MINING PLAN FOR COLOUR GRANITE

(48)

Over an extent of 5.00 Hectares in Sy. No. 27
Meelasathivada (V), Tekkali (M), Srikakulam Dist, A.P.

OWNER

M/s. GALLOP GRANITES
VISHAKAPATNAM

Received

Prepared By

V.T. CHANDER
(Regn. No. RQP / DMG / HYD / 02 / 2001
RQP / HYD / 179 / 2000 / A)
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DECLARATION

This mining plan for Colour Granite over an extent of 5.00 Hectares in Sy. No. 27of Meelasathivada Village, Tekkali Mandal, Srikakulam District, Andhra Pradesh., has been prepared in full consultation with me and we understand its contents and agreed to implement the same in accordance with the law.

Date :

Place : Vishakapatnam

For **M/s. GALLOP GRANITES**

For Gallop Granites Limited

Authorised Signatory

G. P. N.

CERTIFICATE

This is to certify that Mining Plan in respect of Quarry Lease over an extent of 5.00 Hectares in Sy. No. 27of Meelasathivada Village, Tekkali Mandal, Srikakulam District, Andhra Pradesh, has been prepared by Sri V. T. Chander, Consultant Geologist & RQP and we agree to follow the same in accordance to the provision of Law

Date :

Place : Vishakapatnam

For **M/s. GALLOP GRANITES**

For Gallop Granites Limited

Authorised Signatory

Joint Director of Mines & Geology

CERTIFICATE

The provision of Granite Conservation and Development Rules '1999 have been observed in preparation of Mining Plan for Black Granite over an extent of 5.00 Hectares in Sy. No. 27of Meelasathivada Village, Tekkali Mandal, Srikakulam District, Andhra Pradesh

Whenever specific permissions are required the applicant will approach the concerned authorities.

Certified that "The information furnished in the Mining Plan is true and correct to the best of my knowledge".

Date : 06 / 12 / 2008

Place : Hyderabad

RQP

(V.T. CHANDER)

MINING PLAN ON COLOUR GRANITE
Over an extent of 5.00 Hectares, Sy.No. 27, Meelisathivada (V), Tekkali (M), Srikakulam Dist. A.P.

For

M/s. Gallop Granites Ltd
Visakhapatnam

By

V.T Chander, Consultant Geologist & RQP

1.0 INTRODUCTION

M/s. Gallop Granites Ltd, Visakhapatnam, a Private Limited, was granted Quarry Lease for 15 years for Colour Granite over an extent of 5.00 Hectares spread over in Sy.No. 27 of Meelisathivada Village, Tekkali Mandal, Srikakulam Dist. A.P. Vide Director, Department of Mines and Geology, Visakhapatnam. Proceedings No. 273 / Q1 / 93 dated 17-03-1993. The lease deed was executed on 06-04-1993 and permission was granted by the Asst. Director, Mines and Geology, Srikakulam Vide No. 11 / Q / 93 dated 06-04-1993 to commence Quarry operations.

As per the GCDR Rule 17 of 1999, all the owners of the existing quarries are required to submit the mining plan to the Director of Mines & Geology, Hyderabad for approval within stipulated time

M/s. Gallop Granites Ltd, Visakhapatnam, Approached Sri V.T. Chander Consultant Geologist and RQP (RQP/DMGHyd/02/2001) For preparation of Mining Plan in the above mentioned quarry. Accordingly Mining Plan is prepared as per the guidelines given by Govt. India. Ministry of Steel & Mines, GCDR Rules 1999, for the existing quarry.

APPROVED

ZONAL JOINT DIRECTOR OF
MINES AND GEOLOGY
GOVT. OF A.P.
VISAKHAPATNAM

This Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No. 1250 Tech 08 Dated 4-9-08

2.0 GENERAL

2.1	**Name and address the applicant**	M/s. Gallop Granites # 7-8-17, Harbour Park Road, Visakapatnam.
2.2	**Status of the applicant**	Limited Company
2.3	**Mineral for which applicant intends to mine**	Colour Granite
2.4	**Name and address of the RQP who the Mining Plan**	V.T. Chander RQP/ DMG/Hyd/02/2001 RQP/ DMG/Hyd/02/2001 H.No. 10-1, Flat No. 202, Mahalakshmi Ganapathi Complex, Sai Baba Temple Lane, Beside Sri Sai Grammar High School, P & T Colony, Dilsukhnagar, Hyderabad - 500 060. ☎ : 040- 40138229 : 9393383357
2.5	**Name and address of the Prospecting Agency**	M/s. Gallop Granites # 7-8-17, Harbour Park Road, Visakapatnam.

2.6 Details of the Area

The applied area falls in the Survey of India Toposheet No. 74 B/2 and is bounded East Longitude 84° - 12' - 00" and North Latitude 18° - 37' - 00". It is situated 4 Km North West of Tekkali. The road leading from Tekkali to Temburu via. Tirlangi crossing villages Barigipeta, Rama Krishnapuram and a diversion towards east by 400 M at road crossing from Gopalapuram to Bheempuram will lead to the Site.

The location of the area is indicated in Key Cum Location Map (Plate - I).

Table No.1 Details of the Area

District State	Mandal	Village	Sy.No.	Extent	Ownership of Occupancy
Srikakulam Andhra Pradesh	Tekkali	Meelisathivada	27	5.00	Govt. Land (Existing Quarry)

2.7 Period for which Quarry lease was granted = 15 years (From 6-4-1993 to 5-4-2008)

Cadastral Map certified by the Asst. Director of Mines & Geology, Srikakulam in favor of M/s. Gallop Granites Ltd is given as Plate No. II.

Joint Director of Mines & Geology

Infrastructure and Communication

Availability of Water	The Ground Water level is about 6 to 7.0 Mts. below ground level at the foot hill.
Availability of Electricity	Electricity is available at the Quarry area.
Communication Network	The road leading from Tekkali to Temburu via. Tirlangi crossing villages Barigipeta, Rama Krishnapuram and a diversion towards east by 400 M at road crossing from Gopalapuram to Bheempuram will lead to the Site. Amenities like Post & Telegraph Office, Police Station, Primary Health Center etc., are available at Tekkali.
Road Network	The Tekkali Town is located 60 Kms North of Srikakulam on NH 5 from Visakhapatnam to Calcutta. The town is well connected with the road network.
Nearest Rail Head	Nearest Rail Head is located at Amudalavalsa (Srikakulam Road Station), which is located 16 Kms from the Srikakulam and 76 Kms from Tekkali.
Port Facility	Vishakapatnam Port is about 150 Kms from area.
School	Education Facilities from Primary School to College are available in Tekkali Town.
Medical Facility	Medical Facility available in Tekkali Town.

Boundaries

North	Barren Lands
South	Agricultural Lands
East	Barren Lands
West	Agricultural lands

Further vast potential exists for the employment of unskilled labour in the existing Granite Quarries and Allied Small - Scale Industries. The area experiences Semi - Arid Climatic conditions with an average Annual rainfall of 1000 MM. The local day temperature varies from 25° C in November to 48° C in April & May Months. The general wind direction reported is SW to NE and SE to NW.

3.0 GEOLOGY

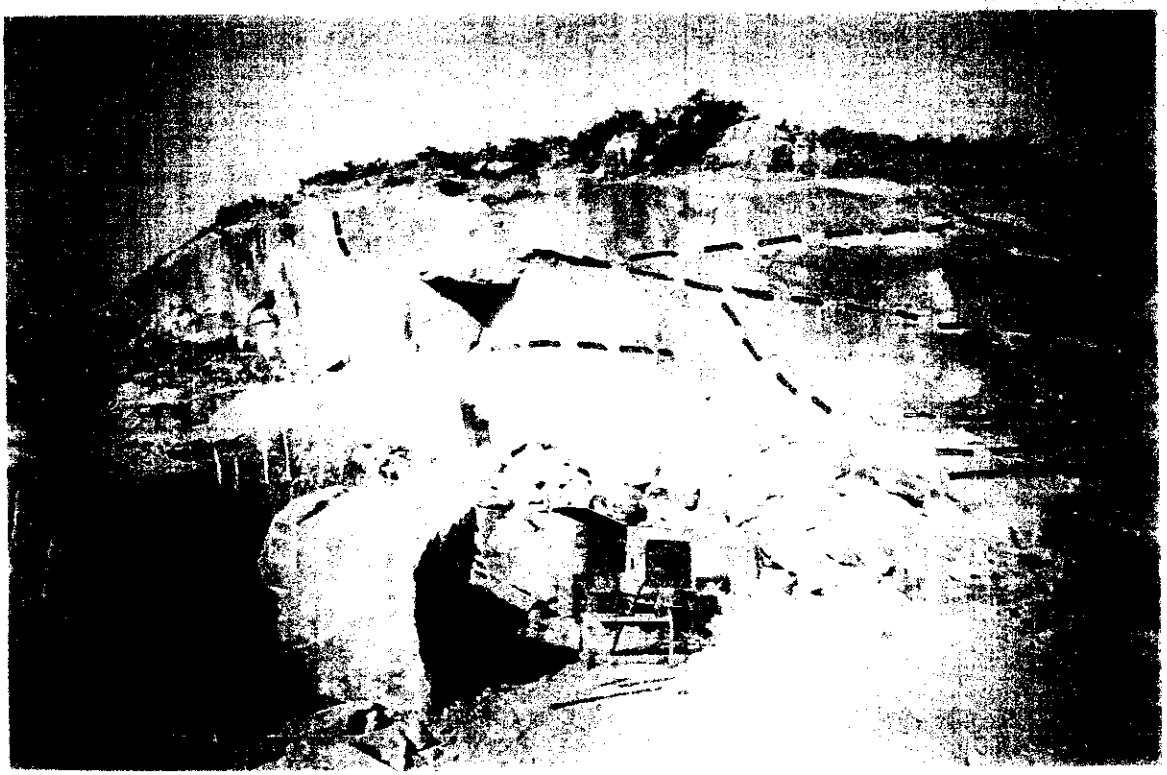
3.1 Physiography

The Quarry area is located on Hill; steeply sloping due South & South East the relief of the area is 85 Mtrs towards South East & 50 Mtrs in the South direction from North West corner of the leased area. Vegetation is developed in between the joints and soil areas.

Joint Director of Mines & Geology

PHOTOGRAPH SHOWING THE VIEW OF THE DEPOSIT

PHOTOGRAPH EXHIBITING THE HORIZONTAL & INCLINED JOINT PATTERN IN THE SHEET



3.1.1 Regional Geology

The Eastern Ghat Mobile Belt (EGMB) is more than 600 Km in Length from Srikakulam in the North to Ongole in the South. This belt is more than 100 Km in width in Northern part and tapers down to less than 20 Km in the South, it has broad actuate trend with west ward convexity. The NNE - SSW trend in the southern part of the belt changes NE - SW in the North. EGMB is divided into 3 longitudinal zones viz.

1. Western - Charnockitic Zone
2. Central - Khondalite Zone
3. Eastern - Migmatite Zone

While in the Northern parts in Srikakulam, Vizianagaram & Vishakapatnam Districts the central Khondalite Zone occupies major part of the area. Where as Western Charnockite Zone occurs in the Southern part. The rocks in this belt are represented High Grade Granulite facies of Metamorphism and suffered by complex deformation. The stratigraphic succession of EGMB is as follows :

Stratigraphic Unit	Lithology
INTRUSIVES	Layered Anorthisites and associated Mafics and Chromiferrous Ultra Mafics
CHARNOCKITE GROUP	Charnockites with Mega Crystic K- Felspar CharnockiteTwo Pyroxene Granulite / Amphibolites
KHONDALITE GROUP	Calc-Sillicate-Granulites. Garnet-Silliminite-Quartz-Biotite-K-Felspar-Graphite Gneiss (Khondalite) Quartzite-Garnet-Silliminite
GRANITOID SUITE	Granitoid with Mega Crystic K-Felspar Un Differenciated (with Migmatitic Dia Tectite Augen) Perferoblastic Granite and Gniesses Garnet-Biotite, Homophanus Granite / Gniess Leptinite, Local Charnockite Neosomes and Relics

In Srikakulam district the EGMB is represented by vide range of litho units Viz : Charnockites, Khondalites, Twopyroxene Granulites, Migmatites, Leptinites and Intrusive Porphyroblastic Charnockites. Large enclaves of Acid Charnockites, Khondalites and Meta-Basic rocks occur within Migmatites, which are largely seen in the area lying between R.Vamsadhara and Coastline.

3.2 Geology of the Area

The Migmatites and Migmatised Charnockite deposits are commercially known as "Srikakulam Blue". The Migmatite essentially consists of Blue Quartz and Bluish Grey to Light Grey Felspar with accessory minerals like Hypersthene, Horneblends and Biotite. The rock displays Wavy Banding, Ptygmatic folding of Bands, Paleosom – Mesosom – Leucosom and Minimal Lineation. A number of parallel slips trending N-S, NNW-SSE and NNE-SSW cut across the Wavy Banding, Pinching and Displacing the Bandings, which imparts additional beauty to the stone besides its Blue Colour. The arrested enclaves of Charnockite (Locally known as Oil Patches) and healed hairline fractures (Known as White and Coloured Lines) cutting across the wavy banding are considered defects.

Three sets of major joints :

1. N – S
2. N 35° W – S 35° E
3. E – W

GEO TECHNICAL PROPERTIES

a) Parameters for Evaluation of Deposit

Quarrying in the locality has helped in studying the following parameters for evaluation of the deposit. Frequency of occurrence of the fractures and joints :

Two sets of joints are recorded in the Charnokite

1.	N - S
2.	N 35° W – S 35° E Vertical Nature
3	E – W Sub Vertical

These joints are closely spaced at the contact of the country rock and on the surface giving raise to bouldery nature to the dyke. On the other hand they are widely spaced in the depth as noticed in the quarry sections.

1.	Variation of Strike	Not Applicable
2.	Splitting Pattern of Strike	Even
3.	Foliation	Absent
4.	Occurrence of Intrusives	Absent
5.	Interaction of Host Rock incase of Dyke Rock	Not Applicable
6.	Extent of Weathering	Restricted along the Joint Planes only
7.	Amount of Weathering	Limited
8.	Climatic Condition	The area experiences Semi Arid Dimatic conditions with summer day temperatures raising upto 47° and receives an average rainfall of 1,050 mm, the prevalent wind direction is SW-NE and SE-NW.

Exploitable Stone available and possible output per month :

Total Mineable Reserves Estimated to be - 9,65,542 M^3

On an average 1,200 M^3 Per Year output is anticipated.

b) Important Parameters for evaluation of Stone Quality

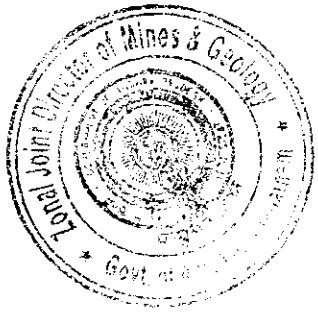
1.	Texture and Grain Size	Medium – Fine Grained, Equigranular
2.	Colour and Aesthetic Beauty of the Stone	Bluish
3.	Hardness	Varying between 6 – 7 on Mohs Scale

Zonal Joint Director of Mines & Geology

4.	Minerological Composition	Generalized Minerological composition of Migmatite of Srikakulam is as follows :
a)	Augite	25 – 40%e
b)	Plagioclase Felspars	42 – 50%
c)	Clino Pyroxene	15%
d)	Amphibole	> 5%
e)	Biotite	2.7%
5.	Density / Specific Gravity	The bulk density of Migmatite is 4.5
6.	Water Absorption Ratio	Fresh Rock has no water absorption capacity
7.	Porosity	Porosity is negligible
8.	Compression Strength	Not Measured
9.	Abbrasiveness	Not Measured
10.	Permeability	The Migmatite in the fresh state is totally impermeable.
11.	Rock Quality, Designation	RQD test not conducted
12.	Young's Modulus Elasticity	Not Measured
13.	Degree of Weathering under Hand Lens / Microscope	Degree of Weathering varying with depth of rock, it is 2 – 3 Cm deep on the surface and it is absent in deep seated rock
14.	Glossiness	Samples taken good polish

c) Defects in Dimensional Stone

1.	Criss Crossing of Veins	Fine thread like acidic veins seen in the rock, but rarely occurring
2.	Closely Spaced Joints	Closely Spaced Joints trending in different directions both vertical and horizontally disposed restricted to weathered upper layers only. Joints are widely spaced in the fresh rock
3.	Dark Or White Patches	Dark Patches or Striations recorded in some of the outcrops, but they have a limited aerial extent
4.	Greater Texture Variations	Textural Variation is absent. Texturally the rock is uniform
5	Alteration due to Metamorphism and Weathering	No alteration due to Metamorphism is noticed. However, in the upper layers white clayey veins are seen in the weathered layer of the rock
6.	Defects at Contact Zone due to Mineralogical Textural and Colour Changes	The rock in lease area is represented by a single rock unit Migmatite. Hence, no defects in the rock are noticed.



4.0 EXPLORATION / MINING ACTIVITY

4.1 Present Status

The Mining Plan is prepared for the existing Granite Mine which is under operation since 1993 by the company.

Mining Operations Carried Out

The deposit was occurring as both floating boulders embedded in the soil and weathered zone. The quarry was opened during the year 1993. In the first year developmental operations carried out which include :

- Clearing of Bushes on the Deposit, Removal of Soil Cover and Small Floating Boulders.
- Laying of roads on the deposit and developing the infrastructure at Quarry Site, such as Shelters, Office Room, Lavatory, Drilling of Borewell for Drinking Water and Magazine etc.
- Deployment of Excavator for removal of over burden and boulders.

Pit

The mining operations were carried out starting from South Western of the lease area towards North and East directions, between the grids N00 – N200 & E 00 – E 200. A pit of with average depth of 18 M was developed in 8048 M^2 area from which 1,44,864 M^3. of Rock mass was retrieved from this pit.

Another pit was developed between the grids N00 – N100 & E 100 – E 300 covering an area of 1241 M^2 with an average depth of 10M. 12,410 M^3 of rock mass is retrieved.

The Details of Production Pits :

Pit No.	Area (M^2)	Depth (M)	Volume of Material (M^3)	Lithology	Remarks
1	8,048	18	1,44,864	0 – 2.5 M	Weathered and Jointed Rock Mass .
				2.5 – 18 M	Fresh Boulders
2	1241	10	12,410	0 – 2.5 M	Weathered and Jointed Rock Mass
				2.5 – 10 M	Fresh Boulders
	Total		1,57,274		

Details of Production so far Mined from the beginning of the Quarry :

Statement Showing Production and Dispatch Details of 15 years

S.No	Year	Production (M^3)	Dispatches (M^3)
1	1993 - 94	809.798	677.087
2	1994 - 95	1285.095	1209.821
3	1995 – 96	2713.765	2605.004

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4	1996 - 97	1872.045	1847.473
5	1997 – 98	1451.745	1577.489
6	1998 – 99	1612.089	1625.731
7	1999 – 2000	1896.844	1942.935
8	2000 - 01	1374.663	1374.663
9	2001 – 02	1280.069	1245.494
10	2002 – 03	1082.387	1145.301
11	2003 – 04	498.949	495.428
12	2004 – 05	120.016	120.16
13	2005 – 06	110.522	110.522
14	2006 – 07	Nil	Nil
15	2007 – 08	186.522	186.522
Total		**16294.509**	**16163.630**
Average		**1086.300**	**1077.57**

The average annual production of this quarry is only 1,086M^3. This indicates that the recovery factor of the market grade blocks is only 10.36 %

The Srikakulam Blue Granite is having international demand and exported only in Gang Saw Size (1.20 Mtrs and above). Therefore, all the above produced and dispatched rough blocks of this size only.

The following machines are used :

1. Excavators - 2 No's.
2. Compressor - 4 No's.
3. Crane - 1 No.
4. Winch Machine - 1 No.
5. Tractor - 1 No.
6. Tipper - 1 No.

The following labour employed:

1. Supervisors - 4 No's.
2. Drillers - 24 No's.
2. Cutters - 15 No's.
4. Non Muster Labour - 4 No's.

4.2 Future Programme

Since the deposit is proved no further exploratory programme is recommended.

5.0 RESERVES

5.1 Geometry of Deposit

Geological Traverses and the study exposures on the hill facilitated to assess the shape and size of the deposit in the area. It is in irregular shape. The surface of sheet rock is wavy and irregular.

5.2 Method of Estimation of Reserves

The exposed deposit is found to be irregular in shape as it is exposed on hill. The total area as per the scale is 5.00 Ha. The Cross Sectional method was adopted for estimation of reserves. Plano Meter was deployed for estimation. 8 Cross sections were drawn at equal intervals for estimation (Plate - IV).

5.3 Categorization of Reserves & Total Mineable Reserves

The deposit that is exposed in the lease area is classified under "**Proved**"

i) Insitu Reserves

Section	Sectional Area (M^2)	Sectional Influence (M)	Volume (M^3)
A – A1	6768.60	50	338430
B – B1	8077.55	50	403877
C – C1	7575.47	50	378773
D – D1	7082.48	50	354124
E – E1	5926.77	50	296338
F – F1	4677.26	50	233863
G – G1	3994.29	50	199714
H – H1	3162.65	66	208735
Total			**24,13,855**

ii) Recoverable Deposits

As undersize boulders, defective boulders, soil creep from 60% of the Rock Mass, Hence deduction of the waste from insitu reserves form recoverable reserves (40% Recovery)

Waste Rock + Soil @ 60% = 14,48,313 M^3

Recoverable Rock Mass @ 40% = 9,65,542 M^3

iii) Market Grade Reserves

@ 20% Recovery of Market Reserves from Recoverable Reserves (with an anticipation that the recovery % will increase in the depth)

= 9,65,542 M^3 x 0.2 = -1,93,108.4M^3

Since buyers prefer only Gang Saw Size hence total Market Grade Reserves considered as Economic Grade Reserves

Life of the Mine = 193108.4/ 1000 = 193 Years

5.4 Economic Marketable Reserves

The Granites, having good export market, rough blocks free of defects like Fractures, Joints, Shears, Hair Line Cracks, Segregation Veins, Drastic Colour variation and having 120 up size (Gang Saw size) are mostly preferred by Exporters and International Buyers. These are known as Economic or Market Grade.

Economic Marketable Reserves = 1,93,108.4 M^3

6.0 MINING

6.1 Type of Mining

Quarrying of Colour Granite in the existing Quarry by Open Cast Semi Mechanised method.

Opening of Mine

The Colour Granite in this area is proposed to be mined by Open Cast, Semi-Mechanized method the Granite deposit in this area is exposed as a hill raising upto 85 M above ground level with boulders and sheet beneath it.

The following method of working is proposed :

Stage 1

Over Burden / Talus / Side Burden Removal :

Consists of development which includes removal of Weathered, Undersized and Defective Boulders using Proclain / Excavator and using Tipper, this waste is dumped at dumping yard. A ramp already constructed during exploratory Mining will be further developed to reach the working pits.

Stage 2

Extracting Boulder and Cutting them into Blocks with Conventional Methods :

After removal of Weathered, Undersized and Defective Boulders the fresh boulders exposed will be split into two or three pieces so that blocks can be made out of them. As the production is only for gang saw size, the boulders are split to the required size at the insitu stage. The undersized and defective blocks are removed. Usually, the advantage of natural joints present in the boulders are taken for splitting them or a line of shot holes are drilled vertically and horizontally at 10 – 15 Cm distance and the primary blocks will be wedged out or split it with the help of feathers and wedges. If the boulder or big enough one or two holes are drilled and blasted with a small charge of gunpowder.

The separated pieces are examined for defects and lines, then the block or blocks are marked in clear area and holes are drilled along the line of marking, with the help of feathers and wedges the waste portions are separated forming a rectangular blocks. Any bulges are removed by drilling and wedging making it perfect blocks. A perfect block is that all the sides shall make with each other 90°.

Dressing

After primary separation the rock mass will be carefully examined to avoid hairline cracks, mineral segregation's and veins etc. The dressing of the rough blocks will be made by chipping the edges and geometrically equating the edges of the block at the dressing yard. The rough blocks obtained after primary cut it will be dressed for obtaining good geometric shape of coloured granite.

Dressing of dimensional rough blocks for export :

Dressing is the final phase of mining operation, wherein the secondary rough blocks are squared into regular perfect rectangular sizes, thereby avoiding uneven bulge or cavities and other defects. Jackhammers with compressor, feather end wedges and sledgehammers are the equipment generally used for dressing the block.

6.2 Mining Programme for the next 5 Years

6.2.1 Scheme of Mining & Year Wise Production

During mining operations the applicant proposes to produce 480 M^3 of Coloured Granite per year. In order to produce this quantity an area of 1,000 M^2 will be utilized.

1st Year :

The mining operations will commence from north of the existing Pit No. 1 forming a bench height of 3 M and the bench will advance towards East, during the first year a total area of 1,771.27 M^2 will be utilized.

In the First year it is planed to produce 1062.76 M^3 of economic grade rough blocks. To produce this quantity an area of 1,771.27 M^2 will be utilized, retrieving 5,313.8 M^3 of Rock Mass, Out of which 20% Market Grade Rough Blocks (1062.76 M^3) is anticipated, 80% waste rock will be generated (4251.04 M^3).

2nd Year :

In the 2nd year the Mining continue East of 1st year workings and North of the Pit No. 1. The mining continues further from first year oriented faces advance further East maintaining average of 3 M bench Height. An area of 2,145.54 M^2 will be covered during this year.

In the Second year it is planed to produce 1287.33 M^3 of economic grade rough blocks. To produce this quantity an area of 2145.54 M^2 will be utilized, retrieving 6436.63 M^3 of Rock Mass, Out of which 20% Market Grade Rough Blocks (1287.33 M^3) is anticipated, 80% waste rock will be generated (5,149.31 M^3)..

3rd Year :

In the 3rd year the mining will continue East of 1st & 2nd year workings in North Eastern side of the Pit with West oriented faces advance further East maintaining average of 3 M bench Height. An area of 2,047.14 M^2 will be covered during this year.

In the third year it is planed to produce 1228.28 M^3 of economic grade rough blocks. To produce this quantity an area of 2,047.14 M^2 will be utilized, retrieving 6141.41 M^3 of Rock Mass, Out of which 20% Market Grade Rough Blocks (1,228.28 M^3) is anticipated, 80% waste rock will be generated (4,913.13 M^3)

Zonal Joint Director of Mines & Geology

4th Year :

In the 4th year the Mining will continue below 1st year workings in North Western side of the Pit. Maintaining average of 3 M bench Height. An area of 1,771.27 M^2 will be covered during this year

In the fourth year it is planed to produce 1062.76 M^3 of economic grade rough blocks. To produce this quantity an area of 1,771.27 M^2 will be utilized, retrieving 5,313.8 M^3 of Rock Mass, Out of which 20% Market Grade Rough Blocks (1062.76 M^3) is anticipated, 80% waste rock will be generated (4251.04 M^3)..

5th Year :

In the 5th year the mining will extend east of 4th year workings below the 2nd year pit. West oriented faces advance further East maintaining average of 3 M bench Height. An area of 1,000 M^2 will be covered during this year

In the fifth year it is planed to produce 1287.33 M^3 of economic grade rough blocks. To produce this quantity an area of 2145.54 M^2 will be utilized, retrieving 6436.63 M^3 of Rock Mass, Out of which 20% Market Grade Rough Blocks (1287.33 M^3) is anticipated, 80% waste rock will be generated (5,149.31 M^3).

YEAR WISE PRODUCTION FOR NEXT FIVE YEARS

Year	Area (M^2)	Bench Height (M)	Total Rock Mass (M^3)	Market Grade Rough Blocks @ 20%	Total Waste Generated (M^3)
1	1771.27	3	5313.80	1062.76	4251.04
2	2145.54	3	6436.63	1287.33	5149.31
3	2047.14	3	6141.41	1228.28	4913.13
4	1771.27	3	5313.80	1062.76	4251.04
5	2145.54	3	6436.63	1287.33	5149.31
Total			29,642.30	**5928.46**	**23713.80**
Average			5298.46	**1185.69**	**4742.76**

The mine layout for production of coloured granite rough blocks during the next five years is showed in Plate No. V.

6.3.2 Quantum of Excavation

To retrieve 5928.46 M^3 of Market Grade Rough Blocks a quantum of 29642.30 M^3 of Rock Mass has to be excavated out of which 23,713.80 M^3 is waste in the form of under size boulder, defective boulder, soil creep and rock debris generated during production of Rough Blocks.

Joint Director of Mines & Geology

6.3.3 Production Schedule

The production of colour granite continuous to through out year expect during monsoon. That is 10 working months, 25 working days per month are considered. The production of 1200 M^3 per year can be easily achieved in a single shift with sufficient men and machinery.

7.0 STORAGE & HANDLING OF EXPLOSIVES

a) Magazine Type and Capacity :

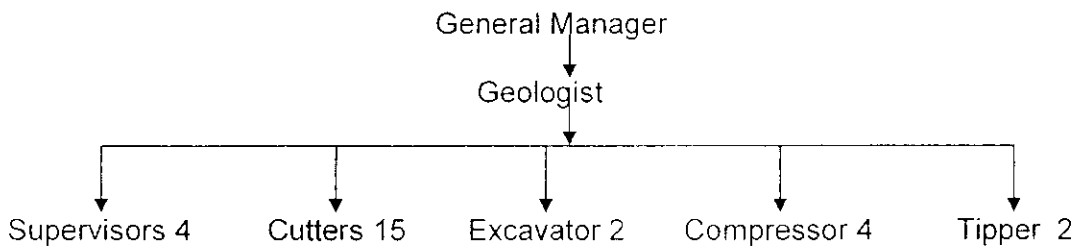
Not Applicable (No permission for storing the blasting material will be granted by the District Administration)

8.0 DESCRIPTION OF PROCESSING PLANT :

M/s Gallop Granites doesn't possess Granite Processing Plant

9.0 ORGANIZATIONAL CHART :

The organ gram of the quarry in this area is as follows :



Besides above managerial and skilled staff

- Semi-Skilled of about 10 members.
- Unskilled workers 4 members are required for the quarry work.

10.0 SITE SERVICES :

The company at Quarry Site has already provided Rest Rooms, First Aid Room, Shelters, Lavatory and Bore well for Drinking Water.

11.0 MARKET ANALYSIS :

This material is having very good demand in Europe - especially Germany & Italy for making monuments. The company owns this premium quarry, which is having a large extent, and very good quality because of good quality & proper demand the company is in direct selling of this material to Europe through its exclusive buyers.

12.0 SCHEME OF WASTE MANAGEMENT PLAN (SOLID & LIQUID)

i) **Solid waste for the next five years :** The granite body exposed to the surface. Hence, the weathering on the surface of the rock closely spaced joints and shears

along with inherent defects like Moles, Dark patches and acidic veins contribute a large extent of waste generation during the mining.

It is estimated that in the next five years a total of 23,713.80 M^3 of waste is expected to be generated with an average of 4742.76 M^3 per annum. The year wise waste generation in 5 years is as follows :

Year	Waste Generated (M^3)
1st	4251.04
2nd	5149.31
3rd	4913.13
4th	4251.04
5th	5149.31
Total	**23713.80**

ii) **Dumping site particulars :** For dumping of waste generated during mining will be dumped along the Southern margin of the lease area. Which is partly in the leased area and also the Private Patta Land owned by the company.

iii) **Estimated waste quantity that will be generated in the entire period:** At the rate of 4743 M^3 per year the volume of waste generated. During the next renewal period of 20 years is estimated to be 94,860 M^3.

iv) **Utilisation of waste if not prevented :**

- Soil can be utilized for reclamation of degraded area.
- Weathered rock if it is sufficiently soft and devoid of rock fragments can be utilized for roads. filling of road side ditches, formation of approach roads to quarries, construction works etc.
- Large and medium sized waste rock can be used as revetment for deep cut stream sections from preventing from soil erosion.
- The waste generated during the mining will also be used for back filling of the mine pit after completion of mining.

13.0 CONCEPTUAL PLAN

In the ultimate context. part of the lease hold with Black granite will be mined out.

Out of the total lease area of 5.00 Ha, the additional area proposed to be utilized for mining is about 5694 M^2 i.e. 0.57 Ha., by the end of plan period

Considering the Geological, Mining, Environmental and Site Specific Constraints, the total deposit in its horizontal and vertical extent will be worked

The ultimate pit limit has been designed considering safety zone of lease hold area Conceptually the ultimate pit layout will be irregular in shape.

Conceptually pit profile is expected to be irregular in shape. Ultimate pit slope would be 56° to provide the stability. Ultimate pit limit will be 9 M covering an area of 5694 M^2 at the end of 5 years. (Conceptual Plan Plate – VI)

14.0 ENVIRONMENTAL MANAGEMENT PLAN

14.1 Baseline Information

i. Existing Land Use Pattern

The applied area is hill. The land is steeply sloping due North and East. The whole land is covered by sparse vegetation. The soil existing in the applied area is bouldery and unfertile. The hill is exposed to a maximum height of 85 M above GL (Between Grids N 100 - 200 & E 100 - 200) and occupies entire quarry lease area.

The entire hill is active with quarry activity and surrounding the hill are agricultural lands.

ii. Water Regime

No Streams or Drainage lines exist in and around Quarry Lease area. Excepting the sheet flows during rainy days

iii. Flora and Fauna

The whole area is occupied by scattered sparse vegetation of thorny trees and small bushes. In the applied area no wild animals are witnessed as per the statements collected from the local population, since 50 years.

iv) Quality of Air, Ambient Noise Level and Water

- Air quality is good but at quarries it is filled with dust, due to haulage on the road, blasting etc
- The noise generated mostly due to blasting, drilling, vehicular traffic
- Granite mining will not effect water quality.

v) Climatic Conditions

The area is falling under semi-arid tropical zone. The area is having dry climate. The temperature recorded in this area is 25°C, in winter and about 48°C. in summer seasons. The wind direction is in SW to NE. The average annual Rainfall of the area is 1000 MM

vi) Human Settlement

The village Dhubagudi is situated 1 Km due North of the area. The population of this village is about 300. The village is surrounded by agricultural lands. The details of the villages in 2 Km. surrounding from the applied area is given in following table.

Table No. II : Human Settlement (Plate No – I)

S. No.	Village	Direction	Distance (Km)	Population
1.	Gopalapuram	South East	2	500
2.	Kothuru	North West	1.2	500
3.	Bheempuram	North West	2	500
4.	Dubbaguddi	North	1	300
5.	Sidipeta	South West	1.75	300

The main occupation of the local population is agriculture and sheep raring / Breeding and Quarry labour.

vii) Public Building, Palace and Monuments

No of public buildings, palaces and monuments are witnessed in and at the vicinity of the area.

viii) Quality of Air and Water

The air and water of the area are free from any kind of pollution, since no industries are established in the area.

ix) Whether the area falls under notified area under water act. 1974

The area will not fall under notified area under water Act. 1974.

14.2 Environmental Impact Assessment

i. Landscape Changes

1) Land Degradation

Granite Mining will alter the physiographic scene; a small portion of the lease area (Part of Hill) will alter its shape. Even the hill will change its appearance due to heavy quarry operations and huge dumps in the form of waste will be formed.

2) Aesthetic Environment

There is no aesthetic environment prevailing in and around the applied area.

3) Soil and Land Use Pattern

The soil cover is absent in the high-elevated areas. However, soil mixed with boulders is fertile but not useful for productive agricultural purposes. Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land. The soil generated will be utilized for afforestation.

4) Agriculture

The applied area is barren land and far away from agricultural lands. Therefore there is no adverse effect on agriculture. The fine dust particles will disturb the air quality and the dust will settle on the plants and trees in turn the plants may get dirt. The fine dust particles will settle in the water bodies and may change the water quality.

5) Forest

The applied area does not fall under forest zone.

6) Vegetation

The applied area barren hill with an exception of small shrubs, herbs and Thorny bushes grown along the interspaces of boulders and joints where some soil exists. Due to mining all this will be uprooted and the area will be exposed as barren land.

7) Water Environment

No Streams or Drainage lines exist in and around Quarry Lease area, except sheet flows during rain days.

COMPOSITION OF AIR (OR ATMOSPHERE) NEAR EARTH'S SURFACE

	Constituents of Air	Proportion in Atmosphere
1.	Nitrogen (N_2)	78.084%
2.	Oxygen (O_2)	20.946%
3.	Argon (Ar)	0.934%
4.	Carbondioxide (CO_2)	0.033%
5.	Neon (Ne)	0.003%
6.	Helium (He)	
7.	Methane (CH_4)	
8.	Krypton (Kr)	
9.	Hydrogen (H_2)	
10.	Nitrous Oxide (N_2O)	
11.	Xenon (Xe)	
12.	Water Vapour (H_2O)	Variable
13.	Dust Particles	Variable

MAJOR POLLUTANTS IN AIR (OR ATMOSPHERE)

1.	Carbon Monoxide	47%
2.	Sulphur Oxides	15%
3	Hydrocarbons	15%
4	Nitrogen Oxides	10%
5	Particulates	13%

SOURCES OF MAJOR POLLUTANTS IN AIR (OR ATMOSPHERE)

1.	Fuel Combustion in Vehicle (Transport)	42%
2.	Fuel Combustion in Stationary Sources	21%
3	Industrial Processes	14%
4.	Forest Fires	8%
5.	Solid Waste Disposal	5%
6.	Miscellaneous	10%

8) Air Quality

For air, the following maximum tolerable pollutant levels have to be adopted in accordance with the limits laid down by the Central Pollution Control Board for the industrial and mixed use areas.

Area	Category	Concentration Microgrammes Per Meter Cube			
		SPM	SO_2	CO	NO_x
A.	Industrial & Mixed Use	500	120	5,000	120
B.	Sensitive	100	30	1,000	30

Air quality will be within the permissible limits by adopting the following :

- The dust rising due to drilling will be controlled by covering the drill rods with cloth, dust extractors will also be employed.
- Dust suppression on haul road with sprinkling of water with chemical additives.
- Proper functioning of dust suppression arrangements in the equipment

9) **No water course is passing through the area excepting run off streams during monsoon.**

Due to the mining of granite, no adverse effect is anticipated on the water regime of the area.

TOLERANCE LIMITS FOR INDUSTRIAL EFFLUENTS

S.No.	Characteristic	Tolerance Limits for Industrial Effluents Discharged Into Inland Surface Waters	Method of Test Reference
1.	Colour & Odour	-	IS : 2488 Part – I 1966
2.	Suspended Solids, Mg / 1, Max	100	IS : 2488 Part – I 1966
3.	Particle Size of Suspended Solids	Shall Pass 850 Micron IS Sieve	IS : 2488 Part – I 1966
4.	pH Value	5.5 to 9.0	IS : 2488 Part – I 1966
5.	Oil & Grease Mg / 1, Max	10	IS : 2488 Part – I 1966
6.	Lead (as Pb) Mg / 1, Max	0.1	IS : 2488 Part – II 1968
7.	Chloride (as Cl) Mg / 1. Max	1,000	IS : 2488 Part – III 1968
8.	Flouride (as F), Mg / 1, Max	2.0	IS : 2488 Part – II 1968
9.	Dissolved Phosphates (as P). Mg / 1. Max	5	IS : 2488 Part – IV 1974
10.	Sulphate (as SO_4 – 2) Mg / 1. Max	1,000	IS : 2488 Part – III 1968
11.	Calcium (as Ca), Mg / 1. Max	Where the mine water is directly used as drinking water maximum tolerable limit is 200 as per the above ISI specification for drinking water.	
12.	Magnesium (as Mg), Mg / 1. Max	Where the mine water is directly used as drinking water maximum tolerable limit is 100 as per the above ISI specification for drinking water.	

It may be seen that the above table for water quality is a considerable modification on the ISI specification 2490 of 1981. The above modified table may be taken as the basis for evaluating the water quality.

Zonal Joint Director of Mines & Geology
Govt. of India

10) Noise Levels

The haulage of machinery and the drilling of boreholes generate Noise. However, the probable noise level will be within the permissible limits and will not cause harm the applicant will provide suitable protective gear to the workers for minimizing the noise pollution and the machinery will be well maintained.

Regarding noise pollution, the DGMS circulars may be followed. The following table gives the actual noise levels as measured in mining areas :

	Equipment	Noise Level dBA	Measurement Location
a)	**Mines**		
	Graders	76 – 104	Operators Cab
	Dozers	84 – 107	Operators Position
	Drills	72 – 100	Operators Position
	Front – End Loaders	83 – 101	Operators Position
	Scrapers	92 – 104	Operators Position
b)	**Fixed Plant Installations**		
	Drill Sharpeners	102 – 122	Operators Position
	Pumps	89 – 100	Operators Position
	Quarry Plant Area	88 – 102	Various External Sites in General Plant Area
	85 M^3 / Min Compressor House with Corrugated Enclosure	52	300 M

SOME COMMON SOURCES OF SOUND (OR NOISE), THEIR INTENSITY AND THE LEVEL OF SOUND EXPERIENCED BY HUMAN BEINGS

	Source of Sound(Or Noise)	Level of Sound (Or Noise)	Effect of Sound (Or Noise) as experienced by Human Beings
1)	Heavy Vehicle (about 8 Metres away)	90 Decibel	Very Loud Sound

The haulage of machinery and the drilling of drill holes generate Noise. However, the probable noise level will be within the permissible limits with in 100 d B (A) and will not cause harm.

- The machinery will be maintained properly to reduce the noise
- The protective noise reducing gear like earmuffs, the company will provide earplugs.
- Proper maintenance of equipment

11) Vibration Levels

Blasting in the area is banned. The vibration generated by the machinery will be feeble with in 8 Hz.

12) Aesthetic Environment

There is no aesthetic environment prevailing in and around the applied area.

Joint Director of Mines & Geology

13) Socio Economic Environment

5 villages within a distance of 2 Kms surround the applied area. The main occupation of villagers is agriculture and sheep raring. The commencement of mining activity in this area has improved the socio-economic status of the local people by employment in the quarries.

14) Occupation Health and Safety

The mining in this area does not involve any hazardous methods. The mining is simple and open cast mining method. In this the possibilities of small injuries is anticipated. This applicant will be providing First Aid facilities at quarry site.

15) Human Settlement

The nearest village Dhubaguda is situated 1 Km from the area. Therefore there is no anticipation of adverse affect on the human settlement.

16) Recreational Facility

The surrounding village's people will go Tekkali Town for purchases, medical & recreation.

14.3 Management Plan

1. **Soil Conservation Methods**

The fertile soil available will be used for plantation around site services and all along the road. Soil mixed with boulders, which is unfertile which will be used for laying roads.

2. **Proposed for Reclamation of Land affected by Mining activity during and at the end of mining**

Even after completion of lease period the hill remains except the reduction of elevation and slopes by the pits that will be formed.

3. **In case of forest programme for phased compensatory afforestation**

The applied area will not come under forest zone.

4. **Measures for Dust Suppression**

The mining will involve dust rising methods. The dust anticipated during dry seasons, due to haulage will be suppressed by sprinkling water. For this purpose, tractor mounted sprinkler will be deployed. The dust generated during the drilling will be suppressed by covering the drill rods by gunny cloth and dust extractors will also deployed

5. **Measures to minimum use vibrations due to blasting and check noise pollution**

Blasting is not permitted in the area. The noise generated by compressors, drilling & machinery like proclain / excavators and tippers will be high. The workers in the quarry area will be provided suitable headgear and noise reducing protective gear (Like Cotton Mufflers etc.) The machinery will be maintained properly for minimizing the noise.

6. **Treatment and disposal of water from the mine and beneficiation plant**

No treatment is required.

7. **Measures for minimising adverse effect on water regime**

No Streams or Drainage lines exist in the Quarry Lease area. The mining is confined to elevated place. Therefore no adverse effect is anticipated to water regime

8. **Afforestation Programme**

The afforestation will be taken up all along the buffer zone. The species that have history of good survival and growth under similar site conditions shall be planted. The recommended plant species are given in table below :

RECOMMENDED PLANT SPECIES

S.No.	Trees Species	Common Name	Utility
1.	Axadirachta Indica	Neem	Fuel, Timber, Fodder
2.	Albizzia Sp.	Siris	Fodder, Fuel
3.	Dalbergia Sissoo	Sisham	Fodder, Timber
4.	Cassia Sp.	Amaltaas	Fuel, Fodder
5.	Pongaamia Pinnata	Karanj	Fuel, Fodder
6.	Gliricidia Sepium		Fodder, Fuel, Timber
7.	Inga Dulce	Jungle Jalebi	Fodder, Fuel, Timber
8.	Eucalyptus Teriticornis	Eucalyputs	Fuel, Timber
9.	Holoptella Intergrifolia	Kanju	Timber, Fuel
10.	Annona Squamosa	Sharifa	Fuel

9. **Preparation of dumping ground for stacking toxic mineral substance**

No toxic minerals are present

15.0 ANY OTHER RELEVANT INFORMATION

All the statutory provisions applicable to granite mining leases, such as Mines & Mineral Concessional Rules, Granite Conservation and Development Rules 1999 Mineral and Mining rules, Indian explosive act, Payment and Wage act, Workmen Welfare act, Employees Provident fund act shall be adhered.

APPLICANT

RQP
(V.T. Chander)

For Gallop Granites Limited

APPROVED

Authorised Signatory

ZONAL JOINT DIRECTOR OF MINES AND GEOLOGY GOVT. OF A.P. VISAKHAPATNAM

Zonal Joint Director of Mines & Geology * Govt. of A.P.

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This Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No.....

ANNEXURE - I

Execution work orders from A.P. Govt.

GOVERNMENT OF ANDHRA PRADESH
DEPARTMENT OF MINES AND GEOLOGY

Proceedings of the Asst.Director of Mines and Geology, SRIKAKULAM.

(Present: Sri P.Sanyasi Naidu, B.Sc., Asst.Director)

Proceedings No.11/Q/93. Dated 6-4-93.

Sub: Mines and Quarries - Quarry Lease for colour granite over an extent of 5.00 Hectares in S.No.27 of Meelisathivada Village Tekkali Mandal Srikakulam District - Granted in favour of M/s Gallap granites ltd., - Execution of lease deed - Workx Orders - Issued - Regarding.

Ref: 1.Proc.No.273/Q1/93, dated 17.3.93 of The Dy.Director of Mines and Geology, Visakhapatnam.

2.Letter dated 6-4-93 from M/s Gallap Granites Ltd, Visakhapatnam.

3. Letter No.No.349/92/B4, dated 1.3.93 from the Collector, Srikakulam.

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O R D E R:

The Quarry Lease granted in favour of M/s Gallop Granites Ltd., Visakhapatnam for colour granite in S.No.27 of Meelisathivada Village, Tekkali Mandal Srikakulam District over an extent of 5.00 Hectares for a period of 15 years has been executed on 6-4-93 by the undersigned. The Quarry Lease is valid for a period of 15 years from 6-4-93 to 5-4-2008.

M/s Gallop Granites Ltd., Visakhapatnam is hereby permitted to enter and work the quarry area under the provisions of A.P.M.M.C.Rules and conditions laid down in G.O.Ms.No.317 Industries and Commerce Department dated 9.7.92 and subsequent instructions issued on the matter from time to time. The lessee should submit the quarterly returns showing the progress in cutting and polishing unit to the concerned District Industries Centre, The Asst.Director of Mines and Geology, Srikakulam, The Dy.Director of Mines and Geology, Visakhapatnam and The Director of Mines and Geology, Hyderabad. This work order is issued subject to the condition that the Government reserve the right to cancel the quarry lease granted and executed under A.P.M.M.C.Rules 1966 without assigning any reasons and giving notice and the conditions imposed in the grant order and appendix.

Asst.Director of Mines & Geology,
SRIKAKULAM.

To
M/s Gallop Granites Ltd., Visakhapatnam.

Copy submitted to The Director of Mines and Geology, Hyderabad for favour of information.

Copy submitted to The Dy.Director of Mines and Geology, Visakhapatnam for favour of information.

Copy submitted to The District Collector, Srikakulam.

Copy to the Mandal Revenue Officer, Tekkali.

Zonal Joint Director of Mines & Geology
Govt. of A.P.