

**Per-feasibility (P.F.S)**

**The Green Production Using Granit Wastes Plane**

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**The Center of Investment Services, South Khorasan Province**

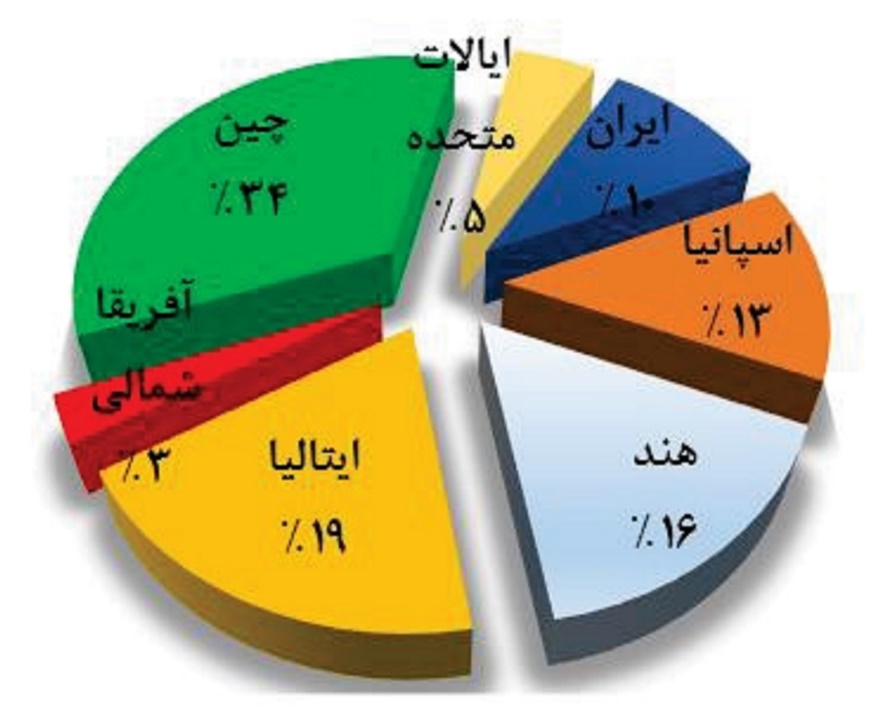
**Project summary**

Using natural materials in construction, especially non-renewable ones, is a serious problem nowadays. Because of lower maintenance costs and higher adaptability, concrete is the world's primary and most used material for construction. In recent years, concrete has been used more than normal which has cause to many concerns about global environmental issues. Additionally, increasing industrial waste in garbage dumps or sites creates more environmental problems. On the other hand, the non-reusability of concern causes more attention to these problems. Stone is one of the most popular products in the construction industry, and it produces a lot of industrial waste in its production processes. Granite is one of the most popular stoneish products in the construction industry. With using of granite waste in the concrete, it became a valuable material, and its environmental problems were reduced. Our current investment is in using granite wastes in concert parts to reduce environmental problems and improve concert properties.

Our current investment is in using granite waste as a replacement for concrete parts to reduce environmental problems and improve concert properties. Various types of stones, such as granite, marble, and lime, are used in the construction and building industry. There are some statistics about stone production in some countries.

As shown in the diagram below, The most prominent countries are China, Italy, India, Spain, Iran, etc.

The world's most extensive stone waste production



As you see in the above chart, Iran is one of biggest stone products and stone waste. Demand for various stoneish products is growing, resulting in more stone waste. Therefore, we must find a useful solution for it.

In 2019, more than 15,5 million tons of decorative stone were produced, which shows an 18% growth than 2017. Based on Iran's customs statistics, in the last year (2023), Iran had 270 million dollars in stone products exports, 35% more than the previous year.

Iran has prosperous mines of precious and decorative stones. However, using decorative stones can used in construction, architecture, and urban furniture, but using stone for this consumption isn't usually done yet.

Iran has more than one-fourth of all decorative and precious stone resources in the world (It is estimated Iran has 4 Billiard tons of decorative and precious stones), so Iran has the first rank in the world for its resources and seventh rank for extraction of these mines; Also Iran has the twelfth position for the quality of its stone.

The infrastructure of this plane needs 373221 Kilowatts of electrical power (per hour) and 2330 cubic meter water. This plan is anticipated to need 163500 cubic meters fule and can make 24 job positions directly.

# Project define:

Using natural materials in construction, especially non-renewable ones, is a serious problem nowadays. Because of lower maintenance costs and higher adaptability, concrete is the world's primary and most used material for construction. In recent years, concrete has been used more than normal which has cause to many concerns about global environmental issues. Additionally, increasing industrial waste in garbage dumps or sites creates more environmental problems. On the other hand, the non-reusability of concern causes more attention to these problems. Stone is one of the most popular products in the construction industry, and it produces a lot of industrial waste in its production processes. Granite is one of the most popular stoneish products in the construction industry. With using of granite waste in the concrete, it became a valuable material, and its environmental problems were reduced. Our current investment is in using granite wastes in concert parts to reduce environmental problems and improve concert properties.

The cement industry is one of the most critical industries and is essential to economic development. Cement has a crucial role in the construction and home building industries, and it is also one of the strategic products for any country, even if we can measure the development of each country with growth in its cement industry. Moreover, it influences the country's GDP index, creating new job opportunities and resulting multiple economic advantages. Despite these advantages, it has its environmental damage and needs to be high in the value of energy resources; it also has one of the most extensive emissions of greenhouse gas resources.

The green concrete advantages are:

* 30% reduction in CO2 emissions in the concrete industry;
* 20% increase in using of concrete wastes;
* Remove enviromental pollution and care for sustainable development;
* The green concrete needs to lower maintenance;
* Green concrete has better performance than usual concrete;
* It is resistant to fire and high temperatures;
* Its compression behavior with an equal value of water is similar to usual concrete;

# Essentials for executing this project:

The growing construction industry means we need more construction materials. Aggregates are the main ingredient of concrete. Excessive extraction of aggregates causes some problems for us. To solve this problem, we need to find a suitable solution. The offering solution to this problem is green concrete. Naming "Green concrete" isn't because of its color but because of its environmental advantages. Green concrete has a lower price because we use mineral and construction wastes in its production, and we don't need to spend money to remove these wastes.

# Review alternative products and analyze their effects:

 Because of its environmental advantage, it is a high-demand product that can be used instead of usual concrete and cement.

Many materials have been evaluated as a replacement for concrete so far. Waste and pollution that produce gradually.

The extraction and cutting of granite stone can be a suitable alternative for aggregate or an ingredient in cement. In many countries, waste granite stone in the production process is collected. Only a low section of waste is used again, and the rest is released into the environment, which has undesirable effects on nature. Approximately all production processes in this industry produce waste that is released outdoors. It is estimated that 22% of all areas of this industry's infrastructures belong to its wastes. Product concrete with gradient waste is a significant help to the granite stone industry's economy and reduces unwanted environmental effects on nature. In the following part, stoneish products statistics of other countries shown.

**Checking and determining the minimum economic capacity**

**1- Fixed project costs**

|  |  |  |
| --- | --- | --- |
| **row** | **Description** | **Total cost (thousand riyals)** |
| 1 | Earth | 4,800,000 |
| 2 | Landscaping | 3,200,000 |
| 3 | Production and administrative building | 35,530,000 |
| 4 | General facilities and equipment | 7,070,000 |
| 5 | equipment and machinery | 76,032,000 |
| 6 | Office furniture and equipment | 2,157,400 |
| 7 | vehicles | 17,200,000 |
| 8 | Laboratory supplies and equipment | 2,173,500 |
| 9 | Unforeseen costs of 3% | 4,300,888 |
| 10 | Pre-operation costs | 1,406,062 |
| **total sum** | | **153,869,848** |

**1-1- land**

|  |  |  |  |
| --- | --- | --- | --- |
| **land location** | **land area** | **Unit price** | **Total price (thousand riyals)** |
| Birjand | 3000 | 1600000 | **4,800,000** |

**1-2- Landscaping**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **row** | **Description** | **Meterage** | **unit** | **unit cost** | **total sum** |
| **(thousand riyals)** | **thousand riyals)** |
| 1 | Leveling and excavation and embankment | 3000 | Square meters | 40 | 120000 |
| 2 | Fencing | 220 | meter long | 7,600 | 1672000 |
| 3 | Street drawing, table drawing, channel drawing and parking lot | 300 | Square meters | 3,900 | 1170000 |
| 5 | Area lighting | 12 | original | 9,000 | 108000 |
| 6 | entrance door | 1 | number | 130,000 | 130000 |
| **total sum** | | | | | **3200000** |

**1-3- construction**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **row** | **Description** | **area (square meter)** | **Unit cost (thousand riyals)** | **Total cost (thousand riyals)** |
| 1 | Production Hall | 600 | 36000 | 21600000 |
| 2 | Roofed warehouse | 200 | 32000 | 6400000 |
| 3 | office building | 80 | 54000 | 4320000 |
| 4 | Caretaker and security and welfare | 50 | 48000 | 2400000 |
| 5 | Laboratory | 15 | 54000 | 810000 |
| **total sum** | | **945** |  | **35530000** |

**1-4- Facilities and equipment**

|  |  |  |
| --- | --- | --- |
| **row** | **Description** | **Total cost (thousand riyals)** |
| 1 | Electricity | 3800000 |
| 2 | Water | 770000 |
| 3 | Cooling and heating | 700000 |
| 4 | fuel | 190000 |
| 5 | Scale and truck unloading station | 1600000 |
| 6 | Telephone lines | 10000 |
| **Total** | | **7070000** |

**1-5- equipment and machinery**

|  |  |  |  |
| --- | --- | --- | --- |
| **row** | **Description** | **Unit cost (thousand riyals)** | **Total cost (thousand riyals)** |
|
| 1 | Feederjak | 3600000 | 3600000 |
| 2 | jaw | 21000000 | 21000000 |
| 3 | Hammer crusher feeding conveyor | 2200000 | 2200000 |
| 4 | hammer crusher | 16800000 | 16800000 |
| 5 | Batching | 8800000 | 8800000 |
| 6 | Serend Vibra | 1440000 | 1440000 |
| 7 | charging silo | 2000000 | 2000000 |
| 8 | dust collector | 8000000 | 8000000 |
| 9 | Compressor | 1420000 | 1420000 |
| 10 | Silo | 1960000 | 1960000 |
| 11 | Templates | 1900000 | 1900000 |
| 12 | The cost of purchase, transportation, installation and operation | 6912000 | 6912000 |
| **Total** | | | **76032000** |

**1-6- Office furniture and equipmen**

|  |  |  |  |
| --- | --- | --- | --- |
| **row** | **Description** | **Unit cost (thousand riyals)** | **Total cost (thousand riyals)** |
| 1 | Table | 28000 | 168000 |
| 2 | the chair | 14000 | 84000 |
| 3 | Computer | 134000 | 670000 |
| 4 | Earphone | 3000 | 18000 |
| 5 | stationery | 1600 | 9600 |
| 6 | Uniforms and safety equipment | 8000 | 192000 |
| 7 | office furniture | 130000 | 130000 |
| 8 | the chair | 8000 | 80000 |
| 9 | Laser printer | 110000 | 110000 |
| 10 | fax | 80000 | 80000 |
| 11 | Kitchen equipment, dining hall and self-service | 300000 | 300000 |
| 12 | Work wardrobe | 42000 | 84000 |
| 13 | dressing room | 50000 | 100000 |
| 14 | office closet | 25600 | 76800 |
| 15 | Zunken shelf | 55000 | 55000 |
| **Total** | | | **2157400** |

**2- Current project costs**

|  |  |  |
| --- | --- | --- |
| **row** | **Description** | **Total cost** |
| **(thousand riyals)** |
| 1 | raw materials | 36442000 |
| 2 | salary | 22461440 |
| 3 | fuel and energy | 1539772 |
| 4 | repair and maintenance | 8395970 |
| 5 | depreciation | 9131136 |
| 6 | Advertising and administrative distribution and sales costs (percentage of sales) 3% | 4320000 |
| 7 | Spare parts (0.5% of investment costs without land) | 739518 |
| 8 | Amortization cost of pre-operational costs | 140606 |
| 9 | Unforeseen excluding depreciation (1%) | 695776 |
| 10 | Standard renewal fees | 80000 |
| 11 | Insurance costs | 286726 |
| **Total** | | **84231746** |

**2-1- raw materials**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **row** | **Description** | **unit** | **Production rate at 100% capacity (tons)** | **Riyal cost per product unit (Ryal)** | **The annual cost of providing materials**  **(thousand riyals)** | |
| 1 | Granite waste | Ton | 40,000 | 170000 | 2380000 | |
| 2 | Granulated sand | Ton | 40,000 | 470000 | 9870000 | |
| 3 | bulk cement | Ton | 40,000 | 4800000 | 24192000 | |
| **total sum** | | | | | | **36442000** |

**2-2- Personnel salaries and wages**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **row** | **Description** | **Number** | **Monthly salary (thousand riyals)** | **Annual salary** |
| **(thousand riyals)** |
| 1 | the manager | 1 | 120000 | 1680000 |
| 2 | production manager | 1 | 140000 | 1960000 |
| 3 | warehouse keeper | 1 | 72000 | 1008000 |
| 4 | Quality control and laboratory | 1 | 90000 | 1260000 |
| 5 | Technician | 1 | 80000 | 1120000 |
| 6 | skilled worker | 4 | 52000 | 2912000 |
| 7 | Simple production worker | 10 | 44000 | 6160000 |
| 8 | Administrative and financial staff | 3 | 64000 | 384000 |
| 9 | Driver | 1 | 52000 | 728000 |
| 10 | Specialist production personnel | 1 | 110000 | 1540000 |
| **Total** | | **24** |  | 22461440 |

**2-3- The amount of energy**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **row** | **Description** | **unit** | **Amount of consumption per year** | **Unit cost** | **Total cost** |
| **(riyals)** | **(thousand riyals** |
| 1 | Water | cubic meter | 2,330 | 15000 | 34942 |
| 2 | Electricity | kilowatt hours | 373,221 | 2400 | 895730 |
| 3 | Gasoline | Liter | 12,600 | 8000 | 100800 |
| 4 | Petrol | Liter | 4,800 | 30000 | 144000 |
| 5 | gas | cubic meter | 163,500 | 1800 | 294300 |
| 6 | Phone and internet | --- | | | 70000 |
| **Total** | | | | | **1539772** |

**3- Estimating the amount of working capital of the plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **row** | **Description** | **Month** | **Total cost (thousand riyals)** |
| 1 | salary | 1 | 1871786 |
| 2 | raw materials | 3 | 10932600 |
| 3 | slanderer | 1 | 993574 |
| **Total** | |  | **13797960** |

**4- investment**

|  |  |  |
| --- | --- | --- |
| **row** | **Description** | **Total cost (thousand riyals)** |
| 1 | Fixed investment | 153869848 |
| 2 | capital in circulation | 13797960 |
| **Total** | | **167667808** |

**5- Financial indicators of the plan**

|  |  |  |
| --- | --- | --- |
| **row** | **Indicator** | **year of operation** |
| 1 | Percentage of sales at breakeven point | 27% |
| 2 | The amount of sales at the breakeven point | 40877086 |
| 3 | The amount of production at the breakeven point | 15140 |
| 4 | The ratio of the total facility to the total investment required | 0.0% |
| 5 | Internal rate of return on investment | 35% |
| 6 | The investor's internal rate of return | 35% |
| 7 | Internal rate of return on investment including all costs | 45% |
| 8 | Return of capital | 2.5 |
| 9 | The return period of the investor's investment | 2.5 |
| 10 | Investment return period including all costs | 1.57 |
| 1 | Net present value of the investment | 167667 |
| 12 | Net present value of the investment share | 167667 |
| 13 | The net present value of the investment including all costs | 384832172 |
| 14 | The cost price of each production unit | 2105794 |
| 15 | The selling price of each production unit | **5400000** |

**Summary of pre-feasibility plan**

|  |
| --- |
| general information |
| Project Title: Production of green concrete using granite waste |
| Project capacity: 40000 Ton |
| Employment rate: 24 people |
| Working days: 300 days |
| Technical study |
| Land area: 3000 square meters |
| Building area:945square meters |
| Electricity required: 373221 kilowatt hours per year |
| Required water: 2330 cubic meters per year |
| Required fuel: 163500 cubic meters |
| Financial and economic study |
| Fixed investment amount: 153869 million Rials |
| Working capital: 13797 million Rials |
| Total investment: 83834 million Rials |
| net present value**:** 167667 million Rials |
| Internal rate of return (IRR: ( 35 percent |
| Investment return period: 2.5 years |