future blasting operations at 50 m and beyond.

- The delay interval between the holes in a row should be 17 ms whereas between the rows, it should be 65 ms or more depending upon the number of rows and effective burden. If the numbers of rows are more than two, the delay interval between rows should be increased by 15% in successive rows.

- It is recommended that the existing Nonel initiation system should be continued in the blasting operations. The sub-grade drilling should be 0.3 to 0.5 m for a blasthole depth of 6 to 7 m and should be initiated from the bottom of the hole.

- The recommended blast designs should be followed for day-to-day blasting operations for safe and efficient blasting operations. The blast designs Annexure as Figures A1-A2, will also ensure the safety of the houses/structures, life of human beings and other property in the periphery of the mine.

1. Introduction

The Joint President- Commercial of M/s Prism Cement Limited entrusted CSIR-Central Institute of Mining & Fuel Research (CIMFR), Dhanbad, vide letter no. PCL/LOI/16-17/CIMFR/365 dated 06.12.2016 for a scientific study and advice for optimization of blast design parameters for deep hole blasting at Prism Cement Limestone Mine of M/s Prism Cement Limited, Satna to control ground vibration within safe limits for the safety of structures in the periphery of the mine with improved production and productivity.

The Rock Excavation Engineering (erstwhile Blasting Department) Research team of CSIR-Central Institute of Mining & Fuel Research, Dhanbad carried out field investigations during December 21-26, 2016. Altogether, fifteen blasts were conducted and blast induced ground vibration & air over-pressure/noise were monitored at various locations in the periphery of the Prism Cement Limestone Mine of M/s prism Cement Limited. The monitoring locations were back-side of the blast free face and in the left flank of the blast free face.

2. Location and geology

The Prism Cement Limestone Mine is situated at about 15 km North-East of Satna railway station. The mining lease area lies between longitude 80°57'31" to 80°58'28" East and Latitude 24°36'47" to 24°37'16" North. The limestone deposit of the mine falls in the Bhander series of Upper Vindhyan System and is Upper Vindhyan in age. The general topography of the area is without any remarkable relief and forms a more or less flat terrain with a general dip of approximately 2°- 6° towards South between S10°W and S5°E. The area is completely devoid of any forest and the topographic elevation varies from 312 m (north direction) to 300 m (south direction) above MSL.

The limestone deposit in the mine occurs in two horizontal bands separated by a shaley limestone. The Vindhyan formations are broadly classified into lower calcareous and an upper arenaceous facies. The Bhander limestone varying in thickness from about 5 to 15 m lies as a calcareous horizon in the upper arenaceous rocks. The Bhander Limestone deposit of the area is the dominant rock type and overlain by Sirbu shale (0 – 2 m thick). It is widely jointed with two sets of joints along and across strike. The overview of the Prism Cement Limestone Mine is presented in Photograph 1.

Photograph 1. The overview of Prism Cement Limestone Mine of M/s Prism Cement Limited.

3. Instrumentations

Blast induced vibrations were monitored by seismographs namely MiniMate Plus, MiniMate Blaster and MiniMate DS-077 (Made in Canada by M/s Instantel Inc.). MiniMate plus are eight as well as four channel seismographs provided with two/one tri-axial transducer(s) for monitoring vibration (in mm/s) and two/one channel(s) for monitoring air over-pressure/noise in dB(L). MiniMate Blaster and MiniMate DS-077 are four channel seismographs provided with one tri-axial transducer for monitoring vibration (in mm/s) and one channel for monitoring of air over-pressure/noise in dB(L). All the seismographs record vibration in three directions i.e. Longitudinal (L), Vertical (V) and Transverse (T). They also record principal frequency of vibration and compute the peak vector sum of the vibration.

Explosives and delay detonators must provide the energy and timing for the blasts used under specific blasting conditions. The DataTrapII data/VOD recorder of M/s MREL, Canada is used to document the VOD performance of the explosives and delay time of delay detonators during blasts to compare the actual VOD and delay time results to the published specification.

4. Blasting details

Fifteen blasts including fourteen production blasts and one signature hole blast were conducted on different benches of Prism Cement Limestone Mine. The number of blast holes detonated in production blasting varied from 14 to 84. The diameters of deep blast holes were 115 mm. The depth of blast holes varied from 2.5 to 6 m and the explosives loaded in a hole varied from 2.8 to 35 kg. The explosives weight per delay ranged between 2.8 to 96 kg. Total

explosive weight detonated in a round of production blast varied between 58.4 and 2678 kg. Out of fifteen trial blasts five were conducted using Nonel initiation system and rest 10 were blasted with the help of electronic initiation system. The vibration measuring distances varied from 50 to 250 m. Details of blast design parameters experimented during the period of investigation are given in Annexure as Table A1.

Vibrations were monitored in terms of peak particle velocity (PPV) that varied from 0.73 mm/s to 31.0 mm/s in case of production blast depending upon the distance of measuring transducers of seismographs from the blasting face and the amount of explosives detonated in particular delay of the blast. The recorded levels of air over-pressure ranged from 110.2 – 137.8 dB(L). Recorded blast induced ground vibrations and air over-pressure are presented in Annexure as Table A2.

The blast movement and ejection of rock, if any, were monitored for each blast. There was no ejection of flying fragments. Precaution was taken by using blasting mate on the blastholes. Photograph 2 depicts the charging of the 15 no. RPL bench and use of blasting mate at 7050 RIL blast face to prevent flyrock.

Photograph 2. The charging of the 15 no. RPL bench and use of blasting mate at 7050 RIL blast face to prevent flyrock.

5. Analyses of recorded vibration data

Ground vibrations data recorded were grouped together for statistical analysis. An empirical relationship has been established correlating the maximum explosive weight per delay (Q_{max} in kg), distance of vibration measuring transducers from the blasting face (R in m) and recorded peak particle velocity (v in mm/s). The established equation for the mine is:

$$v = 200.34 * \left(\frac{R}{\sqrt{Q_{max}}} \right)^{-1.126} \qquad (1)$$

Correlation co-efficient = 87.8 %

Where,

v = Peak particle velocity (mm/s)
R = Distance between vibration monitoring point and blasting face (m)
Q_{max} = Maximum explosive weight per delay (kg)

The above equation is site specific and applicable only for Prism Cement Limestone Mine. It may be used to compute the maximum explosive weight to be detonated in a delay for distances of concern from the blasting site. The regression plot of vibration data recorded at their respective scaled distances is presented in Figure 1.

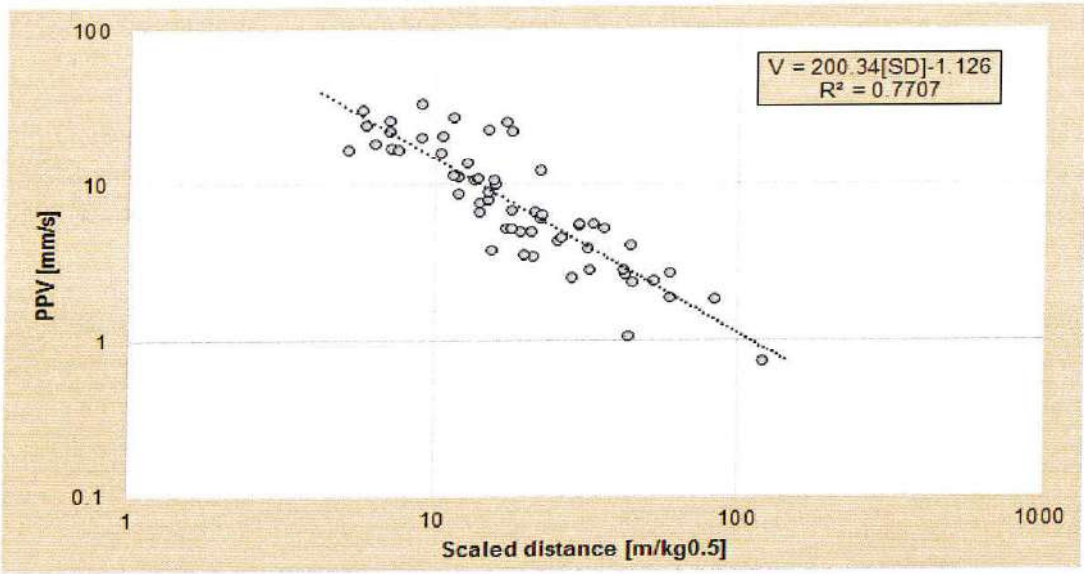


Figure 1. Regression plot of recorded PPV with their respective scaled distances.

5.1 *Frequency of blast vibration*

The dominant peak frequencies of ground vibrations recorded were in the range of 11.4 - 129 Hz whereas the most common range lies between 13.3 to 40.3 Hz. Most of the vibration measuring stations were on compact ground surfaces. The dominant peak frequency recorded at corresponding monitoring locations is presented in Figure 2. The blast wave signature recorded at Shankkar Ji temple of Hinauti village (Distance - 200 m; PPV – 5.29 mm/s) from the blast conducted at New Pit 01 bench of Prism Cement Limestone Mine is depicted in Figure 3 and its Fast Fourier Transform (FFT) analysis of frequency is shown in Figure 4. The blast wave signature recorded at the house of Shri Umesh Prasad from the blast conducted at 15 No. Goyal face bench is shown in Figure 4. Fast Fourier Transform (FFT) analysis of frequency of the vibration signature is presented in Figure 5. The Fast Fourier Transform (FFT) analysis of frequencies indicate high frequency vibrations recorded in blasting. The view of blast vibration monitoring in the periphery of the mine are shown in Photographs 3.

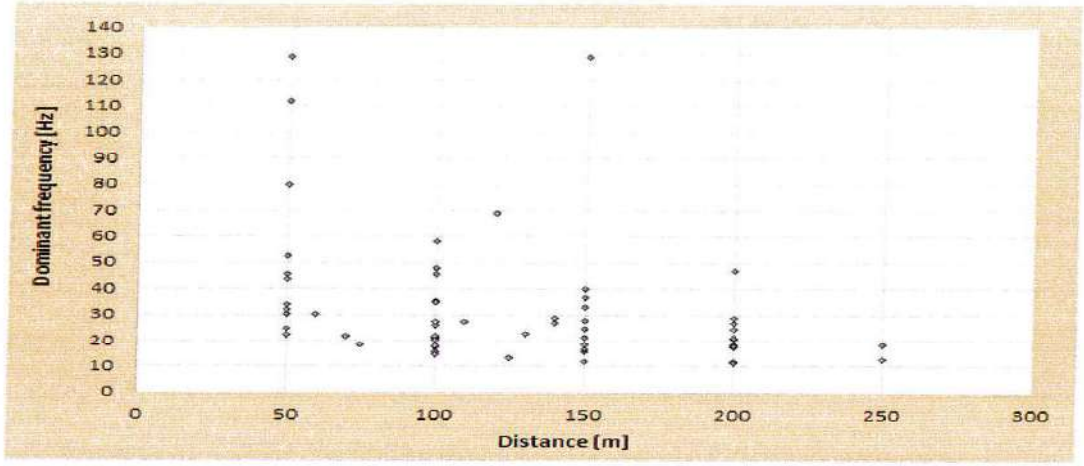


Figure 2. Plot of dominant frequency with respect to respective distances.

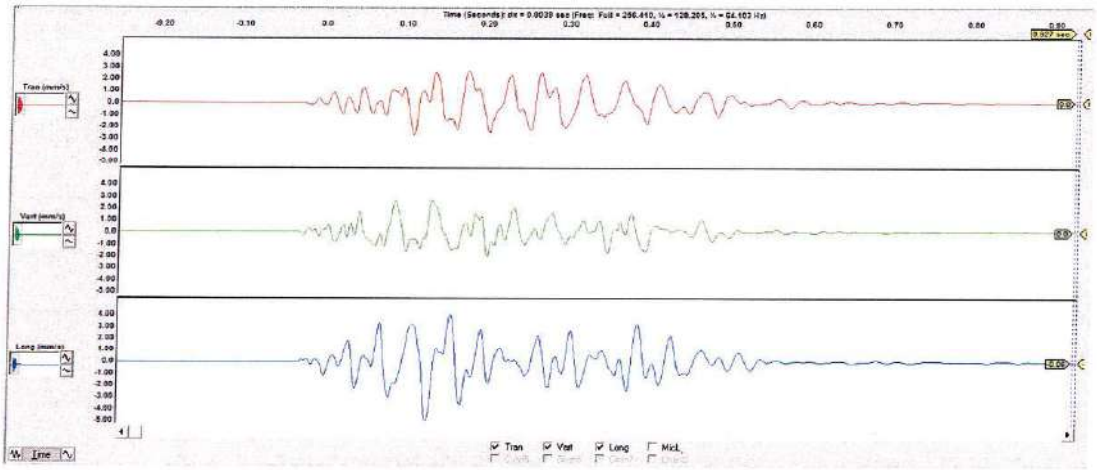


Figure 3. Blast wave signature recorded at Shankarji temple of Hinauti village from the blast conducted at New Pit 01 blastface of Prism Cement Limestone Mine.

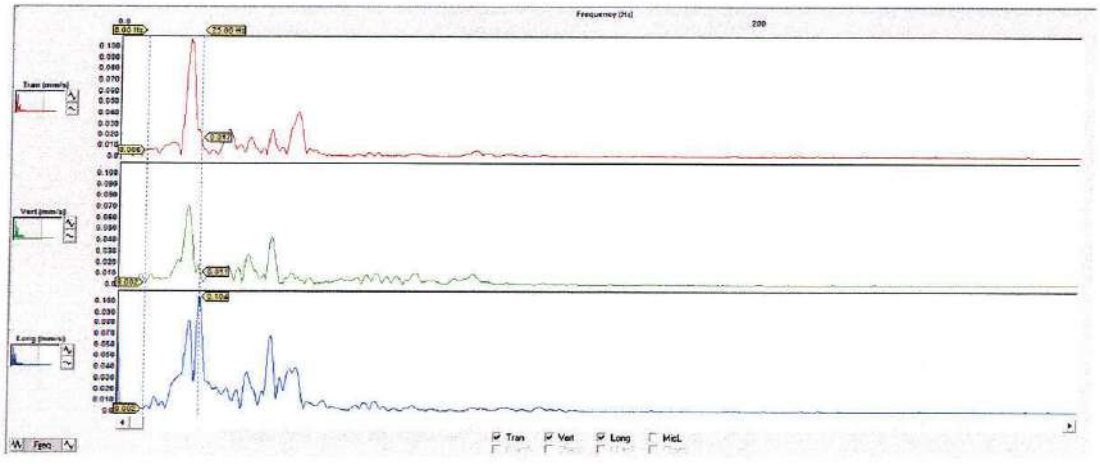


Figure 4. FFT analyses of frequencies of vibration presented in Figure 3.

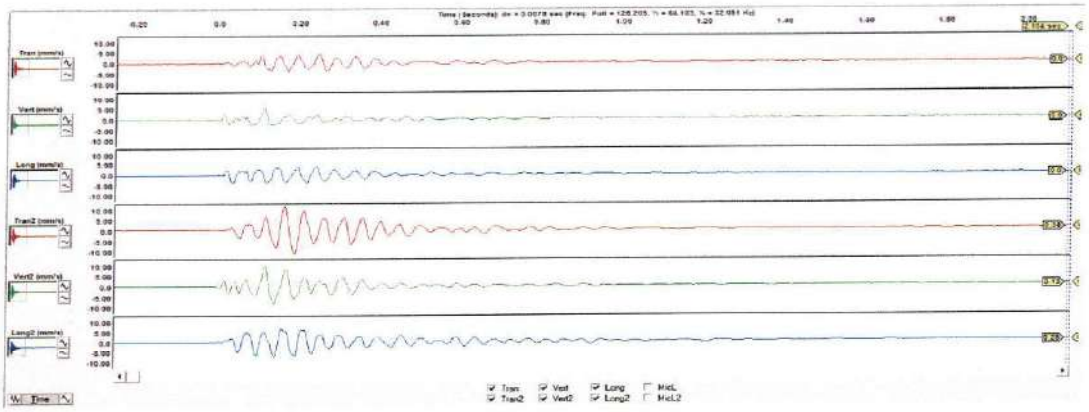


Figure 4. Blast wave signature recorded on the ground surface and roof of the house of Shri Umesh Prasad from the blast conducted at 15 No. Goyal face bench of Prism Cement Limestone Mine.

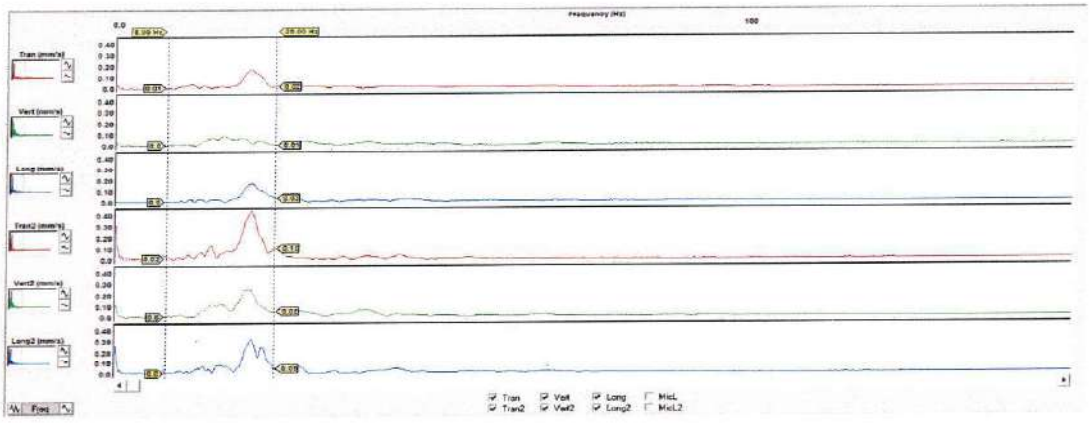
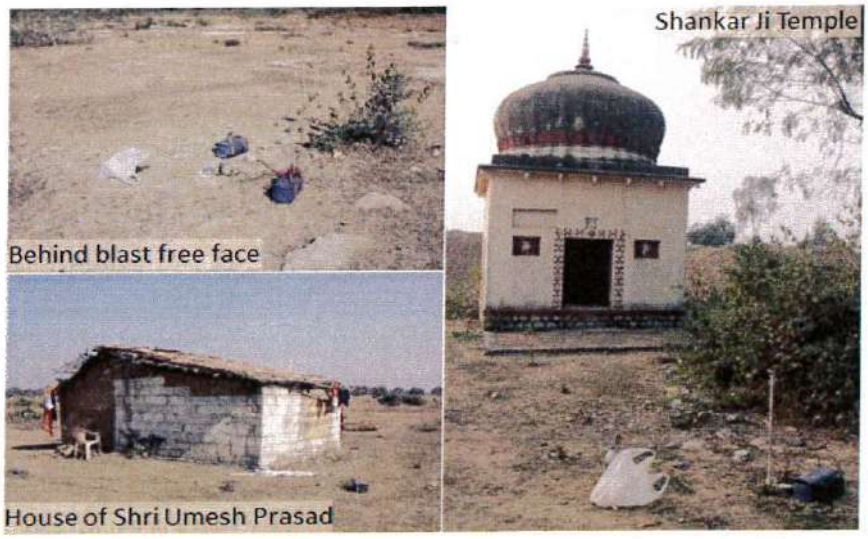


Figure 5. FFT analyses of frequencies of vibration presented in Figure 4.



Photograph 3. Monitoring of blast vibration at different locations in the periphery of the Prism Cement Limestone Mine.

5.2 *Structural responses to ground vibration and their natural frequencies*

The real cause of why people complain about blasting is structural response. All blast vibration complains is due to how much the house shakes, not how much the ground shakes. The ground motion resulting from blast induced waves is transmitted to the structure upside through the foundation, which causes the structure to vibrate. There are three factors of ground vibrations that determine how much structure vibrates. They are ground vibration amplitude, ground vibration duration and ground vibration frequency.

The responses of a few structures in the periphery of the mine was monitored. The recorded natural frequencies of the house of Shri Umesh Prasad was 21.3 Hz. The incoming blast vibration has frequency in the range of natural frequency of the houses and resonance occurred, the resultant amplitude of the vibration in the houses got amplified. The maximum amplification were recorded when incoming blast wave has dominant frequency very close to the natural frequency of the house. The process involved in determination of natural frequency is shown in Figure 6.

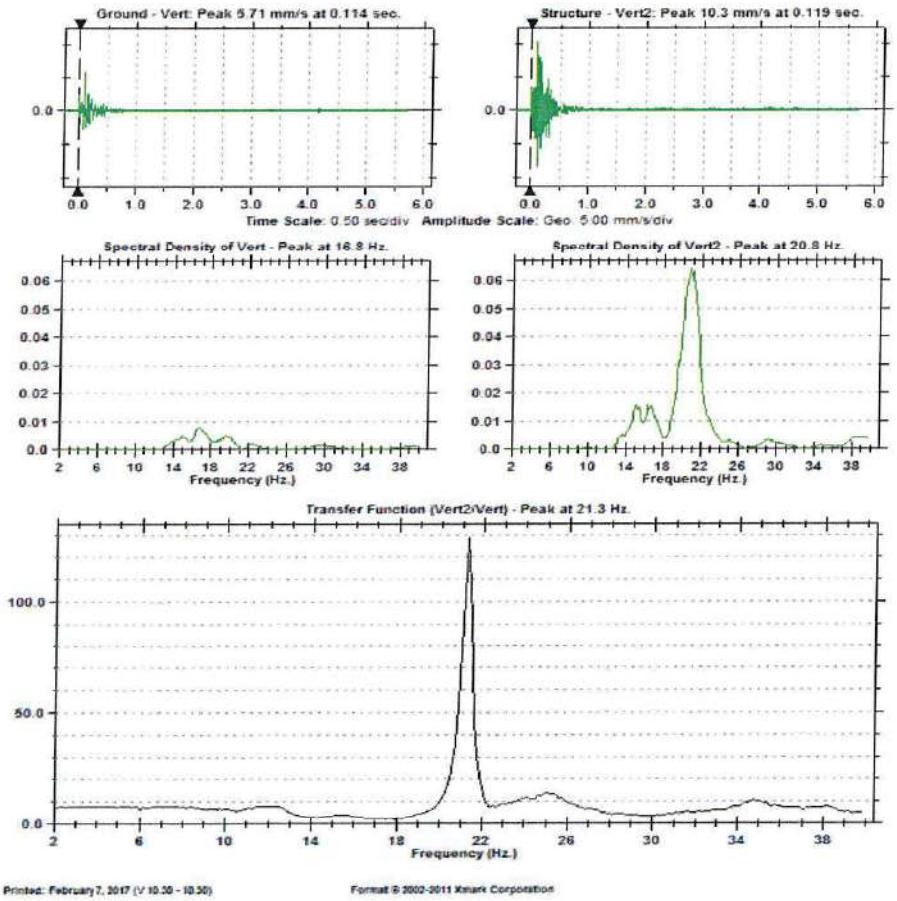


Figure 6. Processing of blast wave signature for determination of natural frequency of the house of Shri Umesh Yadav.

6. Existing vibration standard and criteria to prevent damage

Peak particle velocity (PPV) has been globally used in practice for assessment of blast induced damage to the structures. Different countries adopt different standards depending on their type of industrial/residential buildings. In India, presently DGMS technical circular 7 of 1997 is considered as vibration standard for the safety of surface structures in mining areas. The DGMS standard is given in Table 1.

Table 1. DGMS technical circular 7 of 1997 concerning to blast vibration standard in mm/s.

Type of structure	Dominant excitation frequency, Hz		
	< 8 Hz	8-25 Hz	> 25 Hz
(A) Buildings/structures not belong to the owner			
1. Domestic houses/structures (Kuchcha, brick & cement)	5	10	15
2. Industrial buildings	10	20	25
3. Objects of historical importance and sensitive structures	2	5	10
(B) Buildings belonging to owner with limited span of life			
1. Domestic houses/structures	10	15	25
2. Industrial buildings	15	25	50

7. Air over-pressure/noise

Air overpressure in the mining or quarrying context is the superposition of a number of impulsive air pressures as a result of the detonation of explosive in the ground. Air over-pressure can be measured in pressure unit as well as sound pressure level (SPL).

$$SPL\ (dB) = 20 \log (p/p_o)$$

Where, p = measured over-pressure in Pascal (pa)

p_o = reference pressure level of the lowest sound that can be heard, i.e., zero dB = 2×10^{-5} pa.

United State Bureau of Mines (USBM) has correlated the damage due to air over-pressure. The recommended values are given below:

Over-pressure (dB)	Over-pressure (KPa)	Air Blast Effects
177	14	All windows break
170	6	Most windows break
150	0.63	Some windows break
140	0.20	Some large plate glass windows may break, desk and windows rattle
136	0.13	USBM interim limit for allowable air blast
126	0.05	Complaints likely

The maximum level of air over-pressure recorded was 137.8 dB(L) at 100 m due to blasting at 15 no. Goyal Face bench of Prism Cement Limestone Mine. In this blast 45 blastholes were loaded with 1125 kg of explosives and were fired with the explosives weight per delay of 50 kg. The threshold level of air over pressure/noise is 136 dB(L) as per USBM standard.

8. Flyrocks

Flyrocks are the undesirable ejection of rock particles projected beyond the normal blast area. It is generated when there is insufficient stemming, too much explosive energy for a fixed amount of burden, or poor delay timing pattern, or explosives loaded in voids, mud seams.

The primary means of controlling flyrocks is through proper blast design and optimum delay timing between two detonations. Any pattern which over-confines the explosives or one with insufficient stemming tends to cause material to be thrown up in the air rather than allowing any horizontal movement. None of the blasts ejected flying fragments. The detonation of blast was very ideal and achieved blasting face was without back breaks in most of the time. It is recommended to use blasting mate in sensitive areas for control of flyrock. It was demonstrated and experiment that stemming to burden ratio of 0.7 or more did not cause ejection of flying fragments. Hence, to reduce the generation of boulders from the top portion of the face, stemming length should be 0.7 times of burden.

9. Recording of in-the-hole Velocity of Detonation (VOD) of explosives

The performance of explosives depends upon a number of parameters and VOD is one of the important parameters. The detonation pressure associated with the reaction zone of detonating explosives is directly proportional to the square of its VOD. It is measured in the C-J plane, behind the detonation front, during propagation through the explosives column. The detonation pressure (P_d) can be estimated by the following formula.

$$P_d = \frac{1}{2}\rho_e (VOD)^2 10^{-6}$$

Where, P_d = Detonation pressure (MPa)
ρ_e = Density of explosive (kg/m^3)
VOD = Velocity of detonation (m/s)

Uniform VOD is essentially required throughout the blast holes in the rock formations in order to produce sufficient detonation pressure to the borehole walls. Required booster is provided in the explosives column to maintain the VOD for the uniform breakage of rock. In-the-hole continuous velocity of detonation of explosives was recorded with the help of DataTrap II. The recorded in-the-hole VOD of site mixed emulsion (SME) explosives of M/s Indian Explosives Limited (Orica) was in the range of 5286.8 – 5399.7 m/s (Figure 7 & 8).

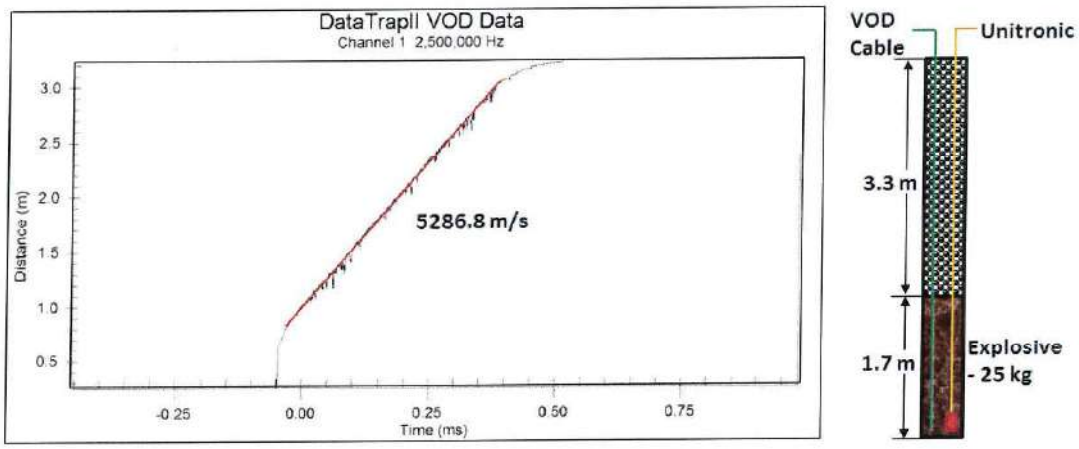


Figure 7. Trace of in-the-hole VOD of SME explosives of M/s Indian Explosives Limited.

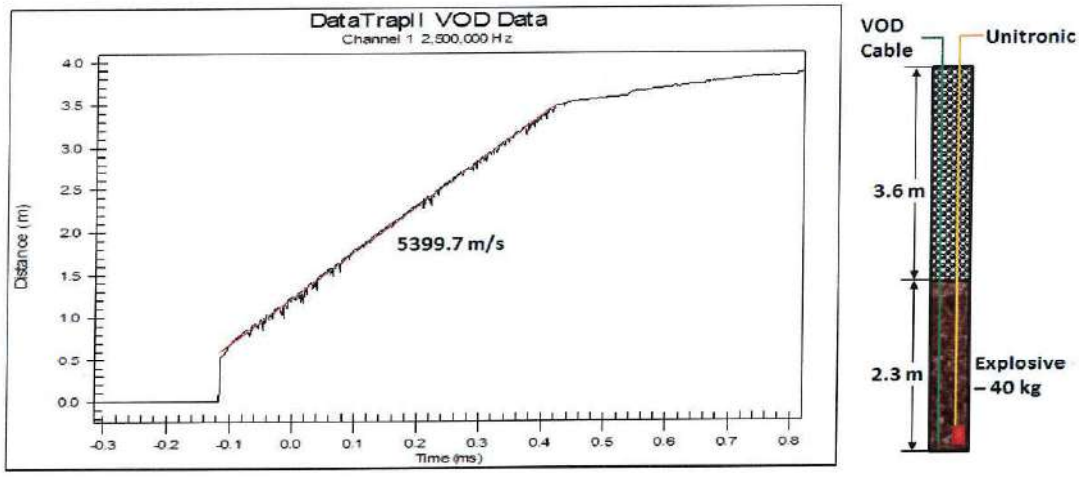


Figure 8. Trace of in-the-hole VOD of SME explosives of M/s Indian Explosives Limited.

10. Blast delay optimisation with the help of signature blast

The optimum blasts have the following objectives.

- Adequate rock fragmentation, swelling and displacement
- Control over the flyrocks and over breaks
- Minimum level of vibration and air blasts

The delay timing between the holes in a row and between rows plays fundamental role in fulfilment of these objectives. To address this issue a blast hole was drilled at 15 No. RPL bench. The blasthole was loaded with 30 kg of explosives and fired instantaneously without in-hole delay. The blast wave signatures were recorded at interval of 50 m at 2 locations. The attenuation characteristics of blast wave were documented. The typical time history of blast wave signature recorded at 50 m from the blast hole is presented in Figure 9. The frequency spectra of the signature blast was analysed. Linear superposition of the waves were done to simulate the waveform characteristics for multi-hole blasting. The analyses revealed that very

short delay times between the holes and very long delay intervals between the rows should be avoided. The analyses further concluded that the mean time needed to start the movement of rock face is 6.4-7.5 ms/m of effective burden. The delay interval between the successive rows should be 13.5-28.5 ms/m of effective burden. The blast designs were optimised considering the out put of linear superimposition techniques. The signature hole analyses table of blast is depicted in Figure 10. The recommended blast designs on the basis of the analyses are given in Annexure.

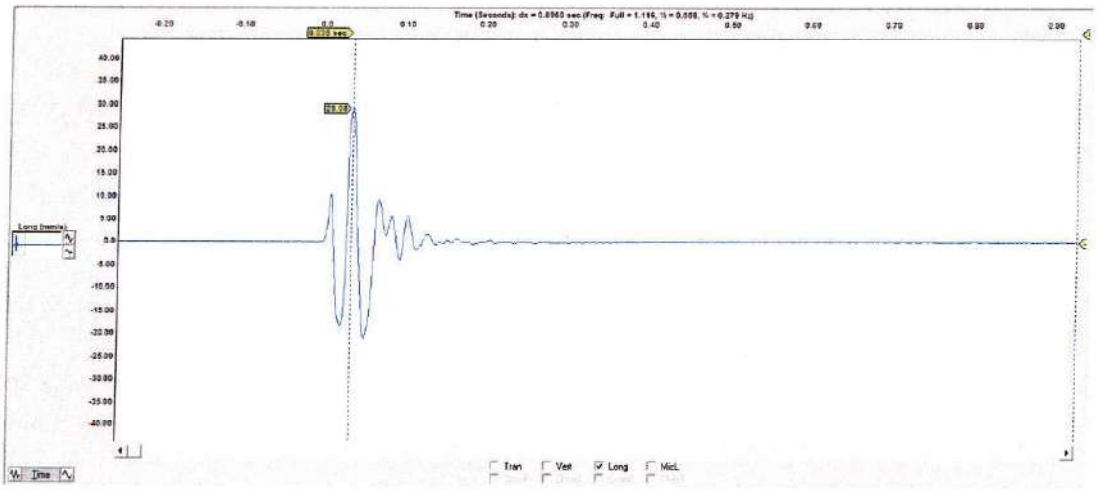


Figure 9. Time history of the signature blast in Longitudinal direction.

Signature Hole Analysis Table

File

Filename (Double Click to view)	Blast Timing			Peak Particle Velocity				PVS	Dominant FFT Frequency				Upper/Lower Frequency Ratio			
	Deck Delay (msec	Hole Delay (msec	Row Delay (msec	Trans (mm/s)	Vert (mm/s)	Long (mm/s)	Peak (mm/s)	Peak Vector Sum	Trans (Hz)	Vert (Hz)	Long (Hz)	Peak (Hz)	Trans	Vert	Long	Peak
2D1H16R100.BWP	1	16	100	19.70	18.40	22.70	22.70	26.50	61.4	61.5	59.3	61.5	0.202	12.000	0.194	12.000
2D1H16R125.BWP	1	16	125	20.50	18.40	23.40	23.40	26.90	63.6	64.1	24.9	64.1	0.251	11.400	0.239	11.400
2D1H16R130.BWP	1	16	130	21.00	19.10	23.30	23.30	27.50	61.4	62.3	61.3	62.3	0.065	3.660	0.068	3.660
R2D1H16R95.BWP	1	16	95	19.80	20.60	24.30	24.30	28.00	63.0	63.3	62.6	63.3	0.061	3.020	0.053	3.020
2D1H12R125.BWP	1	12	125	14.90	22.50	20.50	22.50	28.60	32.6	80.1	32.4	80.1	1.110	47.100	0.979	47.100
R2D1H12R70.BWP	1	12	70	13.00	24.10	20.50	24.10	28.60	2.0	84.8	31.5	84.8	0.247	10.500	0.218	10.500
2D1H12R120.BWP	1	12	120	13.30	23.10	25.00	25.00	28.80	33.8	83.1	33.3	83.1	0.823	30.600	0.703	30.600
R2D1H12R75.BWP	1	12	75	12.90	25.70	20.50	25.70	28.80	2.0	80.4	24.1	80.4	1.060	44.900	0.960	44.900
2D1H12R115.BWP	1	12	115	14.40	23.30	23.80	23.80	30.50	35.0	78.5	34.4	78.5	3.550	98.100	3.370	98.100
6R2D1H8R45.BWP	1	8	45	12.80	14.70	30.30	30.30	30.50	2.0	2.9	27.4	27.4	0.020	1.030	0.014	1.030
R2D1H16R55.BWP	1	16	55	19.50	18.60	26.10	26.10	30.70	58.9	68.5	57.3	68.5	0.129	4.870	0.130	4.870
R2D1H16R60.BWP	1	16	60	26.60	26.20	22.00	26.60	31.10	64.5	65.1	35.3	65.1	0.198	9.600	0.186	9.600
2D1H12R105.BWP	1	12	105	13.00	23.40	25.70	25.70	31.50	37.0	85.4	20.1	85.4	0.261	11.500	0.239	11.500
2D1H12R110.BWP	1	12	110	14.10	23.00	26.20	26.20	31.90	36.1	81.6	35.5	81.6	1.050	43.200	0.948	43.200
2D1H12R130.BWP	1	12	130	13.30	23.40	26.10	26.10	32.80	37.6	84.3	22.9	84.3	0.247	11.100	0.224	11.100
R2D1H12R65.BWP	1	12	65	20.70	22.50	26.40	26.40	32.90	32.9	78.5	32.3	78.5	0.614	26.900	0.551	26.900
R2D1H16R70.BWP	1	16	70	20.20	18.40	29.10	29.10	33.10	59.4	60.0	27.1	60.0	0.063	4.020	0.056	4.020
R2D1H8R100.BWP	1	8	100	13.90	14.50	31.80	31.80	33.10	30.3	129.0	30.0	129.0	0.024	1.390	0.023	1.390
R2D1H8R105.BWP	1	8	105	15.00	13.90	31.80	31.80	33.10	29.1	124.0	29.1	124.0	0.008	0.602	0.010	0.602
R2D1H8R110.BWP	1	8	110	14.60	14.30	31.80	31.80	33.10	28.0	129.0	28.0	128.0	0.035	2.090	0.031	2.090
R2D1H8R115.BWP	1	8	115	15.30	13.40	31.90	31.90	33.10	34.4	130.0	26.9	130.0	0.133	13.700	0.136	13.700
R2D1H8R120.BWP	1	8	120	14.40	13.50	31.80	31.80	33.10	32.9	125.0	32.5	125.0	0.029	1.140	0.021	1.140
R2D1H8R130.BWP	1	8	130	14.20	13.80	31.80	31.80	33.10	30.8	130.0	30.6	130.0	0.007	0.507	0.009	0.507
6R2D1H8R80.BWP	1	8	80	13.90	16.10	31.70	31.70	33.10	35.8	126.0	26.9	126.0	0.022	2.020	0.027	2.020
6R2D1H8R85.BWP	1	8	85	13.90	16.30	31.80	31.80	33.10	34.4	129.0	33.5	129.0	0.140	5.050	0.122	5.050

Figure 10. Signature hole analysis for the blasthole on 15 no. RPL Site of Prism Cement Limestone Mine.

11. Human response to blasting

The tolerance and reactions of human beings to vibrations are important when standards are based on annoyance, interference, work proficiency and health. Human beings notice and react to blast induced vibrations at levels that are lower than the damage thresholds.

It is impossible to establish a vibration level where nobody will complain. There are always some persons in a population who will complain no matter how small the disturbance is. Several researchers recognized that the duration of the vibration was critical. Most evident was that a higher level could be tolerated if the event was of short duration. Consequently, steady state vibration data could not be realistically applied to blasting except for events that exceed several seconds duration.

12. Results and discussions

The maximum vibration recorded from the production blasts in terms of peak particle velocity (PPV) was 31.0 mm/s at 50 m on the ground surface behind the blasting face. The associated dominant peak frequency was 32.0 Hz. This magnitude of vibration was due to detonation of 710 kg of explosives in 28 holes drilled in three rows and fired with maximum charge weight per delay of 50 kg. The PPV recorded at 100 m from the same blast was 6.66 mm/s with dominant peak frequency of 15.0 Hz. Fast attenuation of ground vibration is recorded.

The vibrations recorded in the periphery of the mine were of low amplitude and short duration. The persistence of vibration was in most of the cases less than 1 second. A few recorded blast waveforms at different locations are given in the Annexure which indicates low amplitude and short duration blast events. The existing practice of blasting will not cause any damage to the houses and structures in the periphery of the mine.

The signature hole blast was conducted and ground vibration was recorded at a distance of 50 and 100 m. The ground vibration recorded at 50 m was 33.9 mm/s with dominant peak frequency of 30.3 Hz. The signature hole was of 5 m and charged with the 30 kg of explosive. Ground vibration recorded at 100 m was 22.1 mm/s with dominant frequency of 45.5 Hz. The analyses revealed that very short delay times between the holes and very long delay intervals between the rows should be avoided. The analyses further concluded that the mean time needed to start the movement of rock face is 6.4-7.5 ms/m of effective burden. The delay interval between the successive rows should be 13.5-28.5 ms/m of effective burden.

The dominant peak frequencies of vibrations recorded were in the range of 11.4 to 129 Hz. The FFT analyses of frequency of vibration revealed that the concentration of vibration energy is in the range of 13.3-40.3 Hz. Based on DGMS circular; the safe limit of vibration (PPV) for the houses of surrounding villages is thus, 10 mm/s. The maximum explosives to be fired in a delay for safety of residential houses at various distances from the blasting site

may be computed from the Equation 1. For ready references, the maximum permissible explosive weight per delay to be detonated in blast round has been computed and is Annexured as Table A3. The predicated PPV levels at various distances by detonation of explosives weight per delay of 10, 20, 30 and 50 kg are presented in Table A4.

The maximum air over-pressure recorded was 137.8 dB(L) at 100 m due to the blast conducted at 15 No. Goyal Face on 26.12.2016 by detonation of 1125 kg of explosives in 45 holes. The blasts initiated with Nonel initiation system and Unitronic electronic initiation system generate significantly lower level of air over-pressure compared to detonating fuse initiation system. There was no ejection of flyrock in any of the blasts.

The recorded vibration and air over-pressure data and subsequent analyses revealed that blasting might be performed at 50 m from the nearest house of the village with explosives weight per delay of 12.2 kg. The blast designs have been recommended for blasting operations to be conducted at 50 m and beyond from the nearest house of the concern villages or other structures. The recommended blast designs are given as Figures A1-A2. The recommended explosive weights per delay for various distances of the concern up to 300 m are computed and are presented in Table A3. The predicted peak particle velocities levels for detonation of various charge weight per delay are given in Table A4.

There were no ejections of flyrocks in any of the blast. The experimented blast designs ensured that there were no any ejections of flyrocks, although for more safety, blasting mates with sand bags were used for controlling the flyrocks.

13. Conclusions and recommendations

- Maximum vibration recorded from the production blast was 31.0 mm/s with associated dominant peak frequency of 32.0 Hz at 50 m from blasting site. The explosives weight per delay was 50.8 kg. The PPV recorded at 100 m from the same blast was 6.66 mm/s with dominant peak frequency of 15.0 Hz. Fast attenuation of vibration were encountered.

- The maximum air over-pressure recorded was 137.8 dB(L) at 100 m due to the blast conducted at 15 No. Goyal Face on 26.12.2016. In this blast, explosives detonated in a blasting round and explosives weight per delay were 1125 kg and 75 kg respectively. The Electronic initiation system and Nonel initiation system reduces the air over-pressure to a greater extent and improves the blasting performance too. There was no ejection of flyrocks in any of the blast.

- All the recorded data (blast vibrations, air overpressures and flyrocks) were well within the safe limit at the houses/structures concerned. The dominant peak frequencies of ground vibrations were in the range of 11.4 to 129 Hz. FFT analysis of blast vibration frequencies confirmed that concentration of frequencies is in band of 13.3-40.3 Hz. So, the safe level of vibration has been taken as 10 mm/s for the safety of houses/structures of the surrounding villages as per DGMS standard.

- Propagation equation for the prediction of blast vibration has been established and is given as Equation 1. The permissible explosive weight per delay may be computed from the Equation to contain vibration within safe limits for distances of houses/structures concerned. For convenience, the recommended explosives weight per delay has been computed and is given in Table A3.

- The delay interval between the holes in a row should be 17 ms whereas between the rows, it should be 65 ms or more depending upon the number of rows and effective burden. If the numbers of rows are more than two, the delay interval between rows should be increased by 15% in successive rows.

- It is recommended that the existing Nonel initiation system should be continued in the blasting operations and Electronic initiation systems should be practiced on the benches near to the structures for more precise and accurate delay design. The sub-grade drilling should be 0.3 to 0.5 m for a blasthole depth of 6 to 7 m and should be initiated from the bottom of the hole.

- It is advisable to use blasting mate with sand bags in sensitive area to ensure any non-ejection of flyrocks. For this Nonel as well as electronic system may be used as an initiation system.

- The recommended blast designs should be followed for day-to-day blasting operations for safe and efficient blasting operations. The blast designs given in Annexure as Figures A1-A2, will ensure the safety of the houses/structures, life of human beings and other property in the periphery of the mine.

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Shri Binod Giri,	Asst. Manager
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Shri S. Singh,	Field Surveyor

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Table A1. Summary of blast performed during the period of study at Prism Cement Limestone mine, Prism Cement Limited, Satna (M.P.).

S. No.	Date of Blast	Location of Blast	No. of holes	Hole. dia. [mm]	Hole depth [m]	Burden × Spacing [m]	Top Stemming [m]	Avg. explosive Per hole [kg]	Total explosive Weight [kg]	Remarks
1.	21.12.16	15 No. Goyal Face	30	115	3	3×3.5	2	5.6	165 (Solargel Cartridge & Solar Prime Booster)	❖ Precaution was taken with blasting mate placement to prevent fly rock ejection. ❖ Boulder formation was there. ❖ No ejection of flyrock.
2.	21.12.16	7050 RIL Face	34	115	6	3×3.5	1.6	30.5	1037 (Solargel Cartridge & Solar Prime Booster)	❖ No ejection of flyrock ❖ Nonel (TLD – 17 ms, 42 ms, DTH – 450 ms) ❖ Good fragmentation
3.	22.12.16	15 No. Goyal Fcae	20	115	4.5	3×3.5	3	22	440 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ No ejection of flyrock ❖ Good fragmentation ❖ Unitronic (Orica)
4.	23.12.16	15 No. RPL Site	01	115	5	Burden - 3 m	2.7	30	30 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ Very good movement towards free face. ❖ No fly rock ejection. ❖ Unitronic (Orica). ❖ VOD was measured.
5.	23.12.16	15 No. RPL Site	31	115	4-5	3×3.5	2.8 - 3	20-25	830 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ Very good movement towards free face. ❖ Excellent Fragmentation. ❖ No ejection of flyrock. ❖ Unitronic (Orica)
6.	23.12.16	20 No. Pit	66	115	5-6	3×4	3 - 3.5	25	1670 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ Chocked face. ❖ No ejection of flyrock. ❖ Unitronic
7.	23.12.16	New Pit 01 Hinauti	14	115	5.5-6	3×3.5	3.3 - 3.5	25-30	420 (Booster Primex and SME	❖ Chocked face. ❖ Free face was not available.

									explosives of M/s IEPL Orica)	❖ No ejection of flyrock.
8.	24.12.16	15 No. RPL Site	40	115	6	3×3.5	3.5	35	1405 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ VOD Measurement. ❖ No ejection of flyrock. ❖ Unitronic
9.	24.12.16	15 No. Goyal Face	20	115	5.5	3×3.5	3.6	22	440 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ No ejection of flyrock. ❖ Good fragmentation ❖ Unitronic
10.	24.12.16	15 No. Goyal Face	21	115	2.5	3×3.5	1.7	5.4	113 (Solargel Cartridge & Solar Prime Booster)	❖ No ejection of flyrock ❖ Good fragmentation ❖ Unitronic
11.	24.12.16	15 No. Goyal Face	30	115	3.5-4.5	3×3.5	2.5 - 3	14.7 - 20	603 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ Chocked face ❖ No ejection of flyrock ❖ Good fragmentation ❖ Nonel (TLD – 17 ms, 42 ms, DTH – 450 ms)
12.	25.12.16	15 No. RPL	84	115	6	3×3.5	3.5	32	2678 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ No ejection of flyrock ❖ Good fragmentation ❖ Unitronic
13.	26.12.16	15 No. Goyal Face	28	115	5	3×4	3	25	710 (Booster Primex and SME explosives of M/s IEPL Orica)	❖ No ejection of flyrock ❖ Good fragmentation ❖ Unitronic
14.	26.12.16	15 No. Goyal Face	21	115	3	3×4	2.6	2.78	58.4 (Solar Prime Booster)	❖ No ejection of flyrock ❖ Nonel (TLD – 17 ms, 42 ms, DTH – 450 ms)
15.	26.12.16	15 No. Goyal Face	45	115	6	2.5×3	2.4	25	1125 (Solargel Cartridge & Solar Prime Booster)	❖ No ejection of flyrock ❖ Excellent fragmentation ❖ Nonel (TLD – 17 ms, 42 ms, DTH – 450 ms)

Table A2. Blast induced vibration monitored at different location in and around Prism Cement Limestone mine, Prism Cement Limited, (M.P.)

Blast No.	Location of Blast	Total Explosives detonated in round [Kg]	Maximum Explosives weight per delay [Kg]	Location of measuring instruments	Distance of measuring point from blasting face [m]	Peck particle velocity (PPV) [mm/s]	Dominant peck frequency [Hz]	Air over-pressure/noise [dB (L)]
1.	15 No. Goyal Face	165	11 (2×5.5)	➢ Back Side From Blast Face	50	22.7	79.6	130
				➢ Back Side From Blast Face	100	5.54	26.1	122.5
				➢ Back Side From Blast Face	150	2.35	32.9	122.3
				➢ Back Side From Blast Face	200	1.88	26.9	121.5
2.	7050 RIL Face	1037	61 (2×30.5)	➢ Back Side From Blast Face	50	18.7	33.8	129.8
				➢ Back Side From Blast Face	100	13.9	21.3	123.3
				➢ Back Side From Blast Face	125	10.0	13.3	121.2
				➢ Back Side From Blast Face	150	4.95	12.1	122.9
				➢ Back Side From Blast Face	200	4.33	12.3	121.3
3.	15 No. Goyal Fcae	440	22	➢ Back Side From Blast Face	50	21.0	44	136.1
				➢ Back Side From Blast Face	100	6.75	47.9	119.8
				➢ Back Side From Blast Face	150	3.88	40.3	118.8
				➢ Back Side From Blast Face	200	2.63	47.3	112.6
				➢ Back Side From Blast Face	250	2.40	12.8	116.9
4.	15 No. RPL Site	30	30	➢ Back Side From Blast Face	50	33.9	30.3	127.8
				➢ Back Side From Blast Face	100	22.1	45.5	125.8
5.	15 No. RPL Site	830	50 (2×25)	➢ Back Side From Blast Face	50	22.1	45.5	125.8
				➢ Back Side From Blast Face	100	7.78	21.5	122.9
				➢ Back Side From Blast Face	150	3.49	28	115.7
				➢ Back Side From Blast Face	200	2.55	21	115.9
6.	20 No. Pit	1670	75 (3×25)	➢ Back Side From Blast Face	50	30.4	112	131.5
				➢ Back Side From Blast Face	100	27.1	21.6	122.2
				➢ Back Side From Blast Face	150	25.6	18.5	122.6
				➢ Back Side From Blast Face	200	5.24	24.9	119.1

7.	New Pit 01. Hinauti	420	30	➢ Left Side From Blast Face	50	20.4	22.5	135.1
				➢ Back Side From Blast Face	75	10.7	18.5	132.5
				➢ Left Side From Blast Face	100	5.24	22	134.8
				➢ Left Side From Blast Face (village Shankarji temple)	200	5.29	18.5	122.6
8.	15 No. RPL Site	1405	70 (2×35)	➢ Left Side From Blast Face	50	24.4	52.9	127.8
				➢ Back Side From Blast Face	60	17.5	30.4	128.8
				➢ Back Side From Blast Face	100	11.3	15.9	127.8
				➢ Left Side From Blast Face	100	8.77	17.8	123.9
				➢ Back Side From Blast Face	150	6.89	15.9	128
9.	15 No. Goyal Face	440	20	➢ Back Side From Blast Face	100	12.5	27.4	122.3
				➢ Right Side From Blast Face	100	6.14	35.6	133.4
				➢ Back Side From Blast Face	150	5.62	36.8	120
				➢ Back Side From Blast Face	200	4.07	11.4	116.3
10.	15 No. Goyal Face	113	21	➢ Right Side From Blast Face	150	2.83	24.6	125
				➢ Back Side From Blast Face	200	1.08	28.8	110.2
11.	15 No. Goyal Face	603	44 (2×22)	➢ Left Side From Blast Face	50	17.1	24.5	131.4
				➢ Back Side From Blast Face	100	8.10	18	130.6
				➢ House of Sri Umesh Prasad	150	6.35	16.8	128.9
				➢ Structure height (roof-3m)	150	15.1	21.3	-
				➢ Back Side From Blast Face	200	5.65	17.5	126.5
12.	15 No. RPL	2678	95 (3×31.6)	➢ Back Side From Blast Face	50	17.0	129	131
				➢ Back Side From Blast Face	100	16.3	58.5	121.9
				➢ Back Side From Blast Face	150	10.7	129	121.8
				➢ Back Side From Blast Face	200	5.03	18.0	123.1
				➢ Back Side From Blast Face	250	4.56	18.6	123.5
13.	15 No. Goyal Face	710	50 (2×25)	➢ Left Side From Blast Face	50	31.0	32	130.1
				➢ Left Side From Blast Face	100	6.66	15	123.9
				➢ Right Side From Blast Face	110	3.84	27.5	126.8
				➢ Right Side From Blast Face	140	3.59	27.1	123.6

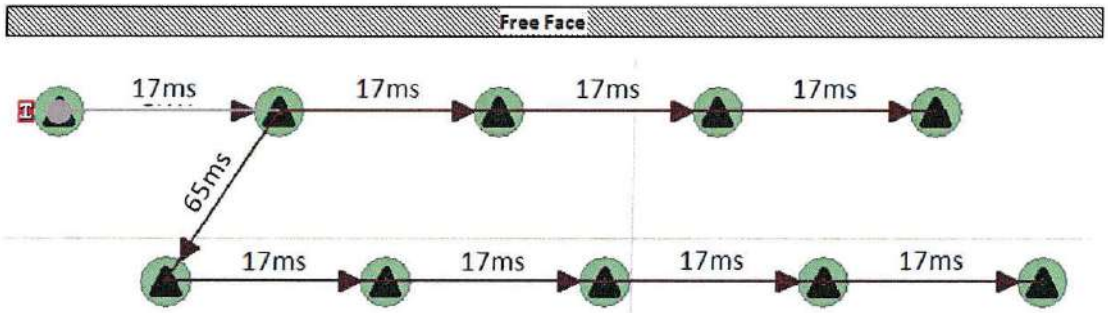
14.	15 No. Goyal Face	58.38	2.78	➢ Back Side From Blast Face	70	2.83	21.8	121.6
				➢ Back Side From Blast Face	100	2.71	20.6	116.1
				➢ Front Side From Blast Face	140	1.84	28.8	119.3
				➢ Front Side From Blast Face	200	0.73	21.3	116.4
15.	15 No. Goyal Face	1125	75 (3×25)	➢ Right Side From Blast Face	100	11.6	34.8	137.8
				➢ Right Side From Blast Face	120	11.0	69.1	132.7
				➢ Right Side From Blast Face	130	9.0	22.8	132.2

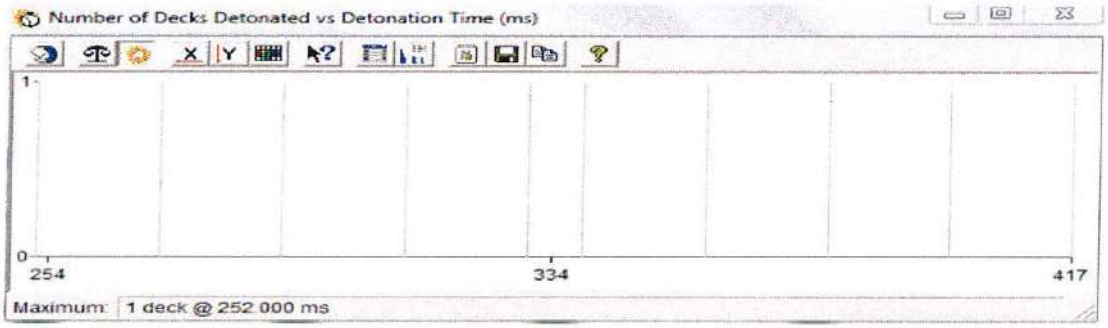
Table A3. Recommended explosives weight per delay to be detonated in a blasting round for the safety of houses/structures taking 10 mm/s (for the houses/structures not belonging to the Owner) and 15 mm/s (for the houses/structures belonging to the Owner) as safe limit of peak particle velocity for Prism Cement Limestone mine, Prism Cement Limited, Satna, (M. P).

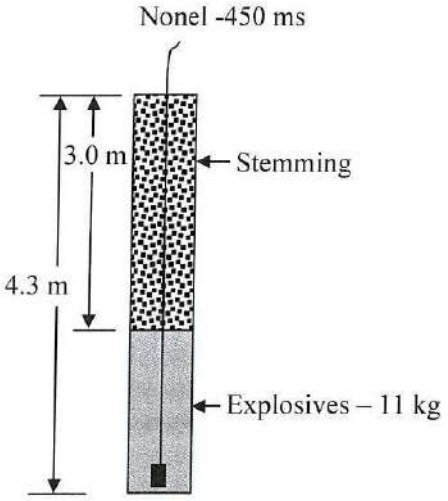
Distance of structures from the blast face [m]	Maximum explosive weight to be detonated in a delay [kg]	
	10 mm/s	15 mm/s
50	12	19
75	27	42
100	49	75
125	76	118
150	110	170
175	149	231
200	195	302
225	247	382
250	305	471
275	369	570
300	439	678

Table A4. Predicted peak particle velocity level at various distance due to detonation of explosive weight per delay of 10, 20, 30 & 50 kg at Prism Cement Limestone mine, Prism Cement Limited, Satna, (M.P).

Distance of structures from the blast face [m]	Predicted peak particle velocity levels [mm/s]			
	10 kg	***20 kg***	***30 kg***	***50 kg***
50	9.9	13.2	16.6	22.1
75	6.3	8.4	10.5	14.0
100	4.6	6.1	7.6	10.1
125	3.5	4.7	5.9	7.9
150	2.9	3.8	4.8	6.4
175	2.4	3.2	4.1	5.4
200	2.1	2.8	3.5	4.6
225	1.8	2.4	3.1	4.1
250	1.6	2.2	2.7	3.6
275	1.5	1.9	2.4	3.2
300	1.3	1.8	2.2	2.9



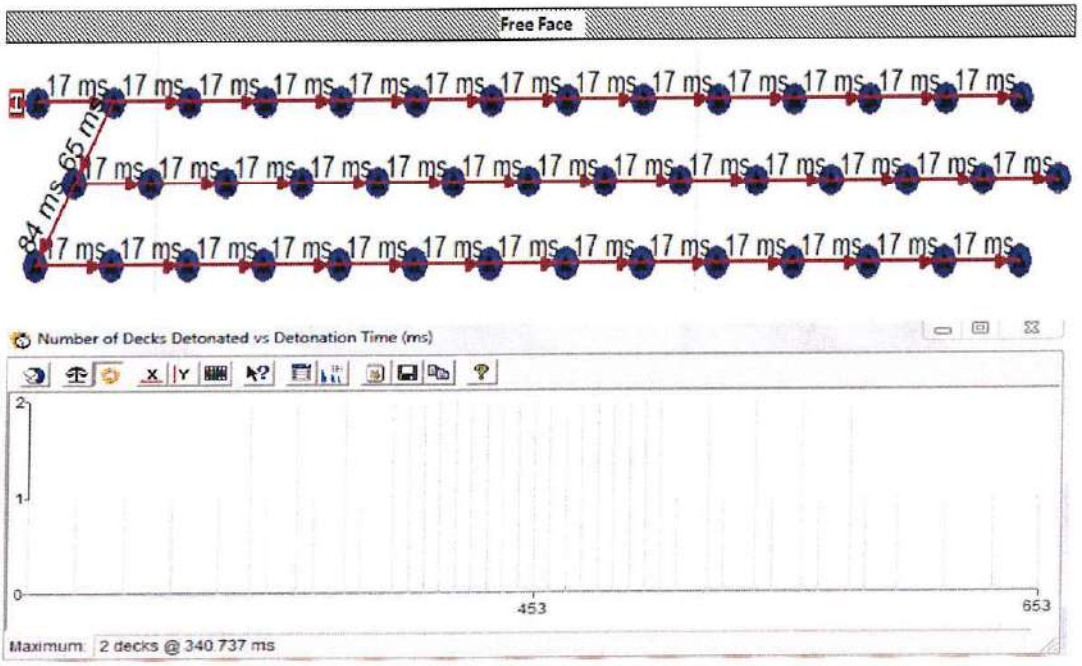


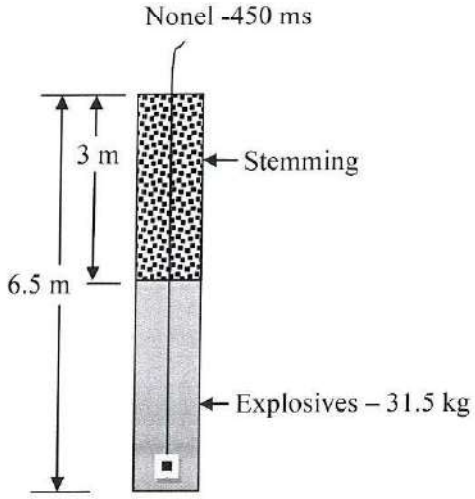


BLAST GEOMETRY

Hole diameter	: 115 mm
Hole depth	: 4.3 m
No. of holes	: 10
Bench height	: 4 m
Burden	: 2 m
Spacing	: 2.5 m
Explosive per hole	: 11 kg (4×2.78kg)
Initiation system	: DTH-450 ms TLD – 17 ms & 65 ms
Explosives	: Cartridge/SME Bulk
Charge factor	: 0.55 kg/m^3

Figure A1. Recommended blast design and charging pattern of holes for 4 m benches of Prism Cement Limestone mine when blasting is to be conducted at or beyond 50m.





BLAST GEOMETRY

Hole diameter	: 115 mm
Hole depth	: 6.5 m
No. of holes	: 42
Bench height	: 6.0 m
Burden	: 3.0 m
Spacing	: 3.5 m
Explosive per hole	: 31.5 kg
Initiation system	: DTH-450 ms TLD – 17 ms, 42ms & 65 ms
Explosives	: Cartridge/Bulk-SME
Charge factor	: 0.5 kg/m^3

Figure A2. Recommended blast design and charging pattern of holes for 6.0 m benches of Prism Cement Limestone mine when blasting is to be conducted at or beyond 100 m.

Instantel

Event Report

Date/Time	Tran at 11:28:03 December 21, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Location: On Ground Surface
Client: PRISM CEMENT LTD. STANA
User Name: REE Division, CSIR- CIMFR, Dhanbad
General:

Extended Notes

Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.

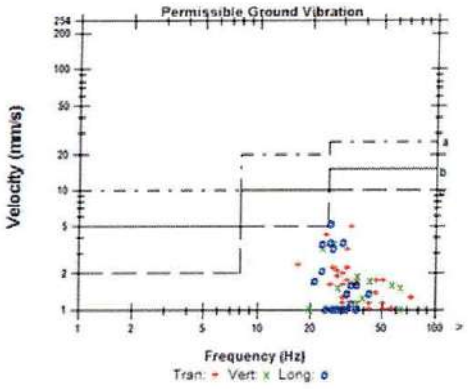
Microphone	Linear Weighting
PSPL	122.5 dB(L) at 0.859 sec
ZC Freq	7.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 504 mv)

	Tran	Vert	Long	
PPV	4.95	3.56	5.21	mm/s
ZC Freq	34	27	26	Hz
Time (Rel. to Trig)	0.682	0.637	0.663	sec
Peak Acceleration	0.166	0.0796	0.119	g
Peak Displacement	0.0223	0.0187	0.0307	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.2	Hz
Overswing Ratio	3.6	3.6	3.8	

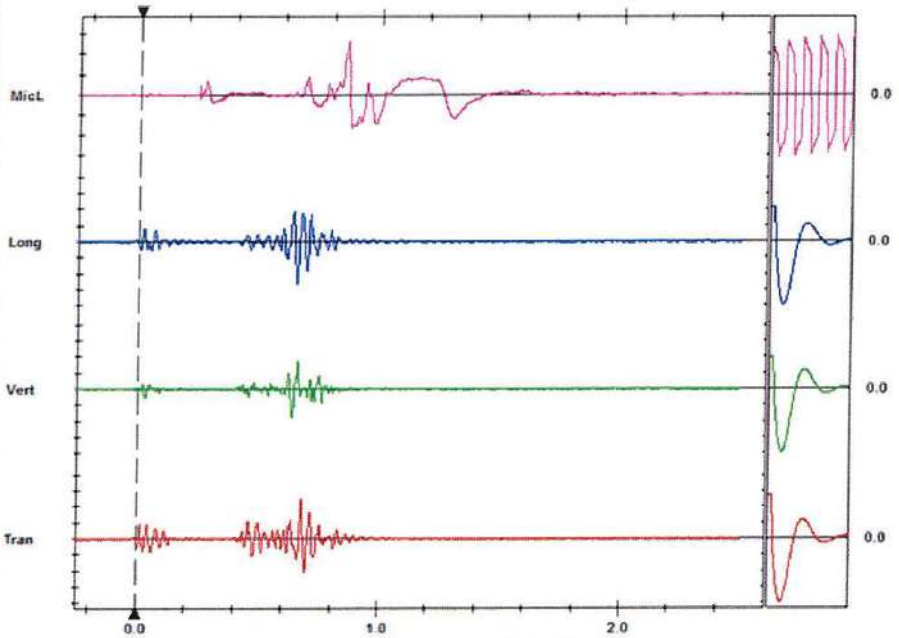
Peak Vector Sum 5.54 mm/s at 0.663 sec

Serial Number	BE20375 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	April 29, 2015 by CIMFR, Dhanbad
File Name	V375GOOY.IR0

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record

Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

Printed: March 19, 2017 (V 10.20 - 10.30)

Instantel

FFT Report

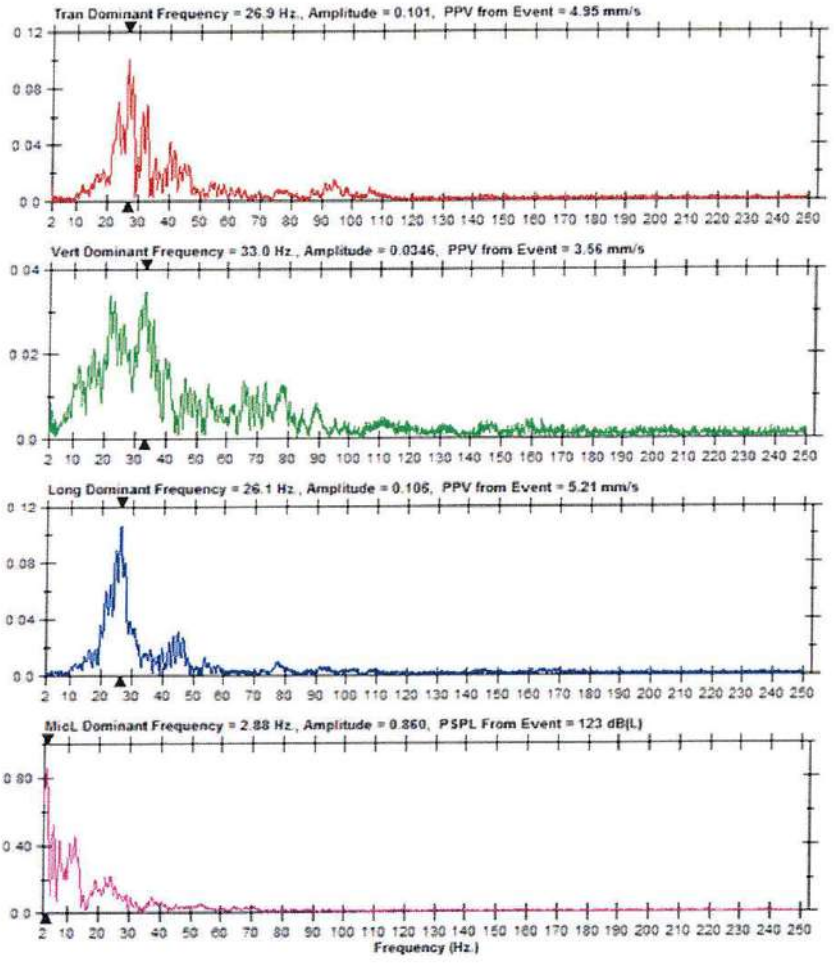
Date/Time	Tran at 11:28:03 December 21, 2016	**Serial Number**	BE20375 V 10.60-8.17 MiniMate Plus
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	April 29, 2015 by CIMFR, Dhanbad
Record Time	6.0 sec at 1024 sps	**File Name**	V375GOOY.IR0

Notes

Location: On Ground Surface
Client: PRISM CEMENT LTD. STANA
User Name: REE Division, CSIR- CIMFR, Dhanbad
General:

Extended Notes

Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Printed: March 19, 2017 (V 10.30 - 10.30)

Instantel

Event Report

Date/Time	Vert at 16:31:38 December 21, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	4.0 sec at 2048 sps
Job Number:	1
Notes	
Location:	On the ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE Division, CSIR-CIMFR,Dhanbad
General:	

Serial Number	BA13814 V.8.12-8.0 BlastMate III
Battery Level	6.1 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	0814GOPC.KQ0

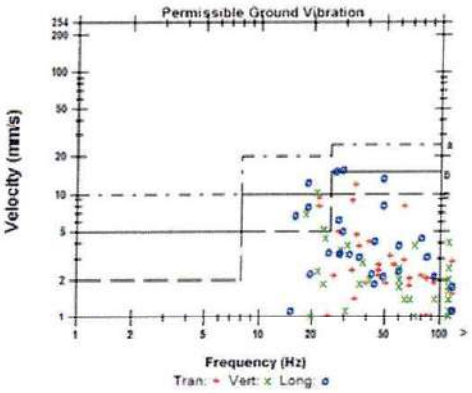
Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.

Microphone	Linear Weighting
PSPL	129.8 dB(L) at 0.266 sec
ZC Freq	7.3 Hz
Channel Test	Passed (Freq = 19.3 Hz Amp = 692 mv)

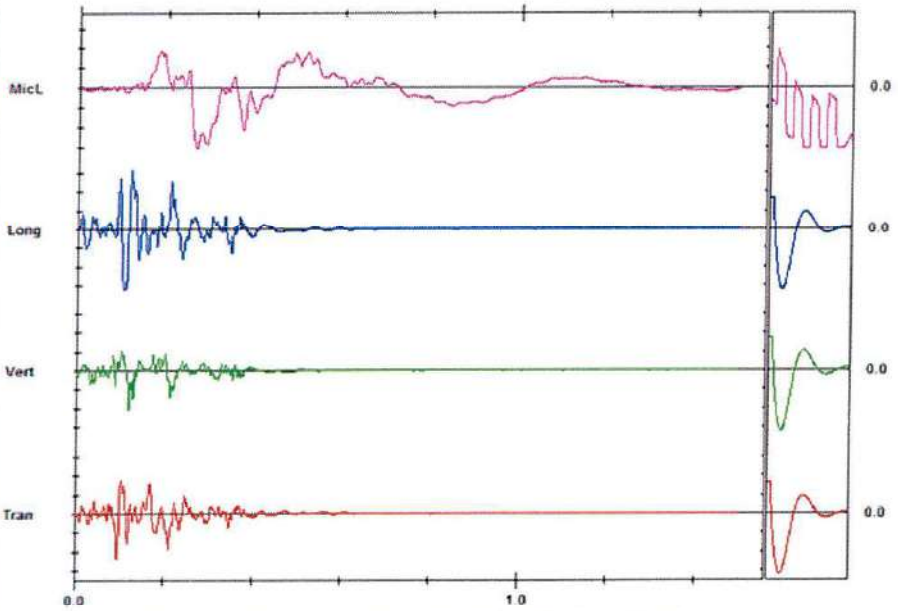
	Tran	Vert	Long	
PPV	11.8	10.3	16.0	mm/s
ZC Freq	34	21	29	Hz
Time (Rel. to Trig)	0.097	0.119	0.105	sec
Peak Acceleration	0.451	0.398	0.530	g
Peak Displacement	0.0497	0.0464	0.101	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.5	Hz
Overswing Ratio	3.7	3.3	3.7	

Peak Vector Sum 18.7 mm/s at 0.120 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 20.0 pa (L)/div Sensor Check

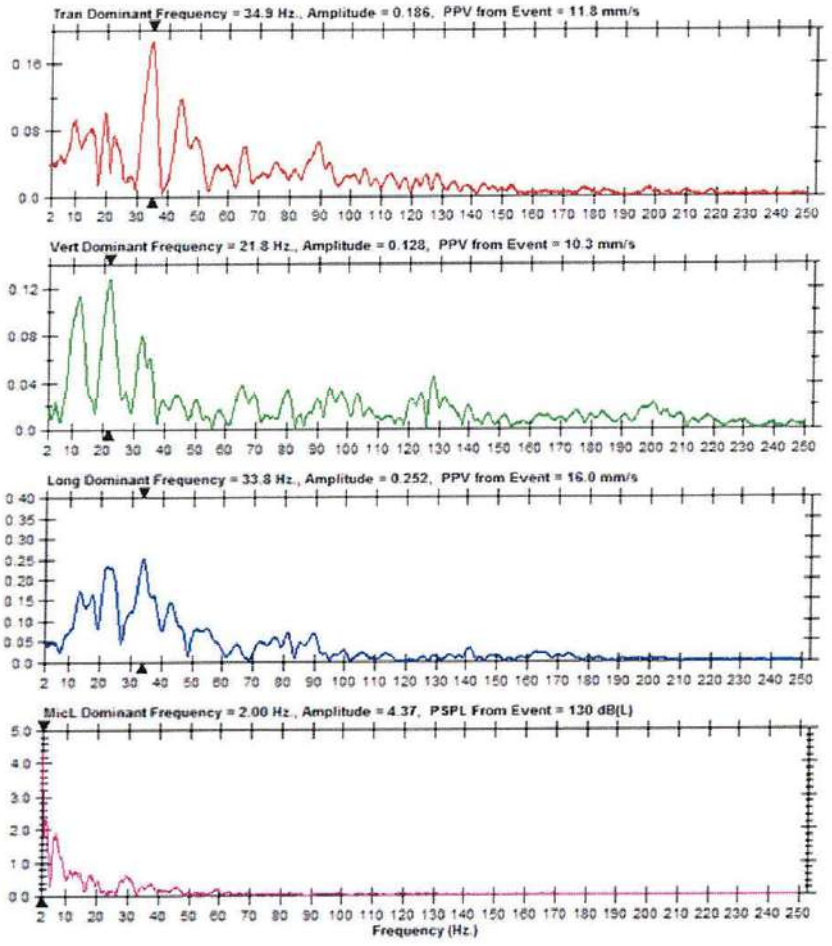
Instantel

FFT Report

Date/Time	Vert at 16:31:38 December 21, 2016	**Serial Number**	BA13814 V.8.12-8.0 BlastMate III
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.1 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	4.0 sec at 2048 sps	**File Name**	OS14GOPC.KQ0
Job Number	1		

Notes
Location: On the ground surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE Division, CSIR-CIMFR,Dhanbad
General:

Extended Notes
Blast vibration study at Menchi and Hinauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Vert at 16:31:40 December 21, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	6.0 sec at 1024 sps
Notes	
Location	On Ground Surface
Client	PRISM CEMENT LTD. STANA
User Name	REE Division, CSIR- CIMFR, Dhanbad
General	

Serial Number	BE20375 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	April 29, 2015 by CIMFR, Dhanbad
File Name	V375GOPC.KS0

Extended Notes

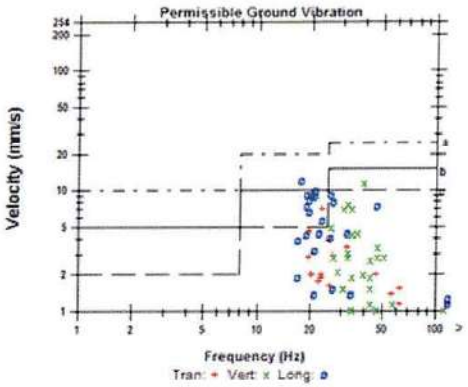
Blast vibration study at Mandhi and Hinauti Limestone Mines of Prism Cement Ltd

Microphone	Linear Weighting
PSPL	123.3 dB(L) at 0.365 sec
ZC Freq	6.7 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 526 mv)

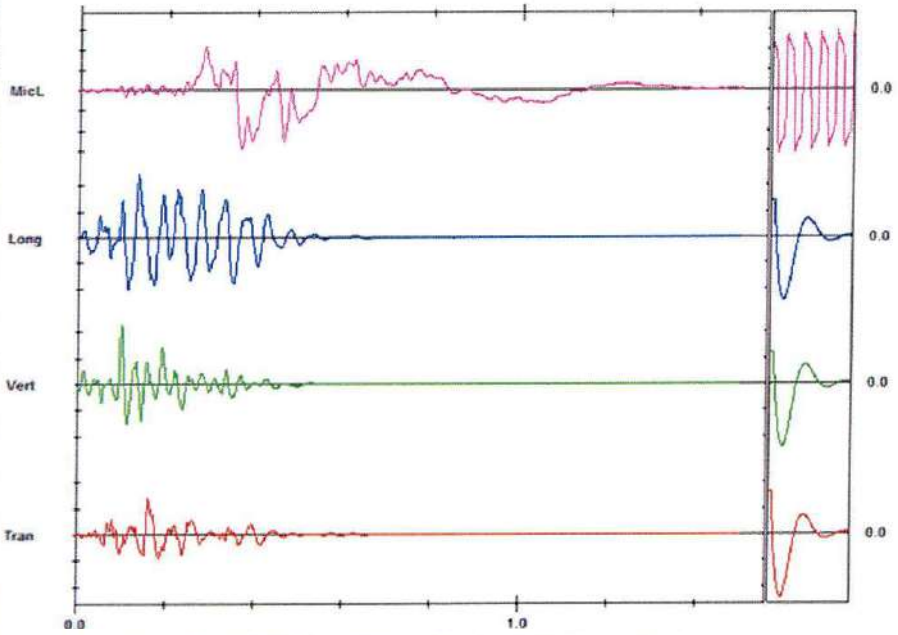
	Tran	Vert	Long	
PPV	7.11	11.4	12.2	mm/s
ZC Freq	23	39	18	Hz
Time (Rel. to Trig)	0.162	0.100	0.133	sec
Peak Acceleration	0.159	0.265	0.265	g
Peak Displacement	0.0432	0.0409	0.0841	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.6	7.3	Hz
Overswing Ratio	3.5	3.6	3.7	

Peak Vector Sum 13.9 mm/s at 0.099 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record

Time Scale: 0.20 sec/div **Amplitude Scale**: Geo: 5.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

Instantel

FFT Report

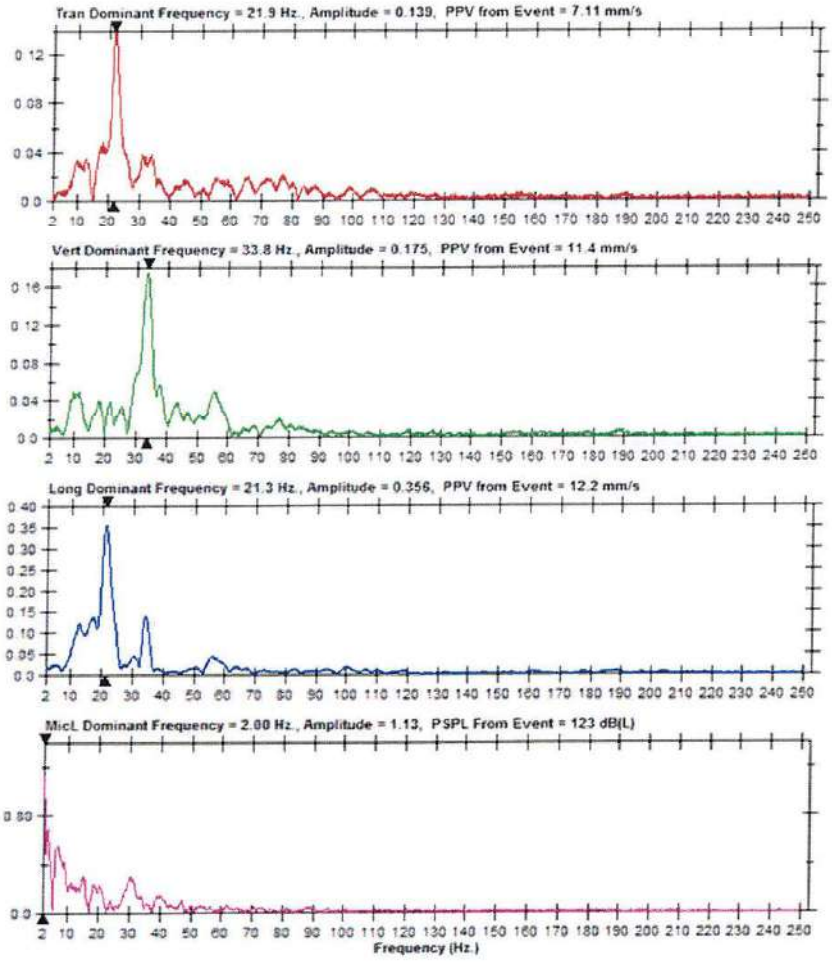
Date/Time	Vert at 16:31:40 December 21, 2016	**Serial Number**	BE20375 V 10.60-8.17 MiniMate Plus
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	April 29, 2015 by CIMFR, Dhanbad
Record Time	8.0 sec at 1024 sps	**File Name**	V375GOPC.KS0

Notes

Location: On Ground Surface
Client: PRISM CEMENT LTD. STANA
User Name: REE Division, CSIR- CIMFR, Dhanbad
General:

Extended Notes

Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Vert at 12:30:58 December 22, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	4.0 sec at 2048 sps
Job Number:	1
Notes	
Location	On the ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE Division, CSIR-CIMFR,Dhanbad
General:	

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd

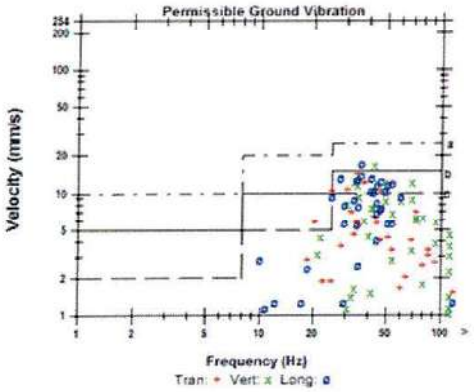
Microphone	Linear Weighting
PSPL	136.1 dB(L) at 0.290 sec
ZC Freq	3.7 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 700 mv)

	Tran	Vert	Long	
PPV	14.2	16.6	17.4	mm/s
ZC Freq	34	43	37	Hz
Time (Rel. to Trig)	0.212	0.293	0.206	sec
Peak Acceleration	0.530	0.583	0.583	g
Peak Displacement	0.0616	0.0554	0.0677	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.6	7.4	Hz
Overswing Ratio	3.6	3.3	3.7	

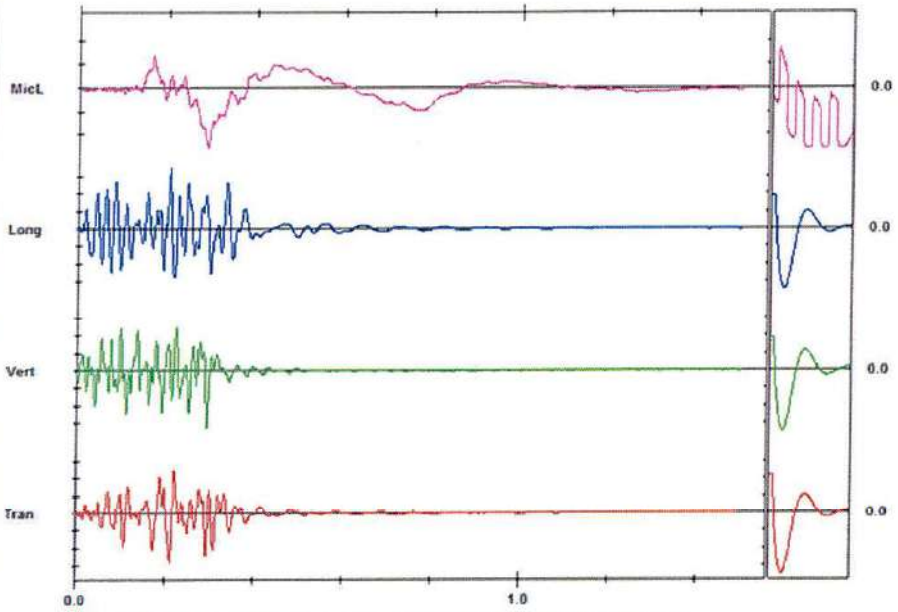
Peak Vector Sum 21.0 mm/s at 0.293 sec

Serial Number	BA13814 V 8.12-8.0 BlastMate III
Battery Level	6.1 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	O814GCQW.3M0

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 50.0 pa (L)/div Sensor Check

Instantel

FFT Report

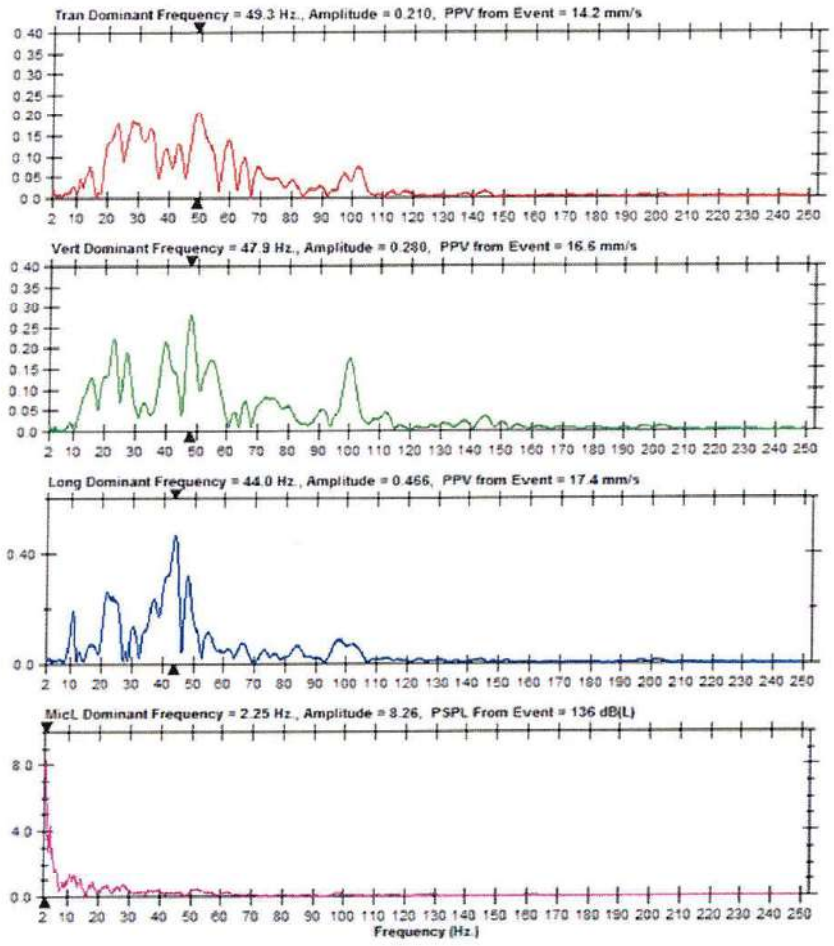
Date/Time	Vert at 12:30:58 December 22, 2016	**Serial Number**	BA13814 V 8.12-8.0 BlastMate III
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.1 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	4.0 sec at 2048 sps	**File Name**	O814GOQW.3M0
Job Number:	1		

Notes

Location	On the ground surface
Client	PRISM CEMENT LTD. SATNA
User Name	REE Division, CSIR-CIMFR,Dhanbad
General	

Extended Notes

Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.



Instantel

Event Report

Date/Time	Vert at 12:30:59 December 22, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	6.0 sec at 1024 sps
Notes	
Location:	On Ground Surface
Client:	PRISM CEMENT LTD. STANA
User Name:	REE Division, CSIR- CIMFR, Dhanbad
General:	

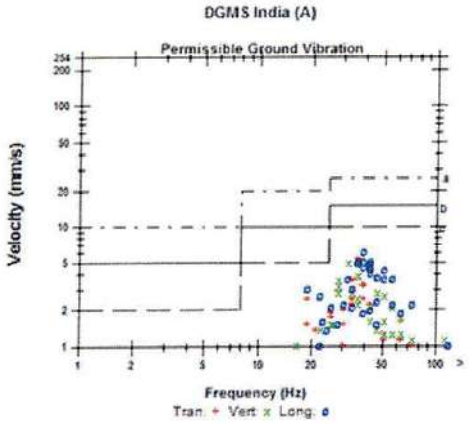
Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.

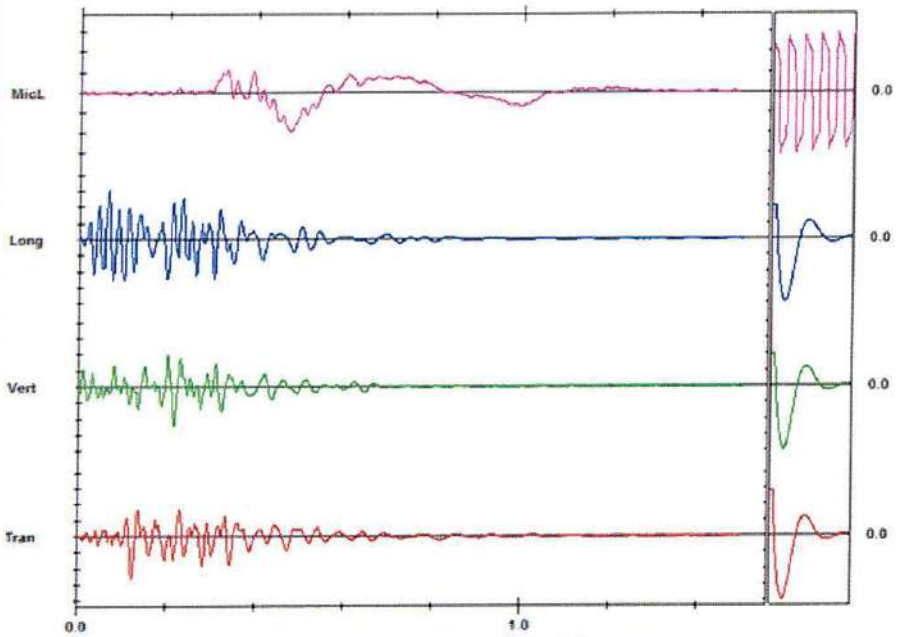
Microphone	Linear Weighting
PSPL	119.8 dB(L) at 0.473 sec
ZC Freq	3.8 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 477 mv)

	Tran	Vert	Long	
PPV	5.33	4.95	6.10	mm/s
ZC Freq	37	32	39	Hz
Time (Rel. to Trig)	0.124	0.217	0.065	sec
Peak Acceleration	0.119	0.106	0.199	g
Peak Displacement	0.0224	0.0205	0.0236	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.2	Hz
Overswing Ratio	3.6	3.6	3.8	

Peak Vector Sum 6.75 mm/s at 0.232 sec

Serial Number	BE20375 V 10.60-8.17 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	April 29, 2015 by CIMFR, Dhanbad
File Name	V375GOQW.3N0





Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

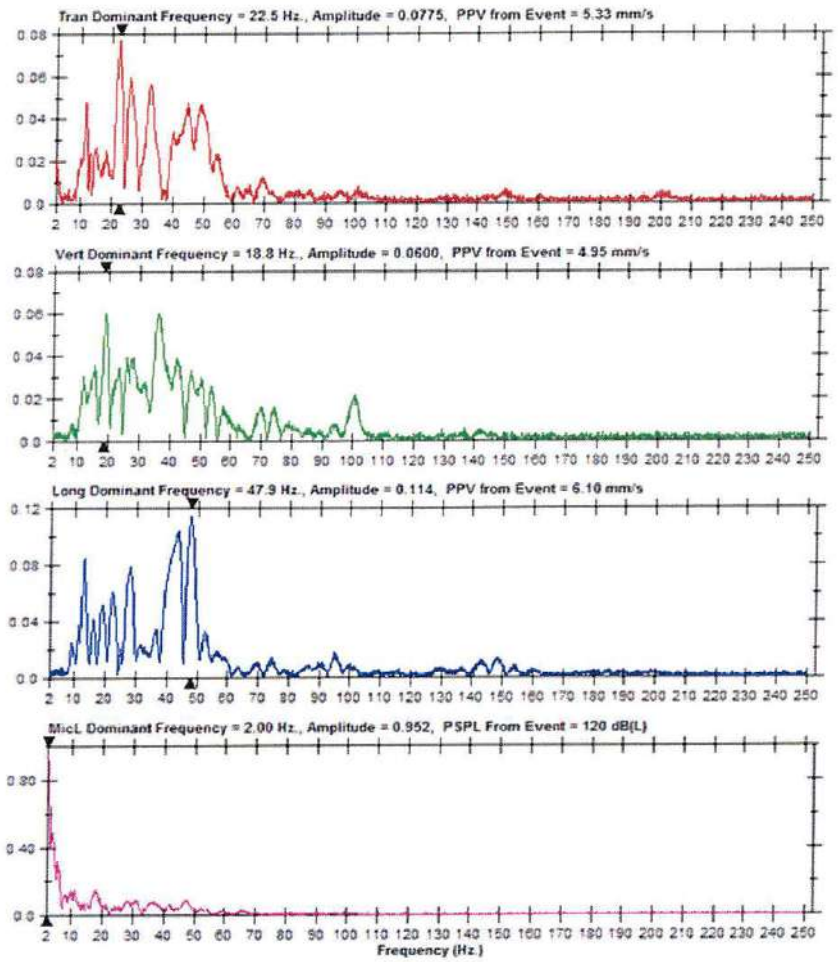
Instantel

FFT Report

Date/Time	Vert at 12:30:59 December 22, 2016	**Serial Number**	BE20375 V 10.60-8.17 MiniMate Plus
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	April 29, 2015 by CIMFR, Dhanbad
Record Time	6.0 sec at 1024 sps	**File Name**	V375GOQW.3N0

Notes
Location: On Ground Surface
Client: PRISM CEMENT LTD. STANA
User Name: REE Division, CSIR- CIMFR, Dhanbad
General:

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Vert at 10:14:09 December 23, 2016
Trigger Source	Geo: 0.508 mm/s
Range	Geo: 127 mm/s
Record Time	6.0 sec at 1024 sps
Notes	
Location:	On ground surface
Client:	PRISM CEMENT LTD. SATNA.
User Name:	REE, CSIR-CIMFR, Dhanbad
Converted:	December 23, 2016 20:27:06 (V10.30)

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd

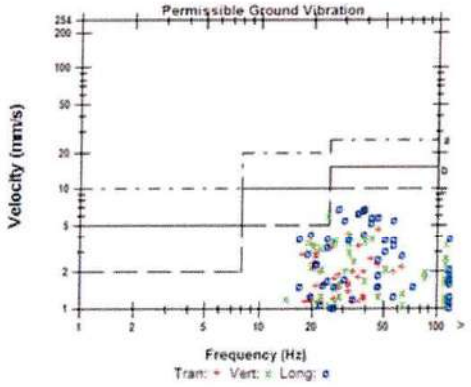
Microphone	Linear Weighting
PSPL	122.9 dB(L) at 4.534 sec
ZC Freq	3.0 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 477 mv)

	Tran	Vert	Long	
PPV	4.57	6.97	6.92	mm/s
ZC Freq	47	24	39	Hz
Time (Rel. to Trig)	4.178	4.189	4.130	sec
Peak Acceleration	0.225	0.239	0.278	g
Peak Displacement	0.0266	0.0335	0.0322	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.8	7.7	Hz
Overswing Ratio	3.5	3.4	3.6	

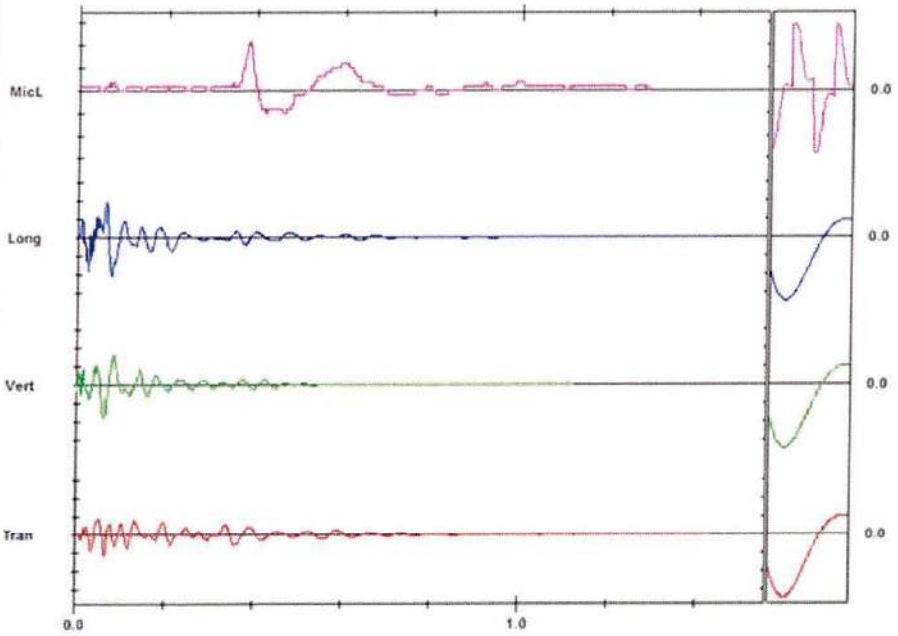
Peak Vector Sum 7.78 mm/s at 4.130 sec

Serial Number	4710 V.2.61 MiniMate
Battery Level	6.3 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	F710GOUF.3L0

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div Sensor Check

Printed: March 15, 2017 (V 10.50 - 10.50)

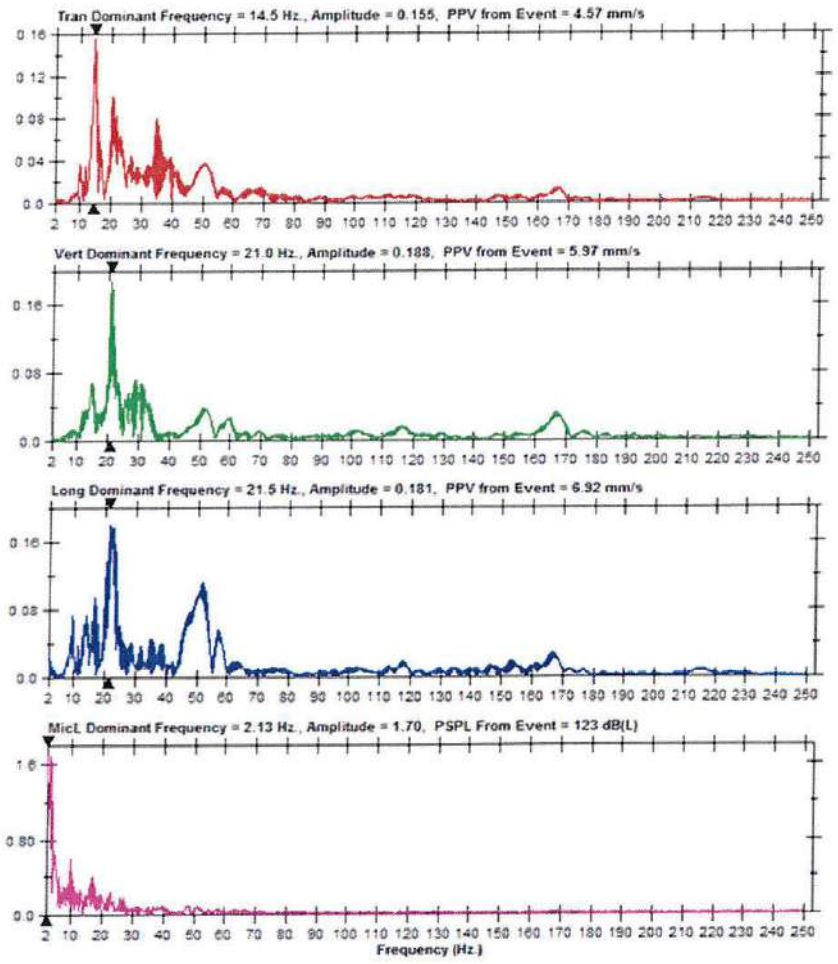
Instantel

FFT Report

Date/Time	Vert at 10:14:09 December 23, 2016	**Serial Number**	4710 V 2.61 MiniMate
Trigger Source	Geo: 0.508 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 127 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	6.0 sec at 1024 sps	**File Name**	F710GOUF.3L0

Notes
Location: On ground surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE, CSIR-CIMFR, Dhanbad
Converted: December 23, 2016 20:27:06 (V10.30)

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Vert at 16:41:31 December 23, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1
Notes	
Location	On ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE-Division, CSIR-CIMFR, Dhanbad
General:	

Serial Number	BE8183 V 10.30-8.17 MiniMate Plus-8
Battery Level	6.2 Volts
Unit Calibration	January 14, 2016 by CIMFR, Dhanbad
File Name	J183GOT2.D70

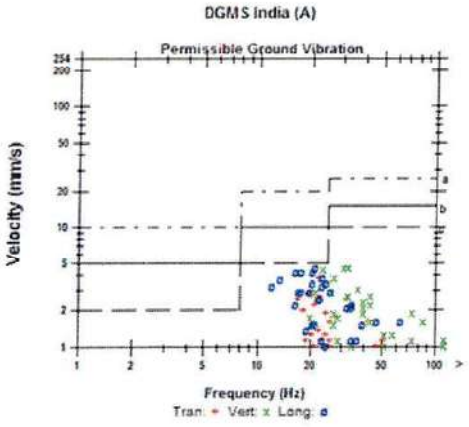
Extended Notes

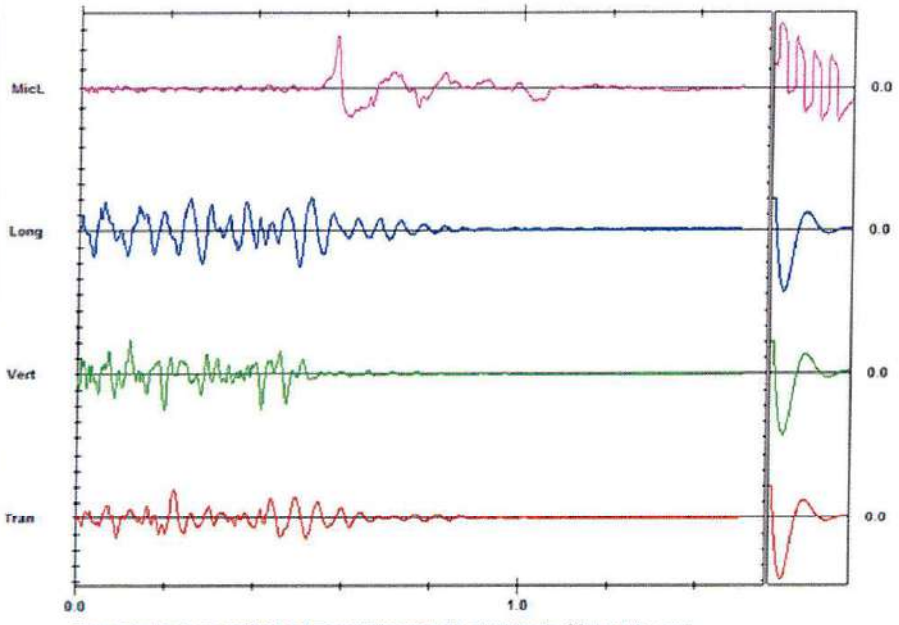
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.

Microphone	Linear Weighting
PSPL	122.6 dB(L) at 0.577 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 507 mv)

	Tran	Vert	Long	
PPV	3.81	4.57	4.57	mm/s
ZC Freq	22	32	21	Hz
Time (Rel. to Trig)	0.218	0.195	0.497	sec
Peak Acceleration	0.0663	0.133	0.106	g
Peak Displacement	0.0282	0.0233	0.0393	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	3.7	3.5	3.8	

Peak Vector Sum 5.24 mm/s at 0.497 sec





Time scale has been modified and may not represent the actual length of the event record

Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

Printed: March 19, 2017 (V 10.30 - 19.30)

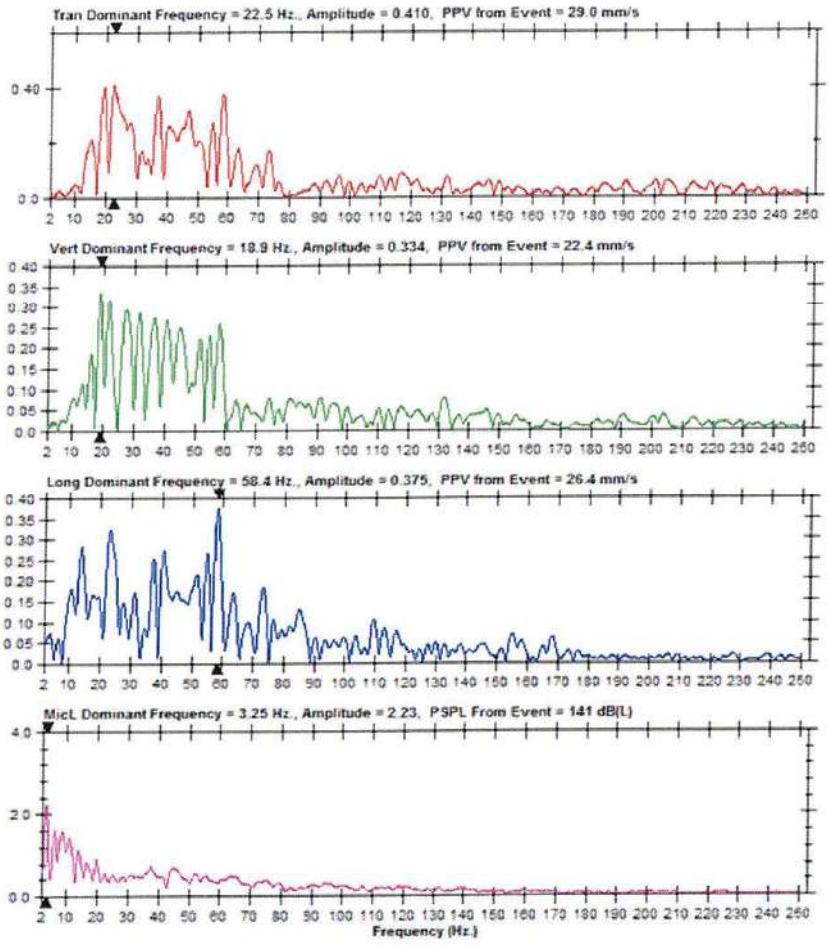
Instantel

FFT Report

Date/Time	Vert at 16:41:33 December 23, 2016	**Serial Number**	BA13814 V.8.12-8.0 BlastMate III
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.2 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	4.0 sec at 4096 sps	**File Name**	C814GOT2.D90
Job Number:	1		

Notes
Location: On the ground surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE Division, CSIR-CIMFR,Dhanbad
General:

Extended Notes
Blast vibration study at Mandhi and Hinauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Vert at 16:41:31 December 23, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1
Notes	
Location:	On ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE-Division, CSIR-CIMFR, Dhanbad
General:	

Serial Number	BE8183 V 10.30-8.17 MiniMate Plus/8
Battery Level	6.2 Volts
Unit Calibration	January 14, 2016 by CIMFR, Dhanbad
File Name	J183GOT2.D70

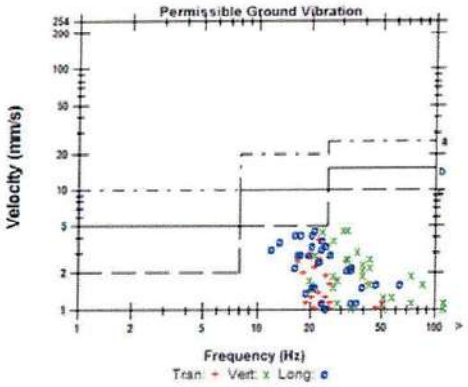
Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.

Microphone	Linear Weighting
PSPL	122.6 dB(L) at 0.577 sec
ZC Freq	9.7 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 507 mv)

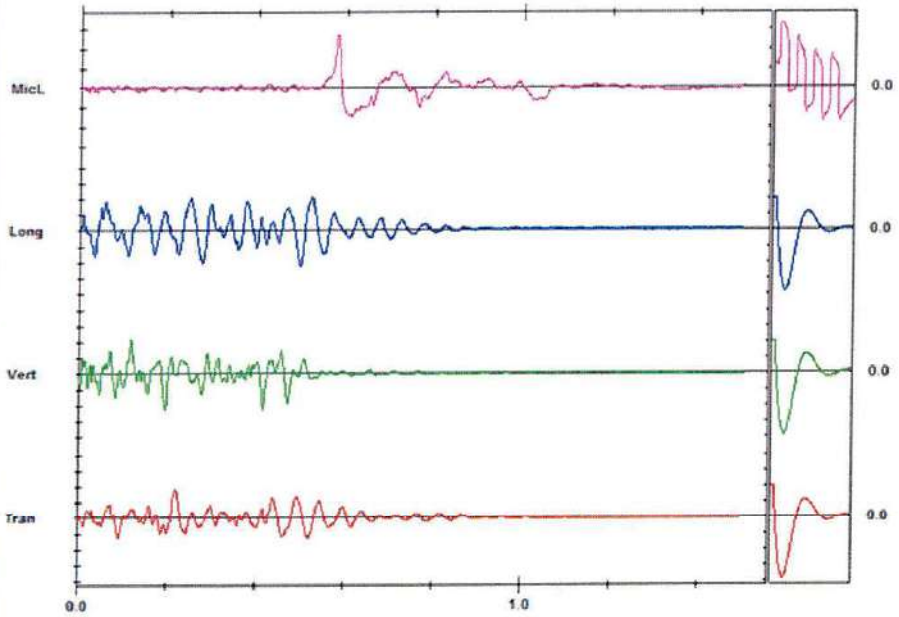
	Tran	Vert	Long	
PPV	3.81	4.57	4.57	mm/s
ZC Freq	22	32	21	Hz
Time (Rel. to Trig)	0.218	0.195	0.497	sec
Peak Acceleration	0.0663	0.133	0.106	g
Peak Displacement	0.0282	0.0233	0.0393	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	3.7	3.5	3.8	

Peak Vector Sum 5.24 mm/s at 0.497 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

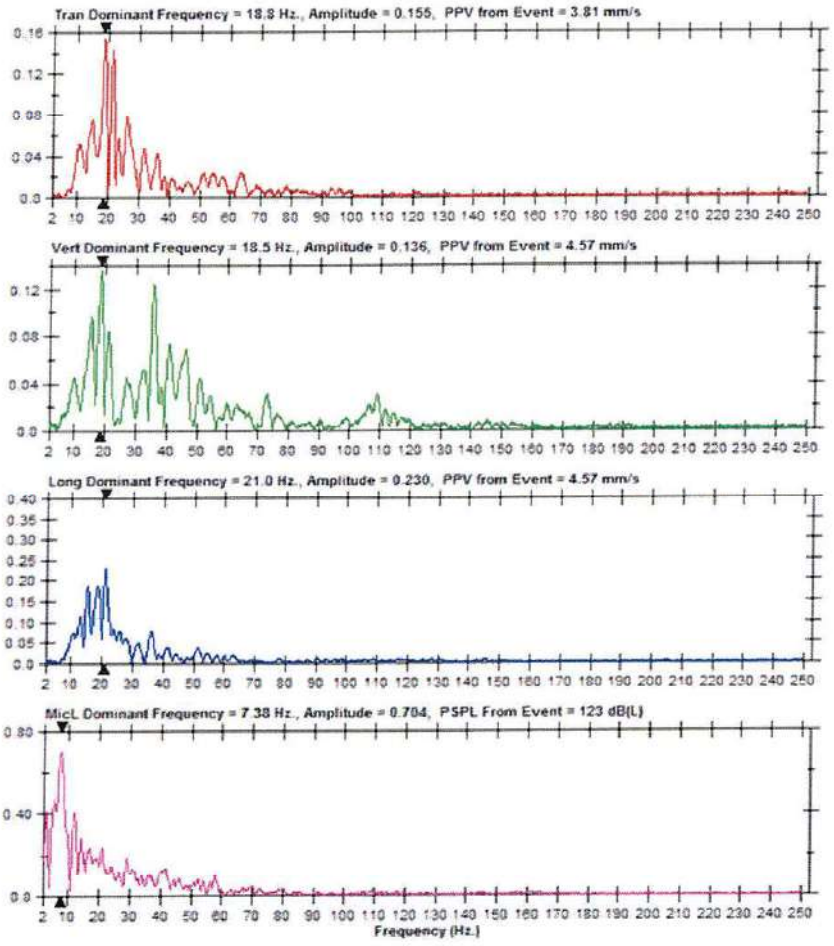
Instantel

FFT Report

Date/Time	Vert at 16:41:31 December 23, 2016	**Serial Number**	BE8183 V 10.30-8.17 MiniMate Plus/8
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.2 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	January 14, 2016 by CIMFR, Dhanbad
Record Time	4.0 sec at 1024 sps	**File Name**	J183GOT2.D70
Job Number:	1		

Notes
Location: On ground surface
Client: PRISM CEMENT LTD, SATNA
User Name: REE-Division, CSIR-CIMFR, Dhanbad
General:

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Printed: March 19, 2017 (V 10.30 - 10.30)

Instantel

Event Report

Date/Time	Vert at 14:33:20 December 23, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	4.0 sec at 4096 sps
Job Number:	1
Notes	
Location:	On the ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE Division, CSIR-CIMFR,Dhanbad
General:	

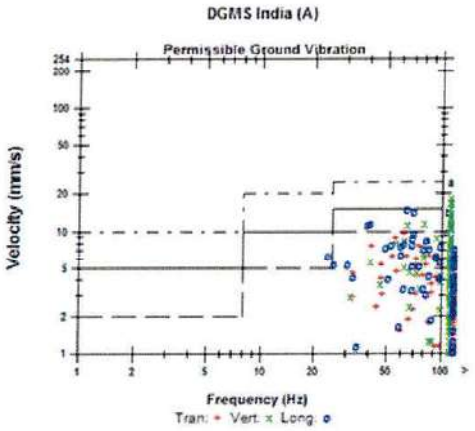
Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.

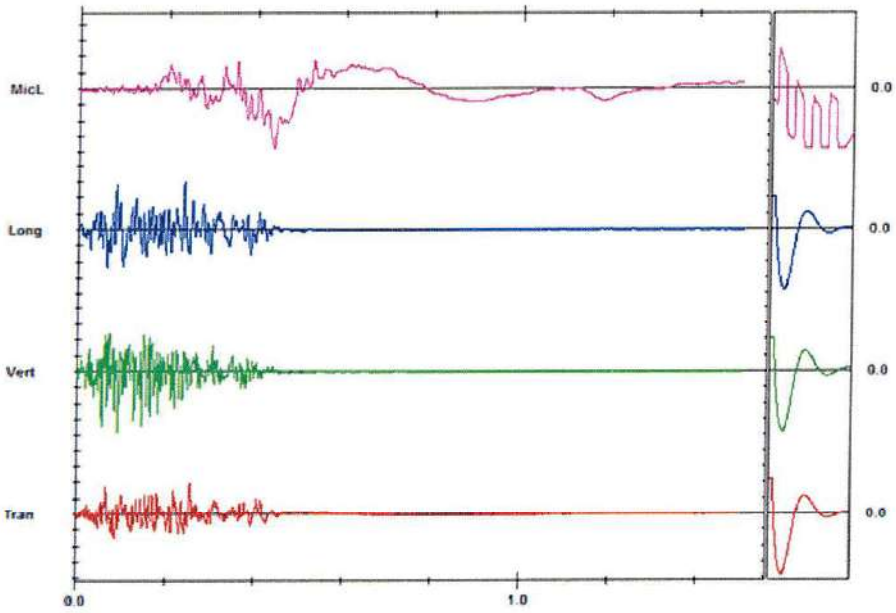
Microphone	Linear Weighting
PSPL	131.5 dB(L) at 0.438 sec
ZC Freq	5.9 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 720 mv)

	Tran	Vert	Long	
PPV	9.52	18.9	15.0	mm/s
ZC Freq	62	114	64	Hz
Time (Rel. to Trig)	0.255	0.092	0.237	sec
Peak Acceleration	0.669	1.43	0.795	g
Peak Displacement	0.0213	0.0244	0.0422	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.5	Hz
Overswing Ratio	3.6	3.3	3.7	

Peak Vector Sum 20.4 mm/s at 0.093 sec

Serial Number	BA13814 V 8.12-8.0 BlastMate III
Battery Level	6.2 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	C814GOSW.FK0





Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 5.00 mm/s/div Mic: 20.0 pa (L)/div Sensor Check

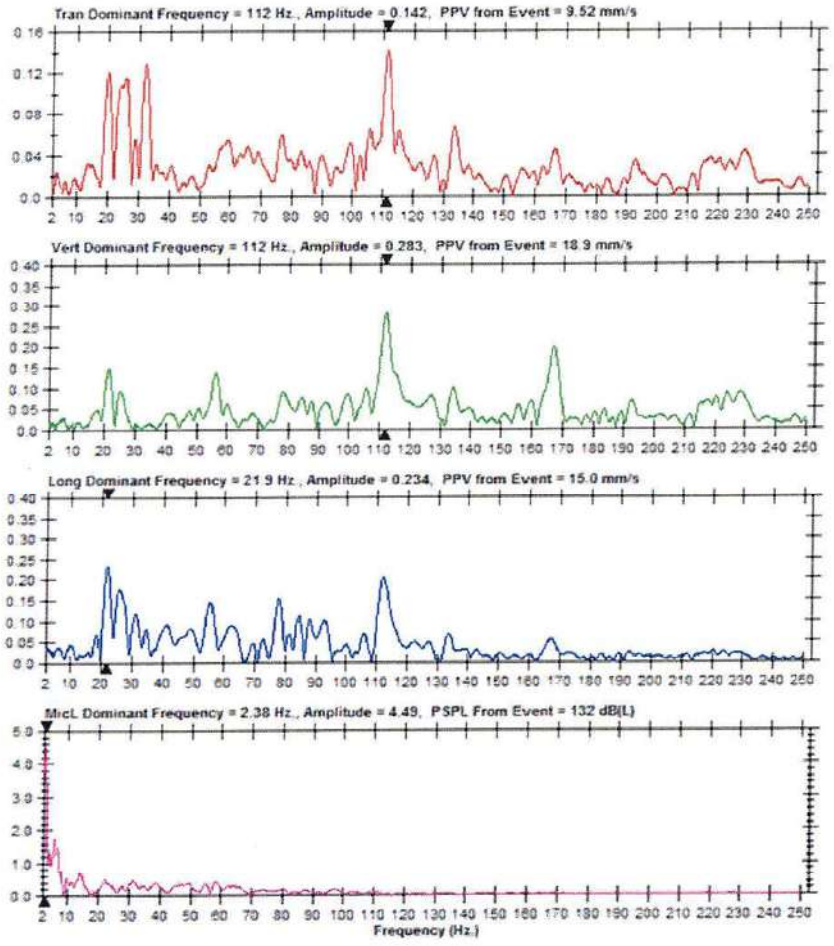
Instantel

FFT Report

Date/Time	Vert at 14:33:20 December 23, 2016	**Serial Number**	BA13814 V 8.12-8.0 BlastMate III
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.2 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	4.0 sec at 4096 sps	**File Name**	C814GOSW.FK0
Job Number:	1		

Notes
Location: On the ground surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE Division, CSIR-CIMFR,Dhanbad
General:

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Printed: March 19, 2017 (V 10.30 - 10.30)

Instantel — Event Report

Date/Time	Long at 14:33:26 December 23, 2016
Trigger Source	Geo: 0.508 mm/s
Range	Geo: 127 mm/s
Record Time	6.0 sec at 1024 sps
Notes	
Location:	On ground surface
Client:	PRISM CEMENT LTD. SATNA.
User Name:	REE, CSIR-CIMFR, Dhanbad
Converted:	December 23, 2016 20:27:06 (V10.30)

Extended Notes
Blast vibration study at Mandhi and Hinauti Limestone Mines of Prism Cement Ltd.

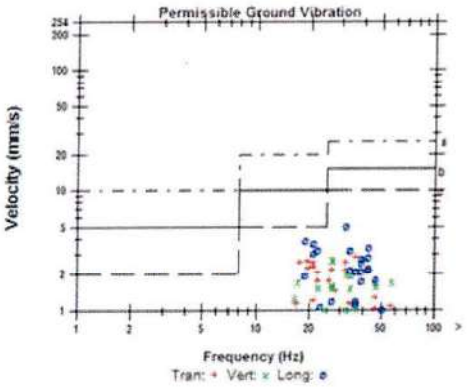
Microphone	Linear Weighting
PSPL	119.1 dB(L) at 0.768 sec
ZC Freq	4.0 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 476 mv)

	Tran	Vert	Long	
PPV	2.79	2.67	5.14	mm/s
ZC Freq	37	27	32	Hz
Time (Rel. to Trig)	0.110	0.089	0.130	sec
Peak Acceleration	0.0663	0.0795	0.106	g
Peak Displacement	0.0182	0.0157	0.0245	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.8	7.8	Hz
Overswing Ratio	3.4	3.4	3.7	

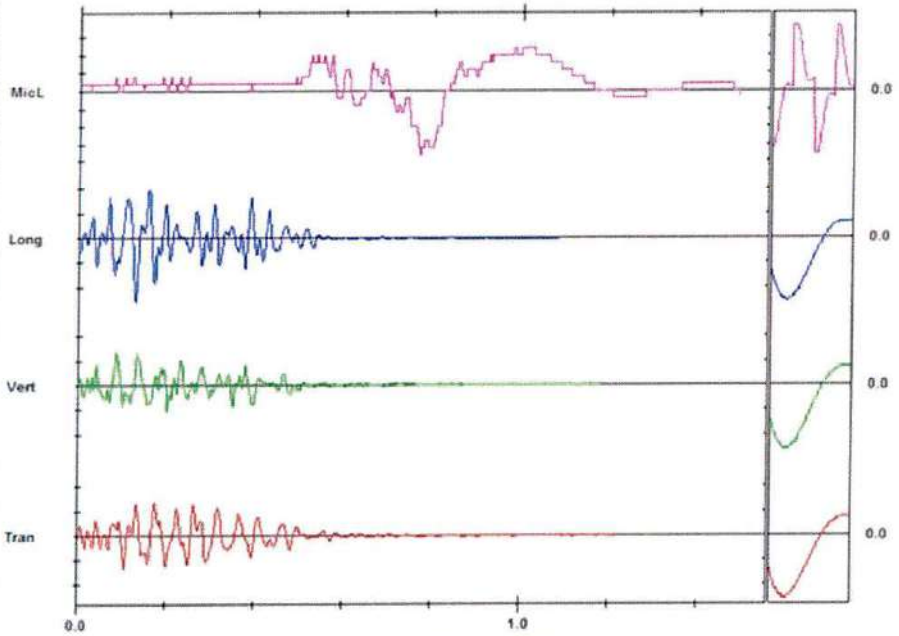
Peak Vector Sum 5.29 mm/s at 0.132 sec

Serial Number	4710 V 2.61 MiniMate
Battery Level	6.3 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	F710GOUR.3Q0

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 6.00 pa.(L)/div

Sensor Check

Printed: March 13, 2017 (V 10.30 - 10.30)

Instantel

FFT Report

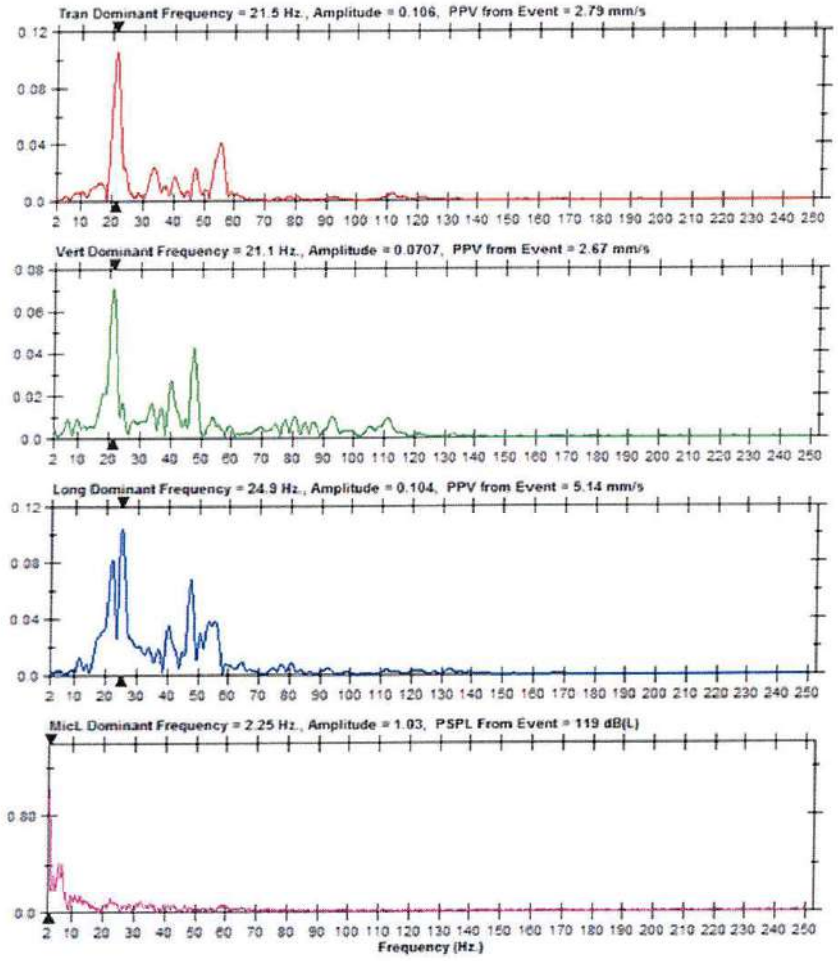
Date/Time	Long at 14:33:26 December 23, 2016	**Serial Number**	4710 V 2.61 MiniMate
Trigger Source	Geo: 0.508 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 127 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	6.0 sec at 1024 sps	**File Name**	F710GOUR.3Q0

Notes

Location	On ground surface
Client	PRISM CEMENT LTD. SATNA
User Name	REE. CSIR-CIMFR, Dhanbad
Converted	December 23, 2016 20:27:06 (V10.30)

Extended Notes

Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.



Instantel Event Report

Date/Time	Vert at 12:42:56 December 25, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	6.0 sec at 1024 sps

Notes

Location:	On Ground Surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE Division, CSIR-CIMFR, Dhnabad
General:	

Extended Notes

Blast vibration study at Mandhi and Hinauti Limestone Mines of Prism Cement Ltd

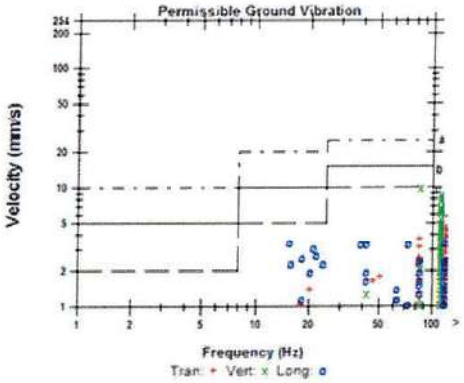
Microphone	Linear Weighting
PSPL	121.8 dB(L) at 0.742 sec
ZC Freq	3.2 Hz
Channel Test	Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	5.71	9.91	3.43	mm/s
ZC Freq	>100	85	>100	Hz
Time (Rel. to Trig)	0.292	0.280	0.290	sec
Peak Acceleration	0.371	0.703	0.172	g
Peak Displacement	0.00893	0.0162	0.0326	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.6	Hz
Overswing Ratio	3.8	3.6	4.0	

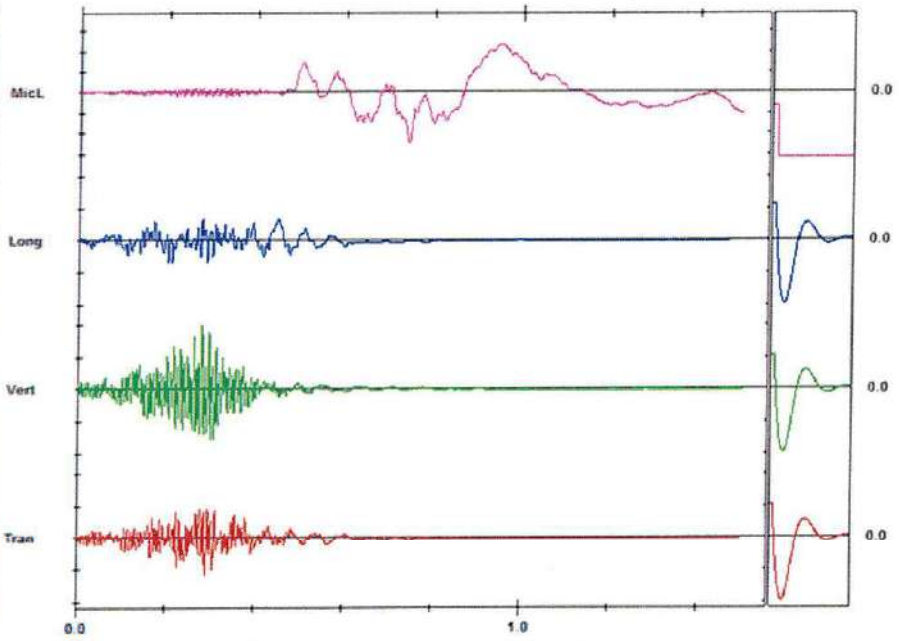
Peak Vector Sum 10.7 mm/s at 0.279 sec

Serial Number	BE10010 V 10.30-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	January 14, 2016 by CIMFR, Dhanbad
File Name	L010GOWG.NK0

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record

Time Scale: 0.20 sec/div **Amplitude Scale**: Geo: 5.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

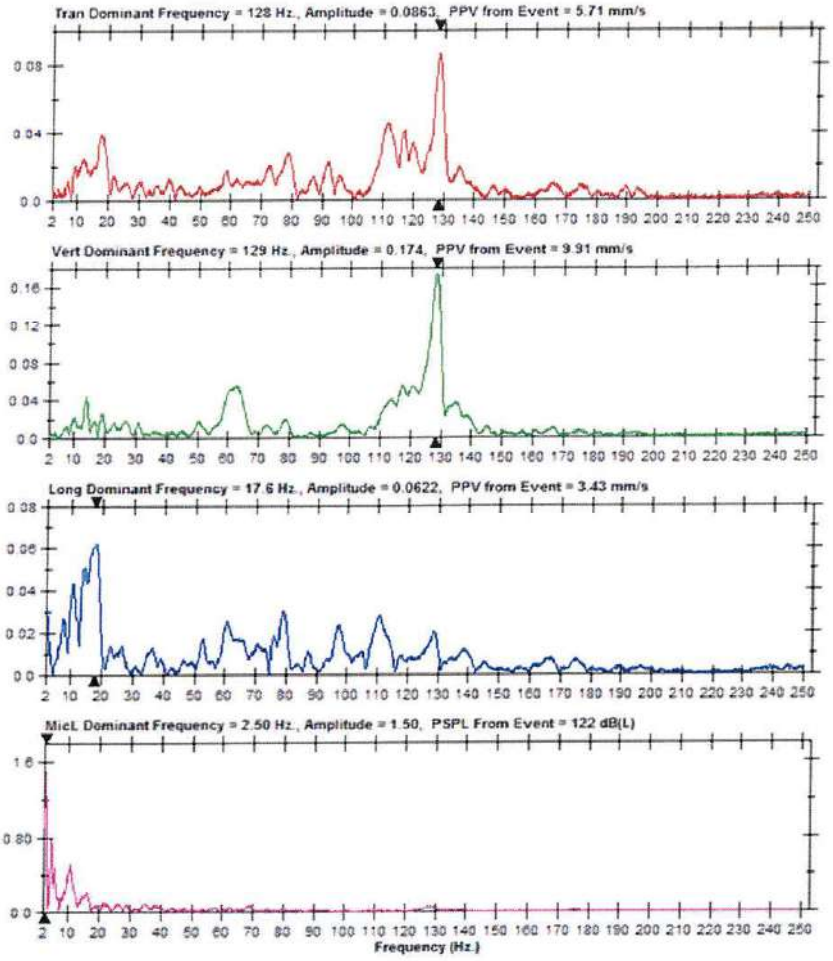
Instantel

FFT Report

Date/Time	Vert at 12:42:56 December 25, 2016	**Serial Number**	BE10010 V 10.30-1.1 Minimate Blaster
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.2 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	January 14, 2016 by CIMFR, Dhanbad
Record Time	6.0 sec at 1024 sps	**File Name**	L010GOWG.NK0

Notes
Location: On Ground Surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE Division, CSIR-CIMFR, Dhanbad
General:

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.



Instantel

Event Report

Date/Time	Vert at 16:22:41 December 26, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	3.0 sec at 1024 sps
Notes	
Location:	On Ground Surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE Division, CSIR-CIMFR, Dhanbad
General:	

Serial Number	BE10010 V 10.30-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	January 14, 2016 by CIMFR, Dhanbad
File Name	L010GOYL.HTO

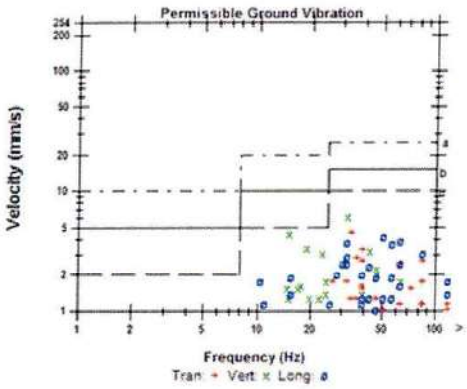
Extended Notes
Blast vibration study at Mandki and Hinauti Limestone Mines of Prism Cement Ltd

Microphone	Linear Weighting
PSPL	123.9 dB(L) at 0.271 sec
ZC Freq	9.0 Hz
Channel Test	Check (Freq = 8.0 Hz Amp = 8 mv)

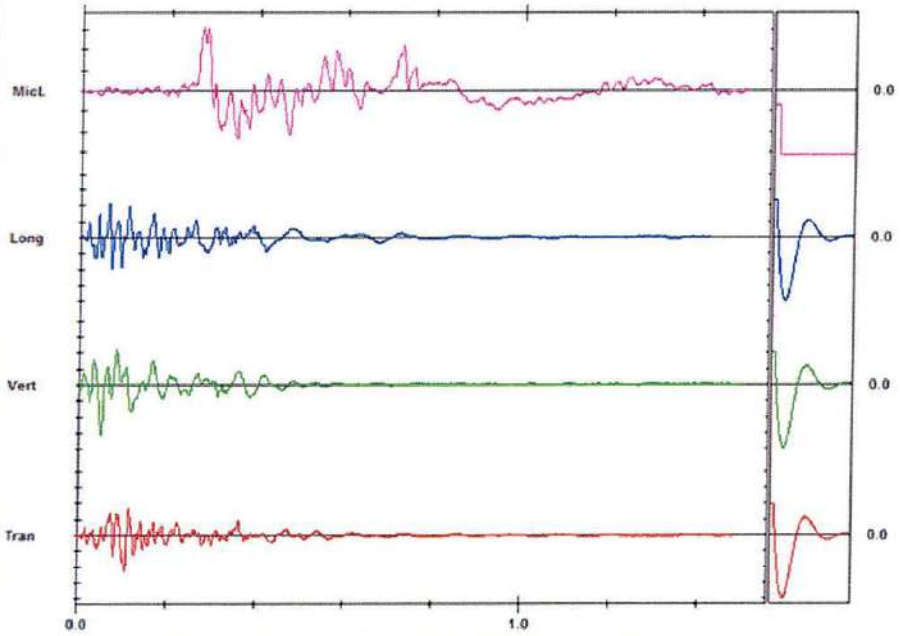
	Tran	Vert	Long	
PPV	4.57	6.10	4.19	mm/s
ZC Freq	34	32	51	Hz
Time (Rel. to Trig)	0.108	0.051	0.064	sec
Peak Acceleration	0.172	0.159	0.199	g
Peak Displacement	0.0203	0.0318	0.0198	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.7	7.6	Hz
Overswing Ratio	3.8	3.8	4.0	

Peak Vector Sum 6.66 mm/s at 0.051 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale**: Geo: 2.00 mm/s/div Mic: 10.00 pa (L)/div Sensor Check

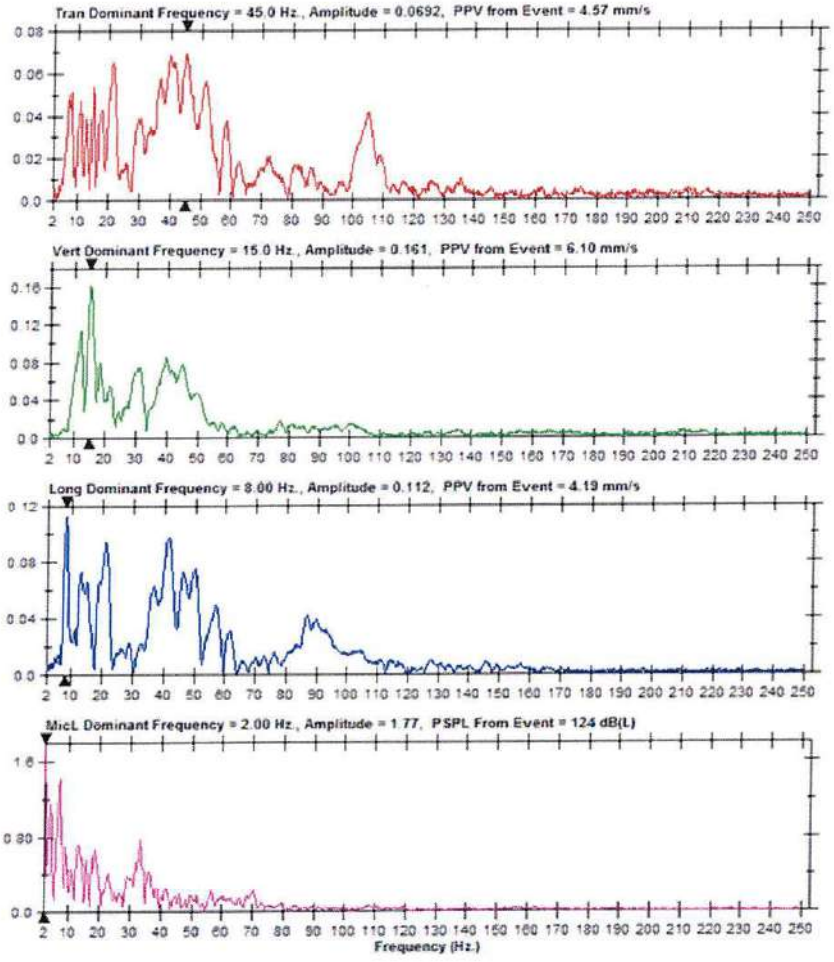
Instantel

FFT Report

Date/Time	Vert at 16:22:41 December 26, 2016	**Serial Number**	BE10010 V 10.30-1.1 Minimate Blaster
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.2 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	January 14, 2016 by CIMFR, Dhanbad
Record Time	3.0 sec at 1024 sps	**File Name**	L010GOYL.HT0

Notes
Location: On Ground Surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE Division, CSIR-CIMFR, Dhnabad
General:

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Long at 16:38:31 December 26, 2016
Trigger Source	Geo: 0.508 mm/s
Range	Geo: 127 mm/s
Record Time	4.0 sec at 1024 sps

Notes

Location:	On ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE, CSIR-CIMFR, Dhanbad
Converted:	December 26, 2016 22:51:18 (V10.30)

Extended Notes

Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd

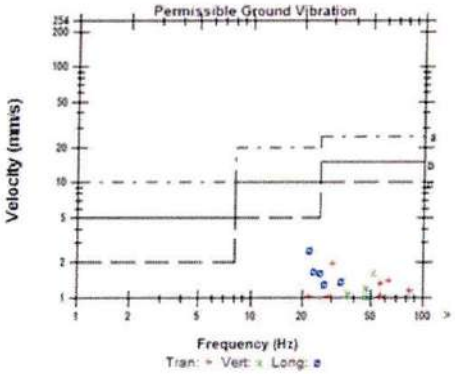
Microphone	Linear Weighting
PSPL	121.6 dB(L) at 0.321 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 476 mv)

	Tran	Vert	Long	
PPV	1.97	1.65	2.60	mm/s
ZC Freq	30	51	22	Hz
Time (Rel. to Trig)	0.135	0.128	0.121	sec
Peak Acceleration	0.0862	0.0862	0.113	g
Peak Displacement	0.00738	0.00592	0.0132	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.9	7.7	Hz
Overswing Ratio	3.5	3.4	3.6	

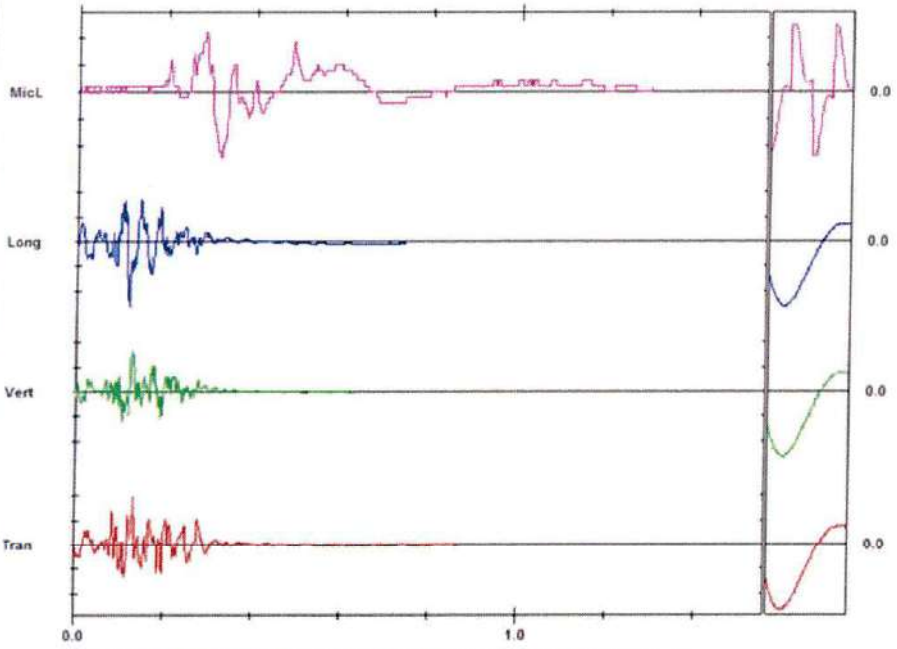
Peak Vector Sum 2.83 mm/s at 0.121 sec

Serial Number	4710 V 2.61 MiniMate
Battery Level	6.3 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	F710GP0G.W70

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record

Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 10.00 pa.(L)/div Sensor Check

Instantel

FFT Report

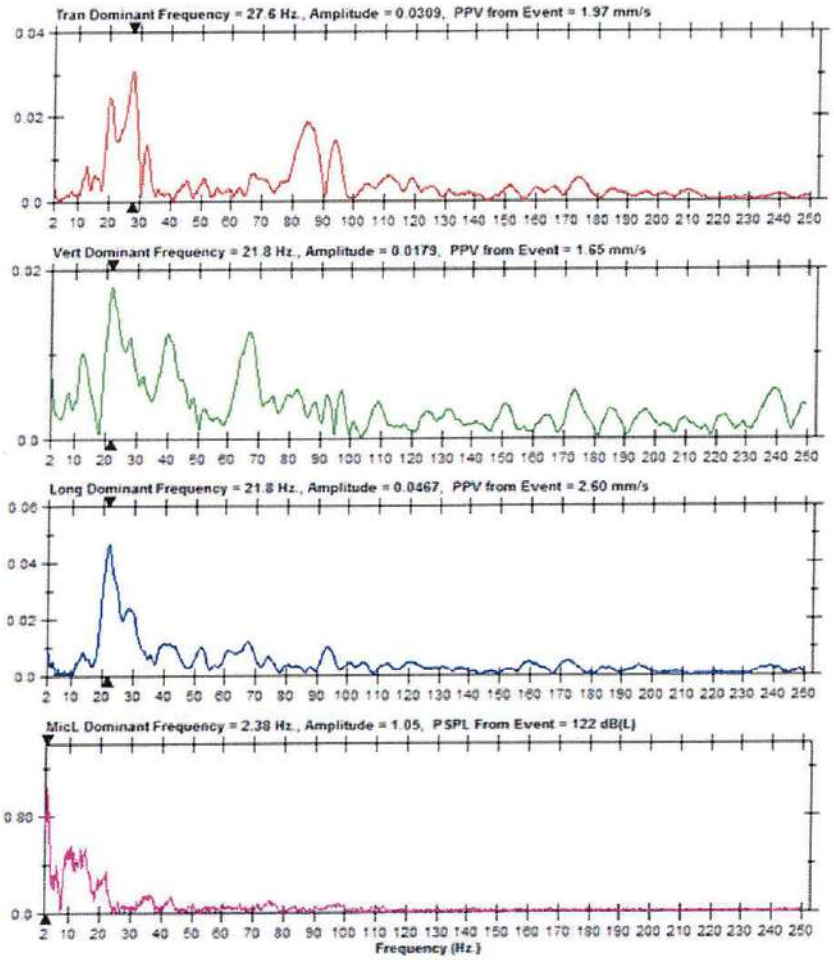
Date/Time	Long at 16:39:31 December 26, 2016	**Serial Number**	4710 V 2.61 MiniMate
Trigger Source	Geo: 0.508 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 127 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	4.0 sec at 1024 sps	**File Name**	F710GP0G.W70

Notes

Location: On ground surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE, CSIR-CIMFR, Dhanbad
Converted: December 26, 2016 22:51:18 (V10.30)

Extended Notes

Blast vibration study at Mandhi and Hirauti Limestone Mines of Prism Cement Ltd



Instantel

Event Report

Date/Time	Vert at 16:53:08 December 26, 2016
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254 mm/s
Record Time	3.0 sec at 4096 sps
Job Number:	1
Notes	
Location:	On the ground surface
Client:	PRISM CEMENT LTD. SATNA
User Name:	REE Division, CSIR-CIMFR,Dhanbad
General	

Serial Number	BA13814 V 8.12-8.0 BlastMate III
Battery Level	6.2 Volts
Unit Calibration	July 14, 2016 by CIMFR, Dhanbad
File Name	0814GOYM.WK0

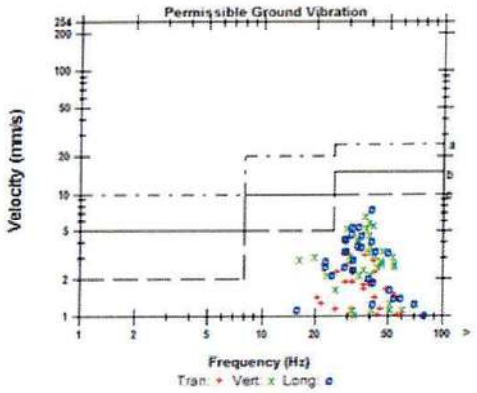
Extended Notes
Blast vibration study at Mandhi and Hinauti Limestone Mines of Prism Cement Ltd.

Microphone	Linear Weighting
PSPL	138.0 dB(L) at 0.566 sec
ZC Freq	41 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 751 mv)

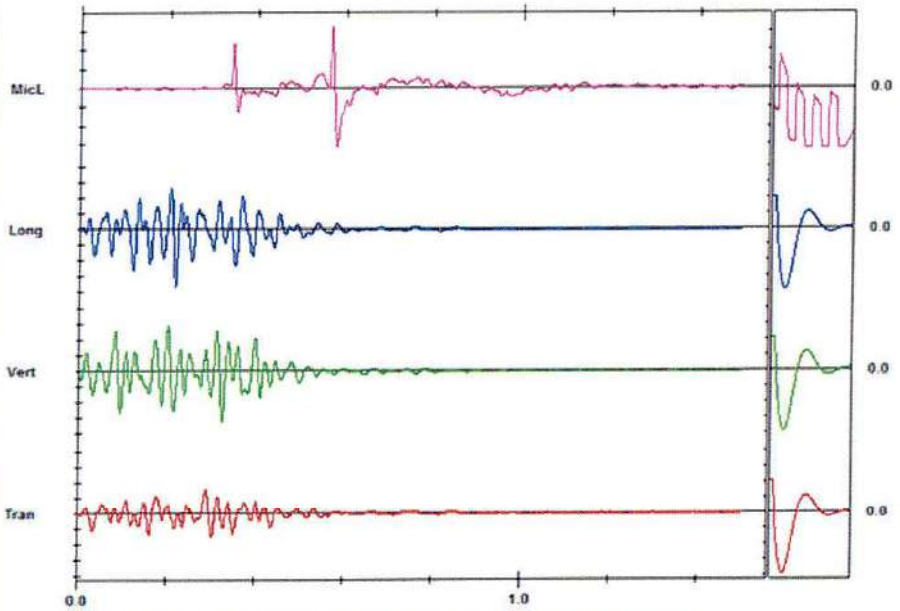
	Tran	Vert	Long	
PPV	3.17	6.60	7.62	mm/s
ZC Freq	31.0	37.2	40	Hz
Time (Rel. to Trig)	0.291	0.325	0.216	sec
Peak Acceleration	0.106	0.212	0.212	g
Peak Displacement	0.0156	0.0296	0.0292	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.3	Hz
Overswing Ratio	3.7	3.4	3.8	

Peak Vector Sum 9.00 mm/s at 0.216 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time scale has been modified and may not represent the actual length of the event record
Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 50.0 pa (L)/div Sensor Check

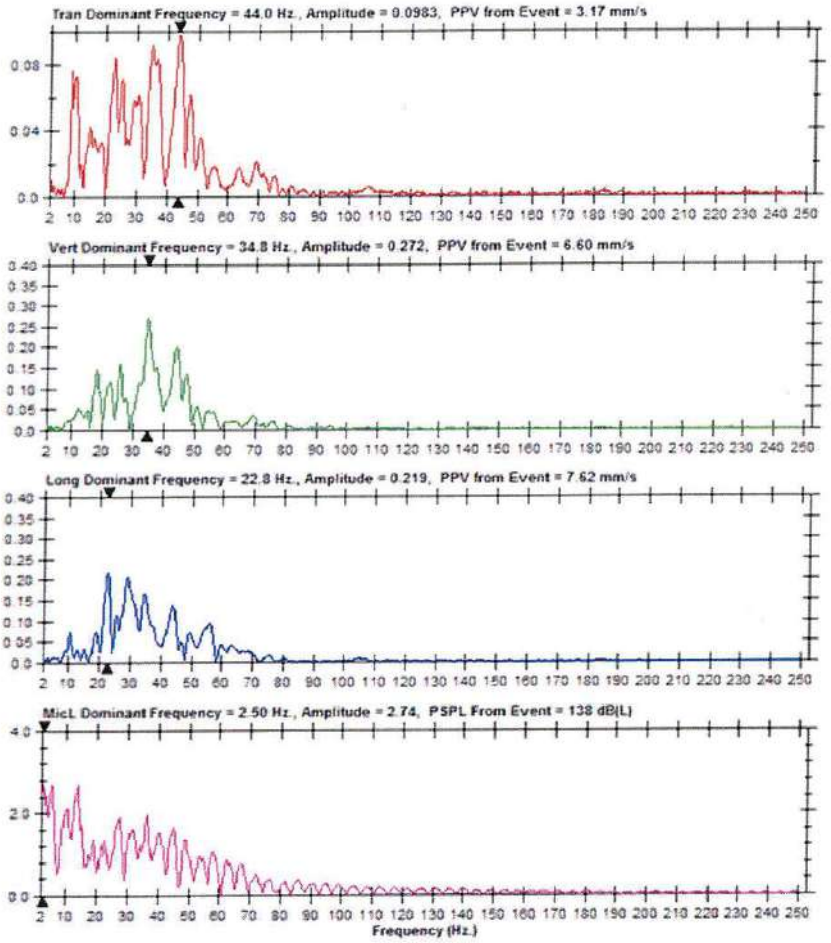
Instantel

FFT Report

Date/Time	Vert at 16:53:08 December 26, 2016	**Serial Number**	BA13814 V 8.12-8.0 BlastMate III
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.2 Volts
Range	Geo: 254 mm/s	**Unit Calibration**	July 14, 2016 by CIMFR, Dhanbad
Record Time	3.0 sec at 4096 sps	**File Name**	C814GOYM.WK0
Job Number:	1		

Notes
Location: On the ground surface
Client: PRISM CEMENT LTD. SATNA
User Name: REE Division, CSIR-CIMFR,Dhanbad
General:

Extended Notes
Blast vibration study at Mendhi and Hinauti Limestone Mines of Prism Cement Ltd.



ANNEXURE - 9

MIN/0701/990628 03.02.2000

The Joint Director(S)
Ministry Of Environment & Forests
(MOEF), Regional Office, Western Region
E-3/240 Arera Colony,
Bhopal-462016(M.P)

Dear Sir,

Sub: **Compliance Report – Sijhata-Hinouti-Limestone Mine of M/s. Prism Cement Ltd.**

Ref: **Letter – No. 11015/37/96/1A II(M) dated 20/12/99 of MOEF, New Delhi**
Your office letter no. 3-1/97(Env)/1359 dated 5/7/99.

We kindly acknowledge the above mentioned letters. We regret very much for not sending the compliance reports in time. We assure you, sir, we will be sending the same in time in future.

We hereby mention our clarifications pointiwise as raised by you:

The garland drains have been done all around the dumping sites, which restrict erosion the settling of silt around the faces.

a) **Monitoring of Quality of Effluent**:

In mines there is no generation of any effluent water. However the Sewage Water generated from the residential colony (combined for plant & mines) is being treated in colony premises and is being monitored regularly as per guidelines of MPPCB.
The rainwater accumulated in the lower benches of the working areas, is being pumped out and carried through pipeline to the reservoirs (settling tanks). The reservoir is in two blocks having cumulative water holding capacities of about 1.5 lakhs cub. mtrs. We find water in the reservoir till end of January or max 2nd week of February.

This water is being used sometimes for plantation and dust suppression on the hauling roads.

(b) Monitoring of RPM:

The monitoring of RPM is presently is not being monitored, as there is no norms mentioned in the MPPCB consent letter. At present we are regularly monitoring SPM, SO_2, NOx in Mines. RPM is not being monitored as on date. If you feel it is required we will arrange to carry out the same. We request for your guidelines for RPM monitoring.

...2/-

c) **Submission of Analysis Report in respect of Noise pollution:**

We have submitted a copy of the comprehensive, EIA and EMP (Post commissioning) for the area, vide our letter no. MIN0703/990369 dated 15/9/99, in person, which is duly acknowledged by your Regional Office, Bhopal on 16/9/99.

However, we are furnishing copies of the same for your ready reference and records.

d) **Submission of analysis -- report on the monitoring data**:

We are furnishing here with the monthly Ambient Air Quality Monitoring reports till date.

e) **Construction of settling tanks and toe-drains leading to it for arresting siltation of surface water.**

We do not have an open drainage system. The pumped out water is being carried through pipelines and released in the reservoir. The reservoirs consist of two blocks of a cumulative water holding capacity of 1.5 lakhs cub. Mtrs. The water is not discharged from reservoir. Hence all the silt will be deposited within the reservoir.

f) **Submission of annual action plan for socio economic development:**

We are herewith furnishing a note on the various social (welfare) economic measures carried out by Prism cement. We have enclosed herewith the Socio Economic Action Plan for your kind perusal.

g) **Establishment of Environment Management Cell:**

We have already established Environmental Management Cell, members of which are as below :

Mr. M.P. Rai	-	Vice President (Works)
Mr. U.K. Das	-	Sr. Jt. General Manager (Mines)
Mr. A.K. Shrivastava	-	Asst.Gen.Manager
Mr. V.V. Kulkarni	-	Manager (Geology).
Mr. D.K. Singh	-	Asst. Manager (Pollution Control)
Mr. S.P. Singh	-	Horticulturist.

...3/-

h) Regular submission of reports for every 6 months about environmental compliance to Regional office:

We regret for not sending regularly the reports as mentioned above. The same will be complied in future.

Hope all these points are in order and we assure you that to the best of our efforts, we shall continue to comply with various provisions of the Act.

Thanking you,

Yours faithfully,
For **PRISM CEMENT LIMITED**

3/2/2000

U.K. DAS
Sr. Jt. General Manager (Mines)

Encl: as above.

CC: Addiional Director, MOEF – For necessary information and records.
CGO Complex, Lodhi Road
New Delhi – 110 003

PS: We have complied all the points referred in your letter dated 20.12.99 and sent all the relevant details to Regional office, Bhopal

03.02.2000

SOCIO- ECONOMIC DEVELOPMENT ACTION PLAN
(WORKSHEET)

S.No	Particular	Details	Amount
1.	Village road repair – leading Eastern Block		Rs. 2000
2.	Soil filling and levelling at Sijhata school (29.1.99)	150 soil trips x 3 = 450 cu. Mtr x Rs.45	Rs. 20250
3.	Soil filling at Hinouti Mandir 24.3.99	50 trips = 50 x 3 = 150 cu.mtr. x Rs.45	Rs. 6750
4.	Soil filling at Sijahata village – Road side (3/3/999)	50 trips = 50 x 3 =150 cu.mtr. x Rs. 45	Rs. 6750
5.	Soil filling at Ramvan for Basanth Panchami (Jan- 2000)	50 trips =50x3 = 150 cu. Mtr x Rs. 45	Rs. 6750
6.	Hinouti village road bridge,near village for water management (culvert built)		Rs. 25000
7.	Village road leading to Pithepur (Magazine) (99-2000)		Rs. 150000
8.	Soil supplied to Rampur – (Police Station)		
9.	Jailor – Rampur		
10.	Hinouti Road – From Baghicha to Hinouti village	Rs. 80000 labour wages + Rs. 100000 material cost.	Rs. 180000
11.	Drains in village for proper water management in the Patel Tola of Hinouti village habitation.		Rs. 50000
12.	Other roads leading to Hinouti village	250 labour x Rs. 70 = 17500 + 2000 trips material x 3 = 6000 cu.mtr = Rs. 270000	Rs. 287500
13.	1300- 1400 trips of soil will be given to the villagers during 2000-2001	1350 x 3 = 4050 cu.mtr. x Rs. 45	Rs. 200000
	Medical facilities 250 patients x Rs. 7 x Rs. 12		Rs. 21000
	Mobile clinic treatment in villages @ Rs. 60/- per patient (inclusive of van charges)	15000 x 12	Rs. 180000

Annexure -3

28/11/2001

SOCIO- ECONOMIC DEVELOPMENT ACTION PLAN

Sl.No	Particulars	Incurred
		2000-2001
1	**General Development of Villages –**	200000
	for 4 villages namely Hinouti, Sijhata,	
	Mankahari & Bamhori @ Rs. 50000/- each	
	per annum to vill. Panchayats	
2	**Welfare to needy villagers – exgratia**	300000
3	**Repairs incurred on village roads within**	320000
	5 km range villages viz. Hinouti,Sijhata,	
	mankahari,Bamhouri,Rampur etc.	
4	**Soil filling & levelling the school and**	
	panchayat buildings areas & playground.	
	Sijahata School area and approach road	241989
	In Hinouti village, Mankahari village, Ramvan, etc.	
5	**Medical facilities:**	
	(i) Patients being treated at medical centre	
	on an average about 250/ month or 1500/ annum.	696000
	(ii)Patients being treated at villages through mobile	21000
	clinic on an average about 21 per day	
6	**Contribution to sports activities**	15000
		1793989
	Total Rs.In Lakhs	17.93

Prism cement is giving preference to the local villagers and land sellers suitable employment based on their qualification and capabilities.

In addition to the employment, indirect employment is also generated/ provided, like deploying trucks, tippers, oil tankers, compressors etc. purchased by local villagers have been hired for internal transportation of materials.

Also employment is provided for the development of horticulature and green belt.

No. of persons employed (workers category) during 1998-99 - 592. (Including plant)

U.K.Das
Gen.Manager (Mines)

ECOMEN LABORATORIES PVT. LTD.
Second Floor Hall, House No. B-1/8, Sector-H, Aliganj, Lucknow - 226 024
Phone No. : 0522 - 4079201/2746282
E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H1ZI
An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/09 TEST REPORT NO: ECO LAB/WW/08/21
TEST REPORT ISSUE DATE: 03.09.2021

TEST REPORT OF WASTE WATER*

Name of the Company : M/s. Prism Johnson Ltd.
Address of the Company : Village Mankahari,Tehsil Rampur Baghelan Distt.Satna (M.P.)
Sampling Method : APHA/ IS: 3025
Sample Collected by : Mr.Maan Singh
Sample Quantity : As per requirement.
Date of Sampling : 21.08.2021
Date of Receiving : 24.08.2021
Date of Analysis : 25.08.2021 to 02.09.2021
Source of Sample : STP Inlet
Sample ID Code : ELW-14754

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	6.98	2-12
2	Total Suspended Solids(mg/l)	APHA, 23rd Ed. 2017, 2540-D	178.0	5.0-1000
3	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 A+B+D	BDL	5.0-600
4	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	41.50	5-10000
5	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+C	156.0	5-50000

*The result are related only to item tested.
BDL = Below Detection Limit

Analyst

Authorized signatory
Ecomen Laboratories Pvt. Ltd.
Second Floor Hall, House No. B-1/8,
Sector-H, Aliganj, Lucknow-226024

Quality Manager

ECOMEN LABORATORIES PVT. LTD.
Second Floor Hall, House No. B-1/8, Sector-H, Aliganj, Lucknow - 226 024
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FORMAT NO. ECO/QS/FORMAT/09 TEST REPORT NO: ECO LAB/WW/08/21
TEST REPORT ISSUE DATE: 03.09.2021

TEST REPORT OF WASTE WATER*

Name of the Company : M/s. Prism Johnson Ltd.
Address of the Company : Village Mankahari,Tehsil Rampur Baghelan Distt.Satna (M.P.)
Sampling Method : APHA/ IS: 3025
Sample Collected by : Mr.Maan Singh
Sample Quantity : As per requirement.
Date of Sampling : 21.08.2021
Date of Receiving : 24.08.2021
Date of Analysis : 25.08.2021 to 02.09.2021
Source of Sample : STP Outlet
Sample ID Code : ELW-14755

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 1265 (E)
1	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.21	2-12	6.5-9.0
2	Total Suspended Solids (mg/l)	APHA, 23rd Ed. 2017, 2540-D	28.0	5.0-1000	<100.0
3	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 A+B+D	BDL	5.0-600	-
4	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
5	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+C	40.0	5-50000	-
6.	Fecal Coliform (MPN/100 ml)	APHA, 23rd Ed. 2017, 9221 A + E	140.0	-	<1000

*The result are related only to item tested.
BDL = Below Detection Limit

Archana
Analyst

Authorized signatory
Ecomen Laboratories Pvt. Ltd.
Second Floor Hall, House No. B-1/8,
Sector-H, Aliganj, Lucknow-226024

Quality Manager

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Second Floor Hall, House No. B-1/8, Sector-H, Aliganj, Lucknow - 226 024
Phone No. : 0522 - 4079201/2746282
E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H1ZI
An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/09 TEST REPORT NO: ECO LAB/WW//1444/08/21
TEST REPORT ISSUE DATE: 03.09.2021

TEST REPORT OF WASTE WATER*

Name of the Company : M/s. Prism Johnson Ltd.
Address of the Company : Village Mankahari,Tehsil Rampur Baghelan Distt.Satna (M.P.)
Sampling Method : APHA/ IS: 3025
Sample Collected by : Mr.Maan Singh
Sample Quantity : As per requirement.
Date of Sampling : 21.08.2021
Date of Receiving : 24.08.2021
Date of Analysis : 25.08.2021 to 02.09.2021
Source of Sample : Mine Workshop after separate Treated Water
Sample ID Code : ELW-14756

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 1265 (E)
1	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.36	2-12	6.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540-D	32.0	5.0-1000	<100.0
3	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 A+B+D	BDL	5.0-600	-
4	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	6.8	5-10000	30.0
5	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+C	52.0	5-50000	-
6.	Fecal Coliform (MPN/100 ml)	APHA, 23rd Ed. 2017,9221 A + E	Absent	-	<1000

*The result are related only to item tested.
BDL = Below Detection Limit

Archana
Analyst

Authorized signatory
Ecomen Laboratories Pvt. Ltd.
Second Floor Hall, House No. B-1/8,
Sector-H, Aliganj, Lucknow-226024

Quality Manager

Environment Management Cell

Annexure 11