

# **Facing Stones Producing in Georgia**

## **Investment Proposal**

<b><u>Project title:</u></b>	Production of marmorized limestone and tuff slabs in Georgia.
<b><u>Project description:</u></b>	This proposal is apply to deposits and occurrences of various building and facing stones on the territory of Georgia. It should be noted, that above mentioned stones have different color shades, hardness and other physical and mechanical properties etc.
<b><u>Commercial purpose of the project:</u></b>	Aim of the investment proposal is the confirmation of expediency of investment in the production of modern facing slabs.
<b><u>Realization of the project:</u></b>	Products - blocks and slabs of marmorized limestone and tuff. For final processing (cutting, polishing and storage) and for elimination seasonality of the slabs manufacturing, blocks will be delivered from the quarry to the factory in Tbilisi. Georgia has a favorable geographic location, advanced infrastructure and communications, as a way out to the West (the Sea ports of Batumi and Poti) and in the Asian region. Planned production should be implemented by the investor in Georgia and the global market



Marmorised limestone (Chobareti)



Polish Tuff (Bazaklo)



Polish Tuff (Bazaklo)



Tuff (Tserakvi)



Fig. 5  
1 – Chobareti; 2 – Bazaklo

**Economic assessment of project:**

In the schedule below are given necessary investments for project and their structure in USD.

**Structure of Investment, USD**

No		Price
	Career Equipment, including:	
1	Outcrop cutting device (Benettimacchine)(2)	630000
2	Stone grinder (for ballast) (1)	50000
3	Power-mobile crane(1)	45000
4	Temporary accommodation on the outcrop(1)	6000
5	Water reservoir, pump and pipes	10000
6	Diesel generator (> 100kw.t)(1)	15000
7	Excavator(1)	25000
8	Lorry "Kamaz"(2)	25000
9	"Jeep" type vehicle(2)	22000
10	Fuel reservoir(1)	5000
11	Auto lift-truck (1)	14 000
12	Plant equipment (block cutter, polishing machine, wrapper,pallets)	640000
13	Reconstruction of Plant	35000
15	Licensing Career	≥30000
16	Other expenses	10000
TOTAL		1562000

## Production Realization Graph

	I month	II month	III month	IV month
	+	+		
Beginning of Career working			+	
Reconstruction of recent Plant	+	+	+	
Plant territory Arranging, building external perimeter		+	+	+
Arranging territory, building external perimeter, assembling fire-protection and security systems.	+	+	+	
Buying technologic cables and accessories and their transportation	+	+	+	
Beginning of Tbilisi Enterprise working				+
Assemble works			+	+
Staff trainings		+	+	+
Arranging the Quality Control Laboratory			+	
Buying Office Furniture		+		

### Career

Characteristics of Career Production are:

- Block expected size – 2.0x2.0x1.0m.
- Mass (on average) – 10 ton.
- Expected daily extraction – 2 blocks (20 ton.)
- In 25 working days - probably it will be got - 200m<sup>3</sup> (500 ton.)

The pictures of Mobile and Stationary Italian machines at career and at Plant are given on Fig. 6 and 7



**Career expenses and delivering blocks to Tbilisi in month= 35740 US\$**

Self-cost of 1m<sup>3</sup> block delivery to Tbilisi = US\$ 35740: 200

**Self-cost of 1m<sup>3</sup> block = US\$ 178**

**Expenses of manufacturing enterprise in a month in Tbilisi = 89590 US \$**

### Self-cost of 1 polished slab = US\$ 16

It is necessary to take into account that industrial wastes - a marble crumb - represent an additional source of the income. The crumb is used for a marble mosaic, and thin fraction for manufacture of an artificial marble.

Production made by the enterprise (for 1 month) and preliminary costs of realization value.

№	Prod. Name	Meas. Unit	Quant.	Unit Price	Total Price
1	Marble Block	m <sup>3</sup>	200	500-700	
2	Polished Marble Slab	m <sup>3</sup>	5 000	25	125 000
3	Marble Ballast (0-5 mm)	T.	130	8	1 400
4	Marble Ballast (6-10mm)	T.	130	16	2 080
5	Marble Ballast (11-20mm)	T.	130	15	1 950
TOTAL					130 430

Cost of similar plates at the European markets is about - US \$ 40-50

The full investment represents US \$ 2 000 000, time of a covering of the investment - is 2.5 year.

#### CHOBARETI MARMARIZED LIMESTONE DEPOSIT

Location of a deposit or occurrence	Characteristic of a mineral deposit, data: on output of fragmental stone, on groups of produced units and on output of net plates from 1 m <sup>3</sup> unit, and also on reserves	Physical-mechanical properties of mineral deposit, chemical composition and compliance of raw material with GOST (State Standard)										
1	2	3										
<p>The deposit is located in Akhalkalaki region to the NW 7 km of Azavreti vil. at the altitude 21 00-2200m s.l.. The distance from the deposit along the automobile road to the Akhalkalaki railway station is 22 km and to the seaport of Batumi is 230km.</p>	<p>It is uniformly, fine-grained ivory-white limestone like marble.</p> <p>The output of fragmental stone from rock mass is 35.2%.</p> <p>Units of IV- V groups predominate.</p> <p>The output of plates from 1 m<sup>3</sup> of fragmental stone is 24.2 m<sup>2</sup>.</p> <p>The quantity of reserves of B+C1 category (provision resources) amounts to 5180 thousand m<sup>3</sup>.</p> <p>The number of units is – 994 thousand m<sup>3</sup>.</p>	<p>The rock is easily worked, after polishing it takes on smooth surface (luster).</p> <p>Volumetric weight - 2610-2716 kg/cm<sup>3</sup></p> <p>Specific weight - 2730 kg/cm<sup>3</sup></p> <p>Water absorption - 0.22-0.56%</p> <p>Porosity - 1.11-4.01%</p> <p>Compression strength :</p> <p>a) in air-dry state - 536-666 kg/cm<sup>2</sup></p> <p>b) after 25 cycles of freezing - 428-561 kg/cm<sup>2</sup></p> <p>Softening coefficient - 0.84-0.27%</p> <p>Abrasiveness - 0.84 - 1.15 g/cm.</p> <p style="text-align: center;"><i>Chemical composition in percentage:</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">SiO<sub>2</sub> - 0.2-0.91</td> <td style="width: 50%;">MgO - 0.2-0.4</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub> - &lt;0.2</td> <td>MnO - &lt;0,03</td> </tr> <tr> <td>Fe<sub>2</sub>O<sub>3</sub> - 0.09-0.11</td> <td>Na<sub>2</sub>O - 0,3</td> </tr> <tr> <td>FeO - &lt;0.2</td> <td>K<sub>2</sub>O - 0,3</td> </tr> <tr> <td>CaO - 54.7-4.9</td> <td>LOI - 42.92-43.36</td> </tr> </table> <p>Moisture content - 0.32-0.4.</p> <p>The number of radionuclide doesn't exceed the norm.</p> <p>The data listed above meet requirements of the State standard 9479-84 and 9480-89.</p> <p>The rock is fit for facing interiors of solid buildings.</p>	SiO <sub>2</sub> - 0.2-0.91	MgO - 0.2-0.4	Al <sub>2</sub> O <sub>3</sub> - <0.2	MnO - <0,03	Fe <sub>2</sub> O <sub>3</sub> - 0.09-0.11	Na <sub>2</sub> O - 0,3	FeO - <0.2	K <sub>2</sub> O - 0,3	CaO - 54.7-4.9	LOI - 42.92-43.36
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### BAZAKLO TUFF DEPOSIT

Location of a deposit or , occurrence	Characteristic of a mineral deposit, data, on output of fragmental stone, on groups of produced units and on output of net plates from 1 m <sup>3</sup> unit, and also on reserves	Physico-mechanical properties of mineral deposit, chemical composition and compliance of raw material with GOST (State Standard)												
1	2	3												
<p>The deposit is located in Dmanisi district, at 67 km to south to the regional centre of Dmanisi,, at the altitude 1500 m s.l. The distance from the deposit to Kazreti railway station is 30 km, to the Tbilisi airport - 110 km and to the seaport of Poti - 410 km</p>	<p>Welded tuff is of different colors - grayish-green, brownish- viol ate, dark-brown, etc.</p> <p>The output of standard unit from rock mass 36.5%.</p> <p>The unit volume is from 0.09 to 12 m<sup>3</sup></p> <p>The output of standard plates (40 mm thickness) from 1 m<sup>3</sup> is 23. 3 m<sup>2</sup></p> <p>The quantity of reserves of A-B (provision resources) in rock mass is 1161 thousand m<sup>3</sup></p>	<p>The tuff is well worked. After working takes on 1 smooth surface.</p> <p>Volumetric weight is 1900-2900 kg/m<sup>3</sup></p> <p>Water absorption - 1.27-9.20%</p> <p>Porosity - 0.5-0.6%</p> <p>Compressive strength in air-dry state - 631-1416 kg/cm<sup>2</sup> after water absorption - 573-1387 kg/cm<sup>2</sup> after 25 short cycles of freezing - 505-1369 kg/cm<sup>2</sup></p> <p>Softening coefficient – 0.72-0.96</p> <p style="text-align: center;"><i>Chemical composition in percentage:</i></p> <table style="width: 100%; border: none;"> <tr> <td>SiO<sub>2</sub> -64.20-71.80</td> <td>MgO - 0.25-1.57</td> </tr> <tr> <td>Al<sub>2</sub>O<sub>3</sub> -12.58-15.91</td> <td>MnO – marks - 0.21</td> </tr> <tr> <td>Fe<sub>2</sub>O<sub>3</sub> - 1.96- 4.39</td> <td>P<sub>2</sub>O<sub>5</sub> - 0.04-0.05</td> </tr> <tr> <td>FeO - 0.79- 1.92</td> <td>Na<sub>2</sub>O - 2.00-3.40</td> </tr> <tr> <td>TiO<sub>2</sub> - 0.46- 0.95</td> <td>K<sub>2</sub>O - 3.00-3.78</td> </tr> <tr> <td>CaO - 2.82- 4.36</td> <td>SO<sub>3</sub>, - no</td> </tr> </table> <p>Quenching loss - 0.57-2.50.</p> <p>The data listed above meet the requirements of the standards on facing stones.</p> <p>Tuff fit for facing buildings and constructions.</p>	SiO <sub>2</sub> -64.20-71.80	MgO - 0.25-1.57	Al <sub>2</sub> O <sub>3</sub> -12.58-15.91	MnO – marks - 0.21	Fe <sub>2</sub> O <sub>3</sub> - 1.96- 4.39	P <sub>2</sub> O <sub>5</sub> - 0.04-0.05	FeO - 0.79- 1.92	Na <sub>2</sub> O - 2.00-3.40	TiO <sub>2</sub> - 0.46- 0.95	K <sub>2</sub> O - 3.00-3.78	CaO - 2.82- 4.36	SO <sub>3</sub> , - no
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