

PROSPECT FOR EXPORT ORIENTED GRANITE UNIT IN GUJARAT

by
J. V. BHATT
Senior Development Officer (Minerals)

iNDEXTb

**INDUSTRIAL EXTENSION BUREAU
(A GOVT. OF GUJARAT ORGANIZATION)**

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PREFACE

Granite has been included in the list of areas identified by the Government of India for making a special thrust in the overseas market. The principal market for growing exports are Japan, the US, Saudi Arabia, Belgium, Switzerland and Thailand. Exports in the last fiscal years reached a level of Rs.147 crores. The target for 1990-91 is Rs.210 crores. According to the projection with the ministry, exports by the end of Eighth Plan could touch the Rs.500 crores mark and increase to Rs.1000 crores by the end of this decade.

With these emerging market in the overseas market, dimension stone granite has occupied important position in the export.

India is a traditional exporter of rough blocks to countries like Japan, Italy, West Germany, France, USA and UK.

Tamil Nadu, Karnataka and Andhra Pradesh have entered in this dimension stone industry export market. Granite quarrying has also been modernised and developed in these states. With the rapid growing market in the international market, Gujarat State has also thought to give attention towards dimension stone industry.

Preliminary geological mapping and engineering properties of the Sabarkantha, Panchmahal, Banaskthant and Baroda districts, granite resources were studied by Gujarat Engineering Research Institute and Petrography & Mineral Chemical Laboratory of DGM. The results indicated that resources can be developed for dimension stone quarrying.

With the increasing demand to establish the granite cutting and polishing units in the State, Industrial Extension Bureau took a study on the granite resources. Report on 'Prospects for EOU Granite Units in Gujarat' was released in May, 1990.

The report was appreciated in the stone market of Gujarat. With its increasing demand, it was decided to revise the edition with supplementary data on foreign trade agencies, price realisation and export potential.

The revised edition is compiled incorporating all changes and market potential.

I appreciate the efforts put by Shri JV Bhatt, Senior Development Officer (Minerals) and his team for revised edition under the supervision of Shri AK Ojha, General Manager (Technical). The revised edition will be useful to the dimension stone worker, traders and lease holders and interested entrepreneurs who desires to go for granite based units in the State.

I am thankful to the Director, Gujarat Engineering Institute and Directorate of Geology and Mining, Govt. of Gujarat.

Ahmedabad,
November 20, 1990

PK Laheri
Industries Commissioner & Chairman, INDEXTb

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1.0 INTRODUCTION

Granite has considerable demand in the world market in the shape of rough cut slab, bush hammered and scorched slabs, paving tiles, wall panelling stair threads, bath room/kitchen units tops.

The charnokites of Tamil Nadu, Karnataka and Andhra Pradesh are amongst the strongest and the most durable stones found anywhere in the world. The numerous ancient temples and monuments in southern India build of granite are of architectural value. Granite potential in the State has remained largely untapped. The demand for ornamental granite abroad is upswing. This two factors have influenced dimension stone workers in evincing keen interest, in granite industries in the State of Gujarat.

State has black granite resources in the Sabarkantha, Panchmahals, Surat, Banaskantha and Kachchh districts. Dimension stone industries in the neighbouring state of Rajasthan has flourished. Makarana marble and Jallor granite are extensively quarried in private sector.

Private entrepreneurs have shown interest for establishing 100% export oriented units in Kandla. With a view to exploit state resources of black and pink granite the comprehensive picture with potential location and distributions of granite has been evolved for the guidance and direction of the new enthusiastic entrepreneurs.

2.0 GRANITE RESOURCES

India has vast deposits of granite scattered over Andhra Pradesh, Assam, Tamil Nadu, Karnataka, West Bengal and Rajasthan. Granite deposits are also available in other States of India though to a lesser extent. No systematic estimates of granite reserves have been made so far. There is no exclusive export promotion organisation to look after the interests of this industry. However, certain states, Department of Mines and Geology and private agencies have made some estimates which together give the following picture:

The Indian Bureau of Mines, Nagpur had reported that the black granite reserves in freehold areas of Tamil Nadu alone is of the order of 6.7 million cubic metre. This does not include the deposits of a leasehold areas and the deposits of all varieties of granites.

However, the total deposits in Tamil Nadu has been assessed at 168 million cubic metres according to private estimates. Nevertheless the utilisation rate is only at about 2.7 lakh cubic metres per annum, indicating abundant untapped resources.

2.1 Statewise Deposits

In India, granite is reported to occur throughout the country, almost in every State. Different types of granite rocks are quarried and used chiefly as building stone, road metal, dimensional and monumental stones. Though granite is produced in many States such as Andhra Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Haryana, Karnataka, Kerala, Maharashtra, Orissa and Rajasthan, Tamil Nadu and Rajasthan are important from the export angle, as they yield the major output of blocks and slabs in the country. West Bengal and Maharashtra also have plans to mine granitic and doleritic rocks of different types occurring in the respective State for export purposes.

2.3 Karnataka

Grey, pink and black varieties of granite exist in a number of districts throughout the State. The important occurrences are distributed in Bangalore, Kolar, Mysore, Tumkur, Chick-mangalur, Hassan, South Kanara, Bellary, Raichur, Gulbarga and Bijapur districts.

The more important deposits of black granite are as follows:

- i Dodakallahalli and Ityandanshalli in Kolar district. They are the extension of the deposit in Chittoor district of Andhra Pradesh.
- ii Banaswadi and other villages in Kanakapur taluka of Bangalore district.
- iii Kundlur, Malemala, etc. villages in Chamjanagar taluka, Gumballi village in Yelandur taluka and Kengadi, Ponnachi, etc. villages in Kollegal taluka in Mysore district.
- iv Gundlagantal, Bachapalli, Madkamhalli, etc. villages in Sira and Tiputur talukas in Tumkur district.
- v Kadur, Ammandahalli, Bogibyle villages in Karwar district and Ankola taluka of North Kanara.
- vi Maroulu villages in Hassan taluka, Gangut, Konanpur, Harlaballi, etc. villages in Arakalagud taluka of Hassan district.
- vii Some areas in Mangalore district.

The more important deposits of grey and pink granites are as follows:

- i Alahalli in Bangalore South taluka and some of the villages of Megadi, nelamangala, Hoskote and Remnagar talukas of Bangalore district.
- ii Bachappanahalli and Kallahalli villages of Chintamani taluka, Soddamere and Narnahalli villages in Bangarpet taluka of Kolar district.
- iii Sivigere and Desapura villages of Sirguppa taluka and some villages in Bellary taluka of Bellary district.
- iv Chikkadagalli, Hungund, etc. villages in Bijapur district.
- v Chingalli, Midewadi, etc. villages in Hassan taluka, Kudlapura, Matigudi, Rudrapatna, etc. villages in Aralalagud taluka in Hassan district.
- vi Salagenudu and Samalpur villages in Sindnur taluka of Raichur district.

2.4 Rajasthan

Granites and gneisses of decorative and ornamental quality exist in a number of districts. Though these granites occur in considerable quantity, they are generally not used for construction purposes because of the easy availability of other building stones like sandstone, limestone, marble, phylites and schists. Granite of good quality is mainly found in Ajmer, Barmer Bhilwara, Jalore, Sorihi and Pall districts. In Ajmer district, granite and granite gneisses are quarried near Vijayanagar, Deoli, Baghera and Para. In Barmer district, pink granite associated with Bhilwara district, fine-grained varieties of biotite gneiss are quarried extensively near Ajitoura. In Jalore district, three types of granites, viz. black, pink and red are exported. Pink granite is mined in Taskhana and Kelkaji temple areas. Black granite is mined in Kolar-ki-ghatt and Kalaghate areas and red granite in Nuan

SUMMARY

Recently granite has entered in the dimensional and decorative stone group. Rajasthan is an important producer of decorative and dimension stone such as marble, granite, serpentine, limestone, sandstone, etc. of different shades, colours and textures. These stones have attracted interest of various producers, processors and users in the State as well as in the country.

Granite has been identified by Government of India for making a special thrust in the overseas market. The target for 1990-91 is Rs.210 crores. By the end of Eighth Plan, it is projected to touch Rs.500 crores mark.

In Gujarat State, granites are spread in Panchmahals, Baroda and Sabarkantha districts. Due to its typical weathering, they are distinguished from the other rocks. Geological Survey of India, Directorate of Geology & Mining, Government of Gujarat, Gujarat Engineering Research Institute have done geological mapping, petrography and engineeringn testing work for the granite rocks of the State.

Granite deposits in Jalwantgadh and Vajasana of Banaskantha district, Navavas, Nandri, Bhavangadh, Pathiol villages of Sabarkantha district, Meghariya, Ataladra villages of Panchmahals district are the potential areas for the dinmensuion stone working.

Black granite (Dolerite dyke) deposits occuring in Surat, Bharuch districts and dolerite dyke occuring in Kutch district are the possible quarry locations for the development of black granite working. Physical requirements of the structural granite and its property tested by Gujarat Engineering Research Institute have highlighted that pink granite of Meghariya, Nandri, Guntanyad, Kantava villages can be developed for the block quarrying.

Dolerite dyke mapping in Dhinodar, Aral, Mura villages of Kutch district have indicated that these rocks can be quarried as a dimension stone. In addition to above, dolerite dykes occuring in Uchhal, Vyara, Songadh talukas of Surat district can also be deoloped for the dimension stone work. Petrographic study indicated hat granite of Sabarkantha and Baroda districs can take good polish and can be quarried on a commercial scale for the dimension stone working.

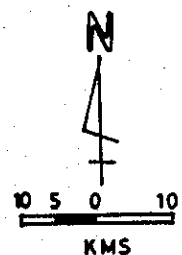
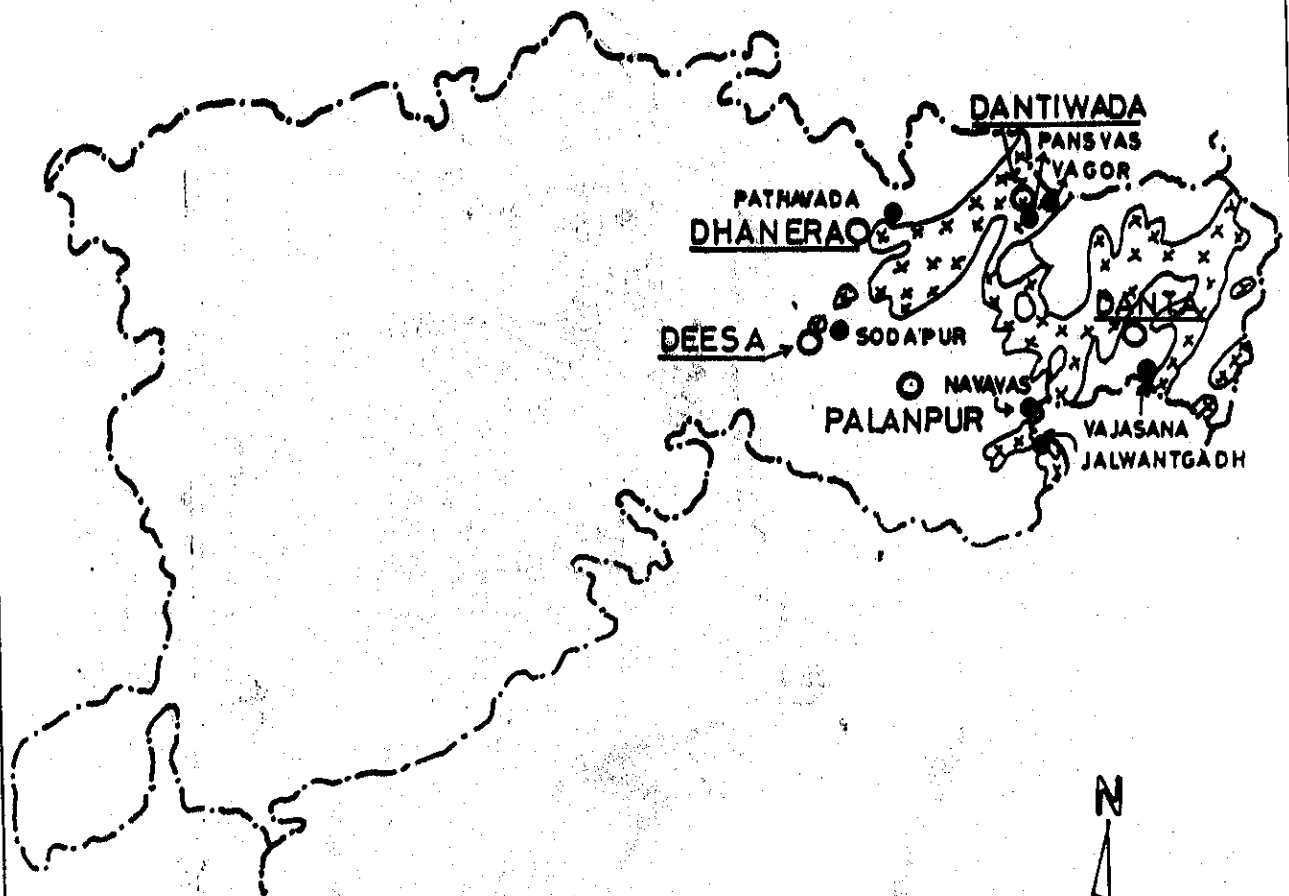
Potential areas for pink granite, grey granite, granite prophery and dolerite dykes have to be developed for a dimension stone quarrying. Quarrying has to be developed asper line of Tamil Nadu, Karnataka and Andhra Pradesh. Skilled wokers for such type of quarrying have to be trained.

Granite cutting and polishing unit can be established in KFTZ or at Palanpur growth centers utilising neighbouring Jalore Siwana granite of Rajasthan.

Cut and sized blocks quarried can be supplied to existing four units situated in the States. These four units are hauling unpolished blocks at a high price.

Inland granite slabs & tiles are also in good demand in constroction market of Gujarat.

GRANITE OCCURRENCES IN BANASKANTHA DISTRICT.



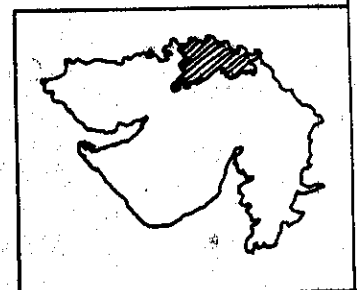
ACID INTRUSIVE (ERINPURA GRANITE)



TALUKA POINT



SUGGESTED LOCATION FOR GRANITE
QUARRYING FOR DIMENSION STONE.



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2.2 Andhra Pradesh

Andhra Pradesh is endowed with granites of export quality. Granites are found in Chittoor, Hyderabad, Khammam, Warangal, Prakasham and other districts.

2.2.1 Chittoor District

Kuppam and Palamner are the well known areas for granite production in Chittoor district. The precambrian granite gneisses of Kuppam taluka exhibits a clear gneissic banding. The commercial granite, i.e. black granite, is actually a gabbroic intrusive into the granite. There are three such prominent dykes at a distance of 19 to 24 kms. North of Kuppam town. Two of these dykes fall in Kuppam taluka and the third one in the form of small hillocks in succession and are partly concealed below the soil cover. The thickness of the dykes varies from 30 to 36 mts. The dyke rocks are also identified in the Koneru-Kuppam, Mallur, Krishnapuram, Ramajupam, Thuminda, Gudipala, Pasumanda, Naragalur, Ped-dasethipelle and Chenchugidi villages.

2.2.2 Hyderabad District

In this district, granite and gneisses are extensively worked, especially around Hyderabad city. Grey and pink are the common varieties. Dolerite dykes are also worked here. The stones take good polish and are used for decorative purposes.

2.2.3 Khammam District

Export quality black granites are reported to existing Polepalli and Edulapuram areas in Khammam district.

2.2.4 Prakasham District

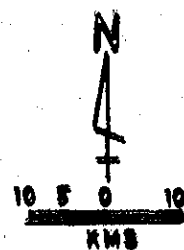
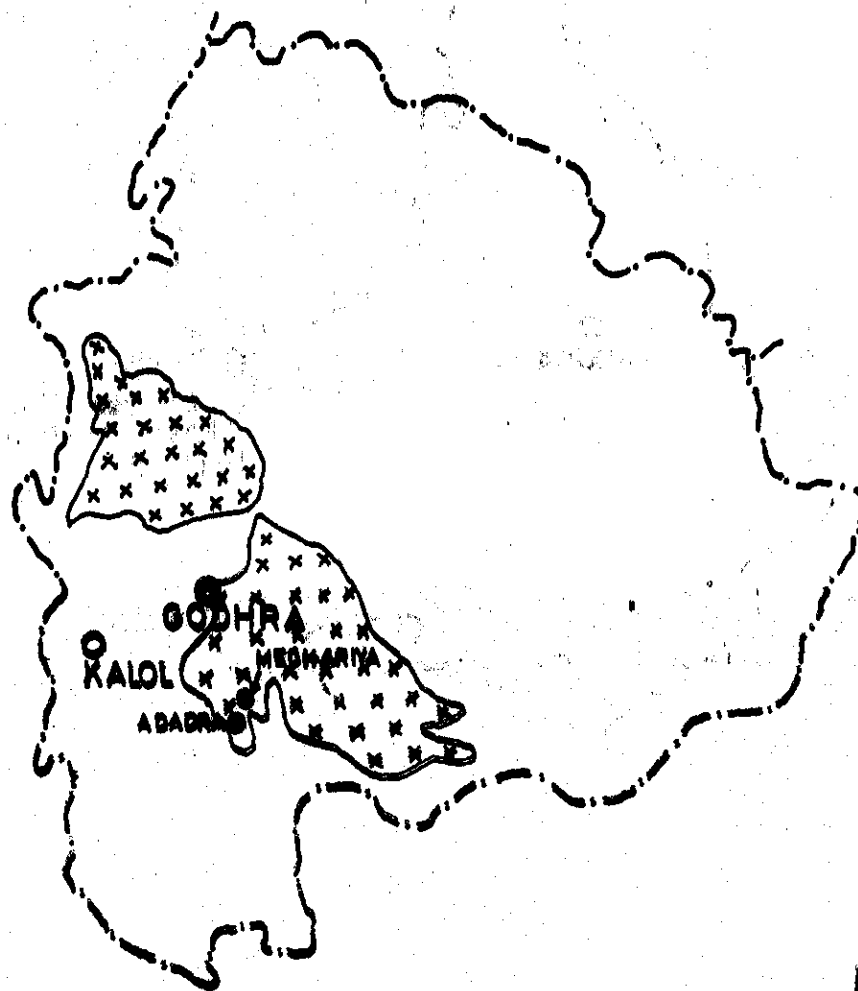
In Prakasham district, black granites are found in and around Kukutapalli and Gokunkonda villages. Another area is situated North of Narasaraopet-Addanki Road, in Shandarlinga and Gudipadu villages. In this area, there is a gabbro sill stretching in a NW-SE direction. The rock is medium grained and is brownish-black in colour. This is an extension of the Chimakurthi igneous complex of Warangal district.

2.2.5 Warangal District

Granites of good quality exist around Kazipet town and Chowtapally area in Warangal district. Grey and black varieties which take good polish are reported to exist around Kazipet. Black granite is reported in Chowtapally area. A good variety of charnockite extending over a square kilometer occurs near Chimakirthi village. Although two varieties of black granites are available here, these are not marketable because of the presence of bronzite flakes in them. The other areas in Andhra Pradesh where good quality granites of black, grey and pink varieties exist are as follows:

- i. Jagital and Metupalli areas of Karimnagar district.
- ii. Some areas of Dharmavaram taluka in Kurnool district.
- iii. Ellapalem and Gullapalem areas in Guntur district.
- iv. Udarapikonda area in Ananthapur district.
- v. Granitoid gneiss of pinkish variety in a number of places in Nellore district.
- vi. Black granites or charnockites and pyroxenites of good export quality in Kondapalli area in Krishna district.

GRANITE OCCURRENCES IN PANCHMAHAL DISTRICT



ACID INTRUSIVE (ERINPURA GRANITE)



TALUKA POINT



SUGGESTED LOCATION FOR GRANITE
QUARRYING FOR DIMENSION STONE.



and Keshwana areas. In addition to the above, large deposits of black granite have been located at Bidiar and Talera in Jalore district. Prophyritic granite which takes good polish occurs South of Jalore rest-house.

The other deposits of granite porphyry which is suitable as building material are located near Desur and Kolar areas in Jalore district.

2.5 Tamil Nadu

A number of areas of granite, black granite and granitoid gneisses have been identified in Tamil Nadu. Granite and Granitoid gneisses of very good quality exist at many places like Dindigul, Tirupathur, Vaniambadi, Walajah, Chermgam and Vellore areas in North Arcot district, Tirusulai, Pulliarapatti, Arupukottai, Tiruparal, Kundaram, Vakkanadu and Tolasampatti areas in Salem district, Tirkonum, Pudukottai, Kunamallai, Virallimalai, etc. areas in Tiruchirappalli district and in many areas of Tanjore and Nilgiri district. Black granite, i.e. gabbros and dolerites of good quality is found at a number of places like Tindivanam, Kunnam, Kallakurichi, Villupuram and Thirukoillur areas in South Arcot district, Bevanur RF Ajjanahalli, Badrahalli, Gopinathapatti Chintalpatti, Devarabetta, Parnagaram, Briyur, Harur, Donnakuttahalli, Chendrapatti, etc. areas in Dharampuri district, Thirumalaipatti, Paithur, Kalipettai, Yellikaradu, Namakkal and Mettur areas in Salem district and Bhavani area in Coimbatore and Kancheepuram and Chingleput areas of Chingleput district. Charnockites and leptinites which take good polish are found at Tiruvattur in Kanyakumari district, Puddur, Chelampatti, Sadamangalem, Varirityappamalai as also on the east bank of Cauvery at Mettur in Salem district and Tambaram and Pallavaram areas of Chingleput district.

Granite deposits exposed in different districts of Gujarat and black granite resources highlighted by preliminary survey are narrated.

3.0 AVAILABILITY OF GRANITE IN THE STATE

Granites are wide spread in the Champaner series. Acidic intrusive nature and its typical weathering distinguish it from the other rocks. Idar granite and Panchmahal granite are the major batholiths in the State.

Geological Survey of India and Directorate of Geology & Mining, Government of Gujarat have done petrographic and mapping work for the above deposits.

Detailed petrographic reports and geological mapping reports are available with the organization.

Granites and granodiorites of decorative/ornamental and building value are worked in Banaskantha, Baroda, Mehsana, Amreli, Panchmahal, Sabarkantha districts.

3.1 Banaskantha District

Granite deposits occur in Jalwantgadh, Vajasama and Navavas villages of Danta taluka, Jaspur, Pansval, Vagor Dantiwada and Pathavada villages of Dhanera taluka, Sodapur village of Disa taluka, Goba Tandiyavadi village of Palanpur taluka.

3.2 Sabarkantha District

The deposits are in the Idar, Mohanpur, Khuski villages in Idar taluka. Preliminary petrographic work has also revealed Nandri Bhavangadh, Pathiol, Laloda villages for the decorative work. In addition, Khalwad in Bhiloda taluka and Chhaniyana and Dhori village of Wadagam taluka are potential areas for granite.

3.3 Panchmahals District

Grey and chocolate granite occurs in the district. State department has carried out detailed mapping for micro-granite and highlighted Meghariya, Ataladra villages in Halol taluka. Engineering characters have been tested in G.R.I.

3.4 Surat District

Dolerite dykes are exposed in Sonagadh, Uchhal, Nizar taluka of Surat district. The details of the villages is mentioned below:

1. Khodtalav, Limbarda: Vyara
2. Sisor, Piparkua, Tokarwa, Dhanjikuva, Khanjer, Kharasi, Ghamkuva, Junwan, Dhamodi: Sonagadh
3. Thanadi, Nanchal, Amanpura, Chapati, Vadgam, Selad, Mirkot, Ukaigam: Uchhal
4. Demogara, Shale: Nizar

From the above village cadestral map, dykes exposed in the wasteland have to be demarked and its engineering properties can be tested as per I.S.I. for block working. Dolerite are marked as a black granite in stone industry.

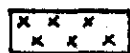
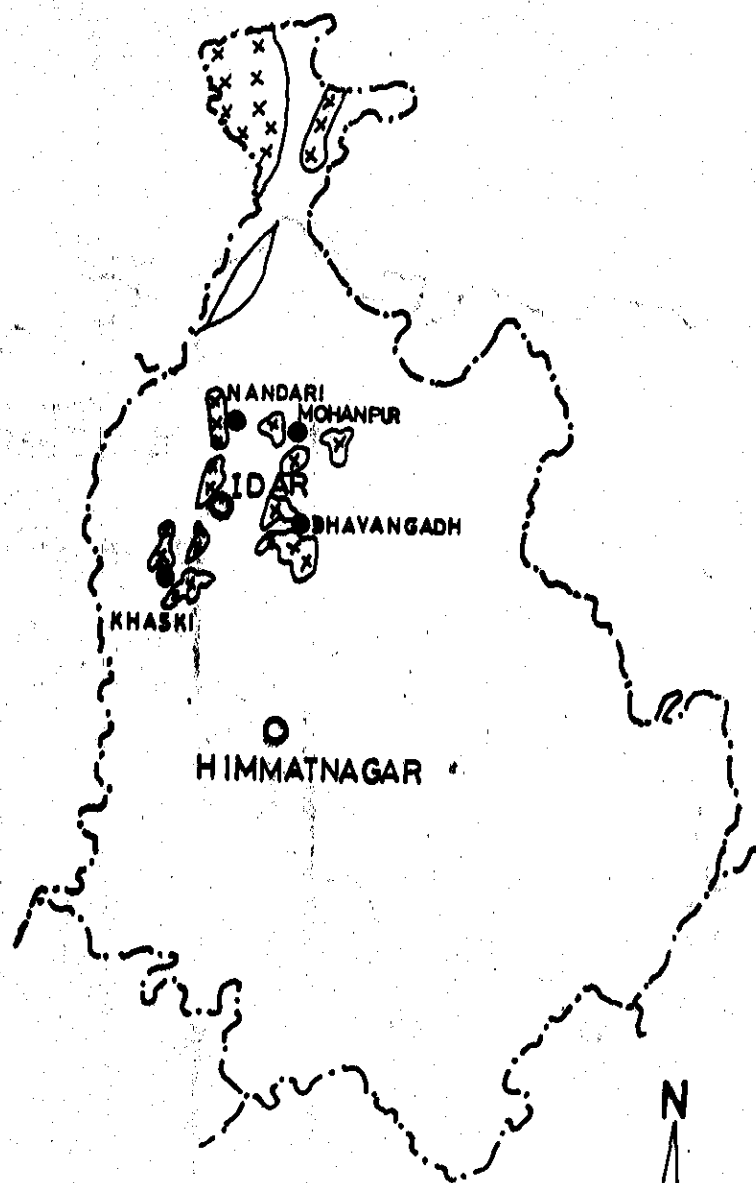
3.5 Kachchh District

Dolerite dykes running in E to W direction for about 4 km, strike length with 10m to 15m width with 70° to 80° dip is exposed in Dinodar and Moti Aral area. Dyke can be worked on a commercial base.

4.0 USES AND SPECIFICATIONS

Granite forms a major source of building material for construction purpose from foundation to the finishing stages. Ballest is used with cement in concreting. In polished form granite slabs of various colours are used for interior decoration for wall facing, steps carrying purpose. It is also used in monuments and tombstones in form of books marker and memorial gravesets which included head stone set, lawn set, kerb set and mousetraps set. In the form of polished surface plades it is used for meterological instruments. The specification for structural granites are grouped into two types (1) Engineering grade and (2) Architectural grade. ISI has evolved a specification for structural granite should be free from flaws damaging veins, cavities and similar imperfections that would impair its structural homogenetly and adversely affects its strength and appearance. Since granite is available in different colours the desinger has to specify the desired colours and permissible natural variations in colours and texture in detail besides granite containing undesirable minerals like pyrites and marcasite which upon exposures rust rapidly and cause objectionable stains on the stone should be excluded. The compressive strength should be not less than 1000 kg/cm² specific gravity should not be more than 2.6 water absorption should not be more than 0.50%. Above all the tests should be according to ISI specification. The dimension of slabs should be rectangular or square and of specific dimension of the bottom face may be rough but the top surface should be finely dressed and joint faces should be dressed back square with the top surface for atleast 50mm without any spalling off. The dimension of the blocks should be specified. The tolerance allowed for facing blocks should be ± 5 mm. The edges of blocks should be dressed according to IS 112*-1972.

GRANITE OCCURRENCES IN SABARKANTHA DISTRICT.



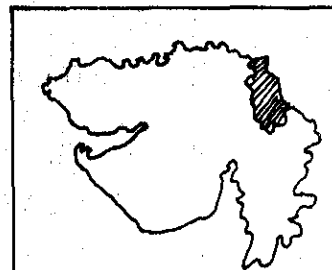
ACID INTRUSIVE (ERINPURA GRANITE)



TALUKA POINT



SUGGESTED LOCATION FOR GRANITE
QUARRYING FOR DIMENSION STONE.



6.3

Initially, a key block is removed by drilling hole in the centre down to the depth of the desired vertical cuts. An explosive charge in this hole frees the block is removed by drilling hole in the centre down the depth of the desired vertical cuts. An explosive charge in this hole frees the block with or without damaging the block. Once the key blocks is removed a series of closely spaced holes are drilled underneath the remaining blocks which are broken free with the use of feathers and wedges. Steel wedges are driven between feathers to produce the break to free a block of stone. The block may be further cut by the same technique. Granite blocks so broken and separated are lifted manually with levers or by cranes and loaded into trucks for despatch to the dressing yards.

6.4

Most of the quarries are operated by manual mining. Few quarries are equipped fully with mining machinery in Dharmapuri and south Arcot districts in Tamil Nadu and at Chamaraj-nagar in Mysore districts in Karnataka. Jet channelling or jet piercing is improved. In some countries flame cutting is done to cut the rocks.

7.0 PROCESSING OF DIMENSION BLOCKS

7.1 Primary Sawing

The dimension blocks are first cut to slab of required thickness as follows product-wise.

a. Slabs for monument industry - Circular sawing

Diamond circular sawing machine with a range of capacities from one (1) metre to three (3) metres saws are most commonly employed. The surfaces sawn are fairly level and smooth with an average rate of output around one (1) square metre (10 square feet) per hour. Usually the maximum length of block that can be sawn is about 3 metres (10 feet) and the height is the difference of the radii of the saw and flange. The most important sawing parameters are as follows :

Peripheral speed of saw = 30 metres/sec.

Longitudinal traverse rate per hour = 2 to 3 metres

Depth of cut per traverse = 5 to 12 mm

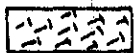
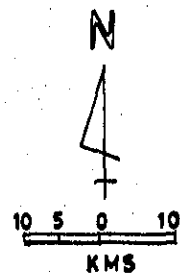
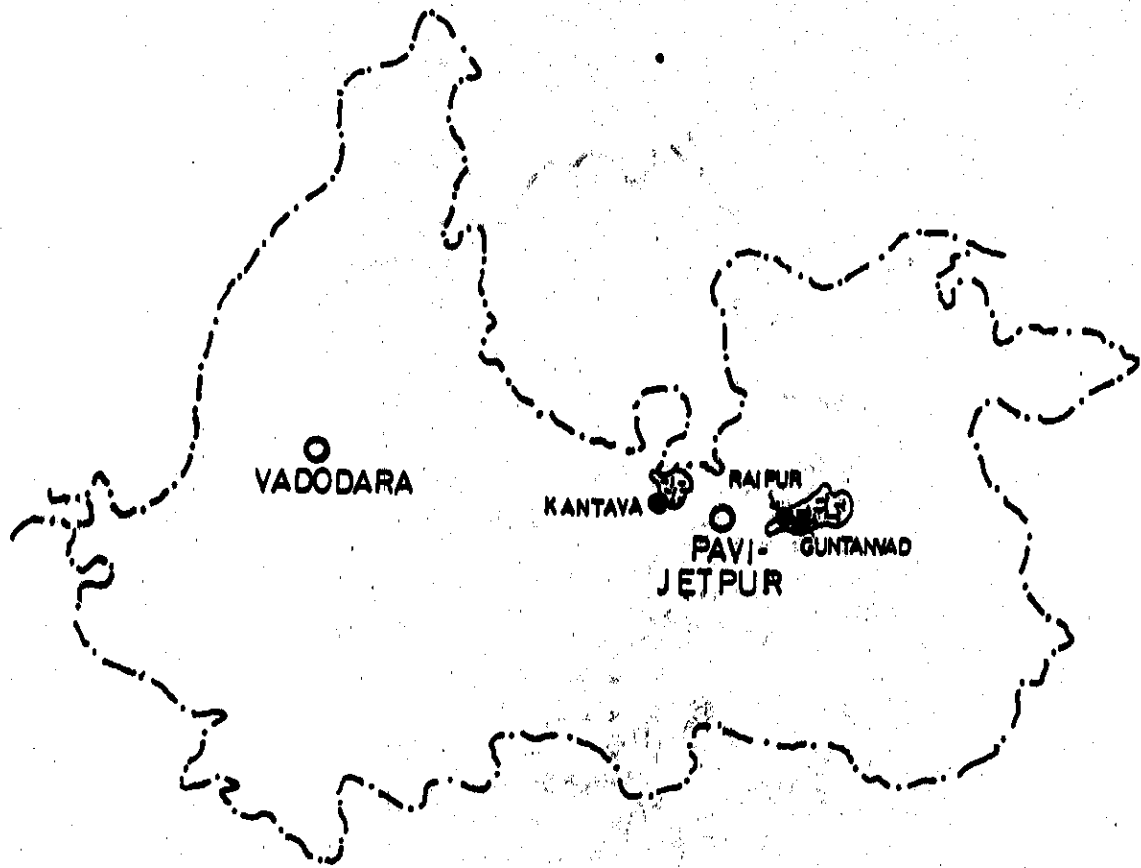
Normally, sawing of black granite does not pose any problem. However, while sawing red or other coloured material, the traverse rate and depth of cut kept at the lower end with frequent dressing of saw ensures smoother operation with good results. However the output of sawn material will be less and sawing costs will be higher while processing granites other than black. It is imperative to maintain the machines' running accuracy along with alignment of saw and slides in order to maintain the overall performance (of the entire primary sawing operation) at optimum levels. Any failure to do so can produce uneven sawn surface, affect tools' performance and ultimately damage the saw and machine.

7.2

b. Slabs for wall cladding (20mm)

Multiblade Gang Saws in which are reciprocating steel frame, carrying a number of steel blades (upto 120) and on to which steel shots and lime are distributed uniformly (like a shower) are most widely used all over the world for the production of 20 mm slabs. The

GRANITE OCCURRENCES IN VADODARA DISTRICT.



GRANITES AND GNEISSES



TALUKA POINT



SUGGESTED LOCATION OF GRANITE
QUARRYING FOR DIMENSION STONE.



7.6 Secondary Sawing

The polished slabs are next cut to the required sizes (length and breadth) on edge cutting machines using circular saw (ranging from 350 mm to 850 mm). As in the case of circular saws, the same cutting parameters apply here also.

Side Polishing

Where there is need for polishing the sides, side polishing machines employing smaller abrasives carry out the operation.

7.7 Process Flow

A brief outline of the sequential operations involved in the productions of slabs/monuments is given below:

Slabs - Building Industry

The rough blocks from the stock yard are loaded on to the block carrying carriages with the aid of mobile cranes. The carriage is taken to the multi-blade gangsaw using steel shot abrasives upon a motorized trolley moving on rails. The block carrying carriage is set into place in the gang saw, where the blocks are cut into slabs of different thicknesses. The sawn slabs are railed to the inspection area upon the carriage after the sawing operation is over. The sawn slabs are inspected for defects like cracks, seams and unevenness. Slabs suitable for polishing are loaded on to the multiple head line polishing machines where the slabs are surface polished to give mirror finished slabs. Further surface polishing is carried out with rails mounted oscillating polishing heads. After this slabs are taken to the multiple head edge cutting machine with circular diamond saws where the irregular edges are trimmed to yield straight edges. The slabs are cut into widths and lengths as per the requirements.

The edge cut slabs are further edge polished, chamfered and shaped on the edge finished machine.

7.8 Monument Industry

Monuments vary widely in form, shape and finishes because of individual tastes and needs. The equipments for processing monuments are simple but high skill is required to produce satisfactory end product. Primary sawing of monuments is carried out with diamond circular saws or wire saws or bands. While height of the block that can be sawn on a circular saw is limited by the diameter of saw (maximum economical size is around 1 meter of height of block) wire saw and bond saws can cut taller blocks upto 15 meters with ease. Bridge type circular saws are most commonly used because of reliability of the machine in turning out slabs of uniform thickness and smooth sawn surface.

Secondary sawing is carried out by edge cutting machine with saw diameters upto 300 mm. These machines with rotary table and light sensors and bridge/table indexing facilities enable the linear dimensions of the slabs to be accurately cut with speed. If rustic cut edges are needed on a mass scale, hydraulic splitters are available for economic production.

Profiling machines using diamond tools and mechanical or hydro-copying attachments are employed when regular shapes are needed in batch quantities. Sometimes, it is possible to carry out profiling by adapting an edge cutting or an articulated arm polishing machine. Another machine that is very usefully employed is a radial arm cutter. Other operations like drilling or coring is carried out using core drills on regular drilling machines.

4.1

Indian granites represent very desirable and durable building stones due to their ornamental nature. These rocks because of their massive nature and homogeneous grain size are preferentially used in monumental and architectural work as well as in massive masonaries. Their wide range of appearance and colour i.e. white, pink, grey, red, black, etc. renders the stones highly ornamental and is widely being accepted for a variety of decorative purpose. The charnokites of Madras, the arcot granites, the Bangalore granites, the porphyries of Shrirangapatnam and many other varieties of granites obtained from various districts of Peninsular India are indeed very attractive.

5.0 GRANITE LEASING SYSTEM

Granite quarry lease/permit is governed under the Gujarat Minor Mineral Rule 1966. Permit can be issued by Collector after paying advance royalty for the tonnes required to be quarried. These can be issued upto ten years and can be renewed further for the same period for a long term working. The lease application in prescribed form with necessary documents can be given to the concerned collector. As regards rent and royalties, royalty at the rate of Rs.12.00 is payable at the end of quarter for the total quantity removed from the quarry. In case of idle period dead rent is charged at the rate of Rs.8,000.00 per hectare. At present 65 leases with 226 hectares of land are in operation for engineering purposes. The list of quarry lease holders is mentioned in Annexure-4.

6.0 GRANITE MINING

In granite quarrying, the principal method used consists of drilling and wedges splitting carried manually or usually with air powered tools and gun powder blasting jet piercing is a relatively modern technique of granite mining. The need to hoist and handle stones of large size calls for the use of cranes.

6.1

After removing the overburden, if any, the fresh surface is visually checked for its suitability, the hard overburden is removed by drilling 30 to 60 cm deep holes of 50m diameter and blasting it with gun powder. The vertical face is developed and the granite quarries in rectangular block of standard size as well as in the form of slabs. Generally only selected portions are cleared and quarried. Granite quarries are opened as trenches tapping advantage of the system of joints. As far as possible rectangular blocks of standard lengths and width are marked either by hand channelling in mineral mining or by channelling machines in semi-mechanised/mechanised mining. After developing a vertical face block is separated from the parent ledge by putting closely spaced linear drill holes and charging gun powder or deep channel cutting by close drilling for making large blocks. Joint surface planes paralld to the surface are called sheeting planes which are useful for horizontal splitting. The direction of easy splitting is called rift and angles to the former is called grain.

6.2

The advancement of rift and grain arrangement is taken for mining granite in blocks. Generally, very little blasting is done in quarry with shattering effect of a mild chage the blocks are separated.

7.12

There are over 80 granite processing units in the country, almost all of them are located in Andhra Pradesh, Karnataka and Tamil Nadu, except three which are located in Rajasthan. One unit near Madras and another at Kuppam are amongst the modern units set up with imported cutting and polishing machines. A majority of the units are employing 2 to 4 polishing machines of indigenous made.

7.12 Steps involved in Granite Processing

The processing of raw granite involves the following four operations

1. Dressing
2. Cutting/Sawing
3. Surface grinding and polishing and
4. Edge cutting/trimming

7.13

In the past, all the processing was done manually due to non-availability of adequate machinery and equipment, Hammers chisels were used for dressing and cutting and abrasives for polishing. Even now, in most cases chisels are used for dressing the raw granite received from the quarry before being sent for machine polishing.

8.0 MARKET

8.1 World Trade

The world trade in granite is the order of 15000 million Indian Rupees. Annual consumption of polished granites in the world for building industry alone, in 1986 was 120 million square metres. The size of demand for monument industry was 10 million square metres. The market size for all kind of tiles is put at 330 million square metre, while production of granite tiles was placed at 10 million square metres. However, the market share of granite tiles is stated to increase in fast pace.

Statistics on world trade in granite is available only at macro level clubbed along with other building stones and connected materials. World trade on worked monumental stone is reported under SITC code 6613 and for raw block under SITC code 273 (Stone, sand and gravel).

8.2 Market Situation in Major Importing Countries.

The major importers of cut and polished granites in the world are Saudi Arabia, Japan, West Germany, Belgium, Netherlands, Switzerland, Singapore, USA, France and some of the middle east countries. The type of usage and the colour preference vary with the country.

In Japan the stones are used in buildings, railroads station roofs and platforms, as building materials for underground passages and used as interior-exterior decorating materials. In gravestone industry the stones are used in mortuary monuments and accessories, stone lanterns and stone pavements for gardens. Generally black and grey granites are preferred in Japan. In West Germany, Indian granites are used mainly in construction activities. There are multi-storeied buildings built only with steel and granite which is known as

7.9 Polishing

Surface Polishing

These vary from simple articulated arm machine to line polishers employing multiple polishing units. A sturdily and accurately built machine gives consistent performance over a period time.

Side Polishing

Depending on the needs, edges can be polished by surface polisher or where batch quantities are needed by side polishing machines with single or multiple polishing heads.

Profile Polishing

When the profiles are simple curves with radius of 300mm and above, polishing carried out with universal joint produces good finish, where the curvatures are intersecting and steps are required to be polished, hand held power tools are employed. In case of batch quantities, special tooling is required.

7.10 Granite Tiles

Machines carrying multiple diamond circular saws (about 1 metre diameter) mounted on the same spindle called block cutters are used to produce 10mm thick, slabs upto 34 cm width. Latest machines take blades upto 1500 mm dia for 600 mm wide tiles. These are subsequently calibrated (for maintenance of thickness) and polished in line polisher with multiple units. Now-a-days the polishing pressure is applied by hydraulic cylinders for achieving uniformity in thickness of tiles. Edge cutting is carried out by single or multiple cross-cutters.

Grooving of tiles at the back and chamfering are carried out by simple cutting and grinding machines respectively.

7.11 Packing

The finished slabs and monuments ready for despatch are manually wrapped in separate polythene covers, in order to ensure scratch proof surface. The individually packed material is further packed in wooden crates. Shock absorbing packing material like thermocol sheet globules or straw are placed between two immediate layers to avoid any damage during handling at the ports or in transit. Container services may be used for transshipment of the goods.

Depending upon the capacity envisaged the principle machinery necessary for cutting and polishing can be procured in the local market or has to be imported from abroad. The material handling systems, utility systems, air hammer, sand blasting apparatus are available indigenously. Processing is a part and parcel of the granite industry. With the passage of time and with improved technology, construction activity has increased manifold. The natural stone traditionally used have been substituted steel and reinforced concrete structures. Nevertheless, the utility of polished stone for memorials and tomb-stones remains unchanged even today and there is increasing awareness of aesthetic value. The stone finds use for claddings, facing and as decorative elements of buildings with an aesthetic value. Granite is also used for making idols, kitchen platforms, bathtubs, etc. Polished granite slabs have been used in some of the finest theatres and auditoriums. Granite holds its own place in metrological use. It is needless to mention that the use and popularity of granite depends basically on its efficient and quality processing.

Table-2
Countrywise Exports of Granite in 1985-86

Country	Cut Block		Granite Polished	
	Tonnes	Rs.Lakhs	Tonnes	Rs.Lakhs
Japan	178006	27587	1476	116
Italy	82019	1102	NA	NA
Netherlands	18290	215	22	-
Germany FR	25979	213	1357	24
Chinapen	15218	212	-	-
Canada	3609	56	297	24
UK	1251	17	2511	175
Belgium	1544	17	-	-
France	1246	14	-	-
USA	472	10	1418	123
Spain	429	5	-	-
Australia	210	3	274	23
Hong Kong	-	-	18	2
Korea RP	-	-	18	2
Malaysia	-	-	7	-
Oman	-	-	58	4
Total	328722	4630	7629	513

-Date not available, but insignificant

-Total need not tally, since it includes others

8.4 India's Market Share

India's market share in the international trade of granites is about 10%. However India's share in the world consumption of granites is negligible.

Major importer of Indian granites are Japan (57% share), Italy (22%), West German (5%), Netherlands (4%), USA (3%). Indian export of raw granite blocks to Japan are estimated to account for around 25%-28% of total Japanese imports of rough granite blocks in the eighties. South Africa, China, South Korea and USA are the main competitors to India in the Japanese market. Since Japan re-exports a portion of imported granite after further processing, it is felt in some quarters, that efforts to increase export of finished granite to the world market may lead to a shrinkage of Japanese orders for Indian granite. However, given that average sales realisation for Indian exports has been highest in the Japanese market (both in case of rough granite blocks and cut/polished granites), increased presence of Indian finished granites in the world market may not effect Indian exports to Japan which is not a major exporter of granite.

Italy, the largest granite exporter and a major importer of granite, depends on imports from India to the extent of around 10% (12.5% in 1983). Indian rough granite exports to Italy

'Steel Truse Granite Curtain Wall Systems' where no cement or precast slabs are used. Indian pink, grey and black varieties have been preferred in West Germany.

In United States it is used as monumental & building stones. Saudi Arabia, one of the major consumers of the world use granite mainly for construction purposes.

In Canada, granite is used as facing stone in the form of cut and polished panels in conjunctions with steel and concrete for institutional and commercial buildings. The emphasis in Canada has now changed from 'Stone for aesthetic quality'.

Pink & grey granites are preferred in Canada.

Usage of granite in the construction of buildings and their facades has come popular in Kuwait recently. The most popular colour is said to be 'Rose Imperial'.

The main use of granites in Belgium is in cemeteries where it is used as grave-stones. The colours preferred are the darkest ones like black, dark-grey, bluishgrey and greenish grey.

In Netherlands, granite is mostly used as tombstones. Similar quantities are used in the restoration of building facades and for other constructional purposes.

In Australia, ornamental stone is used for decoration while monumental stone - a better quality building stone - is used in sculpturing. Thus the market for cut and polished granites can be broadly divided into architectural stone industry and gravestone industry.

In most of the major importing countries in the world, Italy controls more than 75% of the total import market. Italy has got massive processing facility which is equipped with modern sophisticated machinery. It imports raw granite blocks from almost all parts of the world, converts them into slabs, monuments, tiles, etc. and exports in huge quantities to almost all the finished granite importing countries. West Germany, France, Canada, United States, Greece, Spain Portugal, China, Sweden, Korea, South Africa are the other leading exporters of cut and polished granites.

8.3 Indian Exports

The Indian exports have steadily grown over the years. Indian granite exports vis-a-vis world trade is given below:

Table-1
Granites - World Trade & India's Exports(Million USD)

Year	World Trade	India's Exports
1981	272	33.8
1982	255	31.6
1983	275	37.0
1987	600	70.0
1990(E)	900	80.0

The Industry's current year exports are placed at Rs. 120 crores. However the share of finished granites in 1987 was about 10% of the total exports. With establishment of may processing units the share is expected to go up.

Table-4
Exports of Major Indian Exporters

Name of Unit	(Rs.in Crores)		
	1984	1985	1986
Gem Granites	4.0	9.5	11.5
Enterprising Enterprises	3.8	9.5	12.0
TAMIN	3.0	4.0	5.8
Granite(I)Pvt.Ltd.	3.0	3.5	3.5

(Note: Estimates to be taken as representative in character)

However, bulk of these exports were rough blocks. Exports of finished products constituted a small share. The exports of cut and polished granites from India between 1983 to 1986-87 is given below:

	(Rs.in Crores)			
	1983	1984	1985-86	1986-87
Cut & Polished				
Granite Exports	1.3	2.7	5.8	9.5

In 1986, TAMIN set up a major 100% EOU for processing of granites. The other major exporters have also set up processing facility. Hence, exports of cut and polished granites have picked up in the recent past. Encouraged by the market potential, most of them are in the process of expanding their capacity.

8.6 Price Realisation

Granite is used in various applications in building industry, art pieces and monuments. India also exports a sizeable quantity of rough blocks of granite (which is processed into finished items by units outside) as also finished granite products like slabs, tiles and mostly monuments. Price of granite products depends largely upon colour: black granite and red granite are rated as premium quality and fetch higher prices. Prices also depend on grain structure and size of the particular piece. Given below is a productwise description of characteristic that affect the selling price. Table gives the average price realisation for Indian products in export and domestic market.

8.7 Rough Blocks

Broadly, there are six categories of granite products: rough blocks, slabs, panels, monuments and others. Due to shrinkage of exports from South Africa, India has emerged in the recent years as one of the important sources of raw granite-rough blocks (generally quarried as rectangular blocks varying from 0.3 cubic meters to 5 cubic meters in volume). Indian mines in operation are in general can quarry black granite blocks of relatively small sizes.

fetch a relatively low price. Black granite exports however fetch a relatively higher price because of scarcity of top quality black granite in Italy. Import of Indian cut and polished granite by Italy is unlikely even in future.

UK, Canada and USA are net importers of granite and represent good markets for finished granite products from India. The price realisation has been relatively higher for cut and polished Indian granite exports to Canada and USA which have not shown interest in Indian rough granites.

Table No.3 provides the volume of imports India's share among the imports of major destinations of Indian granites.

Table-3
India's Share in Major Importing Countries

	1981	1982	1983	1984	(Volume in CBM) 1985
Japan					
Total import	119411	124410	143620	147072	160260
India's Share	37656	32518	36549	40712	44311
-as %	31.54	26.14	25.45	27.68	27.65
Germany FR					
Total Import	63872	31935	71765	57291	93750
India's Share	2510	4321	NA	7112	65401
-as %	3.9	13.5	-	12.42	7
Italy					
Total Import	-	150350	165300	221696	243092
India's Share	-	20250	17000	21750	23600
-as %	-	13.5	10.28	9.8	9.46

USA: The imports of dimensional blocks is about 10,000 CBM per annum valued at 10 million US \$ apart from large quantity of finished and semi-finished material. However, Indian contribution is not significant.

8.5 Performance of Major Indian Exporters

The major Indian exporters:

- Gem Granites
- Enterprising Enterprises
- Tamil Nadu Minerals Ltd (TAMIN) and
- Granite (I) Pvt Ltd

All of these are Madras based companies. TAMIN is in the State public sector category. These four together have accounted for over 55% of the total exports between 1983 to 1987. An indicative exports of these four companies is given below:

8.10 Monuments

Indian black granite is being exported in finished/semi-finished form for making monuments and tomb stones for graveyards. Some export of red granite monuments have also begun recently. Prices depend upon size, colour, shade, grain structure and shape.

8.11 Other Use

In India, granite is used as kitchen platform, kitchen sink, name plates, foundation stones/inaugural etc. Granite ash trays, flower vases and other art pieces have both domestic and export markets.

8.12 Domestic Market

Domestic market for granite products is growing but still remains limited due to high prices. Hotels and office buildings represent the largest and premium segment of the domestic market. Demand for this segment is likely to maintain high growth but will take considerable time to become sizeable. Market for granite kitchen platform, name plate, table tops, tiles, etc. also are likely to remain limited due to high cost of granite items vis-a-vis the substitute products. High prices (limiting domestic demand size) are partly on account of high incidence of taxes: excise duty at 16% ad valorem and sales tax at 8% in Maharashtra, 7% in Karnataka and 14.5% in Andhra Pradesh.

8.13 Exports

The major importers of Indian granites are Japan, Italy, Netherlands, USA, UK and West Germany.

8.14 Export Projections

Sub-group No.2 on Industrial Mineral Development of the working group on Mineral Exploration and Development (other than coal and lignite) has projected the export of granite during VIII Plan as under:

Table-6 Projected Export of Granite from 1989 To 1995			
	(In '000 Tonnes)		
Type	1989-90	1990-91	1994-95
Rough & Cut blocks	360	130	500
Cut & Polished	10	16	37

However, the Ministry of Commerce during the course of deliberations with the industry has projected granite export at Rs.5,000 million for the year 1994-95 as against about Rs.120 crores projected by the above Sub-Group. Looking to the exports already achieved, the Ministry of Commerce target does not seem to be unrealistic.

8.15

In fact, All India Granite and Stone Association at Bangalore has worked out export projections in 2000 in terms of value of granite exports provided right encouragement is given and the existing constraints are removed.

Table-5
Average Price Realisation

Items	Export USD/CMB	Domestic - Rs.CBM
Rough Granite Block (0.3 - 3 CBM)	Black granite 350-1600 Warangal black 900 Yercaud black 800 Tindivanam 1400 & above Illekal Red 400-500 Kuppam Green 350 400	5,000 to 10,000
Slabs	USD/SQ.M - CM	
	Black (5)	140
	(20)	243
	Red (5)	128-142
	(20)	209-252
Panels	USD/SQ.FT	Rs.Sq.ft.
	Black (20mm) 10-12	Black(10mm) 90-135 Red(20mm) 85-105
	Addl. charges for polishing (Rs.12/sq.ft), half rounding the edge (Rs.35/sq.ft) and full rounding the edge (Rs.50/sq.ft)	
Tiles	USD/Sq.Ft.	Rs.Sq.Ft.
	9-12	3059
Monuments	30-40	
Others	Kitchen platform sink, name plates, inaugural stone, etc.	

8.8 Slabs & Panels

Slabs - a semi-finished block of rectangular size with one size polished and the other outside sawn and thickness in the range 20 mm upto 20 cm are used for exterior finished works in buildings. Price of slabs vary according to colour and thickness.

Panels are used for covering the exterior surface of the buildings, as table tops and as interior wall panellings. Size of panels range from 50 cms x 10 cms upto 100 cms x 300 cms and thickness correspondingly varying from 20 mm upto 50 mm. The price of panels depends on the quality of polishing, colour and grain structure.

8.9 Tiles

Granite tiles are used as flooring material and also for wall cladding (most preferred size 30 x 30 sq.cms. with 10 mm thickness, though size vary within the range 15 x 10 sq.cms. and 60 x 60 sq.cms. tolerance requirement in the international market on thickness is generally vary high -0.1 cm to 0.20 cm). This price depends upon colour, size and thickness.

8.19

Inland market has also developed for residential bungalows, flats, hotels and commercial buildings. In banks, chamber of commerces, townhalls, conference halls granite pannels are used by architects due to pleasing colours. Elevators' entries, counters, poshtable tops are also made from black granites. Government of India has allocated Rs.3000 crores for housing sectors, so construction activities will increase in view of this granite tiles and slabs will be in good demand.

9.0 LOCATION FOR GRANITE QUARRYING SET UP

9.1

Granite quarrying for block and slab working needs geological mapping befor opening a face. In preliminary survey characters like colours, fabric, hardness, lustrure, flaws, joints veins, cavities have to be identified for the exposed granite.

Weathering, joint pattern & sheeting planes are to be recognised. The advancement of rift and grain arrangement is also to be noted. Sheeting planes have to be mapped initially.

After delinination of pleasing colour microgranite area with joint pattern diagram, quarry site is to be selected for quarrying.

9.2

Department of Geology & Mining has intiated granite mapping in Banaskantha, Panchmahals and Baroda districts. Petrographic and engineering charcters of above granite area have been studied for its polishing characters. They are incorporated in the mapping reports (Annexure-5). To start granite quarrying set up, it is advisable to transfer potential micro-granite area in the cadestal map of the concerned village. Such villages are mentioned in Annexure-9.

9.3

For starting black granite (Dolomite, Gabbro, Diorite, Anthosite) set up also possible villages are mentioned in the Surat district by contacting Directorate of Geology & Mining. District offices map will be made available for filing applications. For procuring captive area for granite quarrying in the State, suggested locations are mentioned. A project profile for mechanised granite quarrying and polish granite slabs is also enclosed for guidelines and directions.

10.0 GRANITE PROJECTS IN PIPELINE

10.1 Spartek Granite Project

Spartek Granites Ltd., a Rs.19 crore 100% export oriented project promoted by Spartek Ceramics India Ltd is setting up a unit, the first of its type in Asia, for manufacture of ceramic granite tiles. The tiles will be manufactured at a plant being set up in Gudapakkam village near Tiruvallur in Chengalput district in Tamil Nadu, just 35 kms. from Madras. The unit will have a production capacity of 750,000 sq.mts. per annum in the first phase. The factory building is nearing completion and most of the plant and machinery has already arrived. Production is expected to commence in the second quarter of 1990. The company has entered into technical collaboration with Nasseti Ettore SPA, Italy and financial and marketing collaboration with William Hunt & Co. (International) Ltd of the UK.

Table -7
Estimated Exports - 1990-2000

Year	Value(Million Rs.)
1990	1250
1995	3750
2000	10000

Source: Paper presented in FIMI's Residential Programme at Kathmandu from 7-12, December 1987.

Looking to the wastage and rejects involved, the Sub-Group No.2 has worked out the following domestic production for targetted exports:

Table-8
Domestic Production for Targetted Exports

Items	1989-90	1990-91	1994-95
Blocks for rough & cut block exports	1200	1260	1670
Blocks for cut & polished exports	67	107	247
Total	1267	1367	1917

Country has sufficient capacity to achieve the above production level. However, the overall wastage in granite quarrying can be progressively reduced if modern methods of cutting, flame cutting, waterjet cutting, hoisting, etc. at the quarry faces and adopted using appropriate machinery.

8.16

Large blocks of granite were exported currently 90% of the export turnover of Rs.120 crores. If processed granite could be exported instead of granite blocks, the exported value addition would be 400% i.e. exports of Rs.350 crores could be achieved.

8.17

Rajasthan Government has sanctioned five granite processing projects having a total capacity of 1.50 lakh sq.ft. The total investment on these projects is of the order of Rs.4.62 crores. RMDC is also negotiating with Brussels to export 2000 tonnes granite cables. Market for granite cables is also substantial in Holland, Germany.

Japan, Germany, USA, UK, Canada are the consuming countries for granite cut and polished slabs.

Export market had developed considerably and parties from Karnataka, Tamil Nadu and Andhra Pradesh export polished granite tiles and slabs.

8.18

Granite and other similar rocks like dolerite, diorite diabase, gabbro, syenite, gneiss and porphyry are widely distributed through out the world. But Indian granite due to its hardness and durability preferred in the international market.

10.2 Grapco Granites Tile Unit

Grapco Granites Ltd (GGL) of RP Jhunjhunwala Group plans to set up a plant at Balasore in Orissa with an installed capacity to manufacture 67,000 sq.mts. per annum of tiles and 6500 sq.mts. of granite monuments/surface plants. The company is said to have already used up with wholesale agents and architects in Japan, West Germany and US for its first five years' production of granite tiles and monuments captive sources of raw materials supply placed GGL in an advantageous position. The company has already acquired 16 granite quarries in Orissa, while another 20 quarries have been identified. According to Jhunjhunwala, although India has a large share of the global granite trade of Rs.1000 crores per annum, our exchange earnings is limited as most of the exports consisted of raw material exports. The company's products, it is claimed, would have over 400% value addition.

10.3 Shreeji Granite Ltd (Almirah in Gujarat)

The company has planned to put up Granite slab cutting project in Amirgadh of Banaskantha district. The application is filed for DGTD registration and for loan to GIIC, Govt. of Gujarat

11.0 SCOPE FOR GRANITE PROJECTS

11.1

India exports more than Rs.1200 million worth of granites per annum to various countries. It has been exporting every different variety of rough granite blocks. Among the granites, the black granite is most preferred by the overseas buyers.

Although granite occurs widely throughout the world there is considerable world trade in this commodity due to the preference of buyers for particular types of granite having special colour, dimension, texture and above all its ability to take an extraordinarily good polish. For these reasons, the ebony black granite of Sweden, petit granite of Belgium, black granite of South Africa, black variety of China and black and pink varieties of India are well known in the world market. Because of its primary use as a decorative and monumental stone, much of the world demand emanates from the affluent nations.

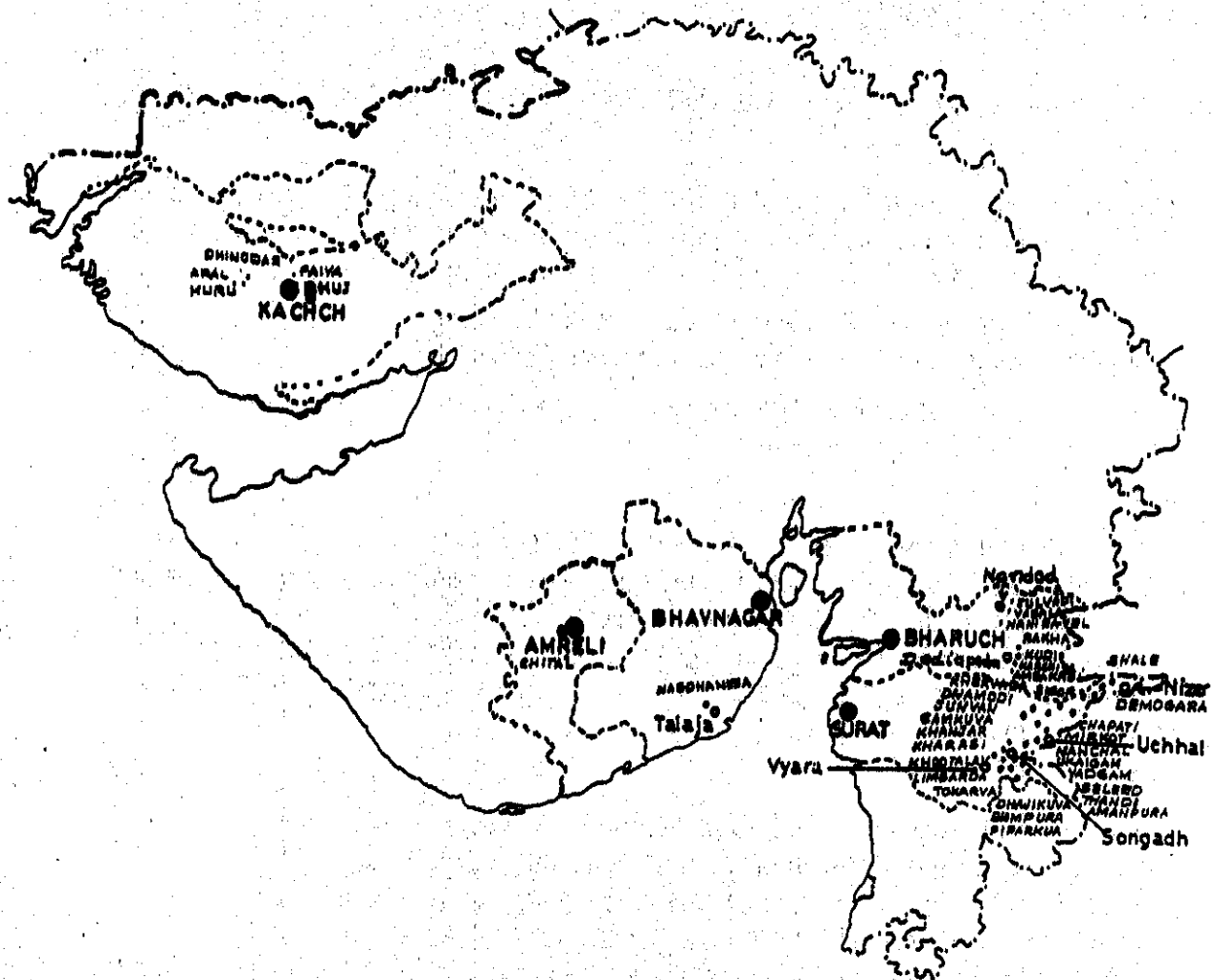
11.2

The main competitors of India has been Sweden and South Africa. With the black granite export trade of Sweden coming almost to a grinding halt due to the non-availability of labour and depleting reserves of ebony jet black granite and in view of the locational advantage of India over South Africa, India can emerge as the leader in the black granite export trade.

11.3

Italy, the pioneer in modern stone processing is the stone centre of the world. In the last 20 years, when the Indian Granite Stone Industry was growing, many other countries were growing much more rapidly. Countries like Italy, South Africa, Spain, South Korea, France, Argentina, Portugal, USSR, China and Australia have tremendously developed their industry. There are many more countries from the Far East, Middle East, African and South American countries that have taken effective steps to develop the stone industry on stronger footing.

POTENTIAL LOCATIONS FOR BLACK GRANITES - QUARRYING IN THE GUJARAT STATE.



- DISTRICT POINT
- TALUKA POINT
- VILLAGE POINT



all the black granite quarries are in the Kachch district.

Entrepreneurs interested to go for granite quarrying set up and polishing unit can avail above survey results and establish above project in medium sector in Palanpur (Banaskantha), Kim (Surat), Kandla (Kachchh) areas. Project profile for above projects with foreign and indigenous machineries are prepared for guidelines and directives. Granite slabs and tile project involves 86 lakhs with 225,000 sq.mtr. capacity. With the Rajasthan Jalore and Ajmer granite resources. Person interested to establish hundred percent export oriented unit can put up the plant at Kandla Free Trade Zone.

12.0 GRANITE INDUSTRY NOTES & NEWS

12.1 Tamil Nadu Granite Policy in line with National Mining Policy:

The Tamil Nadu Government's policy on exploration of granite will make more quarries available to processing. However, stipulation that quarry areas will be auctioned has created fresh uncertainty, according to reports. The policy lays down that existing and intending factory owners will be given quarrying rights for 10 years which can be renewed for another 10 years. This brings the granite policy in line with the national policy on mining of major minerals. The policy also says that quarries will be auctioned whether or not they are located in Govt. or private patta land. The quarry owners will not be allowed to export rough blocks but only processed granite materials. Over and above the auctioned money the quarry will have to pay a royalty. Besides, factory owners will not be allowed to quarry in land owned by others. Payment of auction money and a royalty will not only push up the cost of granite but also result in a large amount of capital being tied up according to the association of quarry owners. It complained that whereas the Tamil Nadu Government organisation TAMIN is allowed to export rough blocks the private explotters and processors have been denied this facility. The association submitted that where new types of granite like certain varieties found in Dharampuri district, have to be launched in the export market, export of rough blocks should be allowed. It pointed out that the new policy does not give the finder of a granite source the right to promote and sell it. Since there is no geological survey to demarcate granite areas and not all finds are of export quality, quarry areas allotted may not always yield export quality granite.

12.2 Lack of clear Policy hits AP Granite Industry:

Frequent changes in the licensing policy and the threat of a ban on private leases have made the outlook uncertain for granite units, according to Vice President, K Raghava Reddy and Natarajan of the industry association. Although the Centre had issued as many as 43 licences for 100% export units, not many are willing to set up units because of the lack of a clear cut policy in Andhra Pradesh, it is stated. At present, there are 30 small units, three large ones and eight fully export units. The association leaders also said the ceiling of 50 acres for a unit dealing in both coloured and black granite was irrational as it made the working of such industries unviable. The association called for a minimum 20 year lease quarry, removal of the acreage ceiling for the larger units and free inter-state movement of raw granite blocks. These measures, it said would ensure the growth of the granite industry from the present Rs.20 crores to Rs.100 crores in the next three years.

11.4

The growth of stone industry in the international world have achieved many technological advancements. The quarrying and processing techniques and the new machinery developed in countries like Italy, Germany, Japan, Sweden, UK and France have contributed very much for the stone development in the third world countries. Today, the quarrying system adopted in countries like Finland, Spain, Norway, Sweden, Italy, South Africa, Japan, USA and Canada are yet to be introduced in India. A few Indian companies have developed international standards in the quarrying systems. Further, there are many more modern systems like handling, waste removal and processing of stones in the factories which are still to be introduced in India.

11.5

Even today the standard of Indian stone varieties are not catalogued and introduced in the international market. Countries like Brazil, Spain and others themselves participate in International Stone Fair and exhibit at their cost the different stones produced by many countries. Naturally, India should take the initiative in the similar exhibitions to project Indian stones. The fact remains that Indian stone industry is still in its infancy.

11.6

India is traditional exporter of rough blocks to countries like Japan, Italy, West Germany, France, USA and UK. Many of these countries import our rough blocks, process them into finished slabs and monuments and re-export them at exorbitant prices. These cut and polished granites are observed to fetch almost four times the price at which rough granites are sold. Some major exporters of rough blocks have set up facilities for export of cut and polished granites.

11.7

Considering the potential, many entrepreneurs, corporate bodies and trading establishments have been attracted towards this industry for investment project in mining and cutting and polishing. However, information on this industry is scattered between the licensing authority, financial institutions, export promotion organisation, industry association, State departments of Geology and Mining and the operating units.

11.8

In dimension stone market, granite has occupied important position. Export potentiality and domestic market in construction have attracted large entrepreneurs to go for granite industry. In Gujarat, four polishing units with 80,000 sq.ft. capacity are in operation at Halol, Kalol, Ahmedabad, Kim areas. Present units are transporting granite blocks from Tamil Nadu, Karnataka and Andhra Pradesh states by incurring Rs.850/- freight per tonnes, as no block quarrying has developed uptill now in the State.

Looking to above, State department has taken effective steps to democrat microgranite areas for block working. During last two field seasons preliminary survey and engineering character study highlighted few spots in Surat, Bharuch, Sabarkantha, Banaskantha, Baroda and Kachchh districts (Annexure-1).

12.7 Need for making Equipment for Granite Industry:

Mr PV Venkatakrishnan is said to have urged machinery manufacturers to make equipment for the growing granite industry so as to reduce its dependence on imports. He said that even though every one was aware of the vast potential of the granite industry, the manufacturing sector has not come up with equipment for this industry. To cut down wastes and reduce costs, the granite industry should give up their primitive techniques of quarrying and other activities and take to modern methods, he said. While the total demand for finished granite was over 120 million square metres, the total installed capacity was only 4 million sq.mts. and there was vast scope for development in this sector. Tamil Nadu had 6.7 million cubic metres of granite deposits but the exploitation level was only 2.7 lakh cubic metres. Talking of new markets, Mr Venkatakrishnan said that there was growing demand for finished products in the Gulf countries and the Netherlands. The Scandinavian countries were having problems with their labour which could be exploited by the granite industry. Of Rs.120 crores worth of granite being exported, finished products accounted for only Rs.10 crores, he said.

12.8 Good Prospects for Granite Industry in Tamil Nadu:

The new granite policy of Tamil Nadu Government by which leasing rights are granted to private parties is reported to have evoked a good response. This opening up of the industry has paved the way for the setting up of a large number of export oriented units by big and small entrepreneurs. Atleast half of a dozen big industries most of them from the North and Bombay, are understood to have registered themselves to obtain leasing rights. The proposals, if cleared, are expected to catalyse investments to the tune of Rs.40 crores. The granite potential in the State has remained largely untapped. Secondly the demand for ornamental granite abroad is on the upswing. These two factors are said to have influenced big industries in evincing keen interest in granite industry in Tamil Nadu. Tamil Nadu has black granite deposits of nearly 6.7 million cubic metres. The exploitation level is put at a meagre 2.7 lakh cubic metres. Besides, there are also some deposits of yellow and brown granite in Pudukottai and white and spotted granite in Madurai, Tirunelveli and Kanyakumari. Since these have been found only recently, the actual volume available is not known.

12.3 Rajasthan Exports to Belgium:

The Rajasthan State Mineral Development Corporation has signed a MoU with NL Natural Stones of Brussels for export of 2000 tonnes of granite cobbles. According to RSMDC's Chairman and Managing Director, Shri RK Saxena there are good prospects for exporting slate for which he expects an order for 3000 sq.mts. from Holland. Meanwhile, the Rajasthan State Minerals Marketing Ltd is planning to set up a Rs.180 crore beneficiation plant near Udaipur to treat low grade rock phosphate that the RSMDC is presently importing from Togo.

12.4 AP to ban Export of Raw Granite:

The latest policy of the Andhra Pradesh Government would not permit export of raw granite from the State and private industry as well as the AP Mining Corporation will have to set up granite polishing units within the State to generate more employment will be allowed to export only the finished products, according to Chief Minister, NT Rama Rao. It is also said to have been decided that hereafter the amount collected towards mining cess should be given to the local bodies for development of roads in their respective areas.

12.5 Granite Units' Plea for Long Base:

Granite is a minor mineral with vast resources, and the State Government should renew the leases, suggest the granite exporters. According to the All India Association of 100% export units, if the leases are not renewed immediately, granite exports would suffer badly. In view of the urgent need for maximising foreign exchange earnings through exports, the State Government should reorient their policies towards the granite industry so that the vast export potential can be fully tapped. The Association has suggested that granite units should be given a long lease of atleast 20 years, with two renewal of 10 years, so that 100% export units can concentrate on production and development of markets abroad.

12.6 Plea to Relax Restrictive Policy on Granite Mining in Tamil Nadu:

The Tamil Nadu Granite Quarry Owners and Exporters Association have decided to submit a memorandum to the State Chief Minister Mr N Karunanidhi seeking relief for the industry's plight. According to Mr V Raghuramachandran Naidu, President and Badrinarayanan, Vice President of the Association thought the present Government has announced that Government land would be released for quarrying by private parties, it has introduced a tender system by which the lease right will go to the highest bidder. Further, it has stipulated that those who are taking up the granite quarrying should have their own factories and export only cut and polished granites and not unfinished rough blocks of stones. According to the Association spokesman, these restrictive policy measures pose a grave threat to the existence of several factories. If we have to export only finished products most of us have to close down the units. They say the global market for granite items, including rough blocks is estimated to be about Rs.1500 crores a year. While India claims a share of Rs.125 crores, it comes to Rs.40 crores for Tamil Nadu. Of this, export of polished granite from the state is around Rs.10 crores contributed mainly by the private sector. The export policy of the Union Government provides for the export of all varieties. None of the leading States like Karnataka, Andhra Pradesh, orissa, Madhya Pradesh and Maharashtra have made it compulsory to set up factories and export only value-added items. So the Tamil Nadu Government alone cannot follow a separate policy overlooking the domestic and global situation, it said.

13.3 Process of Manufacture:

The plant for manufacture of polished granite slabs is to be completely imported from Italy, West Germany. The addresses of main suppliers of granite processing plant are given at Appendix. It comprises of four machines:

a) Steel Shot Gangsaw:

After stationing the granite blocks on the trolley, the same is railed to the steel shot gangsaw. When two or more blocks are laid on the trolley at a time the gaps and cavities have to be filled up with chips and gypsum.

Then the blades are fitted according to the thickness of slabs required (Normally 20mm) and tensioned with the aid of mechanical stretchers. The processing technology contemplates the use of blades and a mixture consisting of steel shots and grits, water and hydrated lime in the grit acts as a suspension medium ensuring circulation of the mixture and also protects the material from oxidation. When the sawing process is complete the slabs trolley blade frame, etc. are washed with clean water and the blade frame is raised upto the upper edge of the slabs sawn.

b) Grinding and Polishing Machine:

The essential part of this mobile machine is the bridge which holds one big wheel (1.5mm) covered with nine grinding heads. The complete machine moves on rails to work slabs on their full width.

Different types of grinding wheels are employed for complete polishing. Mirror polishing is obtained with the use of felts and by gradual spreading of tin oxide on their surface.

c) Bridge Sawing Machine:

The polished slabs are then taken to this machine for cutting the material to required sizes. The machine is equipped with a bridge which holds the cutting disc and table which accomodates the granite slabs.

d) Edge Grinding & Polishing Machine:

This automatic machine, which is equipped with a conveyor belt and several grinding heads performs the function of polishing and chamfering of edges.

13.4 Project Requirements:

Land and Site development (Rs. 0.37 million): The company has to acquire 8,000 sq. mt. of land for the project. The total cost of land and site development is estimated at 0.37 million.

a) Cost of land: 8,000 sq.mt. at Rs.25/-per sq.mt.	0.20
b) Registration and conveyance	0.02
c) Cost of levelling	0.02
d) Boundary wall	0.06
e) Internal roads	0.05
f) Gates	0.01
g) Sewerage & drainage	0.01
Total	<u>0.37</u>

13.0 PROJECT PROFILE ON POLISHED GRANITE SLABS

13.1 Introduction:-

Granite slabs in different sizes and 20 mm thickness are manufactured from natural granite blocks. They are produced in variety of colours, as abundantly available in nature, namely black, pink, red grey, green, white, etc. All four sides of the slabs are machine finished and have a highly polished surface.

Uses and Market:-

Granite is one of the most important dimensional stone. Their high class polish, durability and aesthetic value renders granite slabs, highly effective for variety of decorative purpose. These slabs are used as pillars, beams and for roofing, flooring and other purpose in many buildings, particularly temples, palace, offices, hospitals and hotels.

With the spurt in the construction activities there has been a lot of demand for all type of construction material. The black and red varieties of Indian granite are well known in the world market. Due to lack of enough processing facilities in the country, our granite blocks are imported by Japan and West European markets at exorbitant prices. This shows there exists very good export potential for polished granites slabs.

Granite is also finding increasing indigenous demand due to its widespread use in high rise building, hospitals, hotels, offices, etc.

Raw material and Location:-

Keeping in view state Dept. of Geology & Mining, Govt. of Gujarat has delineated pink micro-granite in Meghariya & Ataladra villages in Halol taluka.

Granite quarries can be developed in Banaskantha district. Palanpur is declared as a growth centre. Rajasthan Jalore granite blocks can also be procured. Alternatively granite blocks can also be procured from Tamil Nadu and Karnataka and Andhra Pradesh, which have abundant reserves of granite.

13.2 Government Approvals :-

- a) **NOC from State Government:** NOC has to be obtained for settling-up granite slabs manufacturing unit from Industry Commissioner.
- b) **Impor Licence:** If the CIF value of imported plant exceed Rs. 25.00 lakhs it is necessary to advertise the requirement in the Indian Export Service Bulletin (IESB) which is published by the Trade Fair Authority of India Limited, New Delhi. Once the requirement has been published in the IESB application for import of capital goods could be submitted after expiry of 45 days from the date of advertisement to the Chief controller of Imports and Export Udyog Bhavan, New Delhi.

In case the CIF value of the imported plant is less than Rs. 25.00 lakhs the application could be directly submitted to the Dy. Chief Controller of Imports and Export Udyog Bhavan, Jaipur.

- c) **Registration with DGTD/DIC :** The proposed unit needs to be registered with DIC, in case it falls under SSI i.e. the investment in Plant and Machinery is less than Rs. 35 lakhs otherwise the unit has to be registered with DGTD.

III. Foundation & Installation charges (Rs.0.20 million)

Expenses on Foreign Technicians (Rs.0.08 million):

Misc. fixed assets (Rs.0.32 million)

a) Furniture & fixture	0.02
b) Office equipment	0.01
c) Equipment for electrical installation including transformer	0.20
d) Fire fighting equipment	0.01
e) Pumps and piping	0.03
f) Workshop equipment	0.04
g) H.S.D storage tank	0.01
Total	<u>0.32</u>

Preliminary and pre-operative expenses (Rs.0.50 million):

Contingency: (Rs.0.20 million)

Margin for working capital: (Rs.0.50 million)

Margin for working capital has been considered on the following basis:

i) 1 year operation

ii) Capacity utilization : 50%

iii) Product-mix : 100% own production

Description	Months require ment	Total Value	Margin	Margin value
1. Consumables	3	0.65	25%	0.16
2. Granite Blocks	1	0.21	40%	0.08
3. Finished goods	1/2	0.30	40%	0.12
4. Receivables	1/2	0.35	10%	0.04
5. Cash for expense	1	0.10	100%	0.10
		<u>1.61</u>		<u>0.50</u>

13.5 Total Project Cost:

a) Land and Site development	0.37
b) Buildings	0.61
c) Plant and Machinery	

Buildings:(Rs.0.61 million) Following buildings are proposed for the projects :

a) Main factory building:6,000 sq.ft,at Rs.65/-per sq.ft.	0.39
b) Factory building for auxillary service 600 sq.ft. at Rs.65/- per sq.ft.	0.04
c) Administrative building 1000 sq.ft. at Rs.90/- per sq.ft.	0.09
d) Water storage & water settling tank	0.06
e) Guard room	0.01
f) Architects fee	0.02
Total	<u>0.61</u>

Plant & Machinery: (Rs.6.06 million)

I. Imported (Rs.5.20 million)

a) Multiblade steel shor gansaw Lira	140,000,000
b) Grinding & polishing machine Lira	160,000,000
c) Bridge cutting machine Lira	55,000,000
d) Edge grinding & polishing machine Lira	25,000,000
F.O.B.Value	<u>326,000,000</u>
Add @ 10% for spares and consumables	32,600,000
Total F.O.B. Value Lira	<u>358,600,000</u>
Add 7.5% for I and F Lira	26,895,000
Total C.I.F. Value	<u>385,495,000</u>
Value in Rs.(Lira 100=Re.0.95)	32,76,707.50
Add: Import Duty at 55%	18,02,189.10
Total	<u>50,78,896.40</u>
Add: Clearing, loading, unloading & transportation charges	<u>1,20,000.00</u>
Total	<u>51,98,896.40</u>

Say Rs.5.20 million

The FOB value of the imported plant has been taken as per the offer of M/s. BRA, ITALY. The actual value will however depend upon the selected plant supplier.

II.Indigenous (Rs.0.66 million)

a) Electricity operated Jib crane (15 tons)	0.10
b) DG set, 200 KVA	0.45
c) Hand polishing machine (4 Nos.)	0.08
d) Edge cutting machine	0.03
Total	<u>0.66</u>

Year	Qty. (Cu.m.)	Rate (Rs.-Cu.m.)	Total Cost (M)
I year	310	8,000	2.48
II year & onwards	372	8,000	2.98

Consumables :

For I year operations (11,250 sq.m)

Description	Quantity	Cost(Million)
Steel blades	42,187 kgs.	0.80
Steel shots & grit	42,188 kgs.	0.70
Polishing abrasives	In lot	0.90
Cutting disc	33 discs	0.13
Misc.consumables	In lot	0.09
Total		<u>2.62</u>

Similarly the cost of consumables in the II year of operation would be Rs. 3.14 million.

Utilities :

a) Power 200 HP inclusive of lighting load.

Power consumption:

$200 \times 0.74 \times 0.75 \times 15 \text{ hrs.} \times 300 \text{ working days}$

= 499,500, 50% by RSEE

2,49,750 units at Re.0.85 = Rs. 212,287.50

2,49,750 units at Rs.1.50 = Rs. 374,625.00

Total = Rs.586,912.50

b) Water 400 gallons per day - Rs.10,000.00

Total cost of power & water would be Rs.0.60 million.

c) Manpower Total 35 persons shall be required for the project. Total expenses towards salary and wages are estimated at Rs.0.40 million.

Schedule of implementation:(in months)

	Start	Completion
i) Land & site development	1	3
ii) Plant & equipment order)	2	4
iii) Construction of bldg.	4	8
iv) Delivery of plant & equipment	8	10
v) Erection/installation/commissioning	11	12
vi) Commercial production		13

i) Imported	5.20	
ii) Indigenous	0.66	
iii) Foundation & installation	<u>0.20</u>	6.06
d) Expenses on foreign technicians		0.08
e) Misc. fixed assets		0.32
f) Preliminary and pre-operative expenses		0.50
g) Contingency		0.20
h) Margin for working capital		0.50
Total		<u>8.64</u>

Means of Finance: The means of finance as per the debt equity ratio of 2:1 works out to as under :

a) Share capital	1.08
b) Central subsidy	1.80
c) Term loan	5.76
Total	<u>8.64</u>

Capacity: (22,500 sq.m/annum) basis:

Working days per year	300
No. of working shifts per day	3
No. of hours per shift	8
No. of blades	120
Average length of block	2.5
Average No. of blades in operation	100
Vertical sink rate	1.5 cm/hr

Production capacity assuming 20 hrs. working per day

$$= 2.5\text{m} \times 0.015\text{m} \times 100 \times 20 \times 300$$

$$= 22,500 \text{ sq.m/annum}$$

Capacity utilisation :

Year	Capacity utilisation	Production per annum
I year	50%	11,250 sq.m.
II year & onwards	60%	13,500 sq.m.

Requirement of Granite blocks :

14.0 PROJECT PROFILE ON MECHANISED GRANITE QUARRYING

14.1

Introduction: Granite occupies vast area in the state. However, inspite of technological revolution in granite quarrying in Italy and other developed countries the granite extraction in India is yet being made by traditional methods of blasting, manual channelling by chiesel, hammer and crow bar, etc. With the help of advanced techniques and modern equipment, it is possible to extract large sized granite blocks at a lower cost of production.

Raw Material: Granite in pink, red, grey, choklate is available in the Sabarmantha, Banaskantha, Baroda and Panchmahal districts. Department of Geology & Mining, Govt. of Gujarat has done detailed mapping in Halol taluka of Panchmahal District.

Presently engineering grade granite is quarried from Umedpura, Godhra, Kothamba, Kikawada quarries in Mehsana, Panchmahal and Baroda Districts. Geological survey of India has also studied petrographical characters of Panchmahal granite.

Criteria for site selection: The consideration for selection of a particular site for mechanized granite quarrying can be broadly divided into following two cato

a)Geology of the area

b)Infrastructure

14.2

Geology of the Area: Following geological factors merit careful consideration before site selection:

- i) **Quality of granite:-** Various factors like grain size hardness of stone, resistance to compressive stress workability presence of sillicious of quartz bands polishability of grnaite, etc, determine the mineability of granite. It is important to carry out these tests on granite sample so as to know the mineability and utility of a particular mining technique.
- ii) **Stratigraphic and Tectonic Features:-** Various stratigraphic and tectonic features of a deposit such as lithology, crystallisation, joint and fracture pattern, cracks sheared zones faults strikes and dip direction, presence of dykes or sils genral topography, over-burden availaibility of large blocks, etc. should be considered for deciding a particular site and mining technique.
- iii) **Reseves:** Before any areas is selected for mechanised quarrying it is advisable to broadly assess the depth and area of continuity of the deposit as the cost involved in develping the site for mechanized quarrying is very high.

14.3

Infrafracture: Availability of water, power, approach road to mines and proximity of mines to processing units large mining lease area, availability of skilled and trained operators and market determine the infrastructural considerations for selecting site for mechanised granite quarrying.

Plant and Equipment:- A list of main equipment suggested for mechanised mining of granite is given below:

Sales Realisation:

Year	Quantity (Sq.m)	Rate (Sq.m)	Total (Rs.in million)
I	11,250	Rs.750	8.44
II & onwards	13,500	Rs.750	10.13

13.6 Cost of Production & Profitability:

Year	I	II
Capacity utilisation	50%	60%
Production in sq.m.	11,250	13,500
Sales realisation	8.44	10.13
1. Raw materials	2.48	2.98
2. Consumables	2.62	3.14
3. Utilities	0.60	0.60
4. Wages & salaries	0.40	0.41
5. repairs & maintenance	0.15	0.41
6. Interest (on term loan & bank loan)	0.90	0.85
7. Depreciation	0.60	0.60
8. Other administrative expenses	0.30	0.31
Total	8.05	9.05
9. Operating profit	0.39	1.08

14.6

Plant and Machinery	(price in US \$)
a) Flamae-Jet burner	4900
b) Automatic drilling device (3 Nos.)	7050
c) Automatic drilling system on rails operating two rock drills	8290
d) HORIZON Automatic system for horizontal drilling	3270
e) SLIMBAR Automatic light drilling system	3280
f) TITANO, Splitting unit	4700
g) Spare parts accessories and consumables	<u>20000</u>
F.O.B. Value	51490
Add: Insurance and freight	<u>4000</u>
CIF Value (US \$)	55490
C.I.F. Value (Rs. (US \$ = Rs.12.70)	7,04,72,300
Add: Import Duty at 55% (Rs.)	3,87,59,765
Add: Clearing and forwarding loading, unloading and transportation to the factory site including foundation and installation	(Rs.) <u>1,07,67,939</u>
	Total Rs. <u>12,00,00,000</u>

Say Rs. 1.20 million

The cost of imported plant has been estimated as per the offer of M/s. Pellegrine. However, the actual cost would depend upon the selected plant suppliers.

Misc. Fixed Assets:	(Billion)
a) DG Set, 50 KVA	0.10
b) Derrick Crane 20 ton capacity (40 boom)	0.50
c) Portable air compressor (3 Nos.) each 8 cu.m/min. air delivery	0.50
d) Dumper Truck	0.28
e) Jeep	0.10
f) Material handling equipment including winches	0.10
g) Pumps and piping equipment	0.10
h) Workshop tools and spares	0.10
i) Oil storage tank	0.02
j) Oxygen Cylinder	0.01
k) Office equipment furniture, etc.	0.02
l) Electrical installation, cables etc.	0.20
Total	<u>2.03</u>

- (a) Pneumatic drilling set:
 - i) Flame Jet Burner
 - ii) Automatic Drilling Device
 - iii) Automatic Drilling System on Bar
 - iv) Automatic Drilling System on Rails
- (b) Handling Set:
 - i) Derrick Crane
 - ii) Splitting Unit with Hydraulic Jacks

The addresses of main suppliers of plant and equipment is given below in appendix.

Process of Granite Mining:- The blocks are mined by drilling regular ranges of holes and then splitting them along these lines. Similarly horizontal holes are also drilled to remove the blocks horizontally. Automatic drilling devices and drilling systems on rails are used for these functions. Quarry Bar, which is equipped with one rock drill, can be moved and adapted in quicker and easier way in the irregular part of the deposit. Flame jet is used to prepare the first trenches towards the inner part of the deposit or in general range of blocks is recovered between two vertical cuts obtained by the intense heating of the Flame jet burner. Derrick crane is utilized for all type of handling operations.

14.4

Land and site development (Rs.0.15 million):- Approximately 4000 sq.m land shall be required for construction of site office, generator room, workshop and stores quarter for essential staff, etc. A provision of Rs. 0.15 million appears reasonable for this purpose.

14.5

Mine development (Rs. 0.20 million): Quarry lease would be obtained from Department of Mine & Geology, Govt. of Gujarat Rs.0.20 million has been considered reasonable towards the mine development (removal of overburden mining face development etc.) fencing of the lease area expenditure towards lease agreement registration, etc. The actual expenses under this head would depend upon the Quarry configuration.

Buildings and other civil works (Rs.0.32 million):-

Following provision of various buildings have been considered reasonable :-

a)	Building for site office workshop stores, etc. sq.ft at Rs. 65/- per sq. ft.	0.13
b)	Quarters for essential staff 1000 sq.ft. at Rs. 90/- per ft.	0.09
c)	Tube-well and water tank	0.10
	Total	<u>0.32</u>

15.0 PROJECT PRIFILE ON MECHANISED GRANITE TILES(SS1)

15.1 INTRODUCTION

Government of India as well as State Government have laid stress on providing housing to everyone during 8th and 9th Five Year Plan. In view of above, construction activities in rural and urban areas have geared up. Mosaic tiles, ceramic tiles and marble tiles are used mainly for asthetic purpose and is being used commonly. Marble and Grante tiles are also utilised for other decoration. In stone market, the use of granite has picked-up export recently. Domestic market of the granite tiles have also found increasing use for commercial complexes, star hotels, hospitals bank building, etc. Granite tiles of sizes 12" x 24" and 12" x 36" with 2 mm thickness are commonly used and manufactured in a small scale. Due to multl colour and attractive texture, granite tiles are also suggested by architects for flooring and outer decoration. Therefore, there is scope for setting up such units in small scale sector.

15.2 MARKET POTENTIAL

Multi colour granite tiles are replacing mosaic tiles market. During Eighth Five Year Plan, in housing sector, a provision of Rs. 300 crores is made by Government of India. If 2% expenditure is estimated for flooring tiels, a sum of Rs. 6.0 crores is assured for tiles. Gujarat Housing Board, Life Insurance Corporation are the major consuming agencies for their residential housing schemes in the major metropol. Commercial Complexes, Hospitals, Town-halls, Cinema Theatres, Hotels, Restaurants-Multicolour & black tiles have good potential market. Builders and Architects are the persons involved in accelerating the sale of the product. Row housing schemes and multi-storeyed flats builders are actively using tiles for toilet wall coverage due to avoid non-recurring expenditure and asthetic service.

15.3 PROCESS

Granite blocks of 1.5' x 2' x 2" and 26" x 14" x 14" from the granite quarries are fixed on Granite slice damond cutting kerosene driven machine to cut the blocks into slices. The cut slices are mounted on granite grinding machines of size 12" x 24" with 33 M S Plate. After coarse grain chrome powder grinding, the tiles are fixed on polishing machine having 33" diamond led plate which polished granite slices with chormium powder. The polished granite tiles are edged on tiles edging machine to make the finished product suitable for marketing.

15.4 PROJECT

The project envisages to manufacture 100 Sq.Ft. granite tiles per day estimated with an investment of Rs. 10.0 lacs.

The details are as under:

1. Land (250x500 sq.mtrs)	Rs. 1.50 lacs
2. Plant & Machineries	Rs. 5.00 lacs
3. Working Capital	Rs. 4.50 lacs
Total	<u>Rs 10.00 lacs</u>

Expenses on foreign technicians and training of Indian personnel abroad	0.20
Preliminary and Pre-operative expenses	0.40
Provision for contingencies	0.25
Margin money for working capital	0.40
Total cost of Project:	(Million)
a) Land and site Development	0.15
b) Mine Development	0.20
c) Building and Civil works	0.32
d) Plant and Machinery	1.20
e) Misc. Fixed Assets	2.03
f) Expenses on Foreign technicians	0.20
g) Preliminary and Pre-operative expenses	0.40
h) Contingencies	0.25
i) Margin Money for working capital	0.40
Total	<u>5.15</u>

Means of Finance : The means of finance considering a debt equity ratio of 2:1 and central subsidy at 15% works out to be as under:-

	(Millions)
i) Shar Capital	1.15
ii) Central Subsidy at 15%	0.57
iii) Term Loan	3.43
Total	5.15
14.7	

Capacity :- The annual capacity of the plant on the basis of 10 hours working per day is estimated at 3000 cu.m.

14.8 Utilities :-

- i) Power: Connected load = 50 HP
- ii) Water requirement shall be met by the tube well. The annual requirement estimated at 3,000 KL.

14.9

Profitability: The profitability of the project would majorly depend upon the selling price of granite blocks which may vary between Rs. 100/- to Rs. 200/- per cft. depending upon the quality of granite and the size of granite blocks. Considering a selling price of Rs. 125/- per cft. the project is expected to yield net profit (after tax) of Rs. 0.75 million in its second year of operations.

- | | |
|--|--------------------|
| 2. Sparkle Granite
23, Paradise Complex, Polytech Road
Ambawadi, Ahmedabad-15. | 461510
463075 |
| 3. Parshwa Granite
2/5-59, Near Tower Idar-383430
Dist. Sabarkantha. | 650 (o)
195 (r) |

15.10

LIST OF MACHINERY SUPPLIERS

- | | |
|--|----------------------------------|
| 1. Shah Industries
Nr. Adarsh Vishranti Grah
Bus Stand, Jalore-343001. | 02973-2320 (o)
02973-2450 (r) |
| 2. Shri Manubhai Panchal
C/O. M.R. Industries
Plot No.7, Warahi Industrial
Estate, Nr. Railway Crossing
Gota, Ahmedabad-7. | 477178
472022 |
| 3. M/s. Durga Industries
Manpura Colony, Jalore-1 (Raj) | |
| 4. M/s. Ashapuri Engineering Works
Plot No.H-115-Indl. Area
Near Bagoda Rd., Jalore (Raj) | |

15.11

LIST OF GRANITE BLOCK SUPPLIERS

1. Vishnukrupa Quarry Works
PO: Amarapura
Tal. Babara-364421, Dist. Amreli.
2. Gujarat Metal Works
North Quest, Opp.DR Vanis Bungalow
Navrangpura, Ahmedabad-9.
3. Milton Mines
1/2, Chitra Ami Apartments
Opp.Old RBI, Ashram Road
Ahmedabad-9.

15.12

KEY ELEMENTS

1. SSI Registration from DIC, Office of the Industries Commissioner.
2. Kerosene quota from District supply Officer of District.
3. Captive quarries of granite from D.G.M., District Office.

15.5 RAW MATERIALS

Black of Multicolour 26"x14"x14" & 14"x14"x12" blocks can be procured from existing granite quarry owners. Captive quarries for different colour can be acquired. Under Gujarat Minor Mineral Rules, 1966 from Sabarkantha, Banaskantha, Mehsana, Baroda & Panchmahals Districts. Geology & Mining Department District Officers will be able to guide for the acquisition of quarry elases. Black blocs of second quality can be purchased from Tamil Nadu, Karnataka, Andhra Pradesh @Rs. 300/- per piece, while multicolour can be available @ Rs.200/- per piece in local market.

15.6 PLANT LOCATION

The porject can be suitably located as well as near metropolis in Khedbrahma, Danta, Palanpur, Idar, Bodeli, Taluka head-quarters in Sabarakantha, Banaskantha and Baroda districts where in such resources are available.

15.7 LIST OF PLANT & MACHINERIES

The plant and machineries required for the unit are available indiginously.

<u>Sl Plant in Rajasthan & Gujarat and the details</u>	
<u>No. of major machinery required are as under</u>	<u>Number</u>
1. Granite slice cutting heavy duty size 12"2/4" with H.P. Electric Motor	One
2. Granite tiles grinding machines size 12"x24" with 33 MS Plate with Electric Motor	Four
3. Granite tiles polishing machine size 12"x24" with 33" led plate with electric Motor	Two
4. Granite tiles edging machine heavy duty head type/light quality	One
5. Diamond cutter : 40" or 35" 8" - for Edgecutter	Two
6. Kerosene Tank 200 capacity	
7. Electric Motor (2 HP-DC)	

15.8

LIST OF EXISTING UNITS

1. Sheelp Granite China Garden, Mithakhali six Roads Netaji Marg, Navrangpura Ahmedabad-9.	Phones: 401000 (o) 66633 (f) 68084 (r)
---	--

Important Granite Cutting & Polishing Plants in the Gujarat State

Sl. No.	Name of Unit	Factory location	Type of unit	Capacity per annum(Sq.Ft.)
1	Gujarat Granite Industries Manisha Marble Compound Near Puna Octroi Naka Kadodara Road, Surat	P.O.Kim Tal.Tarlesjwar Dist. Surat	Medium	30000
2	Tirupati Granite P Ltd Godhva-Highway(Fact.) Village - Maghasar Tal. Halol Dist. Panchmahals	Halol Panchmahals	Medium	25000
3	Krishna Ganite & Marble Industries 3 Rarahi Indl. Estate Near Gandhinagar Rly Crossing, Gota Road Ahmedabad	Gota Ahmedabad	SSI	500
4	Ravi Granite Industry P.O. Gadu Tal. Khedbrama Dist. Sabarkantha	Gadu Tal.Khedbrahma Dist. S.K.	SSI	6000
5	Prasawa Granite 245-59 Near Tower P.O. Idar Dist. Sabarkantha	Idar Dist. S.K.	SSI	6000
6	Shreeji Granites Ltd 12, Agrawal Colony P.O. Abu Road	Village: .Aaval Tal. Palanpur Dist. B.K.	Medium	30000
7	Smart Granite 3, Varahi Indl.Estate Chandlodia Ahmedabad	Gota Ahmedabad	SSI	6000
8	Sharda Granite & Marble 415, Business Centre Pattharkuva, Relief Road Ahmedabad-380 001	Naroda Ahmedabad	SSI	500
9	Sparke Granites O-23, Paradise Complex Complex, Polytech Road Ambawadi Ahmedabad-380 015	Naroda Road	SSI	500
10	Anmol Granites 350/7 Ashish Collender Compound Danilimda Road Ahmedabad-380 022	Ahmedabad	SSI	500

Granite Engineering Characters

Sl. No.	District	Locations	Special	%age water absorption	Compressive strength Kg/Cm ²
1	Mehsana	Keshampa	2.63	0.34	673
2	"	Khodamli	2.65	0.02	1516
3	"	Umedpura	2.65	0.28	1400
4	Panchmahals	Godhra	2.62	0.30	960
5	"	Kothamba	2.68	0.19	946.3
6	Vadodara	Narpur	2.60	0.37	1413
7	"	Kikawada	2.68	0.45	830
8	"	"	2.69	0.69	1203
9	Sabarkantha	Nadri	2.65	0.40	1360
10	"	Bhavangadh	2.58	1.86	1413
11	"	Padhiol	2.51	0.51	740
12	"	Barvav	2.62	1.99	823

**Some Indigenous Manufacturers Of Cutting
And Polishing Machinery**

- | | |
|--|---|
| 1. Shreedharan Engg. Industries
Founders & Genera Engineers
Opp.Old Tollgate, Mysore Road
Bangalore-560 026 | 2. Ashoka Engg. Corporation
D-98 Industrial Estate
Rajaninagar
Bangalore-560 010 |
| 3. TP Roy Choudhary & Co Pvt Ltd
138 Moore Street
Madras-600 001 | 4. Shree Bala Engg. Works
Nr Employment Exchange
Salapose Cross Road
Ahmedabad-380 001 |
| 5. Jaya Engg. Works
Tank Bund Road
Bangalore | 6. New National Engg. Works
132 Reay Roa
Bombay-400 010 |
| 7. Veenedyt
Girish Flat No.3
224 Katariya Rd. Matunga(W)
Bombay-400 016 | 8. Shah Granites Pvt Ltd
Karamahand Mansion
Barrack Rd., B/h Metro Cinema
Bombay-400 016 |
| 9. Greaves Cotton & Co Ltd
1 Dr VB Gandhi Marg
Bombay-400 023 | 10. Sreeramula Engg. Works
JC Road
Bangalore |
| 11. Choudhari Engg. Works
Makarana
Rajasthan | 12. LM Vanmoppes Diamond Tools India
Ltd, 858 Mount Road
Madras-600 002 |
| 13. Rajasthan Industries
Behind Old Power House
Jodhpur, Rajasthan | 14. Rajasthan Udyog
13 Heavy Industrial Area
Jodhpur-432 003 |
| 15. Krishna Industries
Chootabhai ki chawl, Shahpu
Ahmedabad-380 001 | 16. Kilburn & Co Ltd
2 Fairlis Place
Calcutta-700 001 |
| 17. Machinery & Equipment Mfrs.
Pvt Ltd
Ahmedabad-380 021 | |

1	2	3	4	5
11	Arbuda Granite & Marble Company Haveliwala Building 2nd Floor, 221, Bora Bazar Fort Bombay-400 001	Kalol Dist. A'bad	Medium	10000
12	Choukhany Granites Pvt. Ltd 36, Royal Trade Centre Opp. Arenda Hall 2nd Floor, Kapasia Bazar Ahmedabad	Chhatral Dist. Mehsana	Medium	25000
13	Sheelp Granite Mithakhali Navarangpura Ahmedabad	Near Chandan Industries Naroda Road Naroda	SSI	6000
14	Ganesh Granite Veraval (Sapar) Tal. Kotdasangani Dist. Rajkot	Veraval (Sapar)	SSI (Water driven)	50000
15	Gem Granite P.O. Bamanbor Tal. Chotila Dist. Surendrangar	Bamanbor	-do-	60000
16	Bhagirath Granite P.O. Veraval Tal. Kotdasangani Dist. Rajkot	Veraval (Sapar)	SSI (Kerosene driven)	15000

Giorgini Maggi SRL
55047 Seravezza (Lucca)
Via Al Pago
Italy
Phone: 0584/757075/617
Tlx: 590144 Maggi I
Fax: 0584/756996

Gregori SPA
36015 Schio (VI)
Via Piox 1, PO Box 295
Italy
Phone: 0445/523231
Tlx: 480473 Greg I
Fax: 0445/510817

Guglielmi Gino, LC SAS
55046 Querceta (Lucca)
Via Fonda 94, PO Box 55
Italy
Phone: 0584/769205
Tlx: 501821 Gu Maci
Fax: 0584/767403

Kosan Trading Co Ltd
7 Azoma Bldg, 9-1 Chome
Kandasakomacho, Chiyoda-ku
Tokyo 101
Japan

Marchetti
Via Delferro 40c/54031
Carrara Avenza
Italy

Marioni
Carrara Viale XX Settembre 7
Cassella Postale 163
Italy

Menotti Gaspari
54031 Carrara Avenza
Via Aurellia 12, PO Box 17
Carrara
Italy

Montresor & CSRL
1-37069 Villafranca-Vr
Via 1 Maggio 23
Zona Industrial
Italy
Phone: 045/7900322
Tlx: 482568 Montori
Fax: 045/6300311

Mordenti SNC
19020 Piano Di Valeriono
(La Spenzia), PO Box 292
19100 Laspenzia
Italy
Phone: 0187/992276
Tlx: 281041 Morden I
Fax: 0187/991045

Noat SRL
36015 Schio (VI)
Via Marche 12
PO Box 142
Italy
Phone: 0445/510105
Tlx: 481858 Noat I
Fax: 0445/511272

Omag
24050 Zanica (Bg)
Via Steggano 31
Italy
Phone: 0039/35-670070
Tlx: 301589 Bg Exp 1 For Omag
Fax: 0039/35-670259

Pedrini SPA
Via Fusine, 1-24060
Carobbio Degli Angeli (Bg)
Italy
Phone: 035/951043
Tlx: 302182 Pedrin I
Fax: 035/953280

Pegoraro SNC
31037 Castione Di Loria (Tv)
Via Sega, 20
Italy
Phone: 0423/475195
Fax: 0423/455030

Pellegrini Meccanica SPA
Viale Delle Nazioni 8-37135
Italy

Salvatori Spa
55046 Quercetta (Lucca)
Italia-Via Ciochhi
PO Box 73
Italy

Technica Marmo Spa
Via Furelia 3
54033 Carrara
Italy

Tema Longinotti Spa
Via Aurelia, 3 PO Box 239
54033 Carrara (Ms)
Italy
Phone: 0585/857346
Tlx: 500236 Tema I
Fax: 0585/50233

Tenditori Idraulici Marchetti
Via-Del Fero 40c-54031
Avenza Carrara
Italy
Phone: 0585/857206 RA
Tlx: 501061
Fax: 0585/51975

Terzago SPA
28025 Gravellona Toce (No)
Via XX Settembre, 107
Italy
Phone: 0323/846591
Tlx: 200461 Terza Gi
Fax: 0323/840008

Thibaut Sa
Rue De Caen
14500 Vire
France

Waken Kiko Co Ltd
2-12 Saiwaichodori Maniwaku
Osaka
Japan

Waterjet
20052 Monza (Milano)
Via Italia, 44
Italy
Phone: 039/2302035
Fax: 039/362393

Yamana Co Ltd
1000 Moto Michi
4982 Tanade Woakayama-Pref
600 046
Japan

Zambon F Lli. SNC
36015 Schio (Vicenza)
Via Giaretten
PO Box 178
Italy
Phone: 0445/5304499
Tlx: 430591 Zambon
Fax: 0445/26132

Zonato
Via AD Gasperi
6-36072 Chiamopo (Vi)
Italy
Phone: 0444/623134
Tlx: 482381 Zonato I
Fax: 0444/420212

Granite Processing Machinery Manufacturers in Abroad

AP Pardini Off. Mecc. Snc
Querceta- Via Della Sipe
55046 Servezza
Italy
Phone:0584/760180

Alexander Wilow (Aberdeen) Ltd
Asgron Road, Aberdeen
Scotland

Anderson Grace Co Ltd
Thomas Engineering Works Ltd
Campstoe
Scotland

B.M. S.P.A
Via:4 Novembre, 25-36050
Montorso Vicentino (VI)
Italy
Phone:0444/685911
Tlx: 431192 Biemmel
Fax: 0444/685054

Bernucci & CSNC
54031 Carrara Aveuza
Via Passo Volpe, 11 A
Italy

Bisso Fratelli Costr. Mecc.
Ferrada-V.Le De Gasperi, 9
16047 Moconesi
Italy
Phone: 0185/939855-843
Tlx: 271151 Bisso
Fax: 0185/939438

Bombleri & Venturi
37023 Grezzana (Vr)
Via: Tavigliana, 2
Italy
Phone:045/907194-908196
Tlx: 351890 BiVi
Fax: 045/907608

Bra
37034 Zuinto Valpantena
Via Valpantena 61/h (Verona)
Italy
Phone:045/550722
Tlx: 480627 Bra I
Fax: 045/550507

Breton Spa
Via Garibaldi, 27, 31030
Castello Di Godego(Treviso)
Italy
Phone:0423/468141
Tlx: 410539,431445 Breton I
Fax: 0423/469266

Breton, SPA
31030 Castello Di Godego (Tv)
PO Box-1, Via Garibaldi 27
Italy
Phone:0423/468141
Tlx: 410539-410091 Breton I
Fax: 0423/469266

C.M.P.I. S.R.L
36030 S.Vito Di Leguzzano (Vi)
Via Vicenza, II (Z.I)
Italy
Mts.Polishing & Letters Engraving
Machines
Phone:0445/511900
Fax: 0455/511855

Carl Mayer
Steinbearbeitungs Maschine Fabrik
Postfach 380 D8590 Marktredwitz
F.R.Germany

Ceam Srl
Querceta-Via Don Minzoni, 50/52
55046 Seravezza
Italy
Phone:0584/769361
Tlx: 623401 Cafcea I

Cooperativa Meccanica Alpe
SC Ar.L., 38068 Rovereto(Trento)
Viale-Della Vittoria 27
Italy
Phone:0464/435538
Tlx: 400338 Alpe I
Fax: 0464/422524

Cortan Di Cortinovis Antonio
24049 Verdello (Bg)
Via: Mons, Portaluppi
Italy
Phone:035/872738
Tlx:301589 Bg Exp-I for Corta
Fax: 035/872764

Dal Prete
Volargne.Loc.Colombare
37020 Dolce
Italy
Phone:045/7731061
Tlx:481363 Dalpre I

Ditta Moria Bernucci
1-54033 Carrara
Post Box 117
Italy

Ediltenit S.R.L
42100 Reggio Emilia
Via Degola 6, Italy
Phone:0522/516994
Tlx: 530138 Apire
Fax: 0522/513505

Eisenwork Hensel Bayreuth
PO Box 5020, Rathenaustasse 47
D-8580 Bayreuth 13
F.R.Germany
Mts.of Circular Sawing Machine
Milling Polishing etc.
Phone:0921/508-0
Tlx: 642823 Ebubt
Fax: 0921/508-70

Ernst Spielvogel Kg
Neiderraunau
D-8908-Krumbach
West Germany
Mfrs.of Multi-disc, Sawing
Machine
Phone:08282/9008-22
Fax: 08282/9008-55

Ets Bernat Sauliere SA
74 Rue Du Rey, 81100 Castress
France
Phone: 6359164
Tlx: 530977 F
Fax:33/63597423

F.O.M.A. S.P.A
Via Tieste 104
64022 Giulianova Lido (Teramo)
Italy

Fickert & Winterling
Wolsauer Strabe 54, Postfach 166
D-8590 Marktredwitz/bayern
F.R.Germany
Mfrs.of Circular Block Sawing
Machine, Polishing, Edge Cutting,
Curve Grinding etc.
Phone: 09231-4068
Tlx:06/41292 Fiuwid

Fratelli Mordenti
19100 La Spazia
Via A Vola 40, PO Box 292
Italy

Frugoli Macchine SPA
Vile:XX Settembre, 175
54033 Carrara(Ms)
Italy
Phone:0585/857392
Tlx: 500236 Terna I
Fax: 0585/50167

Frugoli Machine Spa
54034 Avenza Carrara
Italy

Gaspari Menotti SPA
54031 Carrara Avenza
Via Aurelia 12, PO Box 17
Italy
Phone: 0585/830818
Fax: 0585/830841

Gaspari Menotti Spa
Via Aurelia, 12
54033 Carrara
Italy
Phone: 0585/57215
Tlx: 590598 Gasmac I

Giorgini Maggi
Foundata Nel 1865 Srl
55047 Servezza, PO Box 18
Italy

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Petrographic Studies of Granite in Parts of
Toposheet No.46/F/10 Panchmahal Dist.,Gujarat
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Area, Panchmahal Dist., Gujarat.
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the work done from 1972-1976).
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Geological studies in Idar and its neighbourhood
with special reference to the structure, metamorphism
and igneous activity of the area - A Thesis, MS University.
- Gopalan K/Trivedi JR/
Rb.Sr. age of Godhra and related granites and
Mersh S.S/Patel PS 1979 related granites Gujarat,
PRL-Ahmedabad and Department of MS University.
- Patel PP,Dr. 1980
"Seminar on Mineral Resources of Gujarat and its
Exploitation", "Polished granites as ornamental stone in building
industry".
- Desai SD 1977
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- Desai ND
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reference to Granite of Gujarat.
- Shukla RT, Dr.
Bhatt JV
"Scope for Establishing Granite Polishing Industry
in Gujarat State", Mineral Wealth-Directorate of Geology
and Mining,Govt. of Gujarat Publication.

Leading Exporters of Granite

Sl. No.	Name of Exporter	Port	Country	FOB Rate Rs./Kg.
1	Gem Granite	Madras	Japan	5.61
2	Gem Granite	"	Australia	4.68
3	Coromandel Agencies	"	Japan	2.63
4	East India Mining Co	"	China	3.42
5	Alif Granite	"	Korea	1.75
6	Yercaud Granite	"	USA	7.39
7	Evershine Granite P.Ltd ((Cut & Polished monuments)	"	Canada	17.60
8	Imperial Granite P.Ltd	"	USA	43.76
9	Deccan Granite P.Ltd (Cut & polished slabs)	"	USA	13.91
10	Laxi Rock (Bangalore) (Granite blocks)	Mangalore	Italy	1.40

Annexure-6A

Prices of Dressed Dimensional Blocks of Granites

Sl. No.	Variety	Domestic Price/CBM in Rs.	Export Price/CBM US Dollars
1	Imperial Red/Ruby Red	10,000 to 13,000	1,000 to 1,200
2	Medium Red	6,000 to 7,000	400 to 500
3	Grey with fine grains	6,000 to 7,000	600 to 700
4	Hassan Green	4,500 to 6,000	400 to 425
5	Multi colour	4,500 to 5,000	350 to 450
6	Chocolate colour	4,000 to 5,000	400 to 500
7	Jet Black	12,000 to 15,000	1,000 to 1,800
8	Medium Black	6,000 to 8,000	600 to 800
9	Himalayan Blue	4,000 to 6,000	400 to 600
10	Krishnagiri Paradise	5,000 to 6,000	600 to 700
11	Orissa Blue/Grey	4,500 to 6,000	600 to 700
12	Ordinary Grey	3,500 to 4,500	300 to 350
13	Kashmiri White	10,000 to 15,000	800 to 1,000

Overseas Trade Assistance Agencies

- | | |
|---|--|
| <p>1 Japan External Trade Organization
2-5 Toranomon 2 Chome
Minato-KU, Tokyo 105, Japan
Tel: 03-582-5511
Tlx: J24378</p> | <p>2 United Kingdom Trade Agency for
Developing Countries
London Chamber of Commerce Bldg.
69 Cannon Street
London EC4N5AB</p> |
| <p>3 Stone Federation
82 New Cavendish Street
London W1M&AP
Tel: 01-580-5588</p> | <p>4 Barbour Compendium of Bldg. Products
Newlodge, Drist Road
Windsor Berks
Tel: 0344-884121</p> |
| <p>5 Import Promotion Office for Products
from Developing Countries
IMPOD P.O.Box 7508
S-103 92 Stockholm
Sweden</p> | <p>6 Trade Development Board of Singapore
No.1 Maritime Square 03-01
World Trade Centre
Telok Blangah Road
Singapore 0409</p> |
| <p>7 Centre for Promotion of Imports
from Developing Countries
PO Box 30009, 3000 DA Rotterdam
Netherlands
Tlx: 27151 C818Z</p> | <p>8 Trade Development Authority of India
New Delhi</p> |
| <p>9 State Trading Corporation of India</p> | <p>10 Minerals & Metals Trading Corp of
India
New Delhi</p> |
| <p>11 Canadian Importers Association Inc.
World Trade Centre
60 Harbour Street, Toronto
Ontario M5J 1B7
Canada
Tlx: 065-24115</p> | <p>12 Bundesverband Steine Und Erden EV
Friedrich-Ebert-Anlage 38
Postf 91 01 71,6000
Frankfurt(Main), West Germany</p> |
| <p>13 The Trade Development Authority in Europe
Wilhelm Leuschner STR 93
D 600 Frankfurt(Main)I
West Germany</p> | <p>14 Association Dell Industria
Marmifera Italiana, E-Delle Industrie
Affini (Assomarmi), Via Nizza 59,
00198 Roma, Italy</p> |

Physical Requirements of Structural Granite

Physical Property	Test Requirement	ASTM Test
Absorption by weight max. percent	0.4	0.97
Density, Min. lb./ft ³ (Kg./m ³)	160 (2,560)	0.97
Compressive strength Min., psi (Kg./mm ²)	19,000 (13.4)	0.97
Modulus of rupture Min., psi (Kg./mm ²)	1,500 (1.05)	0.99

Physical Requirements for Different Life Expectancies

Specific Use	Life Expenctancy	
	Less than 50 Yrs.compressive strength-Min.psi	More than 50 Yrs.compressive strength-Min.psi
Engineering Grade:		
Bridge piers, sea and river walls, dams	25,000	30,000
Bridge super structure grade separations and retaining walls	25,000	30,000
Flexural members (modulus of repture not less than 2000 psi)	30,000	30,000
Traffic controls,etc.	25,000	30,000
Architectural Grade:		
Monumental buildings	28,000	30,000
Industrial buildings	26,000	28,000
Commercial buildings	20,000	26,000
Residential buildings	16,000	20,000
Landscaping buildings	25,000	30,000

Possible Locations of Granite Quarrying for Dimension Stone

Sl.No.	Location	Taluka	District
1	Nandri	Idar	Sabarkantha
2	Bhavangadh	"	"
3	Mohanpur	"	"
4	Khuski	"	"
5	Jalwantgadh	Danta	Banaskantha
6	Vajasana	"	"
7	Navavas	"	"
8	Pansvas	Dentiwada	"
9	Vagor	"	"
10	Pathavada	Dhanera	"
11	Sodapur	Disa	"
12	Mehariya	Halol	Panchmahal
13	Atladra	"	"
14	Guntanvad	Pavi Jetpur	Baroda
15	Rampur	"	"
16	Kantava	"	"

Locations of Granite in Sabarkantha District

Sl. No.	Village	Survey No.	Additional survey number in which granites identical quantity is exposed and its category			
			Kharaba	Gaucher	Revenue	Forest
1	Singha	931	301,302	116,168,236,238 244,249,274,276	-	-
2	Eklara	276	397	288,292/1,292/2 359,384,387	310	-
3	Chitrodi	2	1,156,158, 192,199,229, 266	392	-	-
4	Gadha	159	57,199	1,112,220,129, 221,225,232	124,127	-
5	Kabso	85	63,142,85, 159/1	-	-	-
6	Kabso	134	171,130,134, 137,196	-	-	-
7	Manpura	7	-	7,56,125,132, 149,157,158,159	-	-
8	Jashwantgadh (Deshotar)	1	641,818,937, 114	-	-	-
9	Falasan	518	-	-	-	-
10	Patalia	59	118A,113B	-	-	-
11	Oda	98	-	90,96,323,644	-	-
12	Mahiwada	122	122	-	-	128,125
13	Bhavangadh	187	-	-	-	-
14	Datrolli	515	-	39,515	-	-
15	Rehda	66	-	45,186	40,42,48-51, 54,57,65,68	-
16	Mahor	167	170,613	167,169	-	-
17	Nadri	4	-	4	-	-
18	Sapawada	45	-	90,461,318,326	256,267,288 291,318	-
19	Lulad	45	469/10	38,129,516,551	94,167,340 451/1, 351/2	-
20	Savgadh	324	62,157,323, 324	-	-	-

Possible Locations of Granite Quarrying in Rajasthan State

Sl.No.	District	Locations
1	Jalor	In the South of Jalor town at Raja Bhakar, Dable-Bhakar and part of Bijlia-Bhakar, Keshwana, Kolar-ki-Khati, Kalaghata, Tashkhana, Kalkaji and Nauh areas.
2	Pali	Bear-Sendra, Chitar, Manihar, Paldi-Sumerpur, Erinpura, Nana-Behda areas.
3	Sirohi	Abu, Veerwada, Mermundwara, Sirhoi border granite, Koteswar temple, Sanpur, Mev, Meerpur, Amlari, Sadgaon Dangari areas.
4	Ajmer	Areas near Beawar, Kekri, Bandanwara, Bhinai, Kishangarh-syenite, Vijaynagar-Ramgarh, Pipua, Piplad, Rupnagar, Pisangan, Bhimpura-Sewaria batholith, Udaipur Khurd, Harmada & Buharu (Teh. Kishangarh), Kanpura, Talwara, Dolatpura, Pawaria, Jeewana, Bangera, Makhpura (Teh. Beawar).
5	Chittorgarh	Banded gneisses, Berach granite and dolerites in Gangrar area near Det, Soniana, Khuntia, Ganeshpura, Nimbahera & Chhoti Sadri.
6	Barmer	Siwana, Mokalsar, Viretra, Bhachbhar, Bhorimane, Nosar, Rakhi, Patodi, Piplum areas.
7	Jaipur	Dudu-Bandri Sundri, Ladera, Sukun areas.
8	Sikar	Ajitgarh granite and in Neem-ka-Thana and Shri Madhopur Tehsils.
9	Jodhpur	Near Jasai, Bisla, Taralana, Mongris, Jodhamali, Ransinghaon, Khaniyana, Khojadla & Madlia villages.
10	Nagaur	Basic intrusives near Talera, Bidiyar, Morad, Kinsaria, Kishorepura of Parbatsar Tehsils.
11	Udaipur	Bhim-Karera-Deogarh area, Amet area, Gingla and Unthala granite, Udaisagar boss, Dakankotra-Jaisamand granite, Salumber granite, Jhalara granite, Saira-Pradrada area, Kagwas-Maonda area, Modi-Bathara-Kanor area.
12	Bhilwara	Gyangarh, Luhari Khurd, Basdan Negria, Kaera-Gangapur area, Mandalgarh area.
13	Dungarpur	Ramgarh & Punawali granite gneisses.
14	Alwar	Hazipur granite, Dadikar, Bairath & Halsora area.
15	Banaswara	Mungthali, SAgeta, Tikria, Ganoda, Pipalkhunt & Vijwana area.
16	Jhunjhunu	Around Jhunjhunu, Rizani, Motapahar, Chidawa, Udaipurwati, Khetri areas.
17	Sawaimadhopur	Baunli area, Khajana Dungar, Nagar Pahar, Karwari, Pal, Badagaon, Sarwar areas.
18	Bundi	Near Dewa-ka-Kheda and Basni and in Teh. Hindoli.

Source: Rajasthan Mineral Bulletin: Jan-June 1989, published by Directorate of Mines & Geology (Publication Cell), Udaipur.

Possible Locations for Black Granite Occurance

Sl.No.	Villages	Taluka	District
1	Khodtalav, Limbarda	Vyara	Surat
2	Sisor, Piparkua, Tokarva Dhanjikuva, Khanger, Kharasi, Gamkuva, Junvan and Dhamodi	Songadh	Surat
3	Thandi, Nanchal, Amanpura Chapati, Vadgam, Seled, Mirkot, Ukaigam	Uchhal	Surat
4	Demogara, Shale	Nizer	Surat
5	Chital	Dhari	Amreli
6	Paiya	Bhuj	Bhuj
7	Dhinodar, Aral, Muru	Nakhatrana	Kachchh
8	Rakha Kudi, Karchia, Ambakhadi	Dediapada	Bharuch
9	Fulvadi, Vasala, Naniraval	Nandod	Bharuch
10	Nagdhaniba	Talaja	Bhavnagar

Annexure-13

53 Granite Lease Holders in Gujarat

Sl.No.	Name of the Lease	Area (In Hect.)	Village	District
1	Shri Dhanraj Mavajibhai Chaudhari	3.06	Gola	Banaskantha
2	Shri Swarn Singh	2.00	Dhanera	"
3	Shri Panjiram K Panchal Govindnagar, PO Bhiloda	0.80	Khatwad	Sabarkantha
4	Shri Visanji Ramji & Co Nayaknagar, Sta. Road	2.00	Mohanpura Pushapi	"
5	Shri Manilal K Barod	2.00	Dantivada	Banaskantha
		2.00	Charanka	"

Dimension Granite sold or used in the USA

State	Quantity Short Tons	Cubic feet (000)	Value (\$'000)
California	16525	202	3410
Connecticut	W	W	W
Georgia	166108	1652	11054
Maine	7512	91	5924
Massachusetts	740079	866	12372
N.Hampshire	67479	818	10684
N.Carolina	28525	364	4786
Oklahoma	5950	70	796
Pennsylvania	12516	149	2566
S.Carolina	2319	28	312
S.Dakota	50718	541	18209
Texas	46717	545	6935
Vermont	83660	1012	15400
Wisconsin	2730	31	2241
Other	64526	756	12367
Total	629465	7106	107056

W = Withheld

List of Importers of Cut and Polished Granites**Japan**

01	Amar Company Ltd Dogenzaka Building 5-4, Maruyama-Cho, Shibuya-ka Tokyo 150	02	Isumi Sangyo Matsuo Building 3-16-25 Shonan, Suginami-ku Tokyo 167
03	Kaisei Shoji Kaisha Ltd IBS Building 3-9-6 Shibuya, Shibuya-ku Tokyo 150	04	KSK Enterprises Ltd Koito Building 6-12-3 Nishi Shinjuku Shinjuku-ku, Tokyo 160
05	Koshna Trading Co. Ltd The 7th Higashi Building 1-9 Kanda-Sakumacho Chiyoda-ky, Tokyo 101	06	Kohnan Co. Ltd 1-202 Honmachi, Shibuya-ku Tokyo
07	Shinei Shoji Co. Ltd 3-27, 1 Yushima, Bunkyo-ku Tokyo 113	08	Daiji Co. Ltd 3-28-9-601 Toyo-cho Koto-kut, Tokyo 135
09	Jordan Shoji Co. Ltd 3-52-5-1002, Honmachi Shibuya-ku, Tokyo 151	10	Teikoku Shoji Co. Ltd Kyodo Bldg., Ningyo-Cho 417, 1-3-6, Ningyo-Cho Nihonbashi, Chu-ku, Tokyo 193
11	Tesco Japan Ltd Akasaka Eminance Bldg. 2-17-69 Akasaka Minato-Ku, Tokyo 105	12	Orient Sangyo Kaisha Ltd 2-5-17 Shiroganedal Minato-Ku, Tokyo 105
13	Tohoku Industry Co. Ltd 2-13-45 Kamiosaki Singawa-Ku, Tokyo 141	14	Nachinan Trading Co. Ltd 1-9-2 Shinjuku-ku Tokyo 160
15	Nisso Co. Ltd Koroku Bldg., Yotsuya Shinjuku-ku, Tokyo	16	Matsushite Sangyo Co. Ltd (Tokyo Branch) 7-2-12, Nishishinjuku Shinjuku-ku, Tokyo
17	Maruo Sangyo Co. Ltd 3-23-20 Higashi-Shinagawa Shinagawa-ku, Tokyo 140	18	Meiko Shoji Co. Ltd 1-22 Asama-cho, Omiya-shi Saitama 330
19	Daiwa Bussan Co. Ltd Fukutaka Bldg., 40 Mirami Hon-machi, 2 chome Higashi-ku, Osaka	20	General Co. Ltd Tanaka Tameracho Bldg. 12-15 Simbashi, 2 Chome Mirato-ku, Tokyo
21	International Trade Co. Ltd Miyako Shinjata Bldg. 1-6 Nishi-Shinjuku, 1 Chome Shinju-ku, Tokyo	22	Rumi Trading Co. Ltd Kyodo Bldg. 1 Nitrobashi-Hon-che, Tokyo
23	Mitabhishi Brokers Co. Ltd Fakshihia Bldg., 7-7 Kanda Suda-cho, Chiaoda-ku, Tokyo	24	Sekigahara Stone Co. Ltd 2682, Seikigahaha-cho Gifu

25 Toho Bussan Co. Ltd
Nilon Seimel Shinbashi Bldg.
15-16 Shinbashi 1-Chome
Minato-ku, Tokyo

27 Union Enterprises Inc.
8-16, Higarhalzibe-cho
Higashi-ku
Nagoya

Saudi Arabia

01 Arabian Factory for Marble
PO Box 774
Jeddah, Saudi Arabia

03 Riyadh Marble & Stone Factory
PO Box 1378
Riyadh, Saudi Arabia

05 Saudi Marble Co.
PO Box 1187
Jeddah, Saudi Arabia

07 Binex
PO Box 8776
Jeddah, Saudi Arabia

09 Ahmed & Mohd. Saleh
Kako Group of Companies
PO Box 208
Riyadh, Saudi Arabia

11 Nadco
(HAL Harlthy & Co.)
PO Box 789
Riyadh, Saudi Arabia

13 Al-Midani Est.
PO Box 887
Jeddah, Saudi Arabia

15 National Quarries Co.
PO Box 5953
Jeddah, Saudi Arabia

17 Binladen Reter Saudi
Marble Co. Ltd
PO Box 388
Jeddah, Saudi Arabia

Gulf Countries

01 AK Almoayed
PO Box 363
Bahrain

03 Kavalan & Sons
PO Box 71
Bahrain

05 Quassim Fakhro Gulf Eternit
PO Box 633
Bahrain

26 Union Co. Ltd
39-1 Nishida Orishi-cho
Okazaki, Aichi

28 Wako Dussan Co. Ltd
Nippoa Bldg., 6-2 Ohte-Machi
2-Chome, Chiyoda-ku
Tokyo

02 Naman for Trading & Contg.
PO Box 419
Jeddah, Saudi Arabia

04 Binalden Mhd. Organization
PO Box 958
Jeddah, Saudi Arabia

06 Binlanden Issa Organisation
PO Box 3369
Jeddah, Saudi Arabia

08 Binhimd Mohd. East
PO Box 5972
Jeddah, Saudi Arabia

10 Ali Alfi Tiles Factory
PO Box 1775
Makkah Almokkarama
Saudi Arabia

12 Safa Enterprise Contg. & Trdg.
PO Box 304
Jeddah, Saudi Arabia

14 Zeharani Contracting Co.
Jeddah
Saudi Arabia

16 Unit Grants Marble
PO Box 11883
Jeddah, Saudi Arabia

02 Bhatia & Co
PO Box 95
Bagrain

04 Mohd. Jalal Trdg. Organization
PO Box 747
Bahrain

06 Technical Trdg. Centre
PO Box 383
Bahrain

- | | | | |
|----|---|----|---|
| 07 | Barrak N Alnoun Est.
PO Box 22717
Kuwait | 08 | Portugal Margle & Granite Services
PO Box 765
Bahrain |
| 09 | Badar Maintenance & Constn.
PO Box 1035
Bahrain | 10 | Marblo
PO Box 2024
Abu Dhabi |
| 11 | The Gulf Marble Co. Ltd
PO Box 2309
Kuwait | 12 | Hassanal Sarraj & Sons
PO Box 6074, Hawalli
Kuwait |
| 13 | Saf Co. Ltd
PO Box 5287
Bahrain | 14 | Oman Tiles & Marble Co.
PO Box 662, Muscat
Oman |

Malaysia

- | | | | |
|----|--|----|--|
| 01 | PMB Sendirian Berhad
108 Jalan
SS 14/1, Jaya Selangon
Malaysia | 02 | Chengo Sun Quarry
Sharikat, 10A Jalan Dato
Mahmid, Ipoh
Perak, Malaysia |
| 03 | Chin Ley & Co.
4th Mile, Jalan Klang
Kuala Lumpur
Malaysia | 04 | Ipoh Granite Quarry
Telok Kurin Buntong
Ipoh, Perak
Malaysia |
| 05 | Lian Huat Granite Quarry
19th Mile, Pontain Road
Ulu Choch, Johore
Malaysia | 06 | Malacca Lian Hwa & Co.Ltd
37 Jalan Tengker
Malacca
Malaysia |
| 07 | Malaysian Rock Products Sdn.
Berhad, 10th Mile
Jalan Damansara
Kuala Lumpur, Malaysia | 08 | San Inds. & Quarries Sdn.
Berhad, 9th Mile, PB 644
Kuching Sarawak
Malaysia |
| 09 | Swee Constn. & Trans.Co.(M)Sdn.
Room 402, 4th Floor
Kwong vik Bldg.,Jalan Bandar
Kuala Lumpur, Malaysia | 10 | Joe Seng Rubber Co.Sdn.
(Selangor)
Berhad 691, Weld Quay
Penang, Malaysia |
| 11 | Kopong Quarry & Inds.Ltd
16 Kampong Attap
Kuala Lumpur
Malaysia | 12 | Kwong Fee Loong
248 Jalan Temper
Seremban
NS Malaysia |
| 13 | Potial Granite Quarry Ltd
21st Mile, Jalan Pontain
Ulu Choh, Johore
Malaysia | 14 | Saw Chong Tenk Quarry Ltd
Ganong
Alor Star, Kedah
Malaysia |
| 15 | Malaysian Resources Corpn.
Malaysia | | |

Netherlands

- | | | | |
|----|---|----|---|
| 01 | BV Weg & Water Bougrounds
Stoffen, WEBBO, POB 280
Bergen OP Zoom
Netherlands | 02 | Natuurstevedrif Epe
BV PO 102
EPE
Netherlands |
| 03 | G Keuzwnkam BV
PB No.9793
The Hague
Netherlands | 04 | Natuursteenverwerkende Inds.
Nagarabo Co.
Arkansasdreef 22
Utreol, Netherlands |

- 05 Hessels Naturstedenhandel
BV PO Box 415
Amsterdam
Netherlands
- 07 Rotterdamsche Marmer Inds.BV
Zestienhovensekade 162
Rotterdam
Netherlands

- 06 Nedimex BV
PO Box 18
Sevenum
Netherlands
- 08 JB Peitte BV
Franklin Rosseltalaan
Breda
Netherlands

Singapore

- 01 Chan Guan Chua
176 Serangoon Road
Singapore 7
- 03 Kian Guan Stone Mason
124 Kheam Hock Road
Singapore 11
- 05 Serangoon Monument Contr.
165 Upper Serangoon
Singapore
- 07 Tan Guan Huat
24 Baghdad Street
Singapore

- 02 Christian Gasket
179 Serangoon Road
Singapore 7
- 04 Singapore Casket & Co.Pte.Ltd
133 Lavender Street
Singapore 12
- 06 Tan Chin Teck Co.
1 Aliwal Street
Singapore 7

West Germany

- 01 F H Bertling
Gross Altefaehre 23
34 lubeck 1
West Germany
- 03 Franz Grantigesellschaft
GmbH, Bergweg
8069 Reichertshasen
West Germany
- 05 Kellay Granite GmbH & Co.
Schwarzwaldstr 75
D-6800 Mannheim 1
West Germany
- 07 MIBA, Mineralienand
Bauhandel GmbH
Bornstr 53, D-2800
Bremen 1, West Germany
- 09 Helmut Wizigmann
Magratex, Postfach 23 62
D06800 Mannheim 1
West Germany
- 11 Intergranit GmbH
Scholzstrasse 2-4
Postfach 630, D-8590
Marktredwitz W G
- 13 Mucller Naturstein GmbH
D-7277 Wildberg
West Germany

- 02 Granit-u Senitwerke
Friedenfels GmbH
8591 ridenfels
West Germany
- 04 Intergrama GmbH & Co. KG
Pettenkoferster 20.22
8000 Muenchen 2
West Germany
- 06 Solnhfener Platenwerke
Viktor Henle
D-8831 Moernsheim
West Germany
- 08 Duisbursger Naturstein Import
Trau Zettal & Koegel
Aug Der Union 6
4300 Essen, W G
- 10 Granitwerke H W Hilbert
Postfach 1268, Steinstru 17
D-7580 Bucl (Baden)
West Germany
- 12 Duisburger Naturstein Import GmbH
Trausettel, Koegel & Co.
Auf der Union 6, D-4500
Essen 1
- 14 Tako Granit
Rossdoerfer Str 32
6105 OBER Ramstadt
West Germany

- | | | | |
|----|---|----|--|
| 15 | Continentale Erz-Gds MbH
Berliner Allee 29
D-4000 Dusseldorf
West Germany | 16 | Anna Merckenschlager
Bayerwaldstr 512
D-8391 Grubweg
West Germany |
| 17 | Rekostain Vertriebs GmbH
Kristinusstr 220
D-8999 Weiler
West Germany | 18 | IEC Natursteinhandel
GmbH Martinstrasse 15
D-2800 Bremen 1
West Germany |
| 19 | Chr. Schwarz GmbH & Co. Kg
Postfach
D-3410 Northim 1
West Germany | 20 | Saarlaendische
Steinindustrie
Kuchilweinstrasse
D-6620, Vaelkilinen WG |
| 21 | Deutsche Steinindustrie
A G Nibelungenstr
6147 Lautertal-Reinchenbach
West Germany | 22 | Naturstein Import Ludwig
Schenider & Schwethelm
PMG, Settiner Str.1
4040 NEUSS |
| 23 | Horst Mueller GmbH
Drostweg 16, Postfach 27
D-4401 Havixbeck
West Germany | 24 | Heatsendorfer Granitwerks
Merckenschlager KG, Postfach
Sieglgut 33d, D-8390 Passau
West Germany |
| 25 | Hermann Bartels
Betonsteinwerk
Industriestrasse 59-61
D-2000 edle (Holest) WG | 26 | Arabesco-Marmon-Vertri-
ebs, GmbH Am Kracjenberg
33, D-2000 Hamburg 55
West Germany |
| 27 | Ahlsell GmbH
Friesenweg 2
D-2000 Hamburg 50
West Germany | 28 | Gerhard Rickmann
Mittelleweg 151
D-2000 Hamburg 13
West Germany |
| 29 | Scaweco Handelsgesellschaft
Walter C Joerss
An Karpenteich 78
D-2000 Hamburg 63 WG | | |

Canada

- | | | | |
|----|--|----|--|
| 01 | Distribution Polsire Mirabel Inc.
509 Boul Daniel Johnson St.
Jerome Que J 7Z5V9 | 02 | St.Stephen Granite Co.
72 Queen St.
Stephen NB |
| 03 | Rock of Ages Corp.
Industrial Products Div.
POB 482 Barre Vt 05641 | | |

Australia

- | | | | |
|----|---|----|---|
| 01 | Mr Barter
Melocco Bros
1705 Centre Road
Springvale | 02 | Managing Director
Layton Granite
1 Fourth Avenue
Sunshine |
| 03 | D B Action Pty. Ltd
162 Belmont St.
Alexandria, NSW 2015 | 04 | Amalgamated Marble Co.Pty.Ltd
2A Cunningham St.
Northcote, Vic.3070 |
| 05 | DW Cluster Pty. Ltd
182 Victoria Road
Marrickville NSW 3070 | 06 | Diamonaire Pty.Ltd
105 Collin St.
West Perth WA 6005 |

United Kingdom

- | | | | |
|----|---|----|--|
| 01 | Art Marbles Stone & Mossaic Co.Ltd
Dawson Road
Kingston-upon-Thames
Survey KTI 3AX | 02 | Anselm Golding(Constr.) Ltd
3-4 Chivalry Road
Battersea Rise
London SW11 |
| 03 | Bannocks of Birmingham Ltd
Ambleside Marble Works
1562 Stratford Rd., Hall Green
Birmingham B28 9H 8 | 04 | Booth Bros(Masonry) Ltd
245C Barlow Moor Road
Chorlton
Manchester MW1 2QL |
| 05 | J Bral-Thwaite & Sons Ltd
Granite Merchants
Darwen, Lancs | 06 | SW Bull & Son Ltd
Arterial Rd., Rayleigh Weir
Rayleigh, Essex |
| 07 | J Bysouth Ltd
Dorest Road, Tottenham
London N15 5 AL | 08 | FJ Dangerfield & Co.
261A Finchley Road
London NW3 6 LG |
| 09 | Harvey Barnes Ltd
Culvert Place, Battersea Park Rd.
London SW11 5AZ | 10 | Icona(London) Ltd
7 Beaston Place
London SW1 |
| 11 | Walter W Jenkins & Co.Ltd
The Marble Works, Lymington Rd.
Torquay, Devon | 12 | J Joslin Ltd
287 High Road
London N2 |
| 13 | William Knight & Co.Ltd
British Railways Depot.
Frederic St.,Louth Lincas | 14 | Leakes Masonry Works Ltd
2-16 James St.
Louth Lincs |
| 15 | Philip Leek(Bristol) Ltd
Stratton St.
Bristol BS2 98H | 16 | Geoffrey Pike Ltd
15-17 High St., Borehamwood
Elstree Herts |
| 17 | CA Pisani & Co. Ltd
Transport Avenue, Great West Rd.
Brentford, Middx. | 18 | A Quillizotti
Newby Road, Hazel Grove
Stockport SK7 5 DR |
| 19 | Edward a Reed & Co.Ltd
Rierside House, Carnwath Rd.
London SW6 3 HS | 20 | Konrad Steward Ltd
90 Fulham Road
London SW3 |
| 21 | The Stone Firms Ltd
Manvers St. Bath
Avon BA1 1 LX | 22 | J Whitehead & Sons
Imperial Works, 64 Mt.Vernon
Porchaster NA 02125 |

U.S.A

- | | | | |
|----|---|----|--|
| 01 | Art Monument Co.
26295 Mission Blvd
Hardwar CA 94544 | 02 | Bergen Country Cut Stone Co.Ltd
465 Market St.,Elmood Park
NJ 07470 |
| 03 | Ideal Monumental Works
Mount Arry, NC 27030 | 04 | Marble Associates Inc.
Pittsburgh, PA 1521 |
| 05 | Burner Pacific Marble & Granite
Co. Inc., 2695 N Towne AVC
Pamona, CA 91767 | 06 | Carlini Brothers Co.
701 Hazelwood Avy.
Pittsburgh, PA 15217 |
| 07 | Colonia Marble Co.Inc.
25 Garvery St., Everett
NA 02149 | 08 | Continental Marble Granite Co.Inc
535 Homes Buld, Ste 201
Getna LA 70053 |
| 09 | Elberton Granite Fin.Co.Inc.
PO Box 882, Elberton
GA 30635 | 10 | Hawali Marble & Granite Co.
Construction Co. Inc.
Honolulu, HI 96819 |

- | | | | |
|----|--|----|---|
| 11 | International Granite Corpn.
2038, 83rd Street
North Borgen, NJ 07047 | 12 | Land's Marble Inc.
2516W 3rd Street
Willington, DC 19805 |
| 13 | Manufacturers Mineral Co.
1215 Monstor Road
SW Renton, WA 98055 | 14 | Arlinton Monument Inc(AWRC)
5300 Reisteratown Road
MD 21215 |
| 15 | Associated Marble Inds.Inc.
101 W End Ave
Inwood NY 11696 | 16 | Bloom South & Co.Inc.
9 Melcher Street
Boston, MA 02210 |
| 17 | Canniff & Sons Inc.
531 Cummins Hwy
Roslindale MA, 02131W | 18 | Carnevale & Lohr, Inc.
6521, Clara St., Bel Gardens
CA 90201 |
| 19 | Colonna & Co. Inc.
34-46 Vernon Blvd.
Lond Island City, NY 11106 | 20 | Deland Granite Co.
265 N River St.
Delano, MN 55328 |
| 21 | Fredner Inc., Rolf
800 3rd Ave., New York
NY 10022 | 22 | Interpid Enterprises Inc.
206 Greferhn
Harvey, LA 70059 |
| 23 | Lloyd Brother Walker
Renolds Monument Co.K(M)
3024 Auburn Av.
Teledo, CH 43606 | 24 | Marble Shop Inc.
6000 Walden, POB 10127
Knoxville
TN 37919 |
| 25 | Michigan Tile & Marble Co.
9317 Freeland Detroit
MI 48228 | 26 | NC Granite Corp.
POB 151, Mount Airy
NC 27030 |
| 27 | Ambrit Inteernational
34-36 Vemon Bldg.
Lond Island City, NY 11106 | 28 | Greenville Marble & Granite
POB 103, Greenville
North Caroline 27834 |
| 29 | Baval Granite Co.
119th St., 7 Kedzie Ave.
Chicago, Illigeis | 30 | Colonna & Co. Inc.
34-36 Vornon Blvg.
Long Island City, NY 11106 |
| 31 | Brener Pacific Marble & Granite Inc.
2695, MP Town Ave., POB 70
Pomona, California 91769 | 32 | Domestic Marble & Stone
41E 42nd Street
New Yord 11106 |
| 33 | Flynn's Granite Co.
POB 183, Glen Burine
MD 21061 | 34 | Rolf Fredner Inc.
290 Madison Ave.
New York 10017 |
| 35 | John Larry Murphy
10100 S Leavitt St.
Illinois | 36 | Kiel Tomkins Margle &
Granite Co., 33-01 Vernon Blvd.
Lond Island, NY 11106 |
| 37 | Mar ble Sales Inc.
101 Park Ave.
New York 10022 | 38 | Louis Golday Co.Inc.
509 Madison Ave.
New York 10022 |
| 39 | Marlen Marble Ltd
34-46 Vernon Blvd.
Lond Island City, NY 11106 | 40 | Universal Marble & Granite Co.
3309 Ben Valley Road
Baltimore MD 21207 |
| 41 | Ottavino Granite Corp.
80-60 Pitking Ave.
Ozone Park, NY 11417 | 42 | Phillpsburg Marble Co.Inc.
POB 172, Phillips Burg
NJ 08865 |
| 43 | Read & Emmerich Inc.
110, 40th New York
NY 10018 | 44 | Solari Marble & Granite Co.
1602 B.Road, Lake Charles
LA 70601 |

- | | | | |
|----|---|----|---|
| 45 | Sunkoh Inc.
888 West Sixth Street
Los Angeles CA 90017 | 46 | Townler Corp.
WC Towns end Q, Butler Sales
POB 637, Elberton GA 30360 |
| 47 | Wenz.Col., Inc.
1928 Hamilton St.
Allentown, PA 18104 | 48 | Winterien & Associates Inc.
31711 Solon Road
Solon OH 44139 |
| 49 | Friedman Marble & Slate Works Inc.
3721 Vernon Blvd., Long Island City
NY 11101 | 50 | Gerogia Marble Co.
POB 8, Nelson
GA 30151 |
| 51 | A Barton Jr. & Sons Inc.
5 Brown Square, Ipswich
Massachusetts | 52 | Marsteller Corp.
1809 Franklin Road
Roanoke, VA 24004 |
| 53 | Milford Concrete Prod. Inc.
Honck St., Milford
CT 06460 | 54 | Passort Marble & Tiles
Dunpont
PA 18641 |
| 55 | North Hill Marble & Granite Co.
448 NH Oward, Akkon
OH 44310 | 56 | Quality Marble Imports
3733 N Meridian
Indianapolis IN 46208 |
| 57 | Settimolli & Sons Inc.
24 Totmen, Quiney
MA 02164 | 58 | Straub Brothers Inc.
502, Glassgow Ave.
Fort Wayne IN 46803 |
| 59 | Tem Kins-Kiel Steel Co.
33-01 Vernen Boulevard
Long Island NY 11106 | 60 | Walker & Zanger Inc.
179 Summerfield St., PB 241
Scarsdale NY 10583 |
| 61 | Water Town Monument Works Inc.
POB 130, Water Town
SD 57201 | 62 | White Marble Co. Inc.
714 W, 10th Street
POB 703 55, Houston |
| 63 | Wolverine Marble Co. Inc.
14269 Fleming Road
Detroit MI 48212 | 64 | Geleone AJ
1857 Hulmeville Road
Cornwells Heights PA 19020 |

Italy

- | | | | |
|----|--|----|---|
| 01 | Grant Marmi Graniti Volagyne
Passag, Napotreon 3
3 700020 Doke (VR), Italy | 02 | Nicolato Granitidi F. Nicolato
Via T. Dal Molias, 36072
Chiampo (VI), Italy |
| 03 | Europami Bara
Via Crotoni, 240060
Carobbio, Angeli (BG), Italy | 04 | Pisani Brothers pa
Avenza-V Ice Zaccagna, 54031
Carrara (MS), Italy |
| 05 | IMA Industrial Marmi Als Spa
Ala, 38061 Ala (TN)
Italy | 06 | Mermi Ear Spa
Stradedel Portico, 24060
Bangnatica (BG), Italy |

U.S.Imports of Granite
(Qty.in '000 cu.ft./Value in '000 US\$)

	Rough Granite			Dressed Granite	
	Quantity	Value	Quantity	Value	
1986					
Canada	1078	3757	199	12365	
Italy	665	218	7596	104467	
Saudi Arabia	-	25	7	373	
Spain	13	57	646	109985	
Other	943	2650	1187	13995	
Total	2699	6707	9635	142185	
1987					
Canada	5329	6125	249	12621	
Italy	37	587	4626	89655	
Saudi Arabia	1	11	19	303	
Spain	-	3	355	10527	
Other	1966	4915	814	14488	
Total	7333	10641	6063	127594	

**Production & Export of Cut & Polished Granite
From India**

(Qty. in '000 Tonnes)

States/U.T	1983	1984	1985	1986	1987
India	1146	972	1449	1529	821
Assam	-	9	-	6	6(E)
Andhra Pradesh	42	83	79	71	69
Andaman & Nicobar	2	2	1	-	NA
Gujarat	5	12	14	39	2
Karnataka	713	136	700	587	78
Kerala	72	211	218	290	165
Orissa	77	56	75	125	125(E)
Rajasthan	5	5	3	1	2
Tamil Nadu	230	485	343	400	340

Export of Cut & Polished Granite from India during 1982-1986:

	1982	1983	1984	1985	1986
Quantity (In Tonnes)	199,594	338,478	327,756	410,393	036,351
Value (In Rs.'000)	192,893	232,295	309,140	533,373	514,296

ગુજરાત સરકાર,
ઉધોગ અને ખાણ વિભાગ,
પરિપત્ર ક્રમાંક : એમસીઆર-૧૦૯૦-(૩૧૦)-૨૮૩૩-ઇ,
સચિવાલય, ગાંધીનગર.
તારીખ : ૧૫-૫-૧૯૯૩.

પરિપત્ર:-

ગુજરાત રાજ્યમાં મુખ્યત્વે સાબરકાંઠા જિલ્લાના ઈંડર અને ભિલોડા તાલુકામાં મહેસાણા જિલ્લાના પશોઈ અને તારંગા વિસ્તારમાં, બનાસકાંઠા જિલ્લાના અંબાજી અને ઘાંતા તાલુકાના વિસ્તારો, પંચમહાલ જિલ્લાના ગોપરા અને રતનમહાલ વિસ્તારો, વડોદરા જિલ્લામાં બોડેલી અને છોટાઉદેપુરના વિસ્તારોમાં રેનાઈટ ખનિજ મળી આવે છે. સીરાપ્ટના વિસ્તારો અને ઈશિણ ગુજરાતમાં પણ ડીલેરાઈટ ડાઈકસ સ્વરૂપે આ ખનિજ મળી આવે છે. જ્યારે મારબલ ખનિજ મુખ્યત્વે બનાસકાંઠા જિલ્લાના વિસ્તારોમાં અને વડોદરા જિલ્લાના વિસ્તારમાં ચીન મારબલ તરીકે મળી આવે છે.

રાજ્યમાં મળી આવતા રેનાઈટ અને મારબલના વિસ્તારોમાં મુનિયોગિત અને આધુનિક રીતે વિકસાવી શકાય અને ઘરઆંગણે તથા પરદેશમાં પોલીશ કરેલ રેનાઈટ અને મારબલની માંગ વધી રહેલ છે. ત્યારે રેનાઈટ અને મારબલ ખનિજ કવોરીલીઓ મંજૂર કરવા અંગેની નીતિ નક્કી કરવાની બાબત સરકારશ્રીની વિચારણા હેઠળ હતી. રેનાઈટ અને મારબલ ખનિજના વિકાસને ખાનમાં થઈ સરકારશ્રીએ કાળજીપૂર્વકની વિચારણાને અંતે રાજ્યમાં રેનાઈટ અને મારબલ ખનિજોના કવોરીલીઓ મંજૂર કરવા/રીન્યુ કરવા બાબતે નીચે મુજબ નીતિવિષયક નિર્ણય કરેલ છે.

(૧) ગુજરાત ગૌણ ખનિજ નિયમોમાંની જોગવાઈ અનુસાર રેનાઈટ અને મારબલ ખનિજ માટેના કવોરીલીઝ મંજૂર/રીન્યુ કરવાપાત્ર રહેશે. આ રેનાઈટ/મારબલ ખનિજના કવોરીલીઓ પ્રથમ દશ વર્ષની મુદત માટે અને રીન્યુઅલ દશ વર્ષની મુદતમાટે મંજૂર કરવાના રહેશે.

(૨) રેનાઈટ અને મારબલ ખનિજ માટેના કવોરીલીઓ મંજૂર કરતા સમયે, જે પટેદાર નિકાસશીલ એકમ/કટીંગ પોલીશીંગ પ્લાન્ટ સ્થાપિત કરવા માંગતા હોય તેમને અગ્રીમતા આપવાની રહેશે.

(૩) અગ્રીમતાના ધોરણે મંજૂર કરવાપાત્ર રહેતા કવોરીલીઓ અંગે કવોરીલીઝ ધારકે રેનાઈટ/મારબલ ખનિજનો ઉપયોગ પોતાના કટીંગ-પોલીશીંગ પ્લાન્ટ માટે જ ઉપયોગ કરવાનો રહેશે. સદર ખનિજનો કાચો માલ રાજ્યસરકારની પુર્વમંજૂરી વગર રાજ્ય બહાર મોકલી શકાશે નહિ.

(૪) રેનાઈટ/મારબલ ખનિજ માટે કટીંગ-પોલીશીંગ પ્લાન્ટ પટેદાર બે વર્ષમાં સ્થાપિત કરવાના રહશે અન્યથા કવોરીલીઝ રદ કરી શકાશે.

(૫) રાજ્યના સંબંધિત જિલ્લાનાં કલેક્ટરશ્રીઓ નિયમોનુસાર દરખાસ્તની જરૂરી ચકાસણી કરી. સરકારશ્રીની પુર્વમંજૂરી મેળવવાની રહેશે.

ગુજરાતના રાજ્યપાલશ્રીના હુકમથી અને તેમના નામે.

(રાજેન્દ્ર ભટ્ટ)
સંયુક્ત સચિવ
ઉધોગ અને ખાણ વિભાગ.

પ્રતિ, મા.મુખ્યમંત્રીના સચિવશ્રી, સચિવાલય, ગાંધીનગર.

મા. ઉધોગમંત્રીશ્રીના રહસ્ય સચિવશ્રી, સચિવાલય, ગાંધીનગર.

મા. રાજ્યકક્ષાના મંત્રીશ્રી (ખાણ-ખનિજ)ના અંગતસચિવશ્રી, સચિવાલય, ગાંધીનગર.

નિયામકશ્રી ભુસ્તર વિજ્ઞાન, અમદાવાદ (૫-નકલ)

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ગુજરાત મિનરલ ઇન્ડસ્ટ્રીઝ અસોસીએશન, અમદાવાદ.

સિલેક્ટ ફાઇલ.

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