

MINING PLAN FOR COLOUR GRANITE

FOR

M/s. CHRASS GRANITES

Over an extent of 2.62 Hectares in Sy. No. 1
Addukonda (V), Tekkali (M), Srikakulam District, A.P.



OWNER

M/s. CHRASS GRANITES

Chennai

Prepared By

V.T. CHANDER

(Regn. No. RQP / DMG / HYD / 02 / 2001
RQP / HYD / 179 / 2000 / A)

H.No. 10-1, Flat No. 202, Mahalaxmi Ganapathi Complex,
Sai Baba Temple Lane, Beside Sri Sai Grammer High School,
P & T Colony, Dilsukhnagar, Hyderabad - 500 060.

☎ : 040-24068218 📠 : 9391056234

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ccgeoengineer@rediffmail.com

DECLARATION

Certified that the Mining Plan has been prepared in full consultation with me in respect of our 'M/s. Chrass Granites, over an extent of 2.62 Hectares in Sy. No. 1 of Addukonda (V), Tekkali (M), Srikakulam District, Andhra Pradesh., and I have understood its contents and agree to implement the same in accordance with law.



Date : 21.09.2007.

Place : VISAKHAPATNAM

For CHRASS GRANITES


Proprietor
M/s. CHRASS GRANITES

CERTIFICATE

This is to certify that Mining Plan for Colour Granite in respect of quarry lease area over an extent of 2.62 Hectares in Sy. No. 1 of Addukonda (V), Tekkali (M), 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 : 21.09.2007

Place : VISAKHAPATNAM

For CHRASS GRANITES


Proprietor
M/s. CHRASS GRANITES

CERTIFICATE

The provision of Granite Conservation and Development Rules '1999 have been observed in preparation of the Mining Plan for Colour Granite, over an extent of 2.62 Hectares in Sy. No. 1 of Addukonda (V), Tekkali (M), Srikakulam District, Andhra Pradesh., to be leased to M/s. Chrass Granites, Chennai.

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 : 01 / 09 / 2007

Place : Hyderabad



RQP

(V.T. CHANDER)

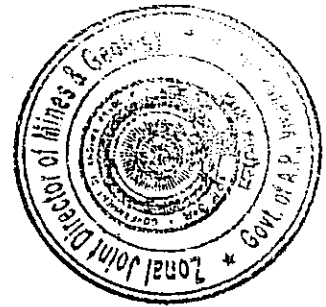
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FOR

M/s. CHRASS GRANITES

Over an extent of 2.62 Hectares in Sy. No. 1
Addukonda (V), Tekkali (M), Srikakulam District, A.P.

By

V.T. CHANDER
Consultant Geologist & RQP

1.0 INTRODUCTION

M/s. Chrass Granites, Chennai, an Entrepreneur in Mining was granted the Mining Lease for Colour Granite over an extent of 2.62 Hectares in Sy. No. 1 of Addukonda (V), Tekkali (M), Srikakulam District, A.P., vide Director, Mines & Geology, Hyderabad., Proceedings No. 2413 / R1 - 3B / 97 dated 20 - 04 - 1998. The lease deed was executed on 29 - 04 - 1998, vide Asst. Director, Mines & Geology, Srikakulam Dist., Proceedings No. 1540 / Q / 98 dated 29 - 04 - 1998, for period of 15 years from 29 - 04 - 1998 to 28-04-2013.

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

M/s. Chrass Granites, Chennai, approached Sri V.T. Chander, Consultant Geologist and RQP (RQP / DMG / HYD / 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 '1999.



APPROVED

N. Subrahmanyan
Zonal Joint Director of
Mines and Geology
Govt of A.P.
sakhapatnam-1

8/10/07

The Mining plan is Approved subject to
the Conditions / Stipulations indicated in
the Mining plan Approval letter No.....
1900/HP/2006 Dated 8-10-2007

2.0 GENERAL

- 2.1 Name and address of the applicant : **M/s. CHRASS GRANITES,**
Prop. Sri. B.C.M. Chandhirian,
AL-1 / 107-A, 4th Avenue,
Shanthi Colony,
Annanagar,
Chennai – 040.
- 2.2 Status of the applicant : Private Firm
- 2.3 Mineral for which applicant intends to mine : Coloured Granite
- 2.4 Name and address of the RQP who prepared the prospecting report : **V.T. CHANDER**
RQP / DMG / HYD / 02 / 2001
RQP / HYD / 179 / 2000 / A
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.
☎ : 040-24068218
☎ : 9391056234
- 2.5 Name and address of the prospecting agency : M/s. Chrass Granites,
Chennai
- 2.6 Details of the area

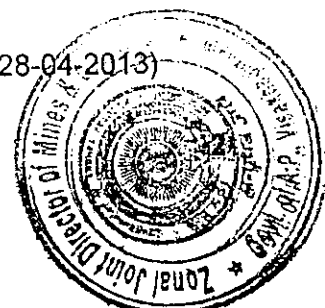
The lease area falls in the Survey of India, Toposheet No. 74 B / 2 and is bounded East Longitude 84° - 12' - 00" and North Latitude 18° - 38' - 00". It is situated 5 Kms North West of Tekkali Town. The road leading from Tekkali to Bheempuram via., Sitampeta crossing villages Barigipeta, Rama Krishnapuram and a diversion towards West by 600 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).

The details of the area are as tabulated below :

District State	Mandal	Village	Sy. No.	Extent	Ownership of Occupancy
Srikakulam Andhra Pradesh	Tekkali	Addukonda	1	2.62 Hectares	Govt. Land

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

- 2.7 Period for which Quarry Lease granted = 15 Years (29-04-1998 to 28-04-2013)



2.8 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	It is situated 5 Kms North West of Tekkali Town. The road leading from Tekkali to Bheempuram via., Sitampeta crossing villages Barigipeta, Rama Krishnapuram and a diversion towards West by 600 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

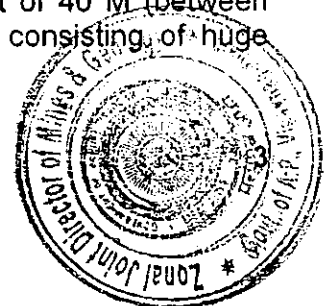
North	Quarry Lease of Sri. K. Venkateswara Rao
South	Agricultural Land
East	M/s. Sterling Stonex (P) Ltd.
West	Quarry Lease of Sri. K. Venkateswara Rao

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

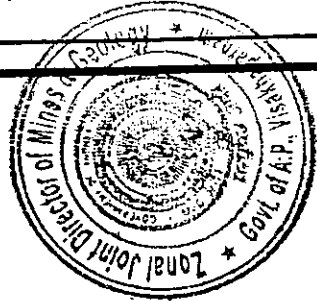
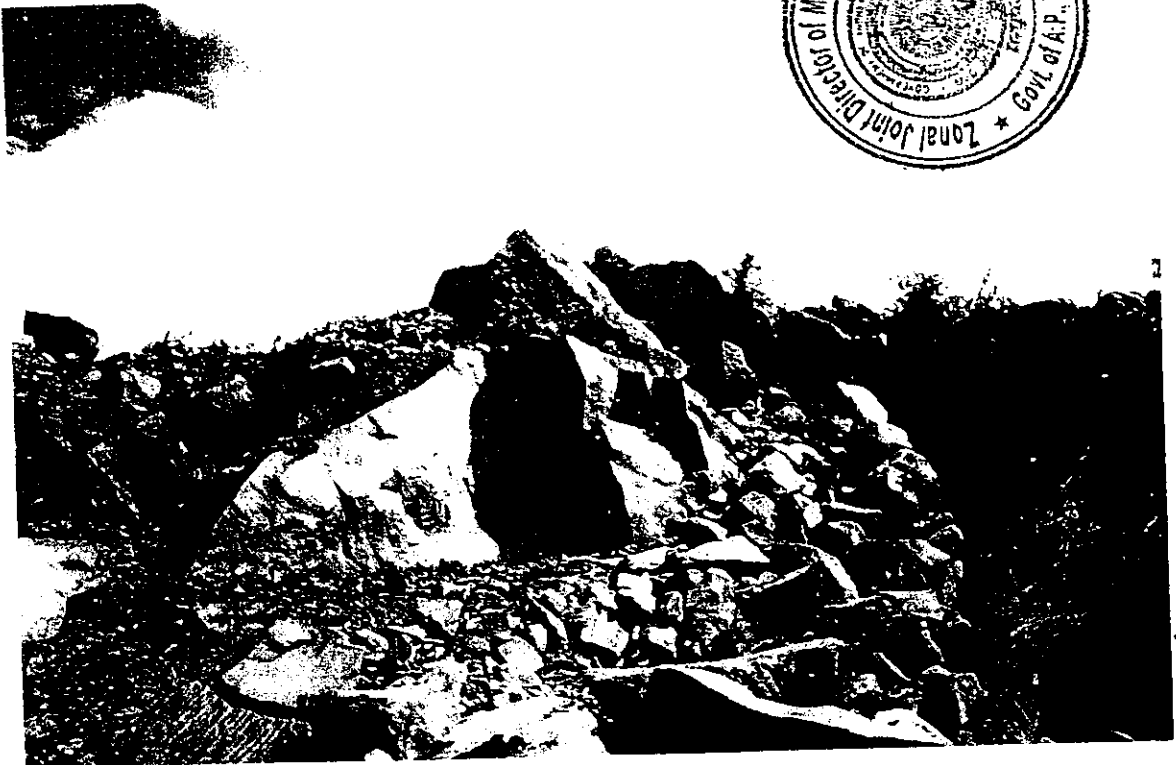
The lease area is located on a part of the hill sloping due south east. The surrounding areas are occupied by hills and mounds. The vegetation is moderate grown in the interstices of the soil between the boulders and below foot hills are agricultural lands. The mound is attaining a maximum height of 40 M (between grids N 50-100 & E 00-50) from the ground level and it is consisting of huge boulders.



PHOTOGRAPH SHOWING THE VIEW OF THE WORKING PIT



PHOTOGRAPH SHOWING THE CLOSE VIEW OF THE DEFECTIVE BOULDER



3.2 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 arcuate trend with Westward 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 - Kondalite Zone
3. Eastern - Migmatite Zone

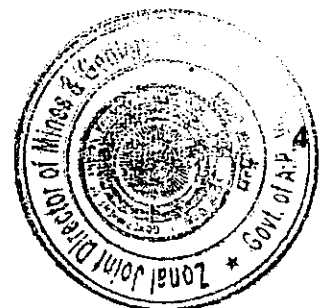
While in the Northern parts in Srikakulam, Vizianagaram & Vishakapatnam Districts the central Khondalite Zone occupies major part of the area. Where as Western Charnockite Zone occurs in the Southern part. The rocks in this belt are represented high-grade Granulite facies of Metamorphism and suffered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

INTRUSIVES	Layered Anorthisites and associated Mafics and Chromiferous Ultra Mafics.
CHARNOCKITE GROUP	Charnockites with Mega Crystic K- Felspar Charnockite Two 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 differentiated (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 wide range of litho units Viz: Charnockites, Khondalites, Two Pyroxene 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 Coast line.

3.2.1 Local Geology

Topography : The lease area falls on a part of the hill sloping due south east rising to a maximum height of 50 M (i.e + RL 160 between grids N 200-300 & E 150-200) above the ground level with in the area. There are two peaks within the lease area between grids N 200-300 & E 150-200 & N 50-150 & E 00-50, sloping due SE. The entire hill is covered with boulders. The soil is embedded with in the joints and interstices of the boulders. The boulders are of the size ranging between 9 M x 3 M x 2 M and 3 M x 2 M x 1 M were as the smaller boulders range from 1 M x 1 M x 1 M to 0.5 M x 0.5 M x 0.3 M.



Geology

The Migmatites and Migmatized 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, Hornblende 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 that 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.

Two sets of major joints :

1. N 70° E – S 70° W
2. N 20° E – S 20° W

3.3 Details of Exploration

3.3.1 Prospecting Operations Carried Out

The following prospecting operations were carried out in applied area.

3.3.1-1 Geological Traverses and Mapping

The Lease area was traversed to demarcate the exposures of the Colour Granite and to record the structural features in the outcrops, the data regarding litho units collected from the existing mine pit (i.e., the broken area N 50-250 & E 00-200) and Surface Geological Map on 1 : 1,000 Scale prepared (Plate – III).

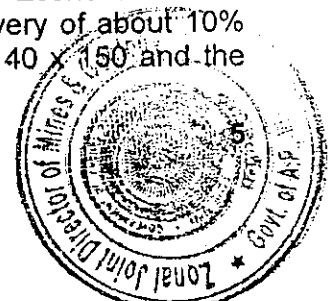
3.3.1-2 Topographic Survey

A micro optic theodolite is used for conducting the topographic survey. An assumed benchmark of 100 M used to measure the elevation differences in the quarry area and also to prepare the surface elevation contour map on 1 : 1,000 Scale.

3.3.1-3 Mining Activity Carried Out

Geological mapping of the Lease area revealed the Migmatites forms as boulders raising up to maximum height of 50 M above ground level. The mining was carried between the two peaks between the grids N50-250 & E 00-200. The exposed boulders were tackled by drilling with Jack Hammers and converting these boulders into blocks. The quarrying advanced NE to SW, benches facing East wards. A ramp / road was formed from South Eastern of the applied area to reach the workings. The mining is of semi mechanised type.

Working pit of 115 M x 55 M x 15 M was developed during the period from April 1998 a total of 94,875 M³ of Rock Mass with soil, undersized boulders were retrieved from the workings and after dressing 4,091.676 M³ of Economic Grade and Marginal Grade Rough Blocks recovered showing the recovery of about 10% are the blocks with sizes ranging 300 x 200 x 200 and 270 x 140 x 150 and the balance 220 x 150 x 100 & 180 x 100 x 100.



The following machines are used :

1. Poelain - 1 No.
2. Compressor - 1 No.
3. Jack Hammers - 5 No's.

With 25 No's of workers (Both skilled and semi-skilled)

3.4 Future Programme

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

4.0 RESERVES

4.1 Geometry of Deposit

Geological Traverses and the study exposures of the mound facilitated to assess the shape and size of the deposit in the area. It is in irregular shape. The surface of the mound is wavy and irregular with two peaks.

4.2 Method of Estimation of Reserves

The exposed deposit is found to be irregular in shape as it is exposed on hill, the volume is computed by cross sectional area method by taking 3 Cross Sections A-A1, B-B1 & C-C1.

Cross Section	Cross Sectional Area (M ²)	Sectional Influence (M)	Volume of Rock Mass (M ³)
A - A1	6,170.65	67.5	4,16,518.875
B - B1	7,715.17	55	4,24,334.35
C - C1	7,466.54	55	4,10,659.7
Total Rock Mass Estimated :			12,51,512.925

Rock Mass Blocked under Buffer Zone

Cross Section	Cross Sectional Area (M ²)	Sectional Influence (M)	Volume of Rock Mass (M ³)
A - A1	837	67.5	56,497.5
B - B1	834	55	45,870
C - C1	689	55	37,895
Total Rock Mass Estimated :			1,40,262.5

Rock Mass Blocked under Safety Slopes

Cross Section	Cross Sectional Area (M ²)	Sectional Influence (M)	Volume of Rock Mass (M ³)
A - A1	1,615	67.5	1,09,012.5
B - B1	1,692	55	93,060
C - C1	1,241	55	68,255
Total Rock Mass Estimated :			2,70,327.5



Total Rock Mass	12,51,513 M ³
Rock Mass Blocked Under Buffer Zone + Safety Slopes	4,10,590 M ³
Mineable Rock Mass	8,40,923 M ³
Recoverable Rock Mass 40% (60% Constitute Soil, Undersized & Defective Boulders)	3,36,369 M ³
Recoverable Market Grade Reserves @ 20%	67,273.8 M ³

Life of the Mine = (Recoverable Market Grade Reserves / Production Per Year)
= 67,274 / 500 = 135 Years

4.3 Categorization of Reserves

The deposit is exposed as mound is considered for computing the reserves. The entire deposit exposed on the surface is classified under "Proved".

4.4 Total Mineable Reserves

No deposit will be blocked under safety slopes. Hence entire rock mass after deduction of Soil Creep, Voids etc., are Mineable Reserves.

Total Mineable Reserves = 3,36,369 M³

4.5 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 Gang saw size are mostly preferred by exporters and international buyers, These are known as Economic or market grade. The Srikakulam Blue Granite is totally export oriented. Hence, all the blocks of Gang Saw size are only demanded by the exporters. The estimated quantity of rough blocks from the total rock mass is calculated @ 40% = 3,36,369 M³. The recovery of marketable grade is further anticipated at 20% from the above.

Economic Marketable Reserves = 67,274 M³

5.0 MARKET ANALYSIS

- i) Assured and expected supply contracts : Mining activity in the adjacent quarries has revealed that only Gang Saw Size of (Economic Grade) Rough Blocks of 2.4 x 1.4 x 1.2 & 3 x 1.9 x 1.8 sizes are required by exporters and will be dispatched to different exporters in Bangalore & Mumbai. The lessee has dispatched 4,091.676 M³ to the market.
- ii) Ability to supply consumer in time : Licensee is having sufficient men and machinery, besides huge and good quality rock at shallow depth. Therefore he is able to supply the material to the consumer in time.
- iii) Pattern of demand : Srikakulam Blue Granite of Srikakulam is having very good demand in international market. The prices of rough blocks of gang Saw size ranging between Rs. 8,000 to Rs. 10,000 depending upon the colour of the rock. Therefore, the material is having good demand and market is already established for the material from this mine.



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 40 M above ground level with boulders 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 Proclaim / 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

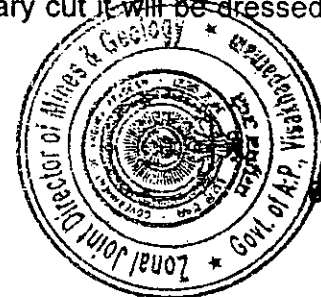
Extracting Boulder and Cutting them into Blocks with Conventional Methods :

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 2,520 M³ of Coloured Granite during next five years. In order to produce this quantity an area of 5,250 M² will be utilized.

1st Year :

The mining operations will commence within the existing working pit from North East forming a bench height of 6 M. The pit slope would be 56° to 60° to provide the stability and the bench will advance towards west, during the first year a total area of 1,050 M² will be utilized.

In the First year it is planned to produce 504 M³ of economic grade rough blocks. To produce this quantity an area of 1050 M² (70 x 15 M) will be utilized in the grids N 150 – N 250 & E 100 – E 200. Producing 6,300 M³ of rock mass from which 40% (2,520 M³) of suitable rock mass is excepted (After deduction of 60% wastage as Defective Boulders, Soil Creep etc.) from this economic grade rough blocks @ 20% (504 M³) will be obtained and 5,796 M³ of waste rock will be realised.

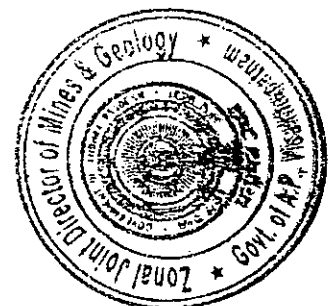
2nd Year :

In the 2nd year the operations will commence from West of 1st year workings in the existing Pit , forming a bench height of 6 M. The pit slope would be 56° to 60° to provide the stability and the bench will advance towards West, during the 2nd year a total area of 1,050 M² will be utilized.

In the Second year it is planned to produce 504 M³ of economic grade rough blocks. To produce this quantity an area of 1,050 M² (70 x 15 M) will be utilized in the grids N 150 – N 250 & E 100 – E 200. Producing 6,300 M³ of rock mass from which 40% (2,520 M³) of suitable rock mass is excepted (After deduction of 60% wastage as Defective Boulders, Soil Creep etc.) from this economic grade rough blocks @ 20% (504 M³) will be obtained and 5,796 M³ of waste rock will be realised.

3rd Year :

In the 3rd year the mining will continue West of 2nd year workings with East oriented faces advance further West maintaining average of 6 M. bench Height. The pit slope would be 56° to 60° to provide the stability An area of 1050 M² will be covered during this year.



In the third year it is planned to produce 504 M³ of economic grade rough blocks. To produce this quantity an area of 1050 M² (70 x 15 M) will be utilized in the grids N 150 – N 250 & E 100 – E 200. Producing 6,300 M³ of rock mass from which 40% (2,520 M³) of suitable rock mass is excepted (After deduction of 60% wastage as Defective Boulders, Soil Creep etc.) from this economic grade rough blocks @ 20% (504 M³) will be obtained and 5,796 M³ of waste rock will be realised.

4th Year :

In the 4th year the mining will continue West of 3rd year workings. Maintaining average of 6 M bench height. The pit slope would be 56° to 60° to provide the stability. East oriented faces advance further West. An area of 1050 M² will be covered during this year

In the fourth year it is planned to produce 504 M³ of economic grade rough blocks. To produce this quantity an area of 1050 M² (70 x 15 M) will be utilized in the grids N 100 – N 250 & E 50 – E 150. Producing 6,300 M³ of rock mass from which 40% (2,520 M³) of suitable rock mass is excepted (After deduction of 60% wastage as Defective Boulders, Soil Creep etc.) from this economic grade rough blocks @ 20% (504 M³) will be obtained and 5,796 M³ of waste rock will be realised.

5th Year :

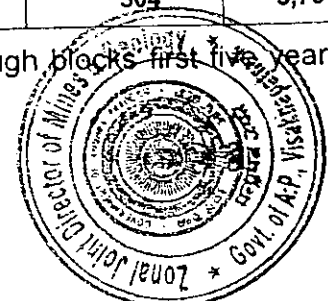
In the 5th year the mining will extent further West of the previous years workings. East oriented faces advance further West maintaining average of 6 M bench Height. The pit slope would be 56° to 60° to provide the stability, an area of 1050 M² will be covered during this year

In the fifth year it is planned to produce 504 M³ of economic grade rough blocks. To produce this quantity an area of 1050 M² (70 x 15 M) will be utilized in the grids N 100 – N 250 & E 50 – E 100. Producing 6,300 M³ of rock mass from which 40% (2,520 M³) of suitable rock mass is excepted (After deduction of 60% wastage as Defective Boulders, Soil Creep etc.) from this economic grade rough blocks @ 20% (504 M³) will be obtained and 5,796 M³ of waste rock will be realised.

YEAR WISE PRODUCTION FOR NEXT FIVE YEARS

Year	Dimensions L x W x Bench Height (M)	Total Rock Mass (M ³)	Recoverable Rock Mass @ 40% (M ³) after deduction of Voids & Soil Creep	Market Grade Rough Blocks @ 20% (M ³)	Waste Generation (M ³)
1 st Year	70 x 15 x 6	6,300	2,520	504	5,796
2 nd Year	70 x 15 x 6	6,300	2,520	504	5,796
3 rd Year	70 x 15 x 6	6,300	2,520	504	5,796
4 th Year	70 x 15 x 6	6,300	2,520	504	5,796
5 th Year	70 x 15 x 6	6,300	2,520	504	5,796
Total :		31,500	12,600	2,520	28,980
Average :		6,300	2,520	504	5,796

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



6.2.2 Quantum of Excavation

To retrieve 2,520 M³ of Market Grade Rough Blocks a quantum of 31,500 M³ of Rock Mass has to be excavated out of which 28,980 M³ is waste in the form of under size boulder, defective boulder, soil creep and rock debris generated during production of Rough Blocks.

6.2.3 Production Schedule

The production of colour granite continuous to through out year expect during monsoon. That is 10 working months, 20 working days per month are considered. The production of 500 M³ per year can be easily achieved in a single shift with sufficient men and machinery.

The following machines are used :

1. Poclain - 1 No.
2. Compressor - 1 No.
3. Jack Hammers - 5 No's.

With 25 No's of workers (Both skilled and semi-skilled)

a) Magazine Type and Capacity :

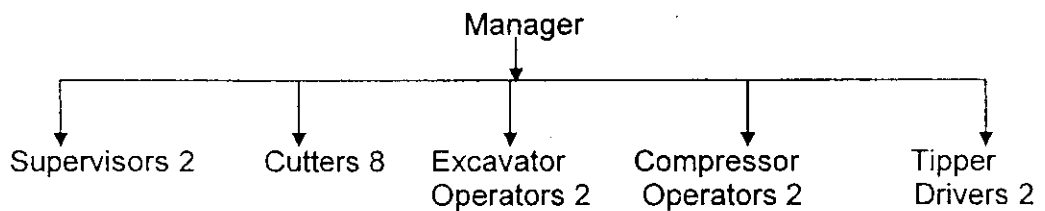
Not Applicable (No permission for storing the blasting material will be granted by the District Administration). The applicant proposes to use AGFRACT Chemical Compound whenever required.

b) Description of Processing Plant :

The applicant does not possess Granite Processing Plant

c) 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.

d) Site Services :

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



7.0 CONCEPTUAL PLAN

In the ultimate context, the entire lease hold with coloured granite will be mined out in the next 135 years.

Out of the total lease area of 2.62 Hectares (26,200 M²), the area proposed to be utilized for mining is about 5,250 M² (i.e., 0.52 Hectares). During the next five years a large dump covering an area of 3,152 M² with a height of 20 M will be formed around the mining pits during the present plan period.

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

The pit level has been designed considering safety zone of lease hold area. Conceptually the ultimate layout will be irregular in shape and the present peak of the hill will be sliced by 30 M.

The mining activity was carried out in an area 115 M x 55 M = 6,325 M² during the present mining plan period an area of 5,250 M² will be utilized within the existing quarry pit. The present lease period will expire after 7 years (28-04-2013). The cross sections for present 5 year plan + balance 2 years are depicted in the cross sections. Further projection for next lease tenure of 20 years is also projected in the cross sections in both vertical and horizontal i.e., both in "X" & "Y" axis.

Conceptually the hill profile of pit is expected to be irregular in shape. Ultimate pit slope would be 56° to provide the stability. Minimum bench width would be kept as 6 M from the faces at the end of ultimate pit limit (Plate - VI, Conceptual Plan).

8.0 SCHEME OF WASTE MANAGEMENT PLAN (SOLID & LIQUID) :

- i) **Solid waste for the first 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 28,980 M³ of waste is expected to be generated with an average of 5,796 M³ per annum. The year wise waste generation in 5 years is as follows :

Year	Waste Generated (M ³)
1 st	5,796
2 nd	5,796
3 rd	5,796
4 th	5,796
5 th	5,796
Total :	28,980



- ii) **Dumping site particulars** : For dumping of waste generated during mining will be dumped on the existing dumps temporarily along the Southern margin of the lease area between grids N 00 – N 100 & E 50 – E 200 and N 50 – N 150 & E 50 – E 150 .
- iii) **Estimated waste quantity that will be generated in the entire period:** At the rate of 5796 M³ per year the volume of waste generated in balance lease period i.e., 7 years is estimated to be 40,572 M³.
- 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.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Baseline Information

i. Existing Land Use Pattern

The applied area is a part of the hill sloping due south east. The whole land is covered by sparse vegetation. The soil existing in the applied area is bouldery and unfertile. The part of the hill in the lease area is exposed to a maximum height 50 M (between grids N 200-300 & E 150-200)

ii. Water Regime

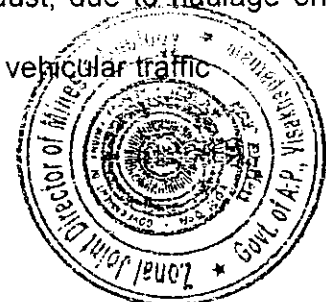
No Streams or Drainage lines exist in and around Quarry Lease area. Excepting the sheet flows during rainy days

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 Gopalapuram is situated 2 Km due South East of the area. The population of this village is about 500. 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.

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 rearing / 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

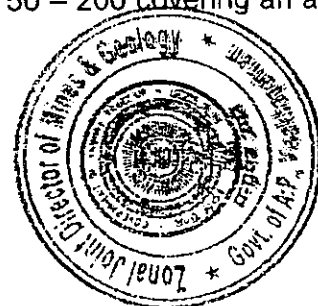
The area will not fall under notified area under water Act. 1974.

9.2 Environmental Impact Assessment

1) Land Degradation

Granite mining will alter the physiographic scene; $\frac{1}{3}$ rd of the present mound will be flatted and a dump covering 3,152 M² with 20 M height will be formed as an artificial mounds at the end of plan period.

The part of the hill (with in the lease area) will alter its shape by further 6 M with in the existing pit covering an area of 5,250 M². A large dump will be formed in the southern boundary between the grids N 00 – 100 & E 50 – 200 covering an area of 3,152 M² with a height of 20 M.



2) Air Quality

Air quality is good but at quarries it is filled with dust, due to haulage on the road, blasting etc. but it will be within the permissible limits by sprinkling water on roads and covering the drill rods with cloth.

Air quality will not be disturbed, as the quarrying is very limited.

AIR QUALITY

Base Level	Allowable Level
SPM = $140 \mu\text{g}/\text{m}^3$	$360 \mu\text{g}/\text{m}^3$
RSPM = $60 \mu\text{g}/\text{m}^3$	$120 \mu\text{g}/\text{m}^3$
SO ₂ = $40 \mu\text{g}/\text{m}^3$	$80 \mu\text{g}/\text{m}^3$
NO ₂ = $40 \mu\text{g}/\text{m}^3$	$80 \mu\text{g}/\text{m}^3$
CO = $1.0 \mu\text{g}/\text{m}^3$	$5.0 \mu\text{g}/\text{m}^3$

Air quality is good but at quarries it is filled with dust, due to haulage on the road, blasting etc., but it 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

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

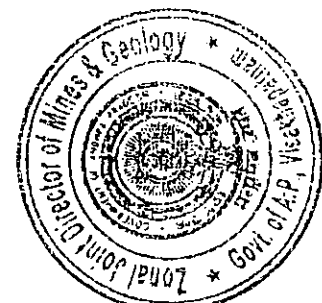
The mining of Granite, no adverse effect is anticipated on the water regime of the area.

IS 10 500 – 1944

S.No.	Characteristic	Desirable Limit	Maximum Permissible Limit
1	Colour	5	25
2	Order & Taste	Un Objectionable	
3	Turbidity	5 NTU	10 NTU
4	pH Value	6.5 tp 8.5	No Relaxation
5	TDS	500 mg.per ltr.	2000 mg.per ltr.
6	Total Hardness	300 mg.per ltr.	600 mg. Per ltr.

4) Noise Levels

The haulage 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.



The noise levels for various activities are

1. Compressor - 84 to 98 dB(A)
2. Tipper Empty - 88 to 91 dB(A),
Tipper Loaded - 95-103 dB(A)
3. Poclaim - 90 to 96 dB(A)

PERMISSIBLE NOISE EXPOSURE FOR DIFFERENT PERIOD OF TIME IS GIVEN BELOW

Duration Per Day (Hrs)	Sound Level Dba
16	80
8	85
4	90
2	95
1	100
½	105
¼	110
1/8	115

The haulage, 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

5) Vibration Levels

The vibrations that are generated due to drilling and haulage is very feeble within 8 Hz

6) Aesthetic Environment

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

7) Soil and Land Use Pattern

The soil cover is absent in the high-elevated areas. However, soil mixed with boulders, which are unfertile, is deposited along the buffer zone of the lease area. Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land.

8) Agriculture

The Quarry area is barren land and far away from agricultural lands. Therefore there is no adverse effect on agriculture.



9) Forest

The applied area is not coming under forest zone. However, the applicant is proposing to undertake afforestation in the area.

10) Vegetation

The Quarry area is covered with scattered vegetation of small shrubs, herbs and Thorny bushes. However, no cutting of trees is involved in mining activity.

11) Socio Economic Environment

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

12) 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 Lessee has already provided First Aid facilities at quarry site.

13) 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.

14) Recreational Facility

The surrounding villages people will go to Tekkali Town for purchases, medical & recreation.

9.3 Management Plan

1. Soil Conservation Methods

The soil cover is absent. The soil mixed with boulders is unfertile; 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 from the inter boulders will be spread in the buffer zone for afforestation.

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

Even after 20 years the mound remains $\frac{2}{3}$ rd of the present shape. Hence no reclamation is possible.

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 dust anticipated during dry seasons, by transportation on road will however be suppressed by sprinkling water on roads. For this purpose, tractor mounted sprinklings will be deployed at this place.
- The dust that rises during blasting will be negligible because of less production and rare blasting.

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

- The noise generated by compressors, drilling & machinery like proclain / excavators and tippers will be high. Proper maintenance of machinery will reduce the noise pollution.
- The workers in the quarry area will be provided suitable headgear and noise reducing protective gear (like cotton mufflers etc.)

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

Granite Mines does not require beneficiation.

7. Measures for minimising adverse effect on water regime

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

8. Afforestation Programme

Since the entire Quarry Lease area is occupied by the deposit. The soil generated will be dumped all along the buffer zone for afforestation. It is proposed in this region by planting suitable type with 2 M spacing. (Plate V).

9. Preparation of dumping ground for stacking toxic mineral substance

No toxic minerals are present

10.0 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.

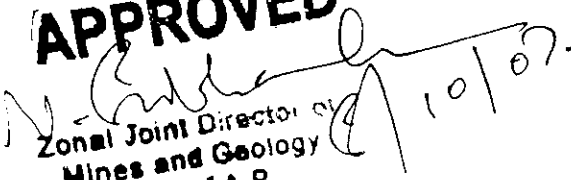
The mining lease will expire on 28-04-2013 (15 Years). The lessee will apply for extension of quarry lease 6 months prior to expiry (During the next mining plan period).

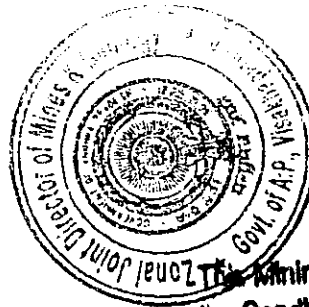
For **CHRASS GRANITES**


Proprietor

LESSEE

APPROVED


Zonal Joint Director of
Mines and Geology
A.P.



RQP


(V. T. CHANDER)

The Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No. 1900/MP/2006 Dated 8-10-2007

GOVERNMENT OF ANDHRA PRADESH
DEPARTMENT OF MINES AND GEOLOGY

PROCEEDINGS OF ASST.DIRECTOR OF MINES AND GEOLOGY: SRIKAKULAM.

(Present: Sri D.Santhappa, M.Sc.,)
ASST.DIRECTOR.

Dated 29-4-1998.

Proceedings No.1540/0/98.

Sub: MINES AND QUARRIES - Quarry Lease for colour granite over an extent of 2.62 Hectares in S.No.1 of Addukonda Village, Tekkali Mandal, Srikakulam District - Granted in favour of M/s CHRASS GRANITES, CHENNAI - Execution of Lease Deed - Work Orders - Issued - Regarding.

Ref: 1.Proc.No.2413/R1-3E/97, Dated 20-4-98 of the Director of Mines and Geology, Hyderabad.

2.D.Dis.1440/97, dt.5-7-97 of the District Collector, Srikakulam.

3.Letter dated 28-4-98 from M/s CHRASS GRANITES, CHENNAI.

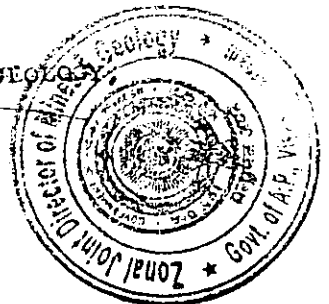
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ORDER

The Quarry Lease granted in favour of M/s CHRASS GRANITES, CHENNAI, for colour granite in S.No.1 of Addukonda Village, Tekkali Mandal, Srikakulam District over an extent of 2.62 Hectares for a period of 15 years has been executed on 29-4-98 by the undersigned. The Quarry Lease is valid for a period of 15 years from 29-4-98 to 28-4-2013.

M/s CHRASS GRANITES, CHENNAI is hereby permitted to enter and work the quarry area under the provisions of A.P.M.M.C.Rules, 1966 and conditions laid down in G.O.Ms.No.317, Industries and Commerce Department, dt.9-7-92 and subsequent instructions issued on the matter from time to time. The lessee should submit the quarterly returns to the concerned 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.

o/c
ASST.DIRECTOR OF MINES AND GEOLOGY
SRIKAKULAM.
29/4/98

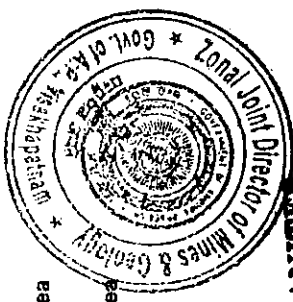


To
M/s CHRASS GRANITES,
Prop: Sri B.C.M.Chandhirian,
A-1/107-A, 4th Avenue,
Shanthi Colony, Annanagar,
CHENNAI-040.




- 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 for favour of information.
- Copy submitted to the Chief Executive Officer, Zilla Parishad, Srikakulam for favour of information.
- Copy submitted to the Revenue Divisional Officer, Tekkali for favour of information.
- Copy submitted to the Mandal Revenue Officer, Tekkali for information.
- Copy submitted to the Mandal Development Officer, Tekkali for information.
- Copy submitted to the Surpanch, Addukonda Village, Tekkali Mandal, Srikakulam District for information.



WIND DIRECTION



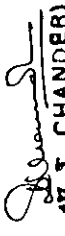
INDEX

-  Lease Area Boundary
-  Buffer Zone of 500M Around the Lease Area
-  Buffer Zone of 60M Around the Lease Area

For CHRASS GRANITES

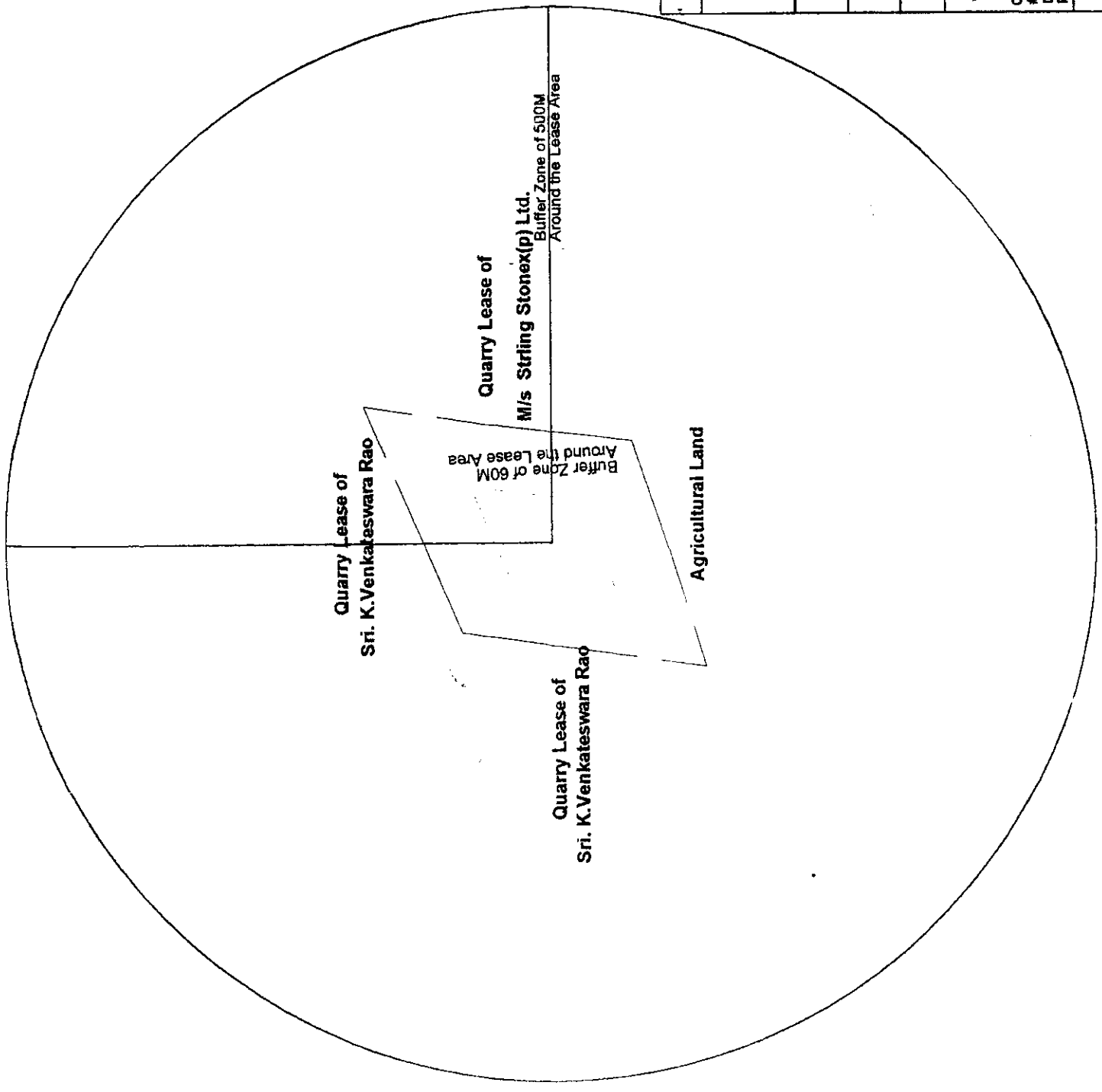
APPLICANT:  Proprietor

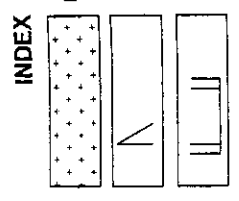
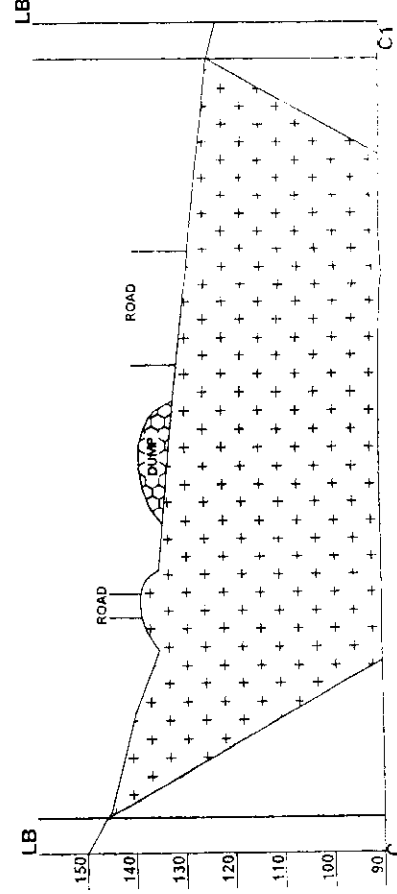
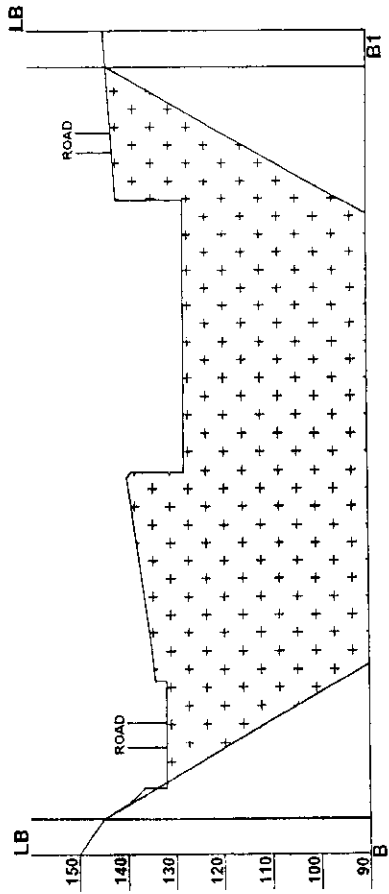
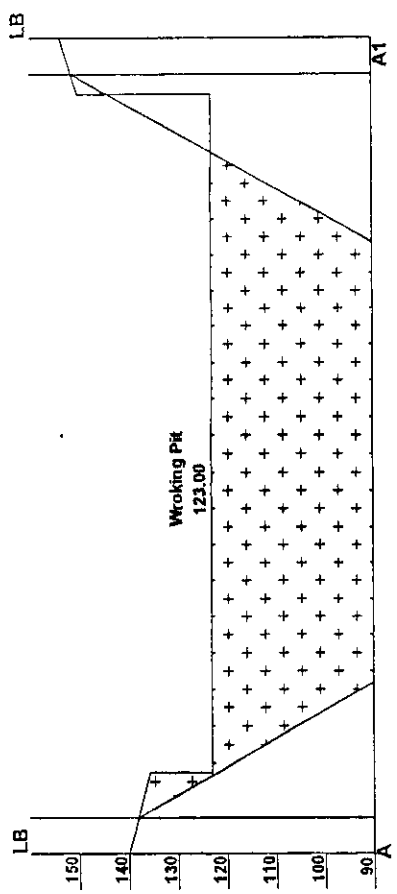
CORRECTNESS CERTIFIED


(V. T. CHANDER)

RQP: RQP/DMG/HYD/02/2001

MINING PLAN FOR COLOUR GRANITE
IN SURVEY No 1, ADDUKONDA(V) TEKKALI MANDAL, SRIKAKULAM Dist Extent : 2.62 Hectrs.
ENVIRONMENTAL PLAN
APPLICANT: M/s CHARAS GRANITES.
SCALE: 1:5000
V.T.CHANDER RQP/HYD/175/2000/A RQP/DMG/HYD/02/2001
CC GEO ENGINEERING CONSULTANTS PVT.LTD. # 202, Mahalakshmi Ganapathi Complex, P & T Colony, Dilsukh Nagar, Hyderabad - 60. Phone No's : 24068218, 939106234
PLATE VI





For CHRASS GRANITES

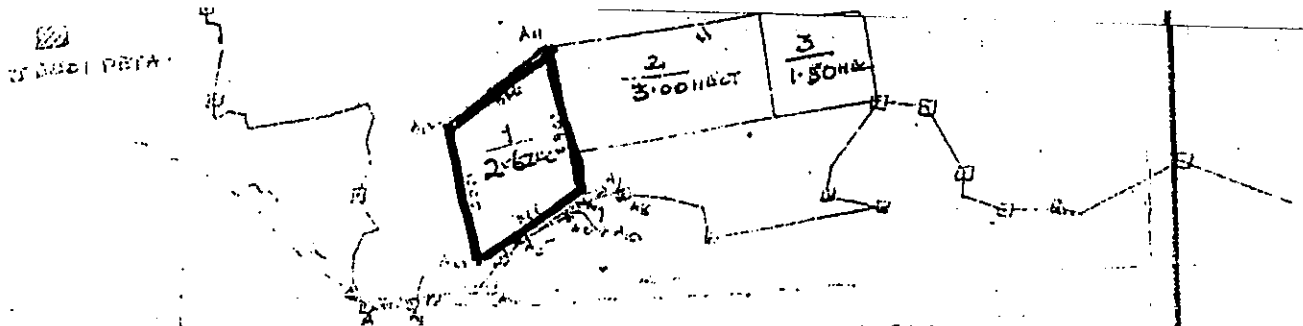
APPLICANT: *[Signature]* Proprietor

CORRECTNESS CERTIFIED

[Signature]
 (V. T. CHANDRAN)
 RGP/DMG/HYD/22001

RQP:

MINING PLAN FOR COLOUR GRANITE
IN SURVEY No 1, ADDUKONDA(V) TEKKALI MANDAL, SRI KAKULAM Dist Extent : 2.62 Hectrs.
GEOLOGICAL CROSS SECTIONS
APPLICANT: M/s CHRASS GRANITES.
H. SCALE: 1:1000 V. SCALE: 1:1000
T. CHANDRAN RGP/IND: 179/2008/A RGP/DMG: HYD/02/2001
CC GEO ENGINEERING CONSULTANTS PVT.LTD. # 22, Mahalakshmi Ganapathi Complex, P & T Colony, D. S. Road, Mysore, Karnataka Ph: 9448151834, 9391066234
FLATE N



A₁, A₂, A₃, A₄ SURVEY STONES IDENTIFIED IN THE FIELD.

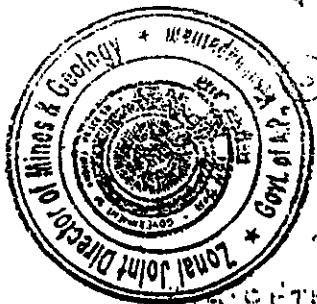
A₁ TO A₁₄ THE OPPOSITE TRAVEL OF STATION ON THE ROAD

POINT	INTERNAL ANG.	DISTANCE	REMARKS
A ₁ TO A ₂	0	60.30 m	A is a village boundary stone OR 200 LINKS CORNER IS LOCATED LEFT SIDE OF THE ROAD.
A ₁ A ₂ A ₃	170° 45'	514 LINKS	
A ₁ A ₂ A ₃	30° 50'	131 LINKS	see A ₃ TO LEFT SIDE IN D/S ABUTMENT OF PIPE CULVERT.
A ₁ A ₂ A ₄	13° 35'	126 LINKS	A ₄ TO RIGHT SIDE IN U/S ABUTMENT OF PIPE CULVERT.
A ₁ A ₂ A ₅	125° 15'	424.5 LINKS	
A ₁ A ₅ A ₆	216° 15'	349.65 LINKS	
A ₆ A ₇ A ₈	171° 30'	258 LINKS	
A ₆ A ₇ A ₈	221° 10'	165.6 LINKS	A ₈ IS A VILLAGE BOUNDARY STONE.
A ₆ A ₇ A ₉	14° 15'	130.5 LINKS	
A ₇ A ₉ A ₁₀	135° 00'	1100 LINKS	
A ₁ A ₂ A ₁₃	75° 10'	256 LINKS	
A ₂ A ₁₃ A ₁₄	134° 15'	1000 LINKS	

1. AREA SURVEYED IN FAVOUR OF M/S CHARASS GRANITE EXT: - 3.62 HECTS.

2. C.P.L. AREA OF M/S STERLING STONEX (P) LTD. EXT: - 3.00 HECTS.

3. C.P.L. AREA OF M/S STERLING STONEX (P) LTD. EXT: - 1.50 HECTS.



(Signature)
THE APPLICANT/AGENT

For CHASS GRANITES

For CHASS GRANITES

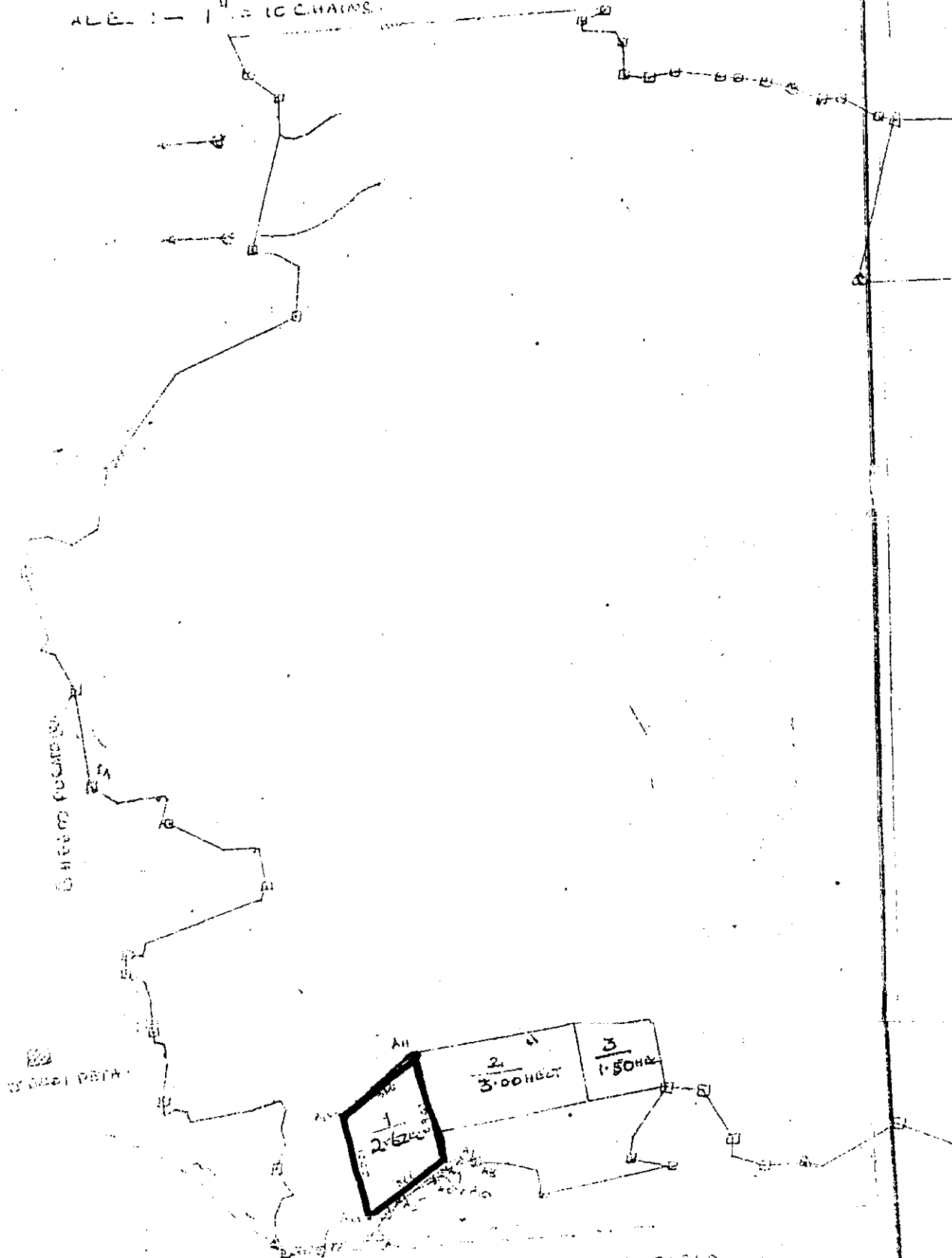
(Signature)
SURVEYOR

(Signature)
DY. DIRECTOR
MINES & GEOLOGY
PATNA

(Signature)
Proprietor

PLATE - II

1. THE TRAIL
 2. ADDENDUM
 3. NO. 1 - II. [PART OF THE AREA]
 4. 10 CHAINS.



A, AB, AC (SURVEY STONES IDENTIFIED IN THE FIELD)
 A, B, C, D, E, F (THE ROAD)
 THE ROAD