

Islamic Republic of Iran
Organization for investment economic and technical assistance of Iran

"Summary of Technical-Economical Prefeasible Study"

Name:

Modern Stone Cutting

Sector: Industrial, Mineral & Metal Industries

Subsector: Non-Metallic Minerals

isic code: 2696512306-2696512307

The owner of:

Industry, Mine and Trade

Counselor plan:

Razi University

The Address:

Kermanshah, Iran.

Date of P.F.S:

2024/10/22

Manager of Iran Investment Opportunities
SHAHRIG Engineering Company

www.shahrig.com



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1- Abstract:

PROJECT PROFILE - SUMMARY SHEET

Project Introduction			
1- Project title: Modern Stone Cutting			
2- Sector: Industrial, Mineral & Metal Industries		Subsector: Non-Metallic Minerals	
3- Products / Services: <p>The product in question belongs to the non-metallic mineral products group (26), specifically the stone cutting, shaping, and finishing subgroup (2696). The product involves cutting marble into tiles (2696512307) and slabs (2696512306).</p> <p>The products of the project fall under the tariff subheadings (2515) of the Iranian Customs regulations, categorized as:</p> <p>"Marble, travertine, eocene stones, and other calcareous stones suitable for monumental or building purposes, with a specific gravity of 2.5 or more, as well as alabaster, even if roughly trimmed or merely cut by sawing or other methods, into blocks (B)," classified under tariff code (25151190) for import and export.</p>			
4- location (address): Harsin Industrial Zone, Harsin County, Kermanshah Province			
Free Zone <input type="checkbox"/>	Economic Special Zone <input type="checkbox"/>	Industrial Estate <input checked="" type="checkbox"/>	Main Land <input type="checkbox"/>
5- Project description: <p>A 3800 square meter plot of land is required to establish a stone processing unit with a capacity of 20,000 square meters. Out of this, 750 square meters will be used for covered spaces, 2850 square meters for open spaces, and the remainder will be allocated for the industrial unit's open area.</p> <p>The preparation and provision of infrastructures are entrusted to the Industrial Zone Company, and the land, which is equipped with access roads, water, electricity, gas, fiber optics, internet, and more, is allocated to individuals who are willing to invest in exchange for a fee.</p> <p>The equipment and machinery required for this project include a crane, a quarry saw, a slab saw, a floor saw, a polishing machine, a press, a center splitting machine, a longitudinal saw, a cornice saw, a twenty-cut saw, an air compressor, and general workshop tools such as shovels, picks, chisels, and hammers.</p>			

Project Status

6- Local / internal raw material access : 100%

7- Sale :

- Anticipated local market :50%
- Anticipated export market : 50%

8 – Project total time (from start of activities to start of commercial operation in years):
15 months and 15 years for implementation and operation time

Schedule	Start of activities :
	Start of works at site
	End of Works :
	Start of commercial operation :

9- Project status :

- Feasibility study available? Yes
- Required land provided? Yes
- Legal permissions (establishment license, foreign currency quota, environment, etc) taken? No
- Partnership agreement concluding with local /foreign investor? No
- Financing agreement concluding? No
- Agreement with local /foreign contractor(s) concluding? No
- Infrastructural utilities (electricity water supply, telecommunication, fuel, road, etc) procured? Yes
- List of know- how, machinery, equipment, as well as seller /builder companies defined? Yes
- Purchases agreement machinery, equipment and know-how concluded? No

Financial Table

10- Financial structure :

Descriptions	Local Currency Required			Foreign Currency Required Million Euro	Total Million Euro
	Million Rials	Rate	Equivalent in Million Euro		
Fix Capital	202,930 Million IRR	600	0.34	-	0.34
Current Capital	28,810 Million IRR	600	0.05	-	0.05
Total Investment	231,740 Million IRR	600	0.39	-	0.39

- Value of foreign equipment / machinery Million Euro
- Value of local equipment / machinery **0.115** Million Euro
- Value of foreign technical know-how..... Million Euro
- Value of local technical know-how..... Million Euro
- Net present value (NPV): **0.096** Million Euro
- Internal Rate of Return (IRR): 31 %
- Capital Rate of Return: 43 %
- Payback Period **4 year and 4 months**

General Information

11 - Project type : Establishment ■

Expansion and completion □

12- Company Profile

- **Name (Legal/Natural persons):** 1. Dr. Nader Naderi 2. Dr. Saba Amiri

- **Company's current activities:** Razi University

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- **Tel:** +988334277605-6

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E-mail: info@razi.ac.ir

Web Site: <https://en.razi.ac.ir>

- **Company's legal structure :**

Government ■

Non-Governmental □

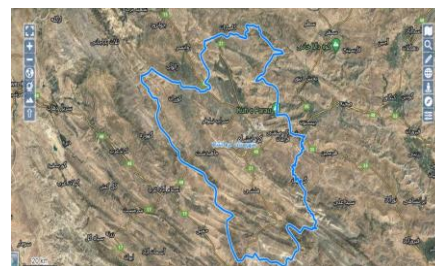
Public non-governmental □

2- Plan Location:

2-1. Province:

Kermanshah Province, spanning 25,009 square kilometers and centered around the city of Kermanshah, ranks as Iran's 17th largest province. Situated in western Iran, it lies between latitudes 33°40' to 35°18' N and longitudes 45°24' to 48°7' E. It borders Kurdistan Province to the north, Lorestan and Ilam Provinces to the south, Hamadan Province to the east, and shares a 371-kilometer border with Iraq to the west. The average elevation is approximately 1,200 meters above sea level. Kermanshah Province covers 1.5% of Iran's total area. According to current administrative divisions, Kermanshah includes 14 counties, 31 cities, 86 rural districts, and 2,793 inhabited villages. The 2016 Census by Iran's Statistical Center recorded a population of 1,952,434, with a density of 78 people per square kilometer across 25,009 square kilometers. The largest city,

Map Showing the Location of Province in Iran



Kermanshah, serves as the provincial capital with a population of 946,651. In terms of road infrastructure, Kermanshah ranks 11th nationwide in total road length (excluding rural roads), 17th in highway and freeway length per 1,000 kilometers, and 18th in main roads. The city of Kermanshah holds the highest proportion of roadways due to its substantial area within the province.

With its extensive network of intercity and rural roads, Kermanshah Province is well-positioned to undertake ambitious road development plans, aiming to upgrade a significant portion of its road network to expressway standards. With six official border crossings (Khosravi, Parviz Khan, Sumar, Shushmi, Sheikh Saleh, and Tileh Koh) and substantial tourism potential, Kermanshah Province is well-positioned to significantly contribute to the country's foreign exchange revenue and national income. A key strategy to realize this potential is to invest in the development of its road infrastructure and transportation fleet. The Kermanshah International Airport is currently one of Iran's leading airports by flight volume, and the planned railway project will link it to the international Khosravi border and Iraq.

Kermanshah is predominantly mountainous, with 70.8% of its area classified as mountainous terrain. The remaining 22.1% consists of plains, while

of its water, and the delight of its breeze compelled him to construct Qarmasin." Kermanshah experiences a maximum of 2999 hours of sunshine annually, with the highest solar radiation occurring in July and August, and the lowest in December and January. The climatic and ecological conditions of Kermanshah, characterized by moderate annual rainfall and relative humidity, give rise to a landscape predominantly covered in forests and pastures. The region also features arable lands that are both irrigated and rain-fed. The annual average temperature in Kermanshah Province is approximately 14 degrees Celsius, and the average annual precipitation is 456.8 millimeters.

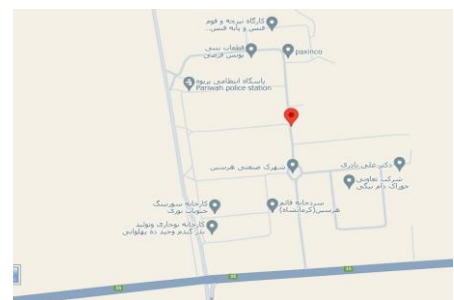
The primary inhabitants of Kermanshah are Kurds. Kermanshah Province is the ancestral homeland of numerous prominent Kurdish tribes, including the Zangeneh, Kalehor, Guran, Jaaf, Sanjabi, Qalakhany, Kelyayi, Bajlan, Zoleh, Jamir, as well as Laki tribes such as Jalalvand, Kakavand, Osmanvand, Payravand, and Balavand. Despite the official classification of Laks as a Kurdish subgroup, Kermanshah exhibits linguistic diversity, with Turkish-speaking communities, particularly the Sonqori Turks, residing alongside the Kilyayi Kurds in the city of Sanqor and Kelyai. The Sanqori dialect is a variety of Azerbaijani Turkish that is often described as a transitional

form between Azerbaijani Turkish and Khorasan Turkish. Additionally, a community of Lurs resides in Kangavar County, speaking the Luri-e-Salasi dialect. Over the past two centuries, migrants from other provinces, particularly Hamadan, Markazi, Isfahan, and Semnan, have settled in Kermanshah. Some non-Kurdish families, such as the Al-Aqa, Nojumi, Meybodi, Feyz Mahdavi, Shahrastani, Soduqi, Mohammadi Eraghi, Kazazi, Jaberi, and Dezfuli families, migrated to Kermanshah due to religious motivations to promote Shia Islam. These migrations have contributed to the distinctive Kermanshahi Persian dialect.

2-2: County:

Harsin County, covering approximately 1,081.6 square kilometers, constitutes 4.3% of Kermanshah Province's area. Located in the southeast of the province, this county borders Sahneh County to the north and east, Lorestan Province to the south, and Kermanshah County to the west. Harsin County includes two cities, two districts, four rural districts, and 121 inhabited villages. According to the 1956 and 1966 censuses, Harsin, a city of historical significance, was ranked as the second most populated city within the province. Kermanshah's mineral resources are divided into

Project Location Map



five mining zones Accordingly, the Harsin region has been recognized for its substantial deposits of limestone, manganese, and various other minerals. This region is rich in mineral resources, comprising over one-third of the province's total mineral reserves. Within Harsin County, two prominent mineral deposits stand out: one mine focuses on the extraction of ornamental stones and marble, while the other is dedicated to manganese ore mining. Both operations are currently under lease for commercial extraction activities.

2-3. Project Location:

The preliminary feasibility studies conducted throughout Kermanshah Province indicate a robust potential for the plan's successful implementation across all counties. A comprehensive evaluation was performed, addressing critical factors such as the procurement of raw materials, infrastructure readiness, transportation accessibility, workforce availability, environmental aspects, government incentives, and competitive landscape. The findings suggest that Harsin Industrial Park presents a favorable environment for the plan's execution. Harsin Industrial Park, located in Harsin County, encompasses an area of 100 hectares, of which 43 hectares are designated for industrial operations. Its strategic geographical positioning—

50 kilometers from the provincial capital and a mere 5 kilometers from the closest urban center—enhances its accessibility and operational viability.

2-4. Infrastructure Accessibility:

Row	Required infrastructure	Distance to the Project	Infrastructure Supply Source
1	Water	0	Harsin Industrial Town
2	Electricity	0	Harsin Industrial Town
3	Gas	0	Harsin Industrial Town
4	Telecommunications	0	Harsin Industrial Town
5	Main Road	2 km	-
6	Secondary Road	1 km	-
7	Airport	40 km	-
8	Port	580 km	-
9	Railway Station	45 km	-

3- Plan Technical Specifications:

3-1. Product:

The intended product of the plan falls under the category of Manufacture of Other Non-Metallic Mineral Products (26), specifically the subgroup Cutting, Shaping, and Finishing of Stones (2696).

The products include cutting marble into tiles (2696512307) and cutting marble into slabs (2696512306). The proposed products of the plan are classified under subcategories of the tariff heading (2515) in the Iranian Customs Regulations.

This category is titled as follows: "Marble, travertine, eocene stones, and other calcareous stones for monumental or building purposes, with an apparent specific gravity of 2.5 or more, and alabaster, whether or not merely cut, roughened, or sawn, into blocks (B)". These products are imported and exported under the tariff subheading (25151190).



Product/Sample Image

3-2. Plan Requirements:

3-2-1. Required Space and Infrastructure:

This project is designed based on a capacity of 20,000 square meters per year. Following the acquisition of the necessary permits, construction will commence, and after obtaining the operational license, activities will begin. Hence, through its annual revenue generated from the sale of decorative building stones, it will be able to cover its costs and achieve annual income.

According to existing standards for modern stone processing units, establishing a facility with a capacity of 20,000 square meters requires 3,800 square meters of land. Out of this, 750 square meters will be allocated to covered space, 2,850 square meters to uncovered space, and the remaining area to open grounds for the industrial unit. The total allocated land area for this plan is 4,000 square meters, with the surplus land dedicated to green spaces and open grounds. For this facility, utility connections and a transformer with the required capacity have been allocated, which will be sourced from the electricity supply of the Harsin industrial park. Additionally, water allocation for the facility has also been secured from the Harsin industrial park. The piping of the grounds, within the workshops, and other sections of the production unit will be carried out by a qualified contractor.

Plan Investment in Land, Site Development, and Buildings

Row	Building Names/Descriptions	Specifications	Plan Required Investment (Million IRR)		Total Cost (Million IRR)
			Quantity/Area Required	Unit Purchase/Construction Price (IRR)	
1	Land	4,000 square meters of Harsin Industrial Park land	4,000	7,500,000	30,000
2	Site Development	As per	5,000	1,790,000	8,940

	Operations	detailed specifications			
3	Construction	Warehouse	600	56,180,000	33,710
		Administrative Building	100	120,000,000	15,000
		Other Buildings	50	120,000,000	7,500
Total			-	-	95,150

3-2-2. Equipment and Machinery:

Stone factories produce various slabs from raw stone blocks. A stone factory may have different sections for cutting blocks into sheets of various thicknesses, cutting sheets into desired geometric shapes and custom dimensions (slabs and tiles), reinforcing sheets, improving stone quality, grinding and polishing, and final finishing. Each of these stages will be discussed below.

1- Stone Block Cutting:

In the first step, the stone extracted from the mine is transported to stone factories in the form of blocks or rough-cut pieces. The appearance of the stone blocks brought to the factory depends on the extraction site and method. If the stone factory receives irregular raw stone blocks, the first machine in the production line is a stone squaring machine. In this case, single-blade saws (steel blades with approximately 35-37 diamond teeth) or other cutting machines such as diamond wire saws are commonly used. These machines square the irregular blocks to make them easier to process with saws.

2- Saw Cutting:

Saw cutting is one of the most common methods used for stone processing. In high-capacity stone factories, gang saws are typically employed. These saws cut stone blocks with parallel diamond blades. Diamond gang saws have various blade counts, ranging from 40 to 80 blades, and different power ratings, and are categorized into hard stone and soft stone saws.

3- Hard Stone Saws:

Hard stone saws cut stone using cast iron or steel abrasive instead of diamond blades. These saws can have several hundred blades, with modern machines having up to 150 blades, capable of cutting stones up to 3.5 x 2 meters. These saws are primarily used for cutting granite.

4- Soft Stone Saws

Soft stone saws are primarily used for limestone such as travertine and marble, offering less waste and higher accuracy compared to other stone saws. These saws are typically categorized into three types:

The block is stationary on a trolley, and the blade unit is lowered for cutting.

The blade is stationary, and the stone is vertically lifted for cutting.

The stone block moves horizontally towards the stationary blade.

5- Circular Saw Cutting (Bridge Saw):

Circular saws are used in various sizes and dimensions. These cutting machines utilize disc-shaped blades with diamond segments attached to their edges. The diameter of circular saw blades ranges from 15 cm to 3 meters. This method uses multiple parallel blades in one or more passes to cut stone blocks into slabs. The table below shows the list of equipment and machinery required for plan implementation.

Required Main Machinery and Equipment

Row	Description	Quantity	Unit Cost (Million IRR)	Total Cost (Million IRR)
1	Crane	2	3,330	6,660
2	Bridge Saw	2	13,310	26,620
3	Forty-Blade Saw	1	1,110	1,110
4	Floor Saw	2	890	1,780
5	Polishing Machine	2	11,050	22,100
6	Press	1	2,240	2,240
7	Center Opener	1	450	450
8	Longitudinal Saw	2	870	1,740
9	Skirting Board Saw	1	1,100	1,100
10	Twenty-Blade Saw	1	3,320	3,320
11	Floor Saw	1	650	650

12	Air Pump	1	260	260
13	Workshop Tools (Shovels, Picks, Chisels, Hammers, etc.)	1	1,300	1,300
Total				69,330

Ancillary Machinery and Equipment			
Row	Items	Description	Total Cost (Million IRR)
1	Power Supply	Power branch and the cost of purchasing panels and other related equipment, and cabling	10,000
2	Heating System	Heating system for ancillary and production buildings	1,500
3	Cooling System	Cooling system for ancillary and production buildings	1,000
4	Air Ventilation Exhaust Fan	Air ventilation for the production building	500
5	Ventilation Fan and Installation and Setup	Air ventilation for the ancillary building	500
6	F.B. Implementation	Ancillary and production buildings	150
7	Telephone Line Purchase and Installation	-	100
8	Water Branch Right and Piping	-	3,000
9	Fire Extinguishing System	Including central system, fire extinguishers, fireproof clothing, etc.	230
Total			16.980

1- Block Cutting

Initially, quarried stone is transported to processing facilities in substantial blocks or slabs. The configuration of these quarried blocks is determined by both the extraction site and the chosen extraction techniques. When a stone

processing plant primarily handles irregular block stone, the first stage typically involves a block saw. These saws are often equipped with a single-blade setup, featuring steel blades with approximately 35-37 diamond segments, or alternative cutting tools like diamond wire saws. These machines are essential for reshaping irregular blocks, preparing them for more precise cutting operations using saws.

2- Saw Cutting

Sawing is one of the predominant techniques in stone cutting. In high-output stone processing scenarios, gang saws are frequently employed, where stone blocks are sliced using parallel arrangements of diamond-tipped blades. These diamond saw blades exhibit a range of configurations, varying from 40 to 80 blades, and they are categorized based on cutting hardness—either hard or soft cutting—tailored to the specific characteristics of the stone being processed.

3- Hard-Cutting Saws

Cast iron or steel abrasives serve as effective alternatives to diamond in hard-cut saw applications. These saws can be configured with several hundred blades, with contemporary machines commonly featuring around 150 blades. This design enables efficient cutting of stone dimensions up to 3.5 by 2 units. Hard-cut saws are predominantly utilized in the quarrying and processing of granite, leveraging their robust blade arrangements to achieve high precision and durability in cutting operations.

4- Soft-Cutting Saws

Soft-cut saws are primarily designed for cutting sedimentary rocks, such as travertine and marble, offering advantages such as reduced waste and enhanced precision compared to other stone-cutting equipment. These saws are generally classified into three main types:

The first type involves a stationary carriage that supports the stone block, while a downward-moving blade assembly carries out the cutting operation.

The second type features a stationary blade, with the block being raised vertically toward the blade for cutting.

In the third type, the stone block is moved horizontally toward a stationary blade to facilitate the cutting process.

5- Gantry Cutters

Gantry cutters come in a diverse array of sizes and configurations. These cutting machines utilize circular saw blades that are equipped with diamond segments along their edges. The diameter of the gantry cutters ranges from 15 centimeters to 3 meters. The cutting process involves the use of multiple parallel blades to divide the stone block into slabs, often necessitating several passes.

Below is a table detailing the essential equipment and machinery required to execute the plan.

Row	Description	Quantity	Unit Cost (Million IRR)	Total Cost (Million IRR)
1	Crane	2	3330	6660
2	Gantry Cutter	2	13310	26620
3	Forte-Saw	1	1110	1110
4	Floor Saw	2	890	1780
5	Polishing Machine	2	11050	22100
6	Press	1	2240	2240
7	Core Cutter	1	450	450
8	Long Saw	2	870	1740
9	Molding Cutter	1	1100	1100
10	Twenty Cutter	1	3320	3320
11	Floor Cutter	1	650	650
12	Air Pump	1	260	260
13	Workshop Tools (Shovel, Pickaxe, Hammer, Chisel, etc)	1	1300	1300
Total				69330

3-2-3. Raw Materials and Intermediate Components

Raw Material Consumption Costs

Row	Description	Unit	Purchase Cost (IRR)	Annual Consumption Quantity	Annual Cost (Million IRR)
1	Marble Raw Blocks	Tonne (t)	12,850,000	2,000	25,700
2	Polishing Machine Segments	Piece (pc)	1,070,000	1,000	1,070
3	1.6 Meter Bridge Saw Disc	Piece (pc)	535,500,000	5	2,680
4	Bridge Saw Head Disc	Piece (pc)	128,520,000	5	650
5	Magnetic Disc	Piece (pc)	430,000	4,000	1,720
6	40 cm Disc	Piece (pc)	10,700,000	10	110
7	1.2 Meter Head Disc	Piece (pc)	263,300,000	3	790
8	Grease	Barrel (bbl)	80,000,000	5	400
9	Oil	Barrel (bbl)	200,000,000	10	2,000
10	Gear Oil	Barrel (bbl)	400,000,000	15	6,000
Total Cost					41,120

3-2-4. Management and Human Resources

Row	Skill Level	Quantity	Base Salary (Rials)
1	Specialist	3	150.000.000
2	Skilled	15	130.000.000
3	Unskilled	2	120.000.000

- Direct Skilled Labor Required: 3 individuals
- Direct Unskilled Labor Required: 15 individuals
- Direct Specialist Labor Required: 2 individuals

4- Ownership and Legal Licenses:

4-1. Land Ownership:

In Harsin industrial town, a title deed is issued to the investor, and the usufruct rights of the property are realized by the title deed in this industrial town. In accordance with the Law on the Transfer of Ownership and Management of Industrial Parks, an industrial park is defined as a specifically delineated geographic area established under the provisions of the Law governing the Establishment of the Iran Industrial Parks Company, along with its subsequent amendments. These parks comprise organized entities that encompass industrial, research, technological, and ancillary service units, equipped with necessary infrastructure and essential services as mandated by the aforementioned legislation.

The legal framework for industrial parks and zones recognizes both individual and shared ownership rights. Common areas within this context are designated spaces within the industrial zone that are accessible to all unit owners and are not earmarked for exclusive use by any single unit or group of units. Areas not expressly designated for exclusive utilization or specified in property deeds as the exclusive entitlement of one or multiple owners fall under the definition of common areas.

Crucially, the ownership rights associated with each owner's exclusive section are inherently linked to their proportionate stake in the common areas. Thus, any transaction involving the exclusive portion of property necessitates the concurrent transfer of associated rights and obligations regarding the common areas, irrespective of the method of transfer employed.

4-2. Intellectual Property and Incentives:

In order to set up a modern stone cutting unit, there is no need to use high technical knowledge and the technical knowledge in question exists in the country. Iranian stone cutters are currently divided into two categories; the first category is stone cutters whose products are for domestic consumption and are equipped with a peak cutter and a longitudinal and sub-slab machine, and most of the stones are processed longitudinally and into tiles. The second category is stone cutters that are equipped with modern machinery and the stones are cut and processed into slabs by saw cutting and sub-slab machines.

4-3. Legal Licenses:

In alignment with Note 5, Article 3 of the amended Law on the Implementation of General Policies under Article 44 of the Constitution, the authority to grant permits for the establishment of industrial parks/zones is delegated to subsidiaries of the Small Industries Organization. In accordance with Clause E, Article 1 of the Executive Regulations pertaining to Note 5, the Iranian Small Industries and Industrial Parks Organization (ISIEO) is tasked with assessing the qualifications of applicants for licenses to set up non-governmental industrial parks. Applicants are required to submit their requests and supporting documentation via the national licensing portal. The provincial industrial parks company will undertake verification of financial, economic, identity, and technical qualifications. If qualified, the documentation is then sent to the oversight department for non-governmental industrial parks and service companies for evaluation by the ISIEO Board of Directors. Upon board approval and assessment, the provincial industrial parks company will issue 31 requisite inquiries. Following positive responses to these inquiries, the license for the establishment of the non-governmental industrial park/zone will be granted.

Once the establishment license is obtained, the license holder is authorized to allocate land use rights within the park or zone to applicants wishing to create industrial units, provided the applicants hold a valid establishment license from the pertinent authorities. Such allocations must comply with the standard contract booklet endorsed by the relevant organization.

To secure a license for the establishment of a stone cutting factory, the following criteria must be fulfilled:

- The property must have a minimum area of 1000 square meters.
- A minimum of 12 square meters of the property must be dedicated to a sales office.
- At least 300 square meters of the unit must be enclosed.
- All health, safety, and technical regulations must be strictly adhered to.

Considering that the type and extent of industrial pollutants vary based on the type of raw materials and products, as well as the processing stages, meaning that different processes are susceptible to pollution in three stages: raw material collection, intermediate material production and conversion, and collection and storage of produced materials, environmental activities such as obtaining certifications like ISO 14000 from reputable institutions approved by the Environmental Protection Organization and the Institute of Standards are recommended through the following activities:

1- Industrial and Sanitary Wastewater Treatment:

Accurate identification of wastewater and quantitative and qualitative measurement of pollutants in all units, and installation of wastewater treatment systems.

2- Efforts to Prevent Air Pollution:

Conducting quantitative and qualitative pollutant assessment studies and implementing necessary measures to control air pollution resulting from industrial activities, including the installation of advanced atmospheric pollutant measurement devices and closed-circuit cameras that perform daily and online (real-time) pollutant measurement.

Solid Waste Management:

Environmental Research: Conducting environmental research focus on process optimization, waste reduction, water and wastewater treatment, air pollution control, and waste recycling.

5- Green Space Development: Integrating industry with green spaces as a primary objective for both upstream and downstream industries. According to environmental standards, ten percent of the industrial area should be dedicated to green spaces. In this complex, a significantly higher percentage has been allocated to green spaces. (Irrigation of these green spaces is carried out using treated industrial effluents, which substantially reduces fresh water consumption.)

6- Utilization of Modern Technology and Avoidance of Inefficient Technology: When a new environmental standard is established, due to environmental pressures, significant costs and human resources are required to eliminate existing pollution and reduce pollution levels. Calculations have shown that if new technology implemented in the relevant industry complies with the required standards, in addition to reducing pollution, it will also increase production due to its high efficiency. In this regard, the company, considering the up-to-date nature of its technology and possessing all global environmental and quality standards, can prove this point. Environmental protection can also facilitate technology advancement. This method has been implemented in European countries, and technologies that have reached the end of their life

cycle and do not comply with the mentioned standards are collected. However, sometimes these technologies are sent to developing countries, and Iran has not been exempt from this. Environmental experts believe that if our industry does not have the capability to produce products while maintaining environmental standards and, at the same time, does not see the ability to access appropriate technology, it should not pursue the production of those products. Because in some units, due to the use of obsolete and outdated technologies, so much raw material and energy are wasted that the argument of economic efficiency taking precedence over environmental protection becomes meaningless. If the costs that must be paid to obtain more expensive but up-to-date technology are compared with the costs that are wasted due to the use of inappropriate technology in raw material and energy consumption and environmental restoration, it can be concluded that these cases are much more cost-effective and also more beneficial in terms of technology development and industrial growth.

Market Analysis and Competition:

Stone is a natural material composed of one or more minerals bonded together, found in the Earth's crust. Hard-stone cutting industries specialize in processing dense stones such as granite for applications like stairs, walls, and floors. In contrast, soft-stone cutting facilities focus on softer materials like travertine and marble, primarily used for building facades and decorative purposes. Due to their softer nature, these stones are often selected for decorative purposes such as building facades, interior design elements, and the production of ornamental stones. Through the use of specialized cutting tools, stone cutting factories transform raw stone blocks into precisely sized, smooth, and polished finished products. Despite their often-overlooked status, stone cutting facilities are integral to the construction and civil engineering sectors, given the

indispensable role of stone as a fundamental building material. Stone cutting facilities also play an indirectly significant role in the construction industry.

Stone quarries in Kermanshah are considered one of the most important industries in the province. The province of Kermanshah, with its substantial stone quarries and other mineral deposits, contributes significantly to Iran's mineral wealth, accounting for approximately 2% of the nation's estimated 57 billion tons of mineral reserves. Kermanshah Province is endowed with a diverse mineral resource base, including ornamental stones, iron ore, and gypsum. These minerals, three of twenty identified types, contribute significantly to the province's economy and have attracted substantial investment in the mining sector. The province is home to 330 mining concessions and 220 active mines, with a significant portion dedicated to stone quarrying. The stone quarries of Kermanshah are numerous and varied, including: Eilavare Silica, Bazan Silica, Kuzaran Rough Stone, Sartip Abad Rough Stone, Sulfur Rough Stone (Kuh-e Sefid), Seyed Khalil Gypsum, Taq-e Bostan Rough Stone, Pariveh Marble, Chek Zard Marble, Kaveh Marble, Negar Sang Ornamental Stone, Parsian Ornamental Stone, Gamasab Marble, Harsin Marble Quarry, Ghamlije Ornamental Stone, Cheshmeh-ye Bigi Ornamental Stone, White Stone. Among the 68 known minerals worldwide, 20 have been identified in Kermanshah Province. Given its rich limestone resources, Kermanshah Province has become a hub for marble production, serving as a major supplier of ornamental stones, especially marble and dolomitic marble. The province extracts approximately 27 million tons of ornamental stone annually. Ornamental stones from Kermanshah Province are among the finest and highest quality in the country. Among these, Faraman and Harsin marbles have established themselves as the premier brands of marble in the country. Harsin marble is widely used for interior wall cladding, flooring in commercial, residential, and parking areas. Major producers and consumers of ornamental stone, including countries with primary resources such as China and the United

States, are significant players in the global stone industry. It is noteworthy that product processing is a prevalent practice in most industrialized nations. Currently, there are 24 production units in the country with licenses to cut marble into tiles and slabs. Considering that 137 additional establishment licenses have been issued for this product, it is evident that there is a significant domestic demand for marble products.

5-1. Target Market Introduction:

The construction stone industry is a highly dynamic sector with a comparative advantage in exports based on standard economic evaluation criteria. To successfully penetrate export markets, a comprehensive foundation must be established, with effective advertising, targeted marketing, and market development as the first and most crucial steps. Based on international statistics, Iran ranks among the top 10 countries globally in terms of the quantity, diversity, and richness of ornamental and facing stone reserves. In terms of the diversity and uniqueness of its stone, Iran ranks third in the world, following China and India. According to the same statistics, Iran has been producing approximately 10 to 15 million metric tons of ornamental stone annually over the past few years, accounting for about 8% of global production. This places Iran as the fourth largest producer of decorative and facing stones worldwide. The export of construction stone from Iran has garnered significant attention due to the country's vast variety of stone types and its high export potential and revenue generation capabilities. With its abundant and diverse reserves of construction stone, Iran has established itself as a major global player in the stone industry. The high quality and diversity of Iranian stones have attracted numerous export markets worldwide. In 2022, Iran exported approximately 5.5 million metric tons of construction stone, generating a revenue of 185 million

US dollars. Compared to 2021, this figure represents a 10% increase in weight and a 20% increase in value. Approximately 70% of Iran's stone exports are in processed form, while the remaining 30% are exported as raw materials. The primary destinations for Iran's stone exports have been China, Iraq, Afghanistan, Turkey, and India. Iran's stone exports experienced approximately a 32% growth in volume in 2022 compared to 2020. This growth can be attributed to the rising global demand for Iranian stones coupled with the government's efforts to promote non-oil exports. Given Iran's significant potential in stone production and export, it is anticipated that the volume of stone exports will increase in the coming years. Iran possesses a vast potential for producing a wide range of construction stones, including marble, granite, travertine, limestone, and other ornamental stones. These abundant resources enable the country to produce and export a diverse range of products. Situated at the heart of the Middle East and in close proximity to significant target markets such as the Persian Gulf, the Gulf Cooperation Council countries, Central Asia, and the Caspian Sea region, Iran serves as a pivotal link between various global regions. This geographical advantage enables Iranian merchants to access target markets with lower transportation costs. The superior quality and distinctive patterns of Iranian building stones have made them highly sought-after on the global market. The export of high-quality building stones can serve as a competitive advantage for Iran's stone industry. Based on the following table, the import and export statistics of micronized hydrated lime in the year 1402 are presented.

Row	Tariff Code	Tariff Description	Country	Weight (kg)	Value (USD)
1	25151190	Marble Stone	Armenia	32420	2497
2	25151190	Marble	Uzbekistan	712695	54181

		Stone			
3	25151190	Marble Stone	Spain	439155	33889
4	25151190	Marble Stone	Germany	48460	3732
5	25151190	Marble Stone	UAE	2589721	250719
6	25151190	Marble Stone	Indonesia	254130	19570
7	25151190	Marble Stone	Italy	2558853	200563
8	25151190	Marble Stone	Belarus	42400	3264
9	25151190	Marble Stone	Belgium	93830	7225
10	25151190	Marble Stone	Bulgaria	19830	1527
11	25151190	Marble Stone	Bangladesh	909364	70026
12	25151190	Marble Stone	Bosnia & Herzegovina	43170	3325
13	25151190	Marble Stone	Pakistan	251025	23356
14	25151190	Marble Stone	Taiwan	1033020	79547
15	25151190	Marble Stone	Turkey	3979440	306492
16	25151190	Marble	Azerbaijan	858095	75784

		Stone			
17	25151190	Marble Stone	China	177126206	13668398
18	25151190	Marble Stone	Iraq	9600	1584
19	25151190	Marble Stone	Oman	123590	9907
20	25151190	Marble Stone	Russian Federation	500890	38533
21	25151190	Marble Stone	Georgia	158165	17239
22	25151190	Marble Stone	Lebanon	75790	5788
23	25151190	Marble Stone	Malaysia	427515	33062
24	25151190	Marble Stone	Egypt	302730	23287
25	25151190	Marble Stone	India	48328333	3719403
26	25151190	Marble Stone	Greece	112150	8630
Total				241030577	18661528

Moreover, in 2023, there were no imports of marble, indicating that the domestic market does not require building stones produced by other countries. Based on the aforementioned table, it can be inferred that Iran has engaged in exporting marble to countries such as Armenia, Uzbekistan, Spain, Germany, the United Arab Emirates, Indonesia, Italy, Belarus, Belgium, Bulgaria,

Bangladesh, Bosnia and Herzegovina, Pakistan, Taiwan, Turkey, Azerbaijan, China, Iraq, Oman, the Russian Federation, Georgia, Lebanon, Malaysia, Egypt, India, and Greece. The existence of such exports signifies a demand for this product in these countries, suggesting that implementing further strategies could facilitate increased exports to these markets.

4- Physical Progress of the Plan to Date: Yes ☐ No ☒

This plan has been initiated with the dual objectives of meeting domestic demand and exporting a portion of the product to foreign markets. The project has not yet been initiated.

5- Operational Program and Plan Implementation Schedule:

Below is the timeline for the project's execution

		M th. 1	Mo nth 2	Mo nth 3	Mo nth 4	Mo nth 5	Mo nth 6	Mo nth 7	Mo nth 8	Mo nth 9	Mo nth 10	Mo nth 11	Mo nth 12	Mo nth 13	Mo nth 14	Mo nth 15
Modern Stone Cutting Plan	Feasibi lity Study															
	Licens es															
	Constr uction															
	Equip ment															
	Trainin g															
	Operati on															

6- Project Financial Plan:

8-1. Cost Estimates:

Costs Estimates

Row	Item	Cost (Million IRR)
1	Fixed Capital Investment	223930
2	Operating Costs (Working Capital)	28810
3	Financing Costs	231740

Fixed Capital Investment Breakdown

Row	Item		Cost (Million IRR)
1	Land Purchase		50000
2	Landscaping and Site Improvement		8940
3	Construction and Civil Works		56210
4	Production Machinery & Equipment		69330
5	Support and Auxiliary Equipment		16980
6	Environmental & Safety Equipment		2540
7	Overhead Costs		5540
8	Pre-Production Expenses	Feasibility Study	1920
		Project Management and Organization	730
		Technology Acquisition	1260
9	Contingencies		10480
Total			223930

Working Capital Estimates (Production Costs)

Row	Item		Cost (Million IRR)
Variable Costs			103790
1	Raw Materials		41120
2	Human Resources		30640
3	Marketing (excluding Human Resources)		3040
4	Other Variable Expenses	Fuel and Energy	14010
		Repair and Maintenance	10040
		Unforeseen Expenses	4940
Fixed Costs			27590
5	Raw Materials		0
6	Human Resources		7790
7	Marketing (excluding Human Resources)		0
8	Depreciation		12680
9	Other Fixed Expenses	Fuel and Energy	3510
		Maintenance	2510
		Unforeseen Expenses	690
		Insurance	410
Total			131380

8-2. Revenue Estimates:

Revenue Estimates for the First 5 Years

Row	Product Item	Q1	Q2	Q3	Q4	Year 1	Year 2	Year 3	Year 4	Year 5
1	Marble (Slabs)	7500	7500	7500	7500	30000	31875	33750	35625	37500
2	Marble (40x40 cm)	8000	8000	8000	8000	32000	34000	36000	38000	40000
3	Marble (60x60 cm)	10000	10000	10000	10000	40000	42500	45000	47500	50000
4	Marble (Staircase)	15000	15000	15000	15000	60000	63750	67500	71250	75000
	Total	40500	40500	40500	40500	162000	172125	182250	192375	202500

8-3. Project Operations Period:

Generally, production plans have three main lifecycle phases:

- Project Lifecycle (Construction Phase);
- Operational Lifecycle (Production Phase);
- Product Lifecycle.

The project life cycle is often equated with the construction phase, in which a lot of costs are usually paid. A successful project is one that can deliver this phase within a compressed timeline and at a reduced cost. This section requires the implementation of project management techniques with robust and timely controls to ensure that any issues identified can be rectified during the planning phase. The operation lifecycle is essentially the production phase, which

includes the useful operational or production life. In stone-cutting plans, this is typically designed for a lifespan of 15 years. During the operation process, due to product sales, revenues and costs are incurred. However, revenues are generally higher than costs; otherwise, the plan would lack economic justification.

In the operation lifecycle, project management techniques should no longer be utilized. Instead, production planning methods and operation process methodologies are more suitable for planning. In projects such as livestock farming, during the operation period, only the proper execution of maintenance and repair management is required.

8-4. Break-Even Analysis:

Fixed Capital = Fixed Costs + Pre-Operational Costs

Fixed Capital = 220,020 + 3,910 = 223,930

A. Product Cost Per Unit (IRR):

Cost per Unit (IRR) = Total Annual Production Costs / Total Product Output

Cost per Unit (IRR) = 127,930,000 / 20,000 = 6,396.5

B. Annual Break-Even Percentage:

Break-even Percentage = Fixed Costs (TFC) / Total Sales (P) – Variable Costs (V)

Annual Break-even Percentage = 27,590 / 202,500 – 103,790 = 28%

The value of (P - V) is known as the contribution margin per unit. This represents the profit per unit that contributes to covering fixed costs. Therefore, the break-even point is attained when the aggregate contribution margin becomes equivalent to the aggregate fixed expenses. In other words, this sales volume contributes more than 28% towards the recovery of fixed expenses.

The relationship between total revenue and total costs indicates that this plan generates a profit 28% above the annual break-even point, sustaining

profitability over three production cycles and creating a margin of safety for the manufacturing operations. In break-even analysis, the margin of safety represents the extent to which actual or projected sales exceed the sales required to break even, in this case by more than 28%.

C. Gross Value Added (Million IRR):

Gross Value Added= Total Sales - (Raw Materials + Fuel & Energy + Maintenance)

Gross Value Added= 202500 - (41120 + 17520 + 12550)= 131310

D. Net Value Added (Million IRR):

Net Value Added= Gross Value Added - (Depreciation Before Production+Annual Depreciation)

Net Value Added= 131310 - (12680 + 780)= 117850

E. Gross and Net Profit (Million IRR):

Gross Profit= Total Revenue–Cost of Goods Sold

Net Profit= Gross Profit - (Administrative, Sales, Advertising, and Other Expenses)

Gross Profit= 202500 -107553 =74570

Net Profit= 74570 – (4170)= 70,400

F. Fixed Capital per Capita (Million IRR):

Fixed Capital per Capita= Fixed Capital/Number of Employees

Fixed Capital per Capita= 223,930 / 20= 11,196

G. Total Investment per Capita (Million IRR):

Total Investment per Capita= Total Investment/Number of Employees

Total Investment per Capita= 252,740 / 20= 12,637

H. Annual Return on Investment (ROI):

ROI= Total Revenue –Total Costs / Total Investment

ROI= 202,500 – 131,380 / 252,740= 28%

I. Annual Payback Period:

$$\text{Payback Period} = \frac{1}{\text{IRR}} + \text{The duration of the construction period}$$

Payback Period= 4 years and 4 months

8-5. Cost-Benefit Analysis:

Table: Project Profitability Indicators

Present Value of Total Costs during Implementation & Operation	131380
Present Value of Total Revenues during Implementation & Operation	202,500
Net Present Value (NPV)	38,184
Benefit-Cost Ratio (B/C)	1.5
Internal Rate of Return (IRR)	31%

8-6. Sensitivity Analysis:

Table: Sensitivity Analysis Table

Discount Rate (%)	Net Present Value (NPV) (Million IRR)
10	241,331
20	63,180
30	-12,876
40	-48,886
50	-66,982
60	-76,213
70	-80,711
80	-82,543
90	-82,816
100	-82,157

8-7- Summary:

Table: Project Economic Aspects Summary

Type of Activity	Detailed Activity Description with Code	Manufactured Product	Nominal Capacity (Unit)
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	(ISIC)		
Industrial	2696512306 2696512307	Marble (Slabs) Marble (40x40 cm) Marble (60x60 cm) Marble (Staircase)	20,000 square meters
Project Duration	Total Fixed Capital (IRR)	Annual Working Capital (IRR)	Required Workforce
15 years	223,930 Million IRR	28,810 Million IRR	20 employees
Internal Rate of Return (IRR)	Net Present Value (NPV) (IRR)	Applicant Contribution (IRR)	Benefit-Cost Ratio (B/C)
28%	38,184 Million IRR	17,930 Million IRR	1.5

8-8. Exchange Rate Fluctuations Estimates during Project Implementation

Given that all machinery and equipment required for implementing the plan are produced and supplied domestically, exchange rate variations will not affect the initial capital investment for the project.

Since all raw materials for implementing plan are sourced from domestic mines in Kermanshah Province, exchange rate variations will have no effect on the final product cost.

Regarding product sales, considering that a portion of the plan's revenue is projected from exports to other countries, an increase in the exchange rate will lead to higher sales revenue. Conversely, in the event of a decrease in the exchange rate, products can be offered in the domestic market.

9- Capital Requirements, Funding Methods, and Collateral:

9-1. Required Foreign Currency Investment

Row	Year	Foreign Currency Requirement
1	First	0
2	Second	0
3	Third	0
4	Fourth	0
5	Fifth	0

9-2. Participation and Funding Methods:

Participation in the present project and its financing are envisaged in the form of establishing a company within the country. The total financial resources required are envisaged through investor contributions. Domestic bank facilities have not been considered for the implementation of the project.

9-3. Payback Period:

Based on the fixed and variable capital invested, as well as projected annual sales, the initial investment in this project is expected to be fully recovered within approximately 4 years and 4 months.

9- Plan Incentives, Features, and Benefits:

- Contractual parties who pay the usage rights and the price of workshop, industrial, etc., units in cash and in full at the time of contract conclusion will be eligible for discounts and exemptions based on the total contract amount. (The exemption percentage is determined by the Board of Directors of the Industrial Parks Company).
- Cash and installment payment of land and facility usage rights costs (only 20 to 40 percent of the land usage rights are paid in cash, and the rest is amortized without interest or fees).
- Possibility of transferring ownership documents and issuing separate deeds after obtaining the operation permit, completion certificate, and fulfilling the specified conditions.
- Possibility of pledging land and facility usage right contract booklets with banks and financial institutions, based on the approval of the esteemed Council of Ministers and current laws. Exemption from municipal laws.
- Issuance of construction and completion permits in the shortest possible time and free of charge.

- Granting special incentives of up to 10 percent in land usage rights for veterans, elites, knowledge-based companies, inventors, foreign investors, and export consortia.
- Allocation of special incentives for early operation (within one year or less for lands with an area of two thousand square meters or less), up to a maximum of ten percent (10%).

Note 1: For every 500 square meters of additional land, one month is added to the one-year operation deadline (maximum deadline up to 30 months from the contract date for areas of eleven thousand square meters and more).

Note 2: The early operation incentive applies to industrial land allocation contracts that have not used less developed area incentives, have not subdivided or consolidated the allocated lands, and have paid installments on time.

- In the case of having a technical and economic feasibility report for large areas, an incentive equivalent to five percent (5%) and for problematic (uneven and low-quality) areas, up to ten percent (10%) incentive will be granted.