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USAID/PAKISTAN: TRADE MARBLE CITY RISALPUR GAP ANALYSIS 2010 - 2013

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ACRONYMS

APMIA	All Pakistan Marble Industry Association
ASTM	American Society Testing Materials
BS	British Standards
CAA	Central Activity Area
CFTC	Common Facility Training Center
CWP	Capital Works Program
DIN	Dutch Institute for Norms (Standards)
EIA	Environmental Impact Assessment
EN	European Norms
EPZA	Export Processing Zone Authority
FATA	Federally Administered Tribal Areas
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GOP	Government of Pakistan
GSP	Geological Survey of Pakistan
GSP	Generalized System of Preferences
ILAC	International Laboratory Accreditation Cooperation
IPODP	Industrial Park Outline Development Plan
ISPM	International Phytosanitary Measure
ISRM	International Society for Rock Mechanics
KPK	Khyber Pakhtunkwha (formally NWFP)
LDC	Least Developed Country
LEED	Leadership in Energy and Environmental Design
MCR	Marble City Risalpur
MIA	Marble Institute of America
NEQS	National Environment Quality Standards
NIP	National Industrial Parks (Development & Management Company)
NWFP	North West Frontier Province
PASDEC	
PCSIR	Pakistan Council for Scientific and Industrial Research
PESC	Peshawar Engineering Support Center
PIDC	Pakistan Industrial Development Corporation
PISDAC	
PKR	Pakistan Rupees
PNAC	Pakistan National Accreditation Council
PSDP	Public Sector Development Program
PTP	Pakistan Trade Project
QIZ	Qualified Industrial Zone
ROO	Rules of Origin
ROZ	Reconstruction Opportunity Zones
SEZ	Special Economic Zone
STL	Stone Testing Laboratory
STPF	Strategic Trade Policy Framework (2009-2012)
SWOG	Strategic Working Group
TDAP	Trade Development Authority Pakistan
TUSDAC	
USAID	United States Agency International Development
USD	United States Dollar

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1. EXECUTIVE SUMMARY

The marble and granite industry are at a positive turning point in their history. Industrial techniques are being refined as to increase efficiency and minimize waste, while the quality of the landed product is also noticeable.

This Gap Analysis provides a solid platform from which a vibrant and exciting new industry can further develop. The investigations contained within this Gap Analysis are tempered with the current operating realities in Pakistan which may seek to undermine opportunities. The number of inhibitors to success should not be underestimated, and the Pakistan Stone Development Company (PASDEC) and its partner network will need a strong will and leadership to achieve the main goals for the industry.

A Gap Analysis is only as good as its implementation. It has been written with realistic targets in mind, and with awareness that a balance take place between strategic and operational priorities. A further note of caution is the realization the leadership team within PASDEC considers which elements to work with and which to exclude. Further, implementation requires budget and human resource allocation, and these are always in limited supply.

One of the aims of the document is to allow decision makers to take any section relevant to them, review it, and use it in a way that makes sense to them. A common failure of the business planning and execution process is the ability to overwhelm the practitioner to a point where the contents become difficult to execute.



The marble and granite sector is an emerging sector with apparent huge potential for growth. Some of the growth estimates and targets contained in the Pakistan Marble and Granite Strategic Working Group (SWOG) 2006 Strategic Plan value the increase in total revenue of the sector from PKR 2.44 billion (2004) to PKR 161.6 billion (2015). Other news reports in Pakistan have also estimated the industry to attain the USD 2 billion mark by 2013.

The order of magnitude of change reflected in the numbers impose certain conditions on the entire process and value chain of the industry, which will not be without pain and a monumental behavior change for some. If projections have any chance of being realized, a mini-revolution in the industry is required.

The strength of this sector comes primarily from the seemingly vast reserves of different high quality varieties of stone. The simple yet daunting aim is to transform this traditional sector into a modern, competitive and knowledge based in Industry. Marble City Risalpur (MCR) is a step in a direction

to engage and mobilize people into a constructive workforce and bring economic growth to under-developed areas of Pakistan.

This benchmark city has the potential for substantial socio-political and economic impact and can be the catalyst for demand in other sectors. However, MCR is still an “unproven” city but with a very aggressive and vibrant team and board of directors leading the vision.

Marble City Risalpur is proposed to offer an enabling world class business environment with modern infrastructure and support services to the tenants that could attract foreign direct investment in the sector once set up. There are numerous caveats and notes of caution that temper this statement however.

The challenges to the industry and the PASDEC are highlighted in the sections of this Gap Analysis. Only through the willingness and co-operation of all involved will the sector be able to emerge as a true and noted contributor to the Gross Domestic Product (GDP) of Pakistan.

2. INTRODUCTION TO PAKISTAN TRADE PROJECT – INDUSTRIAL SITE SELECTION

The USAID Pakistan Trade Project (PTP) is a four year project (2009-2013) designed to focus and harness the power of international trade as an engine for sustainable economic growth and stability in Pakistan. Through targeted technical assistance, this USAID-funded program supports the Government of Pakistan and private sector stakeholders to improve the trade environment. This is being done through effective trade policy implementation; enhancing the capacity of targeted industry and industrial estates, a review of procedures and systems of Pakistan's institutions to increase regional trade, especially through Pakistan's borders. This work aims to build the capacity of Pakistan's private and public sector institutions in order to develop and manage sustainable and competitive special economic zones, including the proposed Reconstruction Opportunity Zones (ROZ).

Deloitte Consulting, LLP is USAID's primary partner in implementing the PTP. They are providing professional services to support the development and operation of industrial estates and Special Economic Zones (SEZ). Their expertise includes feasibility and design analysis in the configuration of SEZ projects, legal/regulatory and institutional frameworks for SEZ governance, and investment promotion and transactional assistance to support zone development.

2.1 SPECIFIC FOCUS FOR THE GAP ANALYSIS

The objectives of most Gap Analysis are to provide quality and reliable information on the business being investigated. The Marble City Gap Analysis covers both high level and company specific details as it attempts to provide a believable roadmap for those who intend to use it.

All of the heading areas drill down into levels of detail with the goal of practical implementation in mind. Where figures and tables are used, they serve to reinforce and illustrate the point being made and will often have some action items or offer practical solutions to the practitioner within PASDEC or partner agency. This document is not designed to sit on a shelf, but rather one that can be taken, section by section, or in its entirety as a positive and income-generating way forward for the senior management team, stakeholder group or estate board of management.

A great deal of positive effort is behind the momentum of the Pakistan Stone Development Company to date. This section covers some of the key public statements of the organization as they frame their purpose. The first is the Mission and Vision of the organization. According to the PASDEC website (accessed April 8, 2010 at www.pasdec.org) it clearly defines the goals:

“To make Pakistan a globally competitive and leading player of the international dimensional stone industry.”

Following this, some future projections and metrics include:

- Waste Reduction
- Increase production per square foot
- Increase net revenue (sector-wide)

- Increase exports (volume and value)

The baseline characteristics of the estate give an understanding of the scale and positioning of the industrial estate.

Table 1: PASDEC Broad Goals for 2013

Stated Goal from Website	2004	2013
Waste Produced	85%	45%
Production per square foot	Rs. 100 Million	250 Million Rupee
Revenue	Rs. 2.4 Billion	Rs. 60 Billion
Exports	USD 23 Million	USD 500 Million

As PASDEC and the PTP work in tandem to sculpt the definition of the Gap Analysis, the PASDEC aspirations are clearly in mind as each component is written, elaborated upon and executed.

All of the sections of the Gap Analysis will review and treat the areas presented below in this quick snapshot of issues. These can be addressed when a management and leadership team deals with the development of an industrial estate.

- **Management Review** – It can be the case that despite the best efforts of the estate managers and their boards, a review of current operating capacities and outputs can be a positive thing. An understanding of the current governance structure (see Section 11.0 of this Gap Analysis) could suggest improvements such as the way in which operating budgets are reconciled against revenue generated and the incentive to use these funds to expand capabilities and management services.
- **Hard Infrastructure Issues** – As expected, the maintenance, upgrade and further modernization of foundation infrastructure is high on the agenda at Marble City. Despite the Greenfield nature of the site, the connecting infrastructure is established, as witnessed by neighboring EPZA/Nowshera Industrial Estate. The reliable supply of electricity, natural gas, road and rail networks, water treatment and waste processing and recycling/sewerage systems are significant items that always require assistance and funds.
- **Opportunity Assessment and Targeting** – Each estate has its own thinking on the best industry and firm-level mix; and assistance can come in the form of an assessment on the supply side and demand side for layers of opportunity. For example, natural competitive advantage elements will include access to raw materials, labor inputs (skilled/semi/unskilled), access to enabling infrastructure such as road and rail to include access to domestic and international markets and time to market factors. A heavy strategic consideration is also the potential of efficient cross border trading routes from Pakistan to Afghanistan and Central Asia over time.
- **Incentive Structure** – Further work needs to be carried out regarding the type and range of incentives possible and available to best assist estates attract the elements mentioned above. Included in the raft of options are tax benefits, duty free, grants assisting plant and equipment, access to public/private investment funds aimed at industrial expansion, and access to certain markets offering tax relief and incentives. The impending decision on the shape of Reconstruction Opportunity Zones (ROZ), Special Economic Zone (SEZ) thinking and Free Trade Agreement (FTA) considerations will undoubtedly ripple through the system and cause the necessary shift in focus on zones and industrial estates. All zones are potentially impacted to varying degrees depending on their outputs and target markets and the percentage of local inputs in the case of ROZ. The Marble City Risalpur leadership needs to be mindful of direct and indirect implications if and when legislations and rulings come into effect.

- **Basic Safety and Security** – In order to invite and sustain varying levels of public and private sector confidence generally within a region and specifically within an estate (Brownfield or Greenfield), certain minimum standards of safety and security are required. Assistance with basic safety and security may involve capital expenditure (e.g. simply a boundary wall, a functioning security guard system and clearly posted signage in the estate). For foreign buyers or investors to be satisfied with the security of Marble City Risalpur, a safety and security plan needs to be considered and developed as part of the operational plan for the estate and its proper functioning.
- **Skill development and Training** – Considered to be ‘soft’ infrastructure inputs by some, this is one obvious area where assistance could be defined, measured (for impact) and implemented. The list can include: common facility and training center; items as part of the machine pool with the requisite training, development and training institutes; testing laboratories and the organization of targeted domestic and international visits (to include conferences/specific meetings/road shows). This subset of assistance can have an element of ‘quick wins’ as well as strategic and sustainable outcomes. Assistance in this area targets productivity and efficiency measures as recognized competitive measures for Pakistan and its export orientation aspirations.
- **Services and Integration Elements** – Falling into this category are: a good availability of suitable worker accommodation (or provision of); proximity to education and hospital

Pakistan Marble and Granite Quick Stats:

Over 40 types of natural color marble

100 million square ft produced in 2004

Rs. 3B in value sold in 2004

2.5% of tonnage in exports = \$23M (USD)

2000 quarries concentrated in northern and western rural areas

Employment for 70,000 people

Wastage targets for 2010 at 45% (2004 estimates of up to 85%)

facilities; banking and other commercial services; recreation and entertainment facilities (or proximity). The timing of the delivery of some or all of these can be ‘micro-interventions’ as well as medium to long term structural interventions such as the design and commissioning of common social spaces for all to enjoy on their time off.

- **Logistics, Internal Systems and Contract Management**– This may actually appear to be inconsequential to some, but this element or group of elements can become the deal breakers and ‘show-stoppers’ when exporting to ‘sophisticated’ and developed markets.

Once dimension stone availability is ascertained with greater accuracy and forecasting, PASDEC will have better control over its knowledge of supply levels, regional location, budget assistance and advice throughout the entire supply chain from extraction to end customer. PASDEC will have to take a leader role, and organize a consortium of industry partners to make this happen.

2.2 2.2 PASDEC AND ITS WIDER ROLE

This Gap Analysis has a specific focus, that of Marble City Risalpur. The role of its sponsor body the Pakistan Stone Development Company (PASDEC) has a much wider role however. PASDEC is the professional Section 42 (under Companies Ordinance) company set up to specifically develop the marble and granite sector of Pakistan. As the industry is made up primarily by up to 90% of small businesses who extract about 10 tons per day (Marble Value Chain Report 2008, JE Austin & Associates), it is wise for Marble City to initially offer smaller sized plots on the open market. Given that the April 2010 market price for 1 ton blocks of stone was around PKR 10,000, daily production from small quarries would gross less than USD 1500 per day. For scale within the industry, volume and quality become major factors as new markets and customers are created.

The Marble and Granite Strategic Working Group (SWOG) called for the formation of PASDEC, and in 2005 identified the constraints and opportunities for the sector as a whole. In 2005, the SWOG arrived at an overall strategy to upgrade the entire value chain with a particular focus on the extraction stage. Nine strategic initiatives were identified and others addressed policy constraints and skill gaps in the workforce.

According to 'Stone Biz' (Issue No. 5; July-October 2009, p. 5), the SWOG made formal presentations of its strategy to the Minister of Industries, Production and Special Initiatives, the Governor of Balochistan and the President and Prime Minister of Pakistan. A series of high level presentations led to the commitment of \$38M USD over five years to implement the SWOG strategic initiatives, including funds for the operation of PASDEC.

PASDEC was incorporated on June 24, 2006, with a Board of Directors comprised of seven members from the private sector and five from the public sector.

Some of the headline targets for PASDEC include the:

- Establishment of 10 model quarries
- Development of 5 marble cities
- Upgrading of 20 quarries
- Establishment of 2 machinery pools vital for precision cutting and shaping of stone, and making equipment available at a reasonable cost to business
- Opening of 4 CMTFCs

PASDEC is the managing body of MCR and headed by a private sector professional, however, the success of Marble City could trigger the public sector to bring PASDEC into their fold and potentially restrict its development work. PASDEC has adopted a financial model requiring limited resources from the Government of Pakistan, allowing it greater independence to run its operations.

PASDEC needs funds to develop some of its major initiatives. These initiatives have the aim of creating and sustaining a viable and competitive model:

- Advisory support from PTP to assist PASDEC in planning and staging processes and requirements
- Assistance with the Machinery Pool for use in model quarries
- Assistance with the establishment of the Common Facility & Training Center (CFTC)
- Mosaic, Handicraft and Inlay Development Center

- Training Institute and Technical Center
- Laboratory for testing of Marble & Granite
- Participation in International Trade Fairs & sending delegations for marketing and promoting the Marble & Granite Products in the major marble & granite markets of world

The practical development of some of the initiatives outlined in this Gap Analysis will create the cash flows needed to sustain them.

2.3 MEASURABLE AND ACHIEVABLE INTERVENTIONS – PASDEC PRIORITY LIST

The PASDEC Executive and Board of Management are working within a five year plan. Their priority list is given here so as to strongly align the efforts and emphasis of this Gap Analysis to their needs.

- ✓ Model Quarry Development to demonstrate quality, consistency and security of supply
- ✓ Investigation into greater product range and quality (export-oriented focus)
- ✓ Progress toward Zero (minimal) emissions from the Park
- ✓ Quarry Selection for Up-Gradation
- ✓ Efficient Use and Maximum Return for Machinery Pool
- ✓ The integration and effective operation of the Common Facility Training Center (CFTC)
- ✓ Improvement upon existing building codes
- ✓ Increase in the number of women working in the mosaic and inlay sub sector
- ✓ Assistance to increase the quality and usage of Indigenous machinery
- ✓ Maximizing employment generated through Marble Eco Park Risalpur – direct and indirect
- ✓ Industrial planning and development consistency with International standards and best practice Eco Parks
- ✓ Maximizing energy efficiency inputs given budget constraints and guidelines for plot owners with regard to clean technology inputs
- ✓ Investigation into how to minimize waste or to use this waste as saleable by-product
- ✓ Consolidation of current list of countries product is exported to; analysis of the market potential of new countries and market segments
- ✓ Expansion of links with quality training institutions and related higher education faculties
- ✓ Expansion of social responsibility program with stakeholders to increase the net of employment among income and skill levels

The Board of Management need to be aware of operating budgets, internal capacity and the ability to partner to achieve certain goals as it works toward the successful delivery of the tasks above. A simple task would be to choose any of the above headline items and work through the necessary programming, thinking and resources needed for delivery. This is never an easy task for any organization. Prioritization and constant program monitoring minimize the risk of under-achieving.

2.4 SUPPORTIVE FRAMEWORK (PUBLIC AND PRIVATE)

Project success will depend on a number of active and contributing members of the PASDEC family. The stakeholder list is long and varied and shows the depth of current relationships. This evaluation attempts to show the tangible value of each stakeholder and the value of the unique offering each brings to the table.

PASDEC Vision:

To make Pakistan a globally competitive and leading player of the international dimension stone industry (website)

Over the next five years, the roles of stakeholder will vary in importance. For example, within the planning phase of Marble City, the infrastructure component and planning development are critical to the organization of the park prior to development. Within this, significant contributors such as the National Industrial Park (NIP) Company work toward site selection and technical feasibilities for appropriate infrastructure within the park, and connection to existing primary infrastructure. As the park is established (e.g. within Year 2-3), the special committees and logistics partners will be active in moving product to ports and across borders. Other stakeholders such as financial institutions will be involved throughout, as plot owners and industry representatives such as APMIA will be looking for ways to extend lines of credit at reasonable and competitive interest rates to allow them to carry appropriate amounts of inventory.

Table 2: Primary and Secondary Stakeholders

Primary Stakeholders	Secondary Stakeholders
<ul style="list-style-type: none"> ○ PASDEC (BOD), Special Committees ○ National Industrial Park (NIP) Company ○ Ministry of Industries and Production ○ Marble City Risalpur Allottees ○ Financial Institutions ○ Industrialists (with industries in the vicinity of Marble City Risalpur) ○ Labor Force ○ Pakistan Railways ○ Transporters ○ Freight Forwarders ○ Handlers ○ Specific Committees of MCR ○ Investors (national and international) ○ Buyers (national and international) 	<ul style="list-style-type: none"> ○ Management Committee ○ Mineral Department (NWFP) ○ Quarry Owners ○ Pakistan Marble Industry Association ○ Research institutions and academia ○ Importers ○ Vendors ○ Consumers ○ Material Testing Laboratories ○ Donor Agencies ○ Trade Development Authority of Pakistan (TDAP) ○ Local Market Intermediaries ○ Allied industries (Machine tool factories Light engineering establishments) ○ Technical and Vocational training institutions ○ Chambers of Commerce and Industry Local and federation ○ Business Innovation and Business Development practitioners ○ Marketing companies and advisors

One of the best ways to organize scarce internal resources is for PASDEC to review and extend the list of critical stakeholders in Table 2, ascertain the current and anticipated level of involvement against some value criteria, and work out what is achievable and with whom.

At times, it becomes a business necessity to shed or reduce relationships to ‘maintenance’ only, as the level of added utility for dealing with them becomes marginal, i.e. they offer no value to your business, and may even be wasting resources.

3. ACTIONS AND RISKS

The usefulness and practicality of any Gap Analysis increases when a section outlining what needs to be done, and what may get in the way of actions is included. PASDEC is entering a phase of potentially high growth, and only carefully considered and prioritized actions will afford them success as human and financial resources are always limited.

As already mentioned, the Board of Management controls operating budgets, internal capacity and the ability to partner to achieve certain goals as it works toward the successful delivery of the actions below. For reference, the action areas are assigned to their relevant section of the Gap Analysis. This will allow for quick reference to be made by the person(s) in charge of executing.

3.1 PASDEC ACTIONS TO ASSIST PRIORITIZATION

3.1.1 VALUE ADDITION WITHIN DIMENSION STONE SECTOR

Action 1: PASDEC to produce a short technical report showing baseline efficiencies and cost savings at model quarries when certain machinery configurations (e.g. Indian versus Chinese versus Turkish machinery) are used to extract the maximum amount of stone from sites.

Action 2: PASDEC to continue to demand the Pakistan dimension stone industry be benchmarked against appropriate international accreditation and for all individual producers and suppliers to achieve minimum accreditation by 2013.

Action 3: Mapping all the stone testing laboratories in Pakistan along with their respective capacity to carry out essential tests on stone. This information will be distributed to all members and affiliates with posting on the PASDEC website.

Action 4: PASDEC to update this list on a bi-annual basis. The responsible person can circulate detailed notes to the senior management team and Board of Directors as sections are updated with actual provider names.

Action 5: PASDEC to work with established stakeholders to increase the quality and availability of shared laboratory and testing facilities. PASDEC to investigate strategic partnerships as Marble City Risalpur is developed and laboratory output aligns with market need. This will build the faith of foreign buyers in the products.

Action 6: As part of the proposed Marble City testing laboratory, the task of undertaking a small Gap Analysis for the lab with comprehensive costings is complete within 6 months of assignment. The user-pays model should include realistic cost recovery assumptions for prompt payback.



Action 7: PASDEC to arrange a series of workshops for plot holders and interested parties outlining the links between product certification and greater profits.

3.1.2 ENABLING ENVIRONMENT

Action 8: PASDEC Board of Directors to put the Strategic Trade Policy Framework (STPF) and its relevant sections on a watch list to be reported against regularly or as requested by the Board.

Action 9: PASDEC to assign internal resources to investigate compliance issues for mining lessors such as property registration, lease conditions and rights under the conditions of the lease.

Action 10: PASDEC to collect, collate and post relevant information on its website, as well as disseminate in other electronic and print form exact import conditions and restrictions for all countries where stone product is, or intends to be, exported. This will greatly assist potential buyers.



Action 11: PASDEC to investigate their ability to act as an intermediary with the banks. Marble City management may be in a position to negotiate with financial institutions on behalf of tenants. PASDEC to investigate the possibility of customizing industry specific financial products to suit the needs of dimension stone companies.

Action 12: PASDEC to investigate the possibility of establishing a quality department to attain the industry benchmark of quarry waste minimization by 2013.

Action 13: PASDEC to investigate the viability of utilizing quarry waste through cobblestone production. The investigation can look at social responsibility, the provision of jobs to unemployed and underemployed people in KPK (formally NWFP) and Baluchistan as well as the merits and marketability of using quarry waste as an eco and ‘green’ output.



Action 14: PASDEC to work with stakeholders to continue the knowledge within the geological mapping and geo chemical prospecting fields. This may take the form of running awareness workshops for processors and suppliers to highlight the importance of forecasting supply locations with accuracy.

Action 15: PASDEC to work with the relevant public and private agencies and to act as a link to government for timely infrastructure upgrades and service provisioning. PASDEC to commission a working group or task force detailing infrastructure provisioning, road carrying capacities and government responsibilities with respect to these items.

Action 16: PASDEC to investigate and create a link with institutions such as the Engineering University Peshawar. This could provide an opportunity for practical research to be applied in the field and advance targeted areas of dimension stone.

3.1.3 INTEGRATED LAND USE MANAGEMENT AND PLANNING

Action 17: PASDEC planning team to review the Master Plan to check and remediate any inconsistencies and concerns as outlined in this Gap Analysis as well as add other items as they arise.

Action 18: The group with the responsibility for planning oversight and compliance with internal planning controls and conditions need to give the highest priority to the ‘Movement Economy’ within Marble City. Attention to traffic and human flows within the major control points is critical, as congestion will destroy physical amenity and commerce.

Action 19: Conduct a post-implementation review (once retail section is operational) of how single fronted small shop retail lots perform and function with the view to making necessary modifications for future planned Marble Cities.

Action 20: PASDEC seek to engage Pakistan’s best ‘natural materials’ architect or designer to create 2 features; a. the entry statement to Marble City and b. the park stone architecture for the central activity area.

Action 21: Internal consideration and discussion of how the inclusion of a 30 or 45 degree diagonal dual carriage road would connect critical control points into and out of the estate, as well as facilitate greater commerce in future Marble Cities.

Action 22: PASDEC or relevant planning group to monitor and evaluate how the form of the green space and commercial shops area affect the function of the estate. The observations will likely influence future designs, sizes, positioning and configurations.

Action 23: PASDEC or relevant park planning group to monitor transport and movement patterns and behaviors within Marble City to define the inputs for a future detailed Transport Management Plan.

Action 24: PASDEC to produce a ‘Quick Reference’ guide for plot owners as part of their ‘Welcome Pack’ to the estate featuring sustainable commercial designs and their savings. This can be given after certain agreed installments have been paid.

Action 25: PASDEC to consider demonstrating sustainability options to industrialists and commercial owner/operators by building 3 or 4 simple energy efficient workshop or factory designs in Stage 1. Cost savings and reduced emissions can be quantified through the discovery process.

3.1.4. EMPLOYMENT GENERATION AND LOCAL JOBS

Action 26:

- a. Develop a comprehensive training program for mosaic craft in collaboration with a local vocational institute and insert as budget line item
- b. Assign a contact person for the purpose of building the mosaic sector. Tasks include assisting with design, production, quality, and building market linkages and sales
- c. Create a ‘mosaic task force’ to collect and use stone waste
- d. Devise short courses for plot owners and managers aimed at quality control and production efficiencies

Action 27: PASDEC to work with the mosaic sub-sector to increase exports from \$3M USD to \$5M USD over the next three years. This would represent an increase of 67%, and the creation of 2000 new jobs.

3.1.5 FINANCIAL CONSIDERATIONS

Action 28: PASDEC to internally review the assumptions in the financials against internal company assumptions. This will allow them to predict internal rates of return (IRR) for the various practices they wish to grow in Pakistan, such as quarrying, common facilities and developing a global brand.

3.1.6 MARKET FACTORS

Action 29: PASDEC to initiate the ‘Pakistan Natural Stone Commercial Contractor’ or similar accreditation. This will set the benchmark for commercial stone installation industry and raise the level of consumer and commercial confidence in the professional handling of the material.

Action 30: PASDEC to initiate a series of networking events for members with each meeting devoted to a particular topic such as quality control, expanding and maximizing market channels, pricing in international markets, controlling costs.

Action 31: PASDEC to review and add to Table 14 & investigate ways and means of expanding their market message through the coordinated use of quality promotional videos on globally popular media such as You Tube. As expansion is considered, the type of video clip and message need to be considered and, if necessary, budgeted for.

Action 32: PASDEC to internally investigate specific areas of interest to the organization; compile a list of specific questions and forward to TDAP for response and assistance. Specific target areas and small defined projects of interest to both groups likely have the greatest chance of success.

Action 33: PASDEC to conduct a survey of Pakistani Institutions to gauge possibilities of collaboration in the areas of stone research and development and technical analysis of regions and their stone varieties. The outcomes can be mapped to specific overseas markets and buyer requirements

Action 34: Establish a relationship with the Higher Education Commission Pakistan for the purpose of setting up a scholarship program in areas that will benefit new knowledge to industry

Action 35: PASDEC to explore linkage programs with ‘best practice’ mining engineering schools in highly regarded universities to develop a local Pakistani expertise base.

3.2 RISKS TO SUCCESSFUL GAP ANALYSIS IMPLEMENTATION

As with any major land use implementation expected to have a 50 year life cycle, there are start up risks with the potential to haunt the project over the decades. These are usually of a structural nature, and are difficult to retrofit once implemented. In a perfect world, PASDEC will update this Gap Analysis in 2013 and over subsequent time periods to continue its life cycle and account for the conditions of the day.

3.2.1 VALUE ADDITION WITHIN DIMENSION STONE SECTOR

- ✓ PASDEC to produce a short technical report showing baseline efficiencies and cost savings at model quarries when certain machinery configurations (e.g. Indian versus Chinese versus Turkish machinery) are used to extract the maximum amount of stone from sites

3.2.2 ENABLING ENVIRONMENT

- ✓ Investment in accreditation and certification of Pakistan stone should be a priority in order for the highest exposure to targeted markets. Failure to do so will reduce the 'believability' of the entire Pakistan stone market and PASDEC export projections will fall drastically short of estimates
- ✓ Any lack of adherence to environmental standards and controls (built form and emissions) may trigger requests for an Environmental Impact Assessment (EIA); failure to comply could affect future public and private investment (or re-investment) decision
- ✓ Any disruption in the steady and reliable flow of raw material will have a flow-on effect to processing plants and the subsequent output of Marble City. The common-user facilities to be provided by PASDEC including the 2.9 acre warehouse will be critical to the smooth supply of materials
- ✓ A lack of adequate general and business-specific security within Marble City will cause a lack of faith in business to stay in the estate or consider expansion. This can apply to staff safety, material supply, theft of materials and equipment, damage to premises and threatening behavior by outside elements. A risk management plan may be required to assure investors and business owners

3.2.3 INTEGRATED LAND USE MANAGEMENT & PLANNING

- ✓ Estate guidelines and caveats for building timelines needs to be enforced. This will minimize vacant lots that will undermine the integrity and amenity of the overall environment. Equally, poor enforcement of compliance to guidelines will erode property values as quality businesses are usually attracted to superior environments
- ✓ PASDEC will face internal congestion in the estate and disorderly vehicle movement (access and exit) if planning principles and road hierarchies are not enforced
- ✓ As the estate is already fully subscribed, expansion considerations need to be explored as soon as possible. The risk will be chaotic development if poor enforcement of the planning regulations occurs
- ✓ Power generation concerns may extend into the estate as processing factories and workshops build their production. PASDEC can minimize this risk by investigating independent power generation for the estate using traditional and alternative energy
- ✓ The lack of a transport management plan will create a chaotic environment. There will be no terms of reference for the movement of: service/haulage vehicles, employee private car parking on-site and in public areas, taxi and bus schedules and pick-up/drop-off points and parking facilities for consumers and visitors to Marble City
- ✓ Any significant changes to build out timelines such as design amendments, equipment delays, servicing delays, unbudgeted environmental compliance or new conditions of approval, industrial disputes, material shortages etc. may damage the credibility of the project

3.2.4 EMPLOYMENT GENERATION & LOCAL JOBS

- ✓ The timing of job creation (direct and indirect) may not meet expectations in the initial phase if PASDEC is unable to create a superior space in terms of timely infrastructure delivery

3.2.5 FINANCIAL CONSIDERATIONS

- ✓ Infrastructure provisioning, servicing and maintenance budgets will be strained if project management and control techniques are not practiced
- ✓ Due to the scarcity of funds in government in Public Sector Development Fund (PSDF), alternate financing plans should be considered if budget allocations are inadequate
- ✓ Stone processing and finishing is capital intensive due to the need for precision equipment. The lack of customized products from banks and other lending institutions will discourage aggressive growth and production from business
- ✓ The lack of initial start-up capital to fund shared facilities can pose a threat to the PASDEC Gap Analysis of offering subsidized facilities to businesses who cannot afford specialized plant and equipment and their operating costs

3.2.6 MARKET FACTORS

- ✓ PASDEC needs to do a market sizing analysis and risk management assessment in order to attract and retaining high value customers, new markets and segments. This should be done prior to finalizing its targeting strategy and subsequent funds allocation
- ✓ Any misrepresentation of the growth and size of local and international markets can distort price structures, distribution channels, trends and competitive analysis through the misallocation of scarce resources

3.2.7 SKILL DEVELOPMENT & TRAINING ASSISTANCE

- ✓ The inability to map and project required skills (semi and high) may result in shortages to business. The flow-on effect will be shortfalls in production targets and subsequent sales and gross profit. Business expansion projections will always be revised downward as a result, and export opportunities may be missed

3.2.8 GOVERNANCE STRUCTURES

- ✓ A separate incorporated association should be considered to oversee Marble City estate operations. An independent management company can minimize the risk of inaction and conflicts of interest
- ✓ PASDEC to review its own ability to follow up and finalize legal and contractual agreements in a timely manner. Failure to do so will lead to a loss of strategic and financial partnerships
- ✓ The lack of a responsive independent estate management committee may lead to ad hoc decision making, poor follow up and inconsistent decision making with regard to macro estate issues and individual lots. The appropriate authority to act will greatly assist the credibility of this group
- ✓ The lack of sound project management practices across all functional areas of estate delivery will lead to ineffective outcomes
- ✓ A lack of PASDEC succession planning will cause project disruptions if institutional and operational knowledge leaves with the exit of senior management and other key personnel

3.2.9 SUSTAINABILITY CONSIDERATIONS

- ✓ A lack of leadership from PASDEC with regard to showing business owners and managers how to build and operate cost effective sustainable factories, workshops, showrooms and offices will not achieve sustainability targets
- ✓ Building the estate with little regard to resource allocation versus critical and strategic infrastructure delivery will cause cash burn and an inability to complete build out as planned

- ✓ Any deviations from the National Environmental Quality Standard (NEQS) will severely restrict the claims of Marble City to minimize emissions. Such things as waste recycling and solid waste disposal may not achieve desired targets
- ✓ Critical servicing infrastructure needs to be in place to allow for continuous business operations. Issues with reliable and sufficient water supply, electricity generation and waste water treatment will hinder small business production within Marble City due to downtime

4. VALUE ADDITION WITHIN DIMENSION STONE SECTOR

4.1 EXAMINATION OF MODEL QUARRIES UNDER CONSIDERATION – BEST PRACTICE SITES

The baseline characteristics of some of the model quarries under consideration give an understanding of the future scale and positioning of Marble City Risalpur. As the efficiency of extracting and transporting square blocks from quarries to processing facilities in strategic marble cities across the country increases, true economies of scale can be achieved over time. This may be problematic as transportation efficiencies rely heavily on the quality of road networks and route connections and many other factors such as truck stops, fuel depots and mechanical service and repair shops. If these secondary services are adequately available and performing the critical functions well, then the transportation issues associated with moving square blocks efficiently can be addressed.

Currently the average loss only at the mine site is estimated to be around 73% (2009). The international benchmark is 40%, and the prevailing average net loss incurred is 85%. A significant proportion of the loss is attributable to rudimentary quarrying techniques. If appropriate quarrying practices are adopted in Pakistan, quarrying loss can be significantly reduced. The establishment of ten (10) model quarries is outlined in the operational plan of PASDEC. Three quarries have been initiated under this plan. The primary objectives of the model quarries are to:

- ✓ Demonstrate the effectiveness of the quarrying techniques
- ✓ Provide quality input to the processors
- ✓ Develop workforce for operating machines and running quarrying operations using modern techniques
- ✓ Reduce environmental degradation

Previous work undertaken in 2006 by the SWOG outlined economic and social value being directly tied to extraction efficiencies at the quarry. According to that report, international best practice processes and technology extract stone in sized, square blocks to be cut and processed with minimum wastage and maximum value. The SWOG expected implementation countermeasures to reduce waste at the mine site from 85% (2006) to 57% by 2015. The SWOG report also published aggressive estimates of total revenue increasing from PKR 2.44 billion (2006) to PKR 161.6 billion (2015) and exports of stone to spike from USD 23 million (2006) to USD 2.44 billion (2015).

The establishment of model quarries had the aim of increasing and stimulating supply and the improvement of stone quality by:

- ✓ Demonstrating international best practice quarrying technology and processes
- ✓ Being a reliable benchmark for secure leasing and regulatory environment
- ✓ Developing higher value supporting services
- ✓ Serving as a training hub for the quarrying industry

To be viable, quarries need to have certain attributes. Some are listed here:

- ✓ Infrastructure availability and accessibility
- ✓ Structure of the deposit – using structural and geological mapping
- ✓ Reserve estimation through core drilling and contour mapping
- ✓ Marketability of the stone locally and internationally (material testing)

- ✓ Technical and financial credibility of the quarry owner/partnership
- ✓ Status of the present quarrying operation
- ✓ Willingness of the quarry company to commit own funds
- ✓ The presence of a Title Deed/Contract
- ✓ The credit worthiness of the quarry company

4.1.1 EXAMINATION OF MODEL QUARRY – NAAL KHUZDAR BALUCHISTAN

The first Model Quarry Koulan is operational at Naal Khuzdar in Baluchistan. For the first time, modern quarrying machinery and techniques are being used under the supervision of national and international experts.

Figure 1: Boulders & Blocks



A total investment of PKR 90 million was assigned to transform this into a model quarry. For the purposes of the financial section in this Gap Analysis, the PKR 90 million figure was used as a benchmark for start up costs of a model quarry.

The Koulan quarry is said to be producing 400 tons per month with the capacity to produce more than 4000 cubic meters per year. If a figure of PKR 10,000 per ton is taken as the market rate for blocks, PKR 4 million per month (gross revenue) can be assumed.

According to a Daily Times report on January 29, 2010, PASDEC auctioned its first extracted marble square blocks from its first model quarry at Naal, Khuzdar through an open auction process. This was the first ever auction in the history of the country’s marble and granite sector, and was administered by PASDEC.

The model quarry has revolutionized the local quarrying industry as the stone commanded a price more than ten times that of comparable product employing conventional quarrying methods.

A quick look at the difference between conventional and conventional quarrying practices demonstrates:

- Waste reduction from (an estimated) 85% to 45% at the quarrying stage
- Improved international acceptability
- Optimal use of available mineral resources
- Improved extraction techniques and handling
- Reduced environmental impacts
- Higher revenue through improved marketability
- Improved quality of outputs

4.1.1.1. ACTIVITY NORMALIZATION AT MINE SITES

There are claims of ‘activity normalization’ at mine sites in recent times (circa 2010) at Mohmand, Kyber, Bajour, and Kurram agencies of Federally Administered Tribal Areas (FATA). These areas, apart from containing major extraction sites are said to contain a good range of colors and shades of stone. This is particularly relevant when talk of opening up export markets and their potential is considered. Potential international buyers and minesite investors need to be assured that the maximum extraction of the variety of stone in the mountains is occurring, while waste minimization occurs.

As mentioned numerous times in this Gap Analysis, the security of supply and movement of material to processing plants will be one of the biggest industry challenges over the coming years. In the Daily Times published article of February 6, 2009, it is reported the FATA region will benefit from the development of a 300 acre Marble City by 2011. The 200 industrial unit site would benefit from the excavation of 1.5M to 2.0M square feet of stone of all qualities. According to the All Pakistan Marble, Mining, Processing, Industries and Exporters Association (APMMPIEA), more than 1 million ton of marble is excavated from FATA annually. In addition, more than 7000 ton of good quality marble such as super white, silky and grey exist in Mohmand, Kyber and Bajour.

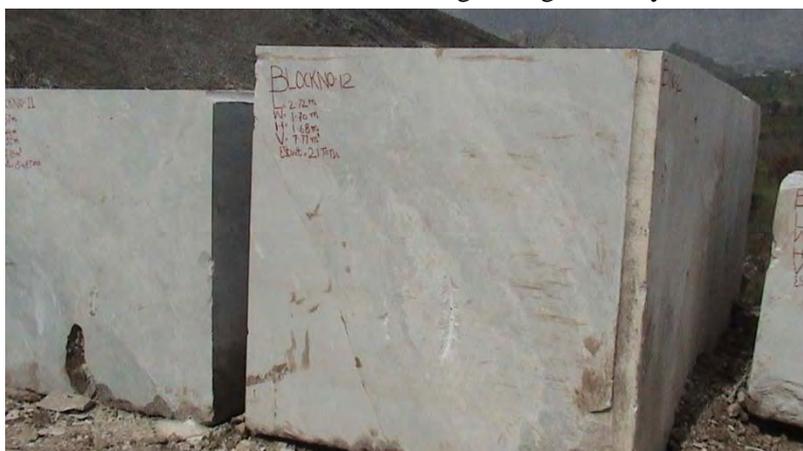
The fully operational “model quarry Khuzdar” excavates 400-450 metric tons per day. Machinery extraction requires greater training and skill levels, and production is 50,000 – 60,000 ton of stone annually. The order of magnitude is ten times that extracted through ‘old economy’ blasting methods.

The export of ‘raw’ marble and granite from the Khuzdar quarry operations alone could net \$7M annually. Further value-adding could double that figure. The importation of machinery and equipment for mining, quarrying and grinding and spare parts from India has also reduced operating costs by up to 50%.

Action 1: PASDEC to produce a short technical report showing baseline efficiencies and cost savings at model quarries when certain machinery configurations (e.g. Indian versus Chinese versus Turkish machinery) are used to extract the maximum amount of stone from sites.

4.2 MODEL QUARRY SELECTION CRITERIA

One of the best demonstrations of the growing maturity of the dimension stone sector in Pakistan is



Quarry Supply Challenges:
Apart from consistent and constant electricity and water supplies, security of stone blocks and movement of raw material will be one of the biggest challenges to face the industry into 2013

the progress made by the model quarry initiative. As techniques are refined and prices per ton in the market continue to increase, shapes and sizes previously known as ‘potatoes’ are being sent to processing plants in the form of square blocks. These regular shapes are easy to

manage on site and more ‘saleable’ product can be retrieved from the blocks. As quarrying techniques continue to improve and the value of quality Pakistan stone becomes more widely known and accepted, further improvements at the quarry site will occur.

According to the ‘Technological Up-Gradation and Model Quarry Development’ project for mechanized quarrying of dimension stones, the selection criteria used to assess the future value of a quarry are as follows:

- Initial geological survey - of the mine site for short listing purposes
- Core Drilling - to assess the reserves and analysis
- Lease License – period and validity
- Financial Position – evaluation of funds allocated by the owner to date
- Analysis – of job outcomes, volume of output, estimation of market value of outputs
- Material Testing – marketability of the stone locally and internationally (testing to be carried out by an independent testing authority)
- Infrastructure Availability – roads, electricity, water and analysis of how each can affect the production of the quarry

A competitive process is adopted for the selection of the model quarry and the attributes considered while evaluating various candidates are provided in the table above. The financial analysis of model quarries is dealt with in Section 7 of this Gap Analysis.

4.3 VALUE OF STANDARDIZATION AND INTERNATIONALLY ACCEPTED ACCREDITATION

The extensive range of products and services available often make it difficult for the customer to decide which product or service best meets their quality, safety and technical requirements. The supplier can therefore apply to have their product or service assessed objectively by an organization such as a certification body or test laboratory.

A certificate of conformance or test report is issued accordingly and the reliability of these certificates or reports is linked to the credibility of the certifying authority/institution. For the Pakistan stone industry to pass the first hurdle of assuring the quality of its exports, international accreditation of organizations and their product range will be a significant milestone. If this occurs, buyer, investor and partner confidence will be converted into gross revenue and sector-wide job creation. Being assessed and benchmarked on global competitive terms will truly indicate international relevance and positioning for Pakistan stone.

Value of Product Standardization of Pakistan Stone:

- Greater international acceptance and the ability to establish Pakistan brand
- Improved market appeal
- Greater revenue generation possibilities and market channels
- Realizing the true potential and benefits of stone
- Necessary prerequisite to enter many global markets
- Essential for branding
- Better prospecting

Stones are generally marketed based on aesthetic manifestation and historical experiences about their durability, usability and strength. However, the assessment of physical-mechanical characteristics of stones can help sellers and

marketers emphasize the quality of their products.

Compliance to standards further contributes toward improving international acceptability, marketability and eventually to gross sales.

One element distinguishing the dimension stone industry from other mineral industries is the broad variation in the type and quality of dimension stones marketed internationally. Dimension stones are traded primarily on:

- Physical, mechanical and weathering characteristics
- Aesthetic value (color, texture and grain size)
- Size of blocks (volume and shape)
- Availability (quality, quantity and time of supply)

The testing of dimension stone is essential to derive basic information about certain characteristics such as color, texture, grain size and physical, mechanical and weathering properties. These features help decide such things as suitability and use.

The certification from accredited bodies eliminates the need for multiple assessments when goods cross borders. In this way, turkey has transformed its marble and granite industry over recent years, and has built a competitive advantage due to the accreditation of the industry. In abstract terms, the Turkish stone industry becomes ‘believable’, and in real terms, it converts the trust of the quality of its output into net revenue, industry growth and job creation opportunities.

Consumer confidence will only rise if basic regulatory and standardizations are in place. Accreditation and certification play a big role in creating the trust implied with development within developing industries.

4.3.1 STANDARDS FOR DIMENSIONAL STONES TESTING

National and International technical bodies like PNAC, PCSIR, American Society of Testing and Materials (ASTM) Standards, International Society for Rock Mechanics (ISRM) Standards, German Standards (DIN Standards), British Standards (BS) and European Standards/Norms (EN) have identified and outlined the test procedures for natural building stones along with their basic properties. In addition, there are other standards like French, Italian, Spanish, Portuguese and Australian Standards; Belgium and Canadian Rules, etc. having jurisdiction in the respective countries.

ASTM standards are the most widely accepted international standards for dimensional stones. This standard is vastly popular among the Asian countries and is the statutory requirement in the North America.

Table 3: ASTM Standards

Standard specification	Relevant ASTM Standards
Granite Dimension Stone	ASTM C-615
Marble	ASTM C-503
Limestone	ASTM C-568
Slate	ASTM C-406 & ASTM C-629
Sandstone	ASTM C-616

Action 2: PASDEC to continue to demand the Pakistan dimension stone industry be benchmarked against appropriate international accreditation and for all individual producers and suppliers to achieve minimum accreditation by 2013.

Action 3: Mapping all the stone testing laboratories in Pakistan along with their respective capacity to carry out essential tests on stone. This information will be distributed to all members and affiliates with posting on the PASDEC website.

4.4 BUSINESS MAPPING ESSENTIAL INPUTS

Various kinds of inputs are required to make Marble City Risalpur functional over the coming years. The table below has identified those inputs and where these products, services and facilities are available.

Marble City Risalpur is located in an area where the stone processing industry is already functional and basic human resources like supervisors, operators and laborers are available within the Nowshera District. Most of the essential inputs can be found within a 100km radius, i.e. in Islamabad, and Peshawar. Among the essential inputs which are either absent in KPK or found in other industrial hubs such as Karachi and Lahore are; certified stone testing services, advisory services and capacity building setups. The presence of these would add significant and lasting value to Marble City.

Facilities marked under “within MCR” are tentatively planned in the overall land use allocation plan, and the rest of the columns give the current status of input availability.

Table 4: Business Mapping & Essential Services

Product/Services/Facilities	Within MCR ¹	Within Nowshera ²	Within 100 Km ³	Available in Pakistan ⁴	Not available ⁵
Human Resources		√			
Factory Managers		√			
Accountants		√			
Mechanical Engineers		√			
Industrial Engineers			√		
Marketing Person			√		
Supervisors		√			
Technical Staff					
Machine Operators					
Factory Helpers					
Daily Wager laborers					
Energy					
Gas	√				
Electricity	√				
Alternate Energy					√
Construction Material (Cement, Sand, aggregate, water, cables, and other material)		√			
		√			

¹ This refers to the facilities planned or available already within the Marble City Risalpur, or Risalpur city

² Nowshera being the nearest district headquarter and there is a presence of various service providers and it is around 10 kilometers

³ Within a radius of 100 kilometers two major cities Peshawar and Islamabad are located and most of the services are available

⁴ Lahore, and Karachi are two main cities where most of the service providers can be found

⁵ Not available refers to the services are not available within Pakistan

Product/Services/Facilities	Within MCR ¹	Within Nowshera ²	Within 100 Km ³	Available in Pakistan ⁴	Not available ⁵
Construction Laborers		√			
Computer					
Networking		√			
Cabling		√			
Computer peripherals and accessories		√			
Computer Stationary		√			
After Sales service			√		
Web Developing			√		
Webhosting Services			√		
Electronic Repairing Facilities					
Electronic equipment Repairs		√			
CNC Machines Repair				√	
Specialized machinery maintenance					√
Electricians					
Wiring		√			
Industrial Electrician		√			
Generator			√		
Packing Material					
Wooden Material		√			
Other form of Packing material			√		
Styrofoam			√		
Container			√		
Container Terminal			√		
Certifying Agencies (Organizations whose certificates are internationally acceptable)					√
Communication					
Telephone	√				
Internet					
Internet (Broadband)			√		
Internet (Dialup)	√				
Machine/ tool manufacturing Facility		√			
Processing Machinery					√
Light Engineering		√			
Machinery Pool		√			
Health Care Facilities					
Basic Medical Treatment		√			
Specialized Treatment			√		
Diagnostic facilities		√			
Emergency health services		√			
Financial institutions					

Product/Services/Facilities	Within MCR ¹	Within Nowshera ²	Within 100 Km ³	Available in Pakistan ⁴	Not available ⁵
Commercial Banks		√			
Emergency Services					
Fire Fighting		√			
Rescue		√			
Disaster Management		√			
Capacity Building					
Training Institutes			√		
Vocational Institutions			√		
Industry Specific Vocational Institutions					√
Other Services					
Legal Services			√		
Audit Firms			√		
Payroll Management			√		
Architects/surveyors(services)			√		
Photographer for product profiling					
Printing services		√			
Advertising			√		
Marketing			√		
Industrial Layout Designing			√		
Educational Institutions					
Primary School		√			
High School		√			
College Girls & Boys		√			
Private School		√			
Other Facilities					
Security Services	√				
Weigh Bridge	√				
Solid Waste Management	√				
Industrial Waste Management	√				
Waste treatment plant	√				
Water Recycling plant	√				
Fuel Stations		√			
Workers Colony	√				
Testing and Monitoring Facilities					
Stone Testing Facilities					√
Quality of Air and Industrial affluent testing					√
Noise metering					√
Facility to monitor other forms of pollution					√
Other Testing facilities (<i>To be determined</i>)					√

Product/Services/Facilities	Within MCR ¹	Within Nowshera ²	Within 100 Km ³	Available in Pakistan ⁴	Not available ⁵
Security/Emergency Services					
Industrial Security Service	√				
Factory Guards		√			
Police Station		√			
Fire fighting		√			
Recreational Activity					
Health Club		√			
Hotels and restaurant		√			
Other facilities (TBD)					
Car Rental Services			√		
Technical guidance/support/facilitation					√
Water	√				
Telephone Exchange		√			
Mechanical and electrical workshops		√			
Model Factory	√				
EPA		√			
Skilled labor force		√			
Logistic					
Transportation Facility	√	√			
Warehouses	√				√
Goods Clearing and forwarding services	√				
Electricity and other utilities	√				
Construction consulting services		√			
Export Facilitation			√		
Market Information service					√
Library Digital					√
Marketing support					√
Infrastructure (Roads, other facilities)	√				
Mosaic Designing Facility					√

Action 4: PASDEC to update this list on a bi-annual basis. The responsible person can circulate detailed notes to the senior management team and Board of Directors as sections are updated with actual provider names.

4.5 EVALUATION OF SHARED LABORATORY AND TESTING FACILITIES

Standardization and accreditation can only occur when the necessary infrastructure is in place for this to occur. The existence of quality laboratory and testing facilities would be monumental for the dimension stone industry.

Testing services of dimension stones can add value to the output of the stone quarrying and processing industry. Presently, there are three testing facilities operating in Pakistan. These cater to the need of the dimension stone industry on a limited scale.

- Material Testing Labs Department of Mining Peshawar
- Center of Excellence University of Engineering Peshawar
- PCSIR Peshawar

These laboratories serve the local dimension stone industry on a limited scale due to inadequate technical capacity, and a lack of awareness among the processors of dimension stones about the role of stone testing in marketing. There is an opportunity in the market for a testing facility catering to the needs of the industry and achieving internationally accepted standards.

The requirements of the buyers vary from market to market and every market calls for a specific set of standards, e.g. ASTM standards are followed in North America, EN are followed in Europe, and Australia follows Australian Stone Standards. The laboratory should have the capacity to fulfill customer requirements and should be accredited to the International Laboratory Accreditation Cooperation (ILAC) or similar bodies.

The figure below presents the primary market for the services provided by the stone testing laboratory (STL) in addition to the necessary qualifications and benefits of establishing and operating a laboratory.

Figure 2: Stone Testing Lab & Services

Market	Stone Testing Lab	Benefits
Government Departments	<p>Services:</p> <ul style="list-style-type: none"> • Stone Testing Services • Advisory Services • Product Certification • Fitness for use in different situations <p>Necessary Qualifications:</p> <ul style="list-style-type: none"> • Qualified Human Resources • Technical Capacity to undertake tests according to the market needs • Accredited with international and local institutions • Financial Resources 	<ul style="list-style-type: none"> • Removal of technical barriers • Enhanced product's acceptability • Value addition • Increased confidence • Time and Cost saving by making these tests locally • Credible information about product
Quarry Owner		
Stone Processors		
Exporters		
Construction Industry		
Importers of Stones		

Action 5: PASDEC to work with established stakeholders to increase the quality and availability of shared laboratory and testing facilities. PASDEC to investigate strategic partnerships as Marble City Risalpur is developed and laboratory output aligns with market need. This will build the faith of foreign buyers in the products.

4.5.1 ESSENTIAL LABORATORY EQUIPMENT

One of the most crucial elements in the uplifting of an industry is the credibility of its products and their quality assurance. If the claim of aiming toward ‘best practice’ is to be taken seriously, the stone product has to be of the highest quality. Close arrangements and partnerships with credible laboratories is one way of achieving this goal. For the purpose of understanding this not to be a cheap exercise, equipment essential for the establishment of a stone laboratory are listed.

The initial cost estimate of the equipment (in USD) is \$650,000, equivalent to PKR.54.6M (Approximate April 2010 exchange rate of 1USD=Rs.80). This list is not exhaustive, but serves an illustrative example of the specialist equipment needed within a basic testing laboratory.

Table 5: Stone Testing Laboratory Equipment

Serial #	Equipment
1.	Universal Testing Machine
2.	Abrasion Testing Machine
3.	Corrosive Testing Machine
4.	Distillation Plant
5.	Specific Gravity Testing Balance
6.	Compression Testing Equipment
7.	Mohs Kit
8.	Flexural Test Machine
9.	Skid Resistance Test
10.	Abrasion Machineries and Equipment
11.	Sonic Velocity Equipment
12.	Thermal Shock Equipment
13.	Sliding Machine & Equipment
14.	Archimet Test Equipment
15.	Acclimatization Set
16.	Oven(s) & Furnace
17.	Deep Freeze
18.	Cutter, Slider
19.	Drilling
20.	Bending Strength Equipment
21.	Impact Strength Equipment
22.	Thin-Section Set
23.	Microscope(s)
24.	ICP-MS (chemical analysis)
25.	Chemical Material (for salt crystallization, etc.)
26.	Compressor

Other cost centers for setting up a Stone Testing Laboratory (STL) are:

- Cost of Construction of STL
- Operational Costs (salaries and other operational costs)
- Cost of accreditation(s)
- Procurement of necessary standards (ASTM, EN, and other according to requirements)
- Capacity building of the laboratory technicians and other staff

Action 6: *As part of the proposed Marble City testing laboratory, the task of undertaking a small Gap Analysis for the lab with comprehensive costing is complete within 6 months of assignment. The user-pays model should include realistic cost recovery assumptions for prompt payback.*

4.5.2 COMPARISON OF INTERNATIONAL STONE TESTING PRICES

The table below provides a comparison of rates charged for conducting different tests in India, USA and Australia. The information presented here was retrieved from multiple sources; Indian: CDOS, US and Australian data was retrieved from *findstone.com*. Tests are used for the purpose of comparison.

Table 6: ASTM Test Cost & Country Comparison

Tests	India (US\$)	USA US\$	Australia US\$
ASTM C97	\$ 59	\$150	\$110
ASTM C99		\$300	\$250
ASTM C121	\$45	\$150	
ASTM C170	\$ 135	\$575	\$320
ASTM C241	\$ 135	\$300	
ASTM C880	\$ 135	\$300	\$275

4.5.3 COST RECOVERY MECHANISM

The cost of services can be recovered by levying a fee for conducting tests. If the Stone Testing Laboratory is able to provide industry with reliable testing facilities and the benefits of using stone testing services are accurately promoted, the potential to increase user numbers of stone testing could be significant.

The Stone Testing Laboratory can sustain its operation by offering services according to market requirements. Below is an abbreviated list of services:

- Stone Testing Services
- Advisory services for the industry
- Product certification
- Pre-shipment inspection on behalf of importers
- Quality Control Services
- Knowledge repository services

Revenue generation will be dependent on the following factors:

- Promotion of the importance of stone testing

- Increases in the volume of value added products
- Number of participating importers
- Number of varieties exported
- Product positioning with respect to usability

Action 7: PASDEC to consider the merits of holding a series of workshops for plot holders and interested parties outlining the greater profit potential to those suppliers with product certification.

5. ENABLING ENVIRONMENT

The macro environment of an industry is generally shaped by political, economic, social, technological, and regulatory factors. The dimension stone industry has to overcome basic issues such as the security of raw material supply as well as more how to attract foreign capital to invest in plant and equipment or companies who need seed money to finance their operations.

5.1 RELEVANT GOVERNMENT POLICIES AND SUPPORTIVE STRUCTURES

Every industry is subject to guiding policies and regulatory frameworks. The purpose of policy is the provision of a level playing field and baseline rules for business to operate within. National environmental standards have to be adhered to and industrial policy shapes the overall business environment.

5.1.1 STRATEGIC TRADE POLICY FRAMEWORK 2009-2012

Industrial policy reflects the priorities of government. The Strategic Trade Policy Framework (STPF) aims at improving exports by initiating structural transformation. Under the framework, efforts are focused on enhancing the sectoral competitiveness of minerals. The mineral sector contribution to GDP is 2.4% and is far below the true potential. The STPF reflects a commitment of government and is evident in the following paragraph:

“Keeping in view the favorable geological environment and the large number of mineral resources in the country, the Government is fully committed to making the mineral sector one of the most dynamic sectors for the country. The ministry of Commerce would join hands with the Ministry of Industry, Petroleum and Natural Resources and Board of Investment to devise effective ways to transform Pakistan’s mineral sector as a major foreign exchange earner...and supplier of raw material and intermediate goods in the local market.”

Other statements contained in the STPF, if implemented successfully could be key enablers for the dimension stone industry:

- Financing at reasonable markup
- Reliability of electricity supply
- Insurance coverage for visiting buyers
- Support for compliance certification
- Compensation for inland freight charges
- Sharing the cost of compliance with safety standards
- 0% duty on the import of machinery for the purpose of stone processing industry

The covenants of the framework offer a promising future for the industry and if implemented would assist the building of Marble City Risalpur and the greater dimension stone industry in Pakistan. PASDEC will need to assign some attention to following this up, as government policy and its implementation are distinct and separate matters.

The operating location or locations of a business can be one of the most important issues determining success. A well chosen location can ensure that the business has access to its customers, suppliers, a reliable workforce, or sufficient room to effectively undertake its operations. International research into the factors influencing the selection of a firm’s operating location within an industrial estate highlights the importance of access to markets, transport routes and labor resources. Also of importance are the cost of the site to acquire and commission, and also the availability of supplies and

support services and public utilities (e.g. power, water and gas). Finally, the level of support or regulatory interference by governments, and the nature of the surrounding community environment are also key considerations.

Action 8: PASDEC Board of Directors to put the Strategic Trade Policy Framework (STPF) and its relevant sections on a watch list to be reported against regularly or as requested by the Board.

5.1.2 MINING RIGHTS AND SITE DEVELOPMENT

The mining industry is governed by the Mineral Policy 1995 with limited implementation success. Rental agreements established between the lease owner and the local inhabitants are loosely defined and are not regulated by the mineral departments. Quarry leases are often revoked due to inconsistent political conditions and the reassignment of personnel holding the relevant key government roles.

The ability to own all types of property and to lease, transfer and register that ownership is a fundamental requirement of business and economic growth. The real property registration and mine leasing processes in Pakistan are slow and complex. These directly affect the marble and granite industry. There are also significant problems with access to implementing institutions. A unified, coherent, reliable, and modern system of property registration and mine leasing needs to be developed and implemented.

Action 9: PASDEC to consider the assignment of internal resources to investigate compliance issues for mining lessors such as property registration, lease conditions and rights under the conditions of the lease.

5.1.3 ADHERENCE TO BUILDING CODES AND OTHER

The process of factory construction requires all tenants of Marble City Risalpur to follow the building codes as laid out by the Pakistan Engineering Council for the construction of buildings. This includes adherence to environmental regulations. In order to be competitive in the international market, international rules and regulations need to be complied with. The necessary international standards with regard to quality, labor, environmental, and phytosanitary standards also need to be met. Below is a list of laws and regulations for the tenants of MCR. These are a source of competitiveness for the products to be produced here.

- National Environmental Policy
- National Environmental Quality standards
- Labor rules
- Marble City Risalpur Rules and Regulations

5.1.4 ADHERENCE TO INTERNATIONAL STANDARDS

International standards and requirements vary from one country to another. An example of this is untreated wood packing material with prohibited entry into a country such as Australia (ISPM-15).

By way of example, in February 2010 the Australian government issued a warning against the importation of natural stone tiles from China. The use of tremolite asbestos (a carcinogenic substance) is a mineral consisting of needle-like fibers, which can lodge in the lungs and cause asbestos-related diseases including mesothelioma, a form of lung cancer. The importation, sale or use of all forms of asbestos is prohibited under the Customs (Prohibited Imports) Regulations 1956 and the NSW Occupational Health and Safety Regulation 2001.

Similarly, some chemicals are banned from entry into Europe. The products using those chemicals cannot be exported. There is a need to be aware of all the relevant international rules, regulations and restrictions so that appropriate steps can be taken prior to export.

Action 10: PASDEC to collect, collate and post relevant information on its website, as well as disseminate in other electronic and print form exact import conditions and restrictions for all countries where stone product is, or intends to be, exported. This will greatly assist potential buyers.

5.1.5 FINANCIAL SECTOR

Currently there are no financial incentives for investors or any financial products available catering to the financing need of the dimension stone industry. Presently, financial institutions are reluctant to lend to industries located in NWFP due to the prevailing law and order situation. However Marble City Risalpur is located in the relatively safe area of NWFP.

Action 11: PASDEC to investigate their ability to act as an intermediary with the banks. The management of MCR may be in a position to negotiate with financial institutions on behalf of tenants. PASDEC to investigate the possibility of customizing industry specific financial products to suit the needs of dimension stone companies.

5.2 COMPARATIVE AND COMPETITIVE ADVANTAGES

5.2.1 INDUSTRY COMPARATIVE ADVANTAGE

Pakistan is endowed with a huge reserve of dimension stones and the cumulative known reserves are a fraction of the total available reserves. (*The News dated March 2, 2010* - A news item appeared in the press stating Pakistan is endowed with more than 297 billion tons of reserves of dimension stone). The comparative advantage of the industry lies in the fact that Pakistan is one of the leading countries with huge reserves of dimension stones, and labor is available at lower cost compared to Italy and other European countries.

Table 7: Average annualized salaries comparative employment – mining & quarrying

Country	Annual Wage US\$
Pakistan (<i>Wikipedia</i>)	3020
China (www.worldsalaries.org , PPP 2005)	7440
Sri Lanka (<i>Wikipedia</i>)	1690
Italy (www.worldsalaries.org)	13,740
USA (<i>Wikipedia</i>)	15,080
Turkey (<i>Wikipedia</i>)	7,376

As is shown in Table 6, at present the comparative wage advantage of Pakistan is a great asset. It should be noted that as efficiencies in production capacities and quality levels rise across the board, domestic wage increases will reduce this advantage. Workers in the stone industry will demand higher wages as their skill levels increase. This is not necessarily a bad thing, and can be justified as the sophistication of a sector and its output value increases.

5.2.2 INDUSTRY COMPETITIVENESS

A number of basic factors and conditions at the quarry and processing factory floor inhibit higher prices being achieved in the stone industry. Poor planning at the firm level can have a negative and dragging effect on productivity. Evidence and examples of how to lift an industry (see Action Items

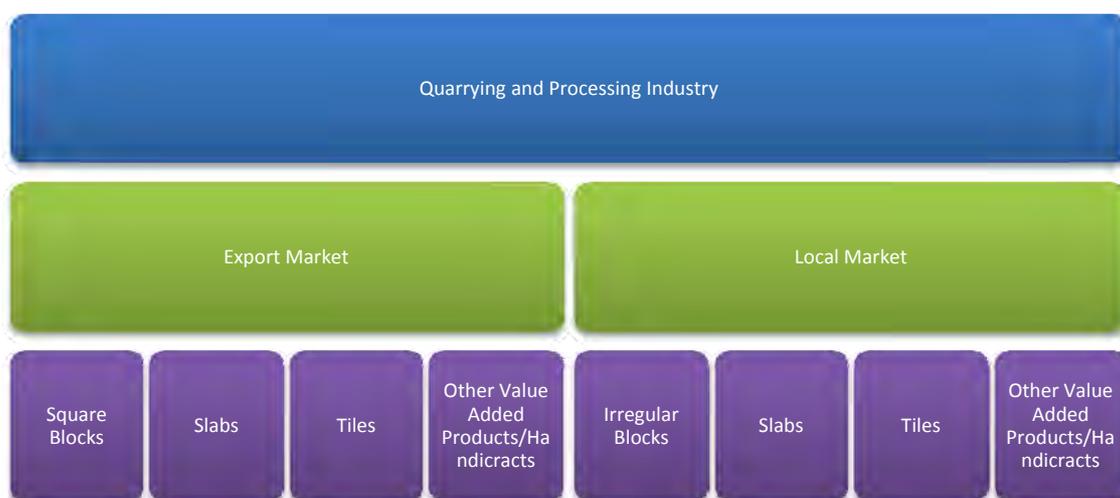
Section 3) to the next level of achievement and output are throughout this business plan. PASDEC will need to internally organize and prioritize with the aim of lifting the overall competitiveness of the industry segment it represents.

Near term (2010-2013) growth potential exists if this business plan is digested and executed. Some of the main focus areas are the review of workflows and work streams at the quarry and processing sub-sectors, the introduction of some technology (such as inventory management systems – whether for blocks and their movement or for the number and type of slabs at a particular processing plant) or the way in which prospecting methods are adopted and cost-effective innovations such as clear documentation at the shipping and handling end are streamlined.

5.2.3 SPECIFIC PRODUCT LINES

The current product mix in the dimension stone is given in the figure below;

Figure 3: Specific Product Lines



5.2.3.1 IRREGULAR BLOCKS

Traditionally irregular blocks are extracted from quarries and these blocks are transported to local processing plants as there is no market for them in other countries. It is not economically viable to import these irregular blocks (also known in the industry as potatoes). At the processing plant these irregular blocks are either cut into square blocks or in the form of slabs. The percentage waste associated with this type of irregular block is no less than 70%.

5.2.3.2 SQUARE BLOCKS

Square blocks are processed from irregular blocks or extracted from quarries using modern methods and their demand is in the local as well as export market. Due to the efficiency of their shape, waste can be minimized to the industry standard of approximately 40%. The greater proportion of usable sheets can be converted directly into greater profits for the quarry owner, and subsequently gives the processing plant access to a greater volume of raw material with which to work. Industrial volumes will increase by a factor of 2 if square block production becomes the exception rather than the rule.

5.2.3.3 SLABS

Slabs are large semi processed sheets of marble stones with varied size and thickness. They are further processed in the local industry or exported to the international market. Slabs are cut on gang saws from large blocks of dimension stones. This category of product provides the user with the flexibility to cut and use according to specific requirements. General uses include table tops, kitchen tops, wall facing and flooring. Slab prices vary with the quality of material, color, physical properties, appearance and grain size. Slabs can achieve high prices in local and international markets. The

demand in residential demand in countries like Australia in recent times has continued the trend in higher prices being paid.

The slab size is directly proportional to the price it can command, i.e. larger the slab size higher will be the price. Table 6 compares different stone varieties, their sizes and the prices they command.

Table 8: Comparative Product Analysis – Stone Variety & Price

Stone Name	Prices in US\$ per Square Meter				
	Dimensions in centimeters				
	30 x 30 cm	30 x 60 cm	60 x 60 cm	60 x 90 cm	90 x 90 cm
GOLDEN	14	15	16	17	18
ONYX with only Veins	40	45	50	55	60
ONYX with small Patches	36	41	45	48	52
Verona	18	19	22	23	24
Verona Plain	20	21	25	28	32
Khargoosh Pink	27	28	30	32	34
Oceanic	19	20	30	32	35
Ziarat White Grey	19	22	35	37	40
Ziarat White Super	30	35	60	65	70
Burma Teak	44	46	52	55	60
Jet Black	24	26	30	33	35
Black Tiger	22	22	23	25	28

<http://www.findstone.com/pl/401.htm>

5.2.3.4 TILES

Tiles are made from slabs and they can be found in various sizes and textured finishes. Currently most of the tiles produced locally are used for domestic consumption and a minimal percentage is exported. If PASDEC wishes to size the current capability and future potential of the tile export market, it can carry out a quick analysis and consider appropriate actions for its development. It may also be a 'diseconomy' to investigate something with limited value in the overall scheme of PASDEC's role. This is why prioritization at the planning level needs to be transparent and swift.

5.2.3.5 OTHER VALUE ADDED PRODUCTS/HANDICRAFTS

Handicrafts are considered value added projects and they are produced from marble and onyx. Handicrafts target both the local and export markets. If time permits, PASDEC or one of its partners can produce a small report on the value addition of handicrafts as a sub-sector and its job creation opportunities.

5.3 WASTE REDUCTION - EXTRACTION AND PROCESSING STAGES

The dimension stone industry in Pakistan is still in an early stage of development. The industry still faces low productivity and high wastage at all stages of the value chain. According to 2010 PASDEC estimations, approximately 75% of the quarried stones are wasted due to inefficient and rudimentary quarrying methods practiced by an unskilled labor force. The remaining 25% successfully extracted is inconsistent and in irregular shapes. This limits the ability to realize the true revenue potential for the extracted stone.

Wasting Valuable Stone:

Despite the vast reserves, poor mining techniques diminishes value opportunities

Block extraction increases market price from Rs. 1500/ton to over Rs. 10,000/ton (April 2010)

Model Quarries will demonstrate profitability at the extraction level

Assistance with quality equipment and requisite training and development needed

Loss reduction target 45% by 2013

Better prospecting

A small percentage (3%) of the recovered stone is exported after being cutting into blocks, and during this process more than half is wasted. Various stages of processing are depicted in the figure below, which also shows that net recovered stone is only 15%. This is far below the average for the industry and far short of the industry benchmark.

There is a significant potential to reduce waste at all stages of the value chain from the quarry to the final customer. Quarry up-gradation is a

key enabler as a significant portion can be reclaimed at this stage.

One of the potential areas of opportunity for a new market of quarry waste is cobblestones. Appendix 1 contains a summarized version of the potential for the export of cobblestones to identified target markets.

Action 12: PASDEC will investigate the possibility of establishing a quality department to attain the industry benchmark of quarry waste minimization by 2013.

Action 13: PASDEC to investigate the viability of utilizing quarry waste through cobblestone production. The investigation can look at social responsibility, the provision of jobs to unemployed and underemployed people in KPK (formally NWFP) and Baluchistan as well as the merits and marketability of using quarry waste as an eco and 'green' output.

5.4 TECHNOLOGIES TO SUPPORT GEOLOGICAL MAPPING GEOCHEMICAL PROSPECTING

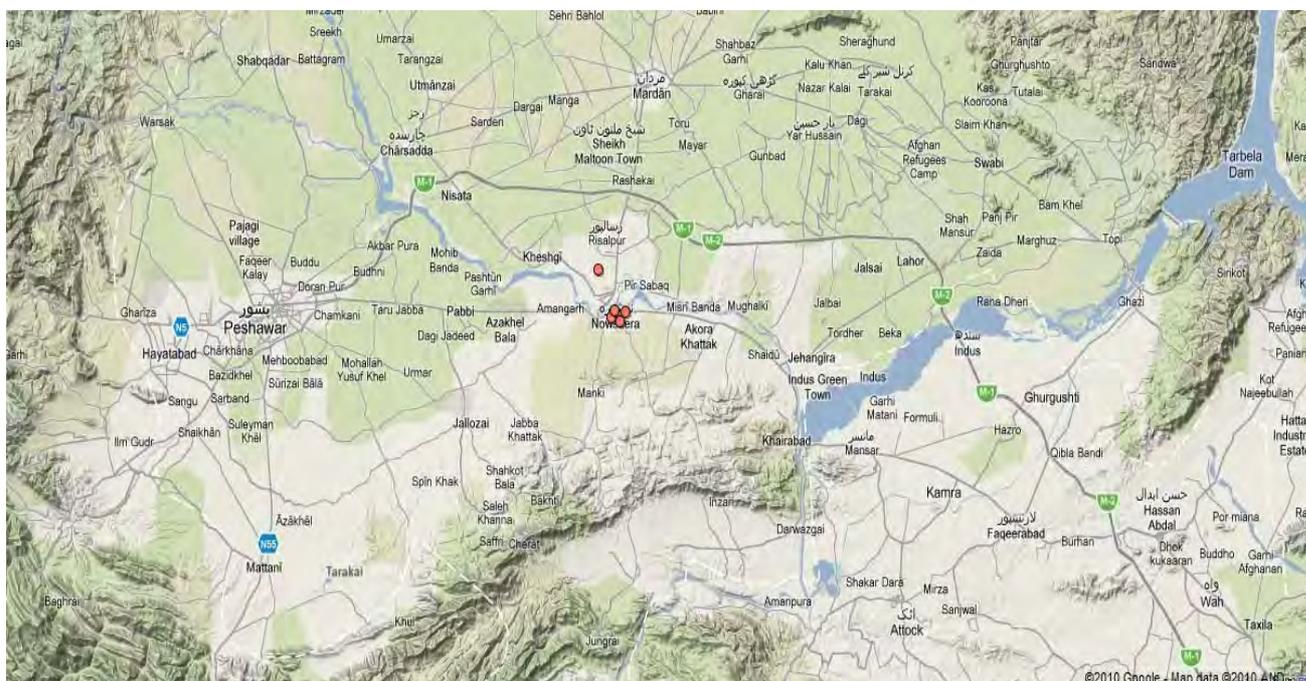
The Geological Survey of Pakistan (GSP) is entrusted with the responsibility of developing geophysical and geochemical maps and reliable geo-data. GSP has mapped all regions within Pakistan with respect to the occurrence of minerals, and has produced a number of maps. There is still more to be done within this field.

If a comprehensive survey of the occurrence of various forms of dimension stone is carried out, greater planning and mining accuracy with respect to deposit concentrations, estimated volumes and type. Once dimension stone availability is ascertained with greater accuracy and forecasting, PASDEC will have better control over its knowledge of supply levels, regional location, budget assistance and advice throughout the entire supply chain from extraction to end customer.

Action 14: PASDEC to work with stakeholders to continue the knowledge within the geological mapping and geo chemical prospecting fields. This may take the form of running awareness workshops for processors and suppliers to highlight the importance of forecasting supply locations with accuracy.

5.5 STRATEGIC LOCATION OF MARBLE CITY RISALPUR

Figure 4: Marble City Location Map



Marble City Risalpur is strategically located in the hub of Quarrying clusters; Chitral, Dir, FATA, Swabi, Buner, Kohat, Manshera, and Nowshera. The Risalpur location is in a relatively safe region, and close to the Punjab border. The quality of the supportive infrastructure is adequate and this has allowed the 200 plot development to attract significant interest from plot buyers.

PASDEC has already demonstrated the type of project it wishes to proceed with in terms of the publically available Master Plan. While technical questions and issues will arise within the plan, the difficult task of integrating it with the surrounding existing infrastructure will be a strong determinant of success. As demonstrated in other industrial estates in Pakistan, basic services and connections are provided to most industrial parks. The road infrastructure has the capacity to serve the prospective industries, but the carrying capacities need to be determined through a detailed analysis and report.

The supportive mechanisms required to service primary industry include:

- Light engineering and skilled human resources for the construction of factories are available as the Dimension Stone processing units are already operational in Nowshera Small Industrial Estate.

- Educational institutions such as the Engineering University Peshawar are within close proximity. They have the capability to provide technical expertise to the industry. At the time of writing, there appears to be minimal collaboration between academia and industry collaboration.

Action 15: *PASDEC to work with the relevant public and private agencies and to act as a link to government for timely infrastructure upgrades and service provisioning. PASDEC to commission a working group or task force detailing infrastructure provisioning, road carrying capacities and government responsibilities with respect to these items.*

Action 16: *PASDEC to investigate and create a link with institutions such as the Engineering University Peshawar if sufficient value is determined. This could provide an opportunity for practical research to be applied in the field and advance targeted areas of dimension stone.*

Figure 5: Marble City Distances from Key Infrastructure

Distance from Karachi Port	:	1,500 kms
Distance from Gwadar Port	:	2,300 kms.
Distance from Dry Port Peshawar	:	60 kms
Distance from Nearest Railway Link	:	Railway track passes in the vicinity of MCR and is close to Risalpur Station
Distance from Islamabad Dry Port	:	100 kms
Distance from Motorway M-1 (Peshawar to Islamabad)	:	3 kms

6. INTEGRATED LAND USE MANAGEMENT AND PLANNING

Urban and industrial developments across the world are currently racing toward minimal, zero or reduced emission environments. According to the marketing literature circulated by PASDEC, Marble City Risalpur appears to have the same expectations. Only time will tell how many estates around the world will fair.

The importance of thoroughly interrogating any Master Plan as it develops into a more detailed and executable structure and subdivision plan is adherence to the integrity of the original concept and vision.

Figure 6: Marble City Master Plan (Non-Technical)



There is a long list associated with the way the land is to be used and the types of services and access points it may have. In basic terms, whether land is privately held or government driven, commercially focused or residential, the way in which it is able to enrich the function is intends to serve is a crucial test of its value and purpose.

Land use revolves around functional aspects and is encapsulated by statements such as “Marble City will ensure a consistently high standard of development throughout the life of the project and

contribute to the creation of an exemplary working environment. Government and business value will be maintained and increased, while the natural environment of Risalpur will be enhanced.” Embedded in this statement is the recognition of changing form and usage within an estate over time.

As mentioned here, respect for the natural environment is an increasing prerequisite for the attraction of the best labor, capital and investment.

Action 17: PASDEC planning team to review the Master Plan to check and remediate any inconsistencies and concerns as outlined in this business plan as well as add other items as they arise.

6.1 CONNECTIVITY WITHIN THE ESTATE

No industrial estate exists in isolation. All major connection points into and out of the park need to support and enhance commercial transactions. The promotional Master Plan has some sound surveying elements that can be further strengthened by detailed planning. The goal of urban planning should be to develop and facilitate the ‘Movement Economy’.

Natural and topographic features in any area should be used to highlight intended use. Vienna, Austria was originally a river crossing, and Sydney, New York and London were river ports when they were first planned to assist commerce. The evolution of viable and sustainable business options only occurs when the movement economy (of goods and services) is a priority within the context of planning.

PASDEC needs to consider (and work with traditional estate planning agencies such as NIP) how to successfully stage Marble City so that all proposed BASIC services to businesses and owner/operators allow them to develop their own lots for production purposes.

One of the critical corners within the plan where significant activity will take place for retail is from the central activity area (CAA) and cutting diagonally across the small shop retail to the south east corner. PASDEC has to consider traffic and human flows within this control point, as congestion will destroy physical amenity and commerce.

All of the cul de sacs on the plan (8 in total) should be reconsidered and redesigned as 4 point connections as connections are limited and only flow in a north south direction. They appear to have no function, and disturb the flow of small shop retail in the 2 Kanal south east portion of the estate.

Action 18: The group with the responsibility for planning oversight and compliance with internal planning controls and conditions need to give the highest priority to the ‘Movement Economy’ within Marble City. Attention to traffic and human flows within the major control points is critical, as congestion will destroy physical amenity and commerce.

6.2 SUPPORTS FOR CENTRAL ACTIVITY AREAS (ON MASTER PLAN)

A key feature of many broad acre industrial estates is the attention to aesthetics paid by the designers and planners. Green space can be a positive differentiator, and can make sense of the regular sized lots and road network.

A weakness in the Marble City Master Plan is the lack of support for the 1 Acre central activity area. Given the fact the estate covers 185Ha in total; the central activity area could cover a larger area and

Crucial Connectivity:

No industrial estate exists in isolation. All major connection points into, and out of, Marble City need to support and enhance commerce.

change its size and shape. The topographical survey and plan may actually show the designated ‘green space’ and residential are to be a swale, natural drainage point or a water collection area.

The 41x 2 Kanal shop retail units on the plan appear to be single fronted. This may be a wasted opportunity, especially if PASDEC is looking to showcase the quality of off-the-shelf and custom products from the businesses in the park.

Natural and topographic features in any area should be used to highlight intended use. Vienna, Austria was originally a river crossing, and Sydney, New York and London were river ports when they were first planned to assist commerce. The evolution of viable and sustainable business options only occurs when the movement economy (of goods and services) is a priority within the context of planning.

PASDEC should consider (and work with traditional estate planning agencies such as NIP) how to successfully stage Marble City so that all proposed BASIC services to businesses and owner/operators allow them to develop their own lots for production purposes.

Action 19: Conduct a post-implementation review of how single fronted small shop retail lots perform and function with the view to making necessary modifications for future planned Marble Cities.

Action 20: PASDEC seek to engage Pakistan’s best ‘natural materials’ architect or designer to create 2 features; a. the entry statement to Marble City and b. the park stone architecture for the central activity area.

Marble City Showcase:
PASDEC seek to engage Pakistan’s best ‘natural materials’ architect or designer to create the entry statement and park stone architecture for the central activity area. These features would set Marble City apart and demonstrate the use of unique Pakistan stone.

6.3 LOT SIZE, LOT TYPE AND ARRANGEMENT

The rectangle containing the 102x1 acre lots uniformly distributes and maximizes the use of the available space in Marble City.

The small shop retail (SE corner) area could be redesigned from the major road intersection at the central activity area (CAA) to include a 45 or 30 degree dual road (up to 65 foot width). Despite changing the shape of some of the 4 Kanal blocks, it would assist retail customers in accessing services and shops. With a greater volume of customers entering the estate, exit would also be an easier task for consumers and would take less time. The movement economy takes priority.

As mentioned, the removal of all cul-de-sacs is advisable unless they are redesigned in such a way that 4 (four) north-south-east-west compass points are incorporated. As vehicles have four options of movement, no sites in proximity are at disadvantage, and multiple visits are possible as well as minimizing customer and delivery mistakes.

Strengthening Small Shop Retail Section:
A 30° or 45° major road cutting through the small shop retail section draw greater energy to the most important corner of the estate, located at the Central Activity Area. Result – greater support for the ‘Movement Economy’

Action 21: Internal consideration and discussion of how the inclusion of a 30 or 45 degree diagonal dual carriage road would connect critical control points into and out of the estate, as well as facilitate greater commerce in future Marble Cities.

The Master Plan appears to have regular blocks and the 1 acre market in mind. This will presumably be for the stone processing market, although PASDEC needs to monitor what it feels the optimum size of a processing unit is. This will help in the planning and staging of future marble cities throughout Pakistan.

If estate development is divided into three (3) stages, half (50%) of the 1 acre blocks (~51 lots) will be developed reasonably quickly and should not affect the smaller ‘finishing’ businesses.

Within the Central Activity Area and green space, an opportunity exists for a trade area offering financial services, banking facilities (even mobile), health and wellness services, and tea/coffee shops. If needed, and depending on the physical features and limitations of the green space, additional 4 Kanal lots could fill out part of the triangle. However, if green space occupies over 10% of the 185 acre area of Marble City, it will add to the overall feeling of amenity within the estate. This appears to be lacking from other estates within the KPK region.

If the monoculture of only marble and granite industry companies is preserved (i.e. high percentage of stone companies in Marble City) throughout staging, PASDEC might think about adopting a risk management approach to development. This is done by considering where businesses are best suited to locate to ensure the highest level of profitability for all. Maximum efficiency would consider how the medium size and largest 1 acre blocks articulate to each other, and if block size equals the provision of vertically integrated services.

Many of the large acre blocks will need back lanes for drop off and pick up options and the ability for forward drive in/drive out.

Action 22: PASDEC or relevant planning group to monitor and evaluate how the form of the green space and commercial shops area affect the function of the estate. The observations will likely influence future designs, sizes, positioning and configurations.

6.4 INFRASTRUCTURE PLAN AND VEHICLE MOVEMENT

For optimum estate movement efficiency, the production or commissioning of a Traffic Management Plan is recommended. This plan would contain all road hierarchies and interconnections.

The transport plan would cascade into how lots are sized and arranged and dictate traffic flows and appropriate road widths and future widening. Road reserves should withstand up to fifty (50) years of increased traffic and upgrades.

A Traffic Management Plan would greatly facilitate the movement economy. Implemented correctly, it can suggest and organize the efficient flow of goods into, and out of Marble City.

Transport Management Plan:

The development of a comprehensive transport management plan would set Marble City apart from other estates in the country. It would ensure maximum efficiencies are considered to assist the *Movement Economy*.

If adequate utilities (water, sewage, power and road network) are provided by PASDEC and its partners as the developers of the estate, commerce will enjoy minimal disruptions to business and production. One of the major and lasting issues for business is the unreliable supply of power during critical business working periods, and load-shedding causing business disruptions.

Water, sewage and power provisioning will require hydraulic engineering and sustainability studies and reporting. The Infrastructure Plan would overlay this plan (known as pipes and wires plan). For example, the correct thickness of conduit and piping to run sufficient water and power (as demand and usage naturally increase over time) to acre sites would maximize production house and minimize disruptions and stoppages to business.

For the most effective planning of how commercial and general traffic will flow within Marble City, regional situational maps of Risalpur and surrounding districts would show connection points. These will identify where traffic comes from, and how these flows will be altered as Marble City is built out.

Transport planning will also greatly assist optimizing bus routes (for worker collection and drop off) and their frequency (peak and non peak hours) and where private transport (e.g. taxis) can park or wait. Failure to consider this can quickly and easily turn any estate into a chaotic mess, causing delays in deliveries and pickups, as well as deter potential customers from coming and consuming services.

Action 23: PASDEC or relevant park planning group to monitor transport and movement patterns and behaviors within Marble City to define the inputs for a future detailed Transport Management Plan.

6.5 SUSTAINABILITY WITHIN THE BUILT FORM

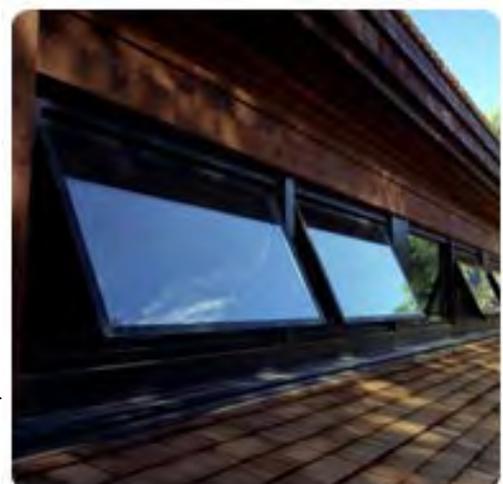
As sustainability is high on the agenda of almost every planned industrial estate across the world, PASDEC will need to produce detailed key criteria and their performance indicators in order to track progress.

At the level where businesses are affected, simple innovations such as roof design, air-flow design, site orientation taking into account where the sun hits the factory or warehouse at certain times of day and site layout can reduce reliance on electricity needed for air-conditioning and cooling as well as water needed for cooling machinery, or lighting needed for workers to carry out their jobs.

PASDEC can take a lead role and demonstrate these things to commercial owners by constructing 3 or 4 energy efficient designs that are also cost-effective and cheaper to run over the years due to the total cost of ownership and savings on outgoings (electricity, water, gas and maintenance).

In countries such as Australia where the sun is harsh for long periods of the day, the installation of relatively inexpensive clear storey windows (Clerestory) highlight the benefits of utilizing passive solar options.

Energy bills can be lowered as the factories have an additional level of light at their roof level. In some cases, electrical lighting can be reduced by over 80% depending on roof heights and design. The cost savings to the commercial owner of a factory or warehouse in Marble City would be significant.



As businesses consider building designs with floor space of between 500-1000sqm, savings can be instant if site orientation and building design are carefully thought of prior to submitting approvals and engaging builders.

Simple and logical design factors can significantly reduce operating costs. PASDEC

can educate businesses about orientations and openings to maximize north and south exposure and natural cross flow ventilation (use of natural breezes).

Action 24: PASDEC to produce a ‘Quick Reference’ guide for plot owners as part of their ‘Welcome Pack’ to the estate featuring sustainable commercial designs and their savings. This can be given after certain agreed installments have been paid.

In order to integrate sustainability to simple design and built form, PASDEC can demonstrate the following:

Natural Light

Rooflights – to introduce UV filtered sunlight into the center of the building, consideration should be given to minimizing solar gain by carefully selecting translucent rooflight material

Clerestory Windows – to introduce natural light into the center of the building, these windows reduce the requirement for artificial lighting

Ventilation

Side Wall Ventilation Openings – to encourage cross-ventilation through the building

Clerestory Windows – to provide an outlet for warm air rising to a high level within the building and to promote cross ventilation

Wind Powered Ventilation Turbines – to aid the relief of hot air at high level and to encourage cooler air to enter at low level in the building. This creates a ‘chimney-stack’ effect for air circulation

Roof Vents (active or passive) – large relief vents to further increase

How to Showcase Sustainability:

The only way to demonstrate sustainability options within Marble City is for PASDEC to construct 3 or 4 simple energy efficient workshop or factory designs in Stage I. Industrialists and owner/operators will be able to see them and ask questions about sustainable design and cost savings.

Clear Directional Signage:

One of the most frustrating things in industrial estates around the world is the lack of clear signage. Good signage will make businesses easy to locate and allow workers, buyers and suppliers to find the stone business they are looking for in the quickest possible time.

upward air flow in the building. This mechanical extraction can be cost effective and inexpensive to fit

Action 25: PASDEC to consider demonstrating sustainability options to industrialists and commercial owner/operators by building 3 or 4 simple energy efficient workshop or factory designs in Stage 1. Cost savings and reduced emissions can be quantified through the discovery process.

6.6 ESSENTIAL SERVICES WITHIN MARBLE CITY

From high level master plans right down to the detailed subdivision level, adherence to planning guidelines and enforcement are critical when determining the success of any estate. This section covers some of the high level considerations for PASDEC, NIP and the Planning Committees involved in execution of Marble City Risalpur as well as future sites. For estates expecting to compete globally, some of the macro issues are listed to illustrate considerations:

Loading Docks – For packing and movement of marble and granite orders (domestic and international). PASDEC needs to confirm there is sufficient room on business sites for the entry and egress of trucks and commercial vehicles as they load and unload goods.

Solid Waste and Recycling – Baseline infrastructure to comply with and exceed environmental restrictions and recycling practices. Marble City marketing material refers to re-use and recycling as important innovations of the estate.

Building Materials (use) – Reference to design guidelines for use of locally available Pakistani materials – adherence to insulation and noise qualities with durability as a central requirement

Parking Allocation – A critical piece of planning – where industrial unit owners have frequent visitation by customers and others. Part of the design guidelines. Worker movement in Pakistan is not generally by private car, therefore other mode of transport frequency and good reticulation cannot be overstated. The Master Plan does not appear to have allowed for adequate turning circles of trucks within the gazetted road. Access to businesses for efficient loading and unloading of product is paramount to the success of the business in the estate. This needs to be revisited as the subdivision plan is finalized.

Screening and Buffers – Adding to the aesthetics of the estate as well as helping integration issues with the surrounding residential neighborhoods and the adjacent Nowshera Industrial Estate. Local by-laws need to be reviewed to ensure adequate buffers are in place with the neighboring residential estates. This will likely not be a concern with the EPZA/Nowshera Industrial Estate, as it is zoned for the same purposes as Marble City, general and light industrial use.

Clear Directional Signage – The best global examples of industrial estates and parks always consider signage (external facing/entry statement/internal street) as central to their development. The value to workers, investors, government visitors, suppliers and delivery workers is immeasurable. The local government should offer assistance and ‘best practice’ examples of this. Also forms part of the design

Amenity, Amenity, Amenity!:

Upholding amenity & clear space:

One of the biggest non-technical challenges for Marble City management will be to keep pedestrian walkways & public areas clear of obstructions.

guidelines at the estate and individual plot owner. Practical issues of size, positioning, street and entry statement differences should be easily followed as plot owners individually submit their designs, sizes and positioning for approval.

Estate Landscaping – Often an afterthought with estate planning, but becoming more important over recent times. Well considered landscaping will provide valuable shade throughout the summer months and allow for more winter sun, depending on where plants and trees are planted. PASDEC will have to plan the integration with waste collection from site (as shown in plan with slurry capture at the back of each unit) where possible. If recycled water can be used on designated park green space, this can be considered a unique feature of MCR.

Management and Disposal of Storm water – The process of land surveying would have exposed the need to plan for runoff and storm water collection as well as the facilities needed.

Building License Issuance – The local government authority (Tehsil District Administration) in conjunction with the planning section and/or Marble City Estate Architects (appointed by PASDEC) will review and approve or seek amendment to detailed building documentation submitted. The resulting building license will ensure consistency and transparency of the process of development as well as deliver on the initial vision of PASDEC with the approved Master Plan in mind. Failure to adhere to the plot design guidelines (for all sizes 8/4/2 Kanal) will erode the integrity of the estate and have a ‘flow on’ effect to other parts of the estate, not the least of which would be strategic investment and public/private interest.

Environmental & Energy Calculations:

PASDEC will need to calculate an ‘Energy Requirements’ plan as businesses ramp up activity. Water, electricity, waste and rubbish collection, transport (diesel), gas estimations need to be included.

Examples below:

Water for Gang Saw = 800L/minute

Stone Polishing = 600L/minute

Small Cutting Machine = 100-120L/minute

Transport to Bunir = 1100Rs/Tonne

Transport to Lasbella = 3500Rs/Tonne

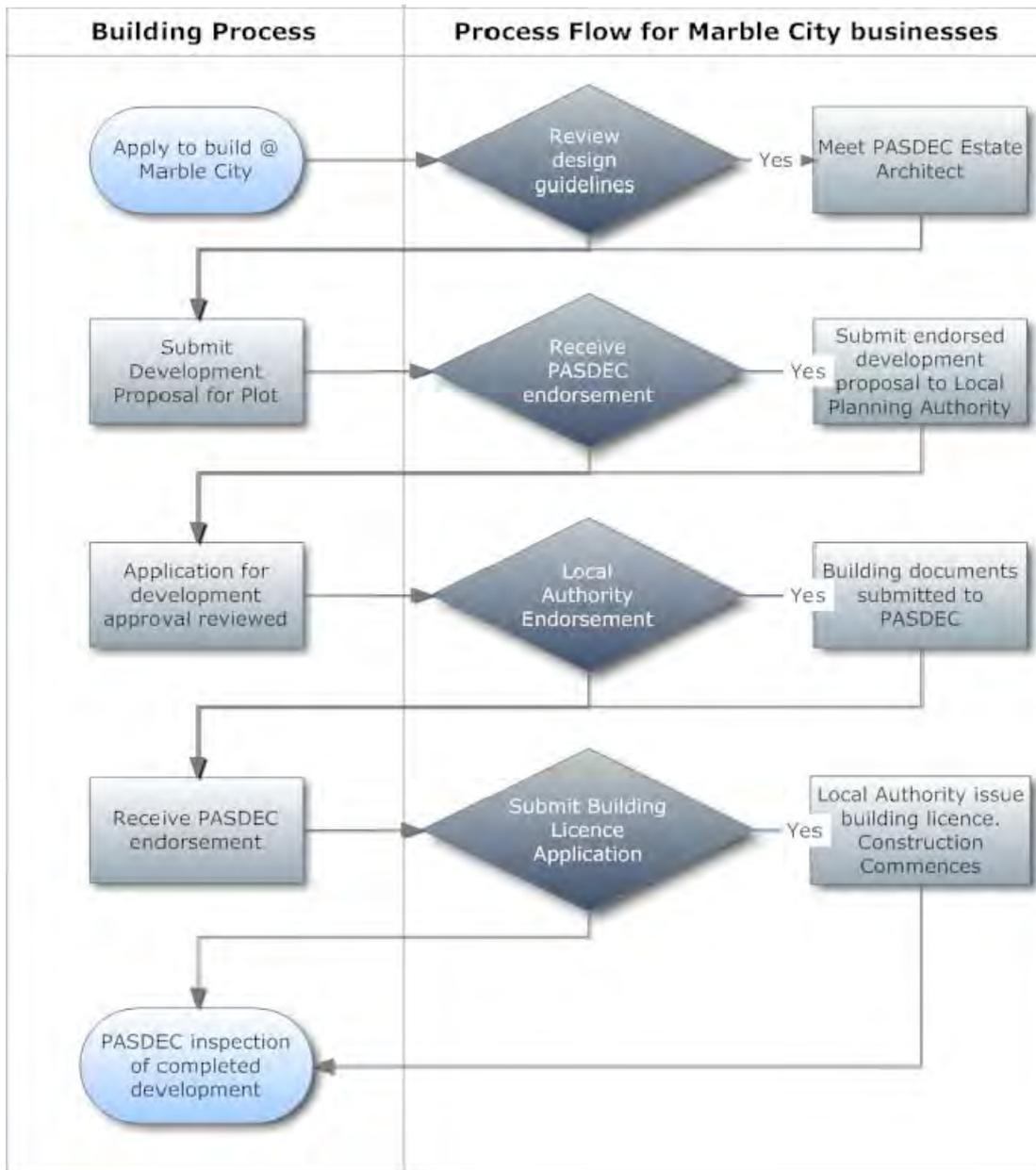
Lubricants (depend on type) = 210Rs/Liter

Stone veteran stone businesses say their biggest costs are electricity, raw material transportation, spare parts.

Figure 7: Building Approvals Process for Businesses

Building Approvals Process for Marble City

Critical coordination points for planning controls within Marble City Risalpur - as the integrity of the design and guidelines are implemented and monitored.



Stage 1 - Development Proposal Submission Requirements

The global practice of incorporating essential elements into planning and development has entered a renaissance in recent times. From the 1990's, greater attention how concept plans, district structure plans, local structure plans and subdivision plans tie together was evident in countries with developed planning regulation and enforcement systems. PASDEC and its planning approvals partners (i.e. Tehsil Administration) have a critical role in determining compliance with, and the success of

properly implemented planning local planning regulations, approvals and adherence to the design guidelines for Marble City Risalpur.

Failure to achieve any of the elements within the planning life cycle, right down to the satisfactory inspection of completed buildings on plots will result in partial or complete

Development proposal submissions to PASDEC and the planning authority for MCR must include the conceptual design, building and natural elements such as landscaping as follows:

1. Brief statement detailing the proposed operations on the premises
2. Sketch Plans
 - a. Site plan with boundary dimensions, existing contours, building location, building boundary setbacks, dimensions and layout of car parking areas, crossovers, waste bin areas, loading and unloading areas, display areas, pedestrian, vehicle circulation, paving materials, calculations for site coverage, parking numbers and area of landscaping, stormwater collection and disposal and calculations, water storage tanks, property boundary fencing and signage
 - b. Building plan(s) showing the internal arrangement of building showing – floor space usage and areas, the location of window glazing and other openings
 - c. Building elevations – sections and perspectives of the proposed buildings sufficient to describe the character of the proposal including – use of materials, colors and finishes, building heights and signage concepts
 - d. Landscape concept plans including – earthworks, ground treatment, existing trees and proposed planting distribution and types and irrigation (if applicable)
3. Other - consideration and notes on:
 - a. Active and passive sustainable initiatives for lighting, energy and water management, landscaping and irrigation
 - b. Building orientation
 - c. Passive venting for the building
 - d. Shading of windows and walls
 - e. Building fabric insulation
 - f. Energy efficient lighting
 - g. Air conditioning plant and control systems
 - h. High efficiency water fixtures and fittings
 - i. Storm water recycling

Another item of key importance is the fact PASDEC and the appropriate building approval authority need to work together to come up with an estimated timeline of how long any assessment will take to be granted approval. It is suggested 15 business days be the rule from the time an application is lodged to its approval. The best efforts to adhere to this principle will give the investors and

entrepreneurs comfort in the fact they are investing in a well managed and well organized industrial development. This type of quality governance will successfully prove the model being implemented at Risalpur.

Stage 2 – Building Documentation Submission Requirements

Building documentation submissions to PASDEC ensure the intent of approved development proposal's are carried forward to the documentation phase of the development. All elements are very similar to Stage 1, with the exception that sketch plans are now replaced by documentation drawings (see Item 2, Stage 1 above). Another difference is documentation to be provided also includes details of the materials, plant and equipment, fittings and fixtures being incorporated into the built form.

PASDEC and the appropriate approval authority will process the building documentation within 15 days of submission. The caveat is amendments will be required if the intent of the guidelines and compliance with the previously approved development proposals is not observed.

3. Site Guidelines

PASDEC has positioned Marble City as an estate aiming to reduce emissions. To this end, site layout and building orientation will play a big role in achieving part of this. When undertaking site planning within Marble City, buildings should be oriented and designed to conserve non-renewable energy. Simple and logical design factors can significantly reduce the daily running costs of buildings with little additional building cost.

Some of the ways in which this can be achieved:

- Orientations and openings to maximize the north and south exposure
- Orientations and openings to maximize natural cross flow ventilation such as cooling summer breezes
- Minimize east and west facing orientation, openings and windows, and the use of adequate shading where possible
- Well considered and planned landscaping can provide valuable shade throughout summer as well as make use of winter sun

4. Land Use

If an Industrial Park Outline Development Plan (IPODP) is available for Marble City, land use will be guided by the provisions within this document. All planning applications under various use classes will be assessed according to the permissibility designation for each use class. This is critical in order to maintain the balance of uses within MCR.

According to the plan, all of the 'common-use' precincts will be under the control of the estate management, namely PASDEC in this instance. PASDEC can also guide owners and builders on maximum building setback from the primary street frontage. If buildings are setback a minimum of 3 meters from both the side and rear lot boundaries, natural light penetration and natural cross flow ventilation will be greatly enhanced.

6.7 ESTATE STATISTICS

The baseline characteristics of the estate give an understanding of the scale and positioning of the industrial estate.

Table 9: Marble City Quick Stats

Estate Variable	Statistic
Total Land Size	185Ha
Price per square meter	3000 Rp
Expected Employment (Build Out)	3700 (direct)
Plot Price (1 Acre)	PKR 4.5M
Number of Plots	199
Distance to Islamabad	139KM
Distance to Peshawar International Airport	58KM
Distance to Railway Station Risalpur	3KM
Investment (Rs Million)	420
Average Wage (Skilled/Month)	PKR 15,000
Average Wage (Unskilled/Month)	PKR 7,000
Average Wage (Semi-Skilled/Month)	PKR 10,000

Occupational Health & Safety:

In addition to the ‘essential services’ marble processing facilities should play increasing attention to occupational health and safety standards. PASDEC may have a coordinating role within the estate offering basic services; the fees of which could be subsidized by Government support. International buyers are often interested in adherence to safe business practice and worker safety.

6.8 MAJOR INFRASTRUCTURE INPUTS

6.8.1 SHARED INFRASTRUCTURE – PRESENTING THE CASE OF SCALE

Common Facility Training Center Establishment

The establishment of this center can contribute to a range of developments in the industry as well as within Marble City. This includes the utilization of quarry waste to produce such new items as cobblestones for international markets, gender engagement in handmade and painted tiles and mosaics, and infrastructure upgrades as the volume of raw material demanded increases over time.

Across the value chain, process workers lack advanced stone working skills and are unable to capture the total value of the products they produce. For example, due to lack of up-to-date equipment and the skills to use to such equipment they have no facility or ability to:

- Carry out quality polishing of stone slabs or other products they produce;
- Appropriately size tiles into 12x12x1 inch tiles to 12x12x1/2 inch tiles as demanded by the market; and
- Chamfer the polished cut to size tile.

Absence of the above-mentioned capacity and the requisite equipment prevents quality processing and results in a lower market value for the stone produced. As a result, processors lose 30% additional income that could be earned through proper processing of the stone.

Quarry managers and processors alike lack knowledge of the properties of locally available stone that would enable them to decide the best and most appropriate uses of the stone. Further, there are no training opportunities or facilities for people to acquire knowledge about modern stone processing techniques.

The establishment of Common Facility Training Centers (CFTC) will overcome the current deficit in training and processing skills. Once operational, the CFTCs will provide skills based vocational training for processors and new workers. The CFTCs will assist to capture the value usually lost due to a lack of availability of a properly equipped and managed model processing and training facility. The CFTC will demonstrate the use of upgraded and new equipment. This will facilitate the production of higher quality outputs without substantial investments. It is hoped sales will increase and lead to greater investment from businesses in their operations.

The training aspect of the CFTC will have two major components:

- Training in processing of stone to produce better quality products such as tiles, and introduce new products based on new skills development and market demand
- Training in manufacturing of household handicrafts and mosaics, improving the quality of current products, and improving skills so that the local industry can effectively use upgraded technologies to expand product lines

In addition, the CFTC will also train processors and workers on basic management and business development skills. These will include:

- Checking for the overall quality of the products and improve packaging for the market;
- Developing improved sales, purchase and services skills;
- Selecting and purchasing stone waste and blocks for processing into handicrafts, mosaics and other products developed under the guidance of the CFTC.

Potential features of the CFTC include:

- Product display of goods designed at Marble City and manufactured at the CFTC
- Consideration of a profit sharing model whereby producers use income generated for their use of the CFTC
- Any shortfall may be met through government assistance and funding will be sought in the short term
- Lower levels of waste and correct training on how to handle slurry
- Access to a range of machinery to broaden the type and variety of products created by the small businesses

- Greater volume of goods produced to have a flow on effect to demands for better quality roads and other infrastructure to transport raw material to Risalpur

Key Result Areas for the CFTC include:

- Better quality jobs in terms of working conditions and income as a result of greater skill due to training
- Reduction in quarry waste through the introduction of new product lines such as cobblestones (targeted at such groups as the land development industry in certain international markets)
- Better quality and better designed handicrafts and mosaics customized to the needs of identified international target markets
- Business plan for the center including certain sales targets for participant businesses and assistance with their target markets
- An increased number of women engaged in decorative tile production due to business planning with them and on their behalf to aggregate their supply quantities to meet the demands of certain orders
- Training of labor to use different processing machines will increase labor productivity, which will lead to a wide range of quality products and higher income.

7. EMPLOYMENT GENERATION AND LOCAL JOBS

7.1 ANALYSIS OF MARBLE AND GRANITE INDUSTRY – EMPLOYMENT COMPONENTS

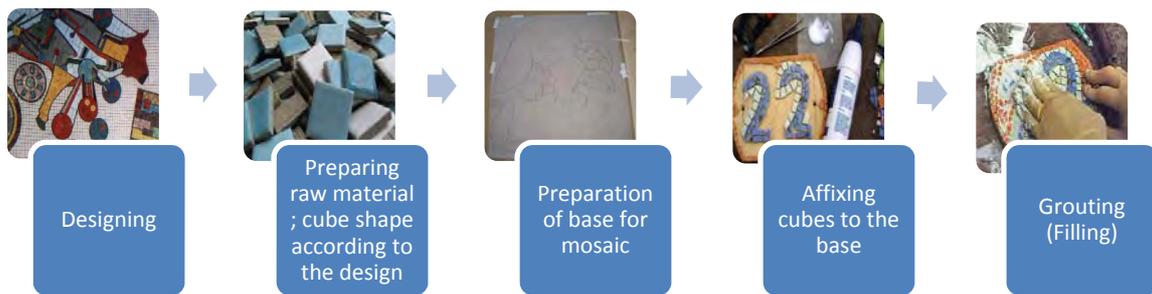
The dimension stone industry primarily comprises of quarrying, processing, and marketing all these processes need a specialized skill set and more than 76,000 people are working in this sector only in NWFP and FATA (*Marble and Granite Sector in NWFP-A briefing paper*). The industry predominantly employs male workforce however there is a potential of accommodating female workforce in this sector like in case of mosaic development, packing, marketing and office based jobs. Under the MCR there is a scope for employment in the following vocational groups;

- a) Management-Factory managers, estate managers
- b) Secretarial-estate management,
- c) Machines operators-factories, and common facilities
- d) General helpers-Factories and common facilities
- e) Computer operators- factories, common facilities, and mosaic development and assistance services
- f) Factory Supervisors- Factories and common facilities
- g) Designer- Mosaic development and assistance services
- h) Quality Assurance Monitors-Factories, Inspection agencies, buyers representatives
- i) Trainer- Common Facilities
- j) Electricians –Estate office, big factories, shared facilities, and self employed service providers
- k) Labors-development of estate and construction of factories
- l) Drivers- estate management, common facilities, factories
- m) Self-employed-Restaurants, machine shops, commercial activities, gas station, others
- n) Janitors- Estate management and factories
- o) Estate Manager- For the effective operation of estate
- p) Construction monitor and Civil engineers and other supervisory
- q) Construction workers skilled
- r) Fabricators- For the fabrication of factory sheds
- s) Machinist

7.2 GENDER OPPORTUNITIES – EXAMINING MOSAICS SUB-SECTOR

Most of the stone processing industry requires extensive physical work and it is considered to be an exclusive domain of male workforce, however mosaic can be a niche in the dimension stone industry which can provide employment to the female workforce. Mosaic is a technique of decorative art, and an aspect of interior decoration. In mosaics, small tiles (tesserae) are used to create a pattern or picture, which can either be used for flooring or for wall hanging. Figure below presents a flow diagram for the process adopted in mosaic development.

Figure 8: Mosaic Process Flow



All the processes depicted in the flow chart above have the potential to employ female workforce, and a factory with average production capacity of 21,000 square feet of mosaic operating at 50% of the capacity, can provide employment to 21 persons (*adapted from Pre-Feasibility Study Marble Mosaic Development Center, Small and Medium Enterprise Development Authority*). The breakup of the employment is given in the table below which has been adapted from the aforementioned prefeasibility;

Table 10: Typical Employment Numbers Mosaic Production Facility

Positions	Number
Factory Manager/Supervisor	1
Computer Designer	1
Cube Cutting Machine Operator	1
Figures Cutting Machine Operator	1
Tumbling Machine Operator	1
Helpers	2
Polishing machine operators	2
Skilled Labor for Mosaic making	10
Marketing Staff	2
Total	21

It can be inferred from the table above that every 10,000 square foot of mosaic produced can potentially provide sustainable employment to 21 people for one year 75-100 % of them can potentially be female. It can be further said that if the demand for the locally produced mosaic is enhanced it can lead to the enhanced opportunities for employing female workforce.

Action 26:

A. Develop a comprehensive training program for mosaic craft in collaboration with a local vocational institute and insert as budget line item

B. Assign a contact person for the purpose of building the mosaic sector. Tasks include assisting with design, production, quality, and building market linkages and sales

C. Create a ‘mosaic task force’ to collect and use stone waste

D. Devise short courses for plot owners and managers aimed at quality control and production efficiencies

There is much discussion regarding the aggregation of female producers of mosaic and inlay product and the opportunity to increase the quality and export potential of their output.

Action 27: PASDEC to work with this important sub-sector to increase exports in the mosaic sector from \$3M USD to \$5M USD over the next three years. This would represent an increase of 67%, and the creation of 2000 new jobs.

7.3 MODELING OF EXPECTED JOB CREATION AND EXPECTED ECONOMIC BENEFITS

Some estimates that approximately 6,000 direct and another 18,000 indirect jobs will be created as a result of Marble City Risalpur. This business plan modeled over 3600 direct full time equivalent jobs.

Table 11: Marble City Employment Estimates – at build out

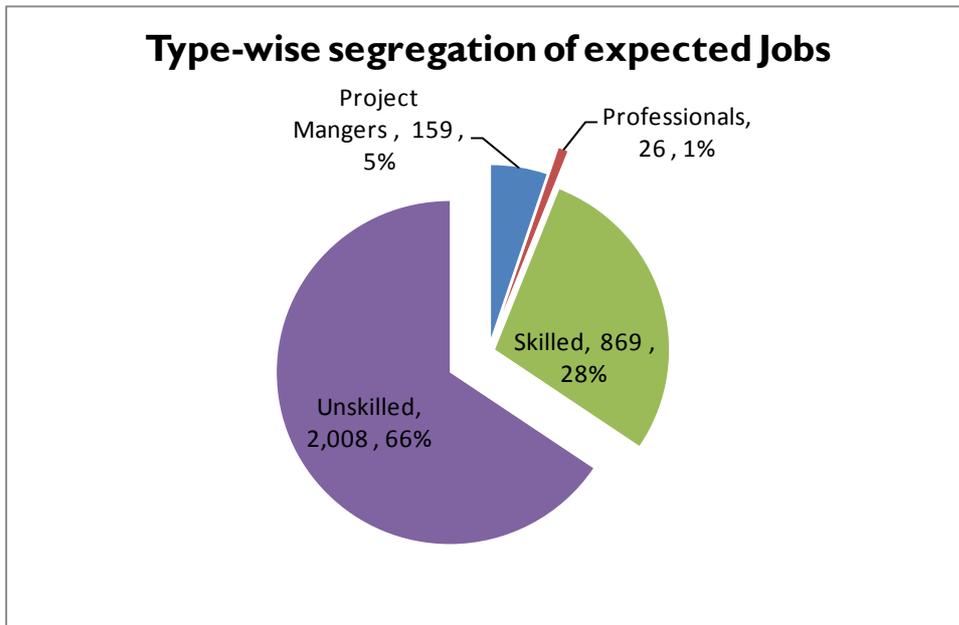
Category	Manager	Professionals	Skilled Supervisors/operators	Unskilled	Skilled Security Guards	Total
CFTC	1	7	7	7	3	25
Warehouse	1	2	5	10	3	21
Wastewater Treatment Plant	1	2	4	6	3	16
Waste Collection and Management System	1		4	20		25
Machinery Pool	1	2	15	6	3	27
Estate Management	1	3	4	8	3	19
Park Security	1				40	41
Expo Center	1	4		4	2	11
Stone Lab	1	6	6	6	2	21
Weigh Bridges	2			8	2	12
Dispensary	1			4	1	6
Fire Brigade	2		8			10
Grid Station	2		10		8	20
Service Area Industry (Restaurants, shops, hotels, and others)						400
Processing Units Large (8 Kanals)	102		510	1,224		1,836
Processing Units Medium (4 Kanals)	13		172	387		602
Processing Unit Small (2 Kanals)	18		54	108		180
Allied Industries						200
Mosaic Development	10		70	140		200
Total	159	26	869	1,938	70	3,672

Simultaneously, construction related industries will also develop in the adjacent areas which can employ more people. This could resolve some of the unemployment in the region.

- ✓ The employment scenario in the table represents Marble City at full build out (e.g. 2015-2016).
- ✓ The largest plot sizes (8 Kanal) are allocated to processing factories. Most sites will be equipped with essential stone processing machines. Estimated employment on larger sites around 18 workers
- ✓ Medium plots (4 Kanal) will employ around 14 persons with 3 or 4 machines on site
- ✓ Small plots may have mosaic, showroom, small shop retail and employ up to 10 persons
- ✓ 20 plots are earmarked for allied industries (13 plots from 4 Kanal & 7 plots from 2 Kanal) category
- ✓ Managers include owners as well; according to industry data, most will be owner/occupier

From Figure 9 below, the unskilled-to-skilled worker mix is good, but the professional categories will likely increase as business development-related activity increases.

Figure 9: Job Breakdown by Segment



8. FINANCIAL CONSIDERATIONS

Despite the ‘cooling off’ period that took place in the global economic downturn of 2008/09, Pakistan is still faced with a certain macro-economic conditions that are causing micro-economic outcomes. These continued risks and vulnerabilities include:

- Rising oil and commodity prices
- Persistence of high imports
- Weak prospects of significant foreign investment
- Rise in non-fuel and non-food items such as wages, rent and transportation costs (e.g. bus fares)
- Poor reliability of essential utilities such as water, gas and electricity (load shedding to enable maximum distributed use of a scarce resource)
- Weak Rupee against the US Dollar

Despite the slowing of supply-side shocks, and with the State Bank of Pakistan policy discount rate at 15%, any falls in bank liquidity (despite total credit growth in 2009) will impact projects such as Marble City Raisalpur for the fact small business lending may be tightened as the fear of default increases. The development of a liquid government debt market may assist long term government assets such as industrial estates, but any Treasury contractions will directly impact the operating budgets of Government ministries such as Industries and Production.

Some good news in the January 2009 statement from the State Bank of Pakistan (<http://www.sbp.org.pk/press/2009/MPS-31-Jan-09.pdf>; accessed March 23, 2010) is increased support for the long term investment in new plant and machinery, the limits under LTFF were raised over 100% to Rs 19.5B.

The weaker rupee has also assisted the market driven adjustments of the currency in favor of lower prices of Pakistan exports abroad. PASDEC may wish to view the currency movement as an opportunity to create, retain or expand market share in their target markets. If belief in the ‘homegrown’ stabilization packages is strong, then further government assistance may be forthcoming.

As this business plan weighs the real and perceived risks of dealing with companies in Pakistan and the integrity of their supply of goods or services, it is fair to consider the country risk premium and country volatility. As letters of credit are difficult to raise in the current investment climate, Pakistan faces a number of hurdles as exports deal at the firm-firm level. The Moody’s country rating is the basis for this measurement of risk.

Pakistan is also considered an emerging market and attracts a total risk premium of about 14.5% according to some analysts such as McKinsey. The equity risk premium is linked to labor market performance and economic growth. The 14.5% figure puts Pakistan in the same country risk category as Cuba, Moldova, Jamaica and Paraguay.

8.1 MODELING PROJECT SUPPORT AGAINST EXPECTED OUTCOMES

The SWOG included some Net Present Value (NPV) calculations for the 2006 report. These have been reviewed, modified and upgraded to reflect the present day and current practices and cash flow projections.

Notes to accompany the financials presented in this section are explained in three sections and include three cases; Optimistic, Company and Downside:

- a. Quarry Facilities and ten year cash flow projections, with Internal Rate of Return (IRR) calculations
- b. Common Facility Training Center (CFTC) costs and expected revenues
- c. Marble and Granite Branding expenditures and expected returns (assumptions are quite elastic given the nature of the intangible item being treated)



A February 2010 Recorder Report highlighted the 2009 value of marble blocks had increased from Rs. 1500 per ton to Rs. 7000 per ton. Machinery for the model quarry was imported from Italy for Rs. 90M. per set of machinery. This machinery consists of a wire saw, chain saw, excavator and loaders, drilling machines, compressors and other tools. To give an idea of scale, a reported 6000 tons of blocks were auctioned with Kolan blocks attracting Rs. 10,800 per ton, and Mastung blocks receiving Rs. 8,900 per ton. At that time, model quarry production was 300 tons per month. Some of these figures were used as a basis for the three scenario modeling in the section below.

8.1.1 UPGRADED QUARRY FACILITIES – MODELS AND ASSUMPTIONS

The flow of consistent and high quality materials will be a critical success factor for Marble City. The PASDEC marketing materials released in 2009 outline plans for the upgrading of 1400 quarries over the next fifteen (15) years. To the uninitiated, the scale of this type of undertaking is incomprehensible. The only way to achieve supply coordination with any degree of success will be the existence of clear and concise key performance indicators. Some of the first thoughts on the upgrading of quarries:

1. At whose feet will the responsibility for upgrading a quarry lie? Is upgrading a shared responsibility or for the owners of the quarries?
2. Will PASDEC or other accredited bodies be responsible for the inspection of these 'upgraded' quarries?
3. Will there be 'minimum' criteria to be followed as quarries follow the process of upgrading?
4. Once a 'pass' grade is met for the upgraded quarry, what type of official certification is granted, and by whom?
5. If not in existence at present, will an authority be established with sufficient expertise to carry out internationally recognized accreditations?

Given that assumptions made in the press about prices, volumes or raw material and other costs all differ, the financial models run three scenarios for each of the headings; quarrying, common facility, and country branding. As Net Present Value (NPV) is an unreliable indicator of whether an investment should be considered or not, the Internal Rate of Return (IRR) was preferred and subsequently used.

8.2 QUARRY

8.2.1 QUARRY – OPTIMISTIC CASE

Table 12: Quarry Optimistic

Quarry Optimistic											
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Annual Revenue Growth			10.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Annual Labor Cost Growth			10.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Revenues		25,200,000	27,720,000	28,274,400	28,839,888	29,416,686	30,005,019	30,605,120	31,217,222	31,841,567	32,478,398
Labor Costs		(6,000,000)	(6,600,000)	(6,798,000)	(7,001,940)	(7,211,998)	(7,428,358)	(7,651,209)	(7,880,745)	(8,117,168)	(8,360,683)
Other Operating Costs		(3,000,000)	(3,300,000)	(3,399,000)	(3,500,970)	(3,605,999)	(3,714,179)	(3,825,604)	(3,940,373)	(4,058,584)	(4,180,341)
Cash Flows (Rps)	(90,000,000)	16,200,000	17,820,000	18,077,400	18,336,978	18,598,688	18,862,482	19,128,307	19,396,105	19,665,815	19,937,374
Discount Rate	20.0%										
Exchange Rate	80.0 Rs to USD										
NPV	(11,790,364) Rs	(147,380) USD									
IRR		█	-22.7%	-9.0%	-0.4%	5.3%	9.2%	11.9%	13.9%	15.4%	15.4%

Analysis conducted on stone quarries used the following assumptions:

- Ten year time horizon - given the ‘type’ of investment class categorization for a quarry or long term asset
- Labor costs based on 25 workers per quarry
- Other operating costs were assumed at 50% of the labor costs as a contingency
- The initial capital outlay of Rs. 90M reflects the cost of heavy equipment and other machinery including vehicles. This is treated as a one-off charge.
- Given the current country risk premium (2010) of approximately 15% for Pakistan, the discount rate of 20% was arrived at due to the geographical nature of quarries in the KPP and Baluchistan. Investors certainly get nervous when they hear supply sources are from these areas.
- The exchange rate of Rs. 80 to one US dollar was used, despite continued weakening of the Rupee at the time of writing.
- Discount rate used is 20% to reflect sensitivity to risk.

The risk of securing supply of raw materials is considered slightly higher in these areas based on incidents of the recent past.

The first negative cash flow of Rs 30M represents the capital equipment required for International Accreditation (Level 2) to be granted. In other country competitors, technological adaptations to open cast mining methods have been evolving over the past couple of years. Enhancing technology at extraction sites improves the quality of the stone being removed and helps lower production costs. Quarrying techniques in Pakistan remain outdated, slow and uneconomical, but waste minimization techniques are becoming more widespread.

For the ten year cash flow projections, Yr. 1 returns Rs. 10M. Year 2 and 3 cash flows were calculated using a 25% increase year-on-year, and Yr 4-10 a 10% increase. Year 10 cash flow is Rs. 30,448,705. The US Dollar (USD) – Pakistan Rupee (PKR) exchange rate used is 80PKR/1USD. Other assumptions include labor costs in Yr. 1 at 1,752,000 and increasing marginally until Yr. 10 as skill upgrading over time creates higher wage expectations in the labor force. The benchmark for other operating costs is set at 10% of labor costs and increased at 10% per year, year on year.

The Internal Rate of Return (IRR) is negative in Yr. 1 (-16.7%) based on the inputs, but is positive from Yr. 2 (12.0%).

Given the assumptions above, the breakeven for a quarry should occur within the first quarter of Yr.

5, ceteris paribus.

8.2.2 QUARRY – COMPANY CASE

Table 13: Quarry Company

Quarry Company		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Annual Revenue Growth				8.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Annual Labor Cost Growth				10.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Revenues (A)			22,680,000	24,494,400	24,984,288	25,483,974	25,993,653	26,513,526	27,043,797	27,584,673	28,136,366	28,699,094
Labor Costs (B)			(6,500,000)	(7,150,000)	(7,364,500)	(7,585,435)	(7,812,998)	(8,047,388)	(8,288,810)	(8,537,474)	(8,793,598)	(9,057,406)
Other Operating Costs (C)			(3,250,000)	(3,575,000)	(3,682,250)	(3,792,718)	(3,906,499)	(4,023,694)	(4,144,405)	(4,268,737)	(4,396,799)	(4,528,703)
Cash Flows (Rps) A-(B+C)	(100,000,000)	16,200,000	13,769,400	13,937,538	14,105,821	14,274,156	14,442,444	14,610,582	14,778,462	14,945,969	15,112,984	
Discount Rate	20.0%											
Exchange Rate	80.0	Rs to USD										
NPV	(32,203,686)	Rs										
	(402,546)	USD										
IRR				-32.6%	-19.0%	-10.1%	-4.0%	0.3%	3.5%	5.8%	7.6%	7.6%

Analysis conducted on stone quarries used the following assumptions:

- Ten year time horizon - given the ‘type’ of investment class categorization for a quarry or long term asset
- Labor costs based on 25 workers per quarry
- Other operating costs were assumed at 50% of the labor costs as a contingency
- The initial capital outlay of PKR 100 million reflects the cost of heavy equipment and other machinery including vehicles. The 11% increase over the Optimistic Case reflects the reality of higher charges incurred due to a number of factors, including, but not limited to, a weak Rupee. The CAPEX charge is treated as one-off.
- Given the current country risk premium (2010) of approximately 15% for Pakistan, the discount rate of 20% was arrived at due to the geographical nature of quarries in the KPP and Baluchistan
- The exchange rate of Rs. 80 to one US dollar was used, despite continued weakening of the Rupee at the time of writing.
- Discount rate used is 20% to incorporate country and other risks (such as electricity supply reliability adding to production and output delays).

Given the current country risk premium (2010) of approximately 15% for Pakistan, the discount rate of 20% was arrived at due to the geographical nature of quarries in KPK and Baluchistan. The risk of securing supply of raw materials is considered slightly higher in these areas based on incidents of the recent past.

The big difference with the Company Case is that initial revenues (Yr. 1) factor in a 10% reduction in expected revenues for Yr. 1. All other inputs including annual labor cost growth remaining the same as the Optimistic Case. Yr. 2 Annual Revenue Growth was also trimmed from 10% to 8% to reflect conservative estimates.

The Internal Rate of Return (IRR) enters break even toward the end of Yr. 6, and given continued management capabilities and the ability to fine tune quarrying techniques and raw material handling, the IRR hits 7.6% at Yr. 10. It is assumed in all models stone block preparation will be well advanced over the next decade, and investment into quarries will be of greater interest to more people and groups as the profit motivation and revenue opportunities mature.

Given the assumptions above, the breakeven for the Company Case quarry occurs toward the end of Yr. 6, ceteris paribus.

8.2.3 QUARRY – DOWNSIDE CASE

Analysis conducted on stone quarries used the following assumptions:

- Ten year time horizon - given the ‘type’ of investment class categorization for a quarry or long term asset
- Labor costs based on 25 workers per quarry
- Other operating costs were assumed at 50% of the labor costs as a contingency
- The initial capital outlay of PKR 100 million reflects the cost of heavy equipment and other machinery including vehicles. The 11% increase over the Optimistic Case reflects the reality of higher charges incurred due to a number of factors, including, but not limited to, a weak Rupee. The CAPEX charge is treated as one-off.
- Given the current country risk premium (2010) of approximately 15% for Pakistan, the discount rate of 20% was arrived at due to the geographical nature of quarries in the KPP and Baluchistan.
- The exchange rate of Rs. 80 to one US dollar was used, despite continued weakening of the Rupee at the time of writing.
- Discount rate used is 20%.

Table 14: Quarry Downside

Quarry Downside											
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Annual Revenue Growth			8.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Annual Labor Cost Growth			10.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Revenues		18,900,000	20,412,000	20,820,240	21,236,645	21,661,378	22,094,605	22,536,497	22,987,227	23,446,972	23,915,911
Labor Costs		(6,500,000)	(7,150,000)	(7,364,500)	(7,585,435)	(7,812,998)	(8,047,388)	(8,288,810)	(8,537,474)	(8,793,598)	(9,057,406)
Other Operating Costs		(3,250,000)	(3,575,000)	(3,682,250)	(3,792,718)	(3,906,499)	(4,023,694)	(4,144,405)	(4,268,737)	(4,396,799)	(4,528,703)
Cash Flows (Rps)	(100,000,000)	16,200,000	9,687,000	9,773,490	9,858,492	9,941,881	10,023,523	10,103,283	10,181,016	10,256,575	10,329,802
Discount Rate		20.0%									
Exchange Rate		80.0	Rs to USD								
NPV		(44,305,720) Rs									
		(563,821) USD									
IRR		■	■	-26.9%	-17.9%	-11.5%	-6.9%	-3.5%	-0.8%	1.2%	1.2%

Given the current country risk premium (2010) of approximately 15% for Pakistan, the discount rate of 20% was arrived at due to the geographical nature of quarries in KPK and Baluchistan. The risk of securing supply of raw materials is considered slightly higher in these areas based on incidents of the recent past.

As the name infers, the downside case is underlined by a number of weaknesses at the quarry including:

- Poor operating environment despite the PKR 100M equipment being deployed and in use
- Initial revenues in Yr. 1 at 25% less than the Optimistic Case (PKR 18,900,000)
- Break even for the quarry owner/partnership toward the end of Yr. 9 due to inherent inefficiencies and a consistent inability to meet the market with timely quality material. The flow on effect to Marble City Risalpur and other aggregation points is a weakness in this scenario.
- A stronger contribution of wage inflation to the bottom line despite consistent annual revenue growth
- Potentially lack of working capital distorting the ability for the quarry to achieve breakeven – inventory control issues
- Poor performance of the equipment (despite an extra Rs. 100,000 at the quarry site in the start up phase) due to a lack of skilled operators. Monthly production of blocks for delivery to Marble City Risalpur is low
- Any number of operating issues soaks up all of the contingency in the model (as other operating costs) such as broken down equipment, idle machines due to lack of power, water

or other

The reality of the ‘actual’ operating efficiencies and quarry outputs will lie somewhere between the Quarry Company and Quarry Downside case. Given all of the environmental and industrial challenges within Pakistan, securing an effective supply source of stone material will go a long way to ensuring the success of aggregation points such as Marble City Risalpur.

8.3 PRE-FEASIBILITY OF MODEL QUARRY (2007)

The results of field work undertaken in July 2007 by local consultants and the renowned Benetti Group (Italy) proposed quarrying methods and technologies, a work layout plan and a pre-feasibility for a model quarry.

The pre-feasibility was based on a medium scale marble quarry operation of 2000-4000 m³/year of international standard dimensions. Production cost estimates included:

1. Labor Inputs
2. Investment in Quarrying Machines
3. Ancillary Equipment, Facilities and Services
4. Spare Parts and Consumables
5. Miscellaneous

One major assumption was that intensive and mechanized quarry operations would be carried out, returning the types of numbers represented in the report as being a valuable pursuit.

Table 15: Labor Costs at Model Quarry - July 2007 Report

Job Designation	Monthly Salary (Rs.)
Quarry Master (Italian)	550,000
Quarry Foreman (Local)	44,000
Quarry Workers (x12)	22,000 (176,000 for 8)
Heavy Equipment Driver (x2)	22,000 (44,000 for 2)
Mechanic	33,000
Electrician	33,000
Accountant/Marketing	44,000
Total Wages	924,000

Source: 2007 Model Quarry – Available from PASDEC (1Euro = Rs. 110)

8.4 COMMON FACILITY TRAINING CENTER (CFTC) – MODELS AND ASSUMPTIONS

A critical piece of infrastructure within Marble City is the Common Facility Training Center (CFTC). If equipped the way PASDEC envisions, to appropriate standards and quality, the CFTC will be a critical and central piece holding the development together.

After a site visit (May 2010), observations are that PASDEC need to tightly monitor the servicing infrastructure for site access by trucks and other delivery vehicles. The efficiency of this infrastructure input will have an impact on cash flows and efficiencies from the CFTC, as well as the transportation savings.



Some of the assumptions in the model for CFTC are as follows:

- ✓ Machinery Costs based on 1 (imported) set of quality machinery
- ✓ Cost for civil works and layout (design) + fit out also allowing for further internal upgrades (x2) within the first 5 years
- ✓ Revenue assumptions based on hours per day (functional operation), indicative demand and the ability to maintain competitive market rates (built in 20% year on year increase in expected revenues due to increased popularity of offered service)
- ✓ Operating costs (including labor) were increased 10% year on year

Certain efficiencies obviously affect the bottom line of the facility including:



- ✓ PASDEC ability to source quality equipment at the best competitive prices
- ✓ Efficient building design and minimizing the need for reconfiguration, machinery movement, de-commissioning of certain equipment or hours/days lost due to repair
- ✓ The ability to operate at capacity at the highest cost assists the profitability of the facility, but a balance always needs to occur to achieve repeat business and a loyal Marble City customer base

8.4.1 CFTC – OPTIMISTIC CASE

A critical piece of infrastructure within Marble City is the Common Facility Training Center (CFTC). If equipped to appropriate standards and quality, the CFTC will be a critical and central piece of the development.

Analysis conducted on stone quarries used the following assumptions:

- ✓ Machinery costs in Yr. 0 to buy quality and appropriate machinery (according to some form of demand study)
- ✓ A 70% contingency built in (Yr. 3 and Yr. 5)
- ✓ Revenues of PKR 6 million achieved in Year 1 and increasing 20% year on year. Word of mouth and operational efficiencies
- ✓ Operating costs (including labor) annual increase 10% year-on-year
- ✓ Transportation savings (due to provision of central aggregation point) and increasing 10%

- ✓ year-on-year as CFTC efficiencies improve over time
- ✓ Discount rate of 10% applied to indicate the lower level of risk due to location onsite at Risalpur
- ✓ Returning a positive NPV

Table 16: Common Facility Optimistic

CFTC Optimistic						
Upfront Costs	Yr 0	Yr 1	Yr 2 (2013)	Yr 3	Yr 4	Yr 5
Machinery Costs (based on 1 set)	(7,860,000)			(5,502,000)		(5,502,000)
Civil Works & Layout Design	(3,500,000)	(350,000)		(350,000)		
Ongoing Costs						
Revenues		7,000,000	8,750,000	10,500,000	12,600,000	15,120,000
Operating Costs (incl. labor)		(4,462,000)	(4,908,200)	(5,293,200)	(5,822,520)	(6,404,772)
Transportation Savings		2,076,923	2,284,615	2,513,077	2,764,385	3,040,823
Cash Flows	(11,360,000)	4,264,923	6,126,415	1,867,877	9,541,865	6,254,051
Discount Rate		10%				
Exchange Rate		80 Rs to USD				
NPV		8,531,104 Rs				106,639 USD

According to JE report: NPV in USD should be \$0.1M

8.4.2 CFTC – COMPANY CASE

A critical piece of infrastructure within Marble City is the Common Facility Training Center (CFTC). If equipped to appropriate standards and quality, the CFTC will be a critical and central piece of the development.

Table 17: Common Facility Company

CFTC Company						
Upfront Costs	Yr 0	Yr 1	Yr 2 (2013)	Yr 3	Yr 4	Yr 5
Machinery Costs (based on 1 set)	(9,039,000)			(6,327,300)		(6,327,300)
Civil Works & Layout Design	(4,025,000)	(402,500)		(402,500)		
Ongoing Costs						
Revenues		7,000,000	8,750,000	10,500,000	12,600,000	15,120,000
Operating Costs (incl. labor)		(4,112,000)	(4,523,200)	(4,975,520)	(5,473,072)	(6,020,379)
Transportation Savings		2,076,923	2,284,615	2,513,077	2,764,385	3,040,823
Cash Flows	(13,064,000)	4,562,423	6,511,415	1,307,757	9,891,313	5,813,144
Discount Rate		10%				
Exchange Rate		80 Rs to USD				
NPV		7,102,667 Rs				88,783 USD

According to JE report: NPV in USD should be \$0.1M

Analysis conducted on stone quarries used the following assumptions:

- ✓ Further 15% contingency for sourcing machinery in Yr. 0 to buy quality and appropriate machinery – may be applied to delays in contracts, negotiations, payment etc. and assume extra wages paid to contracting officers
- ✓ A 70% contingency built in (Yr. 3 and Yr. 5) remain
- ✓ Revenues of PKR 7 million achieved in Year 1, spiking 25% to coincide with increased

marketing of facilities in Yr. 2 (2013) and increasing 20% annually thereafter. Something simple as creating better revenue streams for the facility has a profound effect (example – identifying core and loyal customer base from the estate and servicing their needs, or even better processes on receivables). This actually changes the figures to be better than PASDEC Optimistic

- ✓ Operating costs (including labor) increasing at 10% per year
- ✓ Transportation savings (due to provision of central aggregation point) also projected to increase 10% per year
- ✓ Discount rate of 10% applied to indicate the lower level of risk
- ✓ Positive NPV of USD 88,783

8.4.3 CFTC – DOWNSIDE CASE

A critical piece of infrastructure within Marble City is the Common Facility Training Center (CFTC). If equipped to appropriate standards and quality, the CFTC will be a critical and central piece of the development.

Table 18: Common Facility Downside

CFTC Downside						
Upfront Costs	Yr 0	Yr 1	Yr 2 (2013)	Yr 3	Yr 4	Yr 5
Machinery Costs (based on 1 set)	(9,432,000)			(7,074,000)		(7,074,000)
Civil Works & Layout Design	(3,500,000)	(700,000)		(700,000)		
Ongoing Costs						
Revenues		5,500,000	6,875,000	8,250,000	9,900,000	11,880,000
Operating Costs (incl. labor)		(4,112,000)	(4,523,200)	(4,975,520)	(5,473,072)	(6,020,379)
Transportation Savings		2,076,923	2,076,923	2,076,923	2,076,923	2,076,923
Cash Flows	(12,932,000)	2,764,923	4,428,723	(2,422,597)	6,503,851	862,544
Discount Rate	10%					
Exchange Rate	80 Rs to USD					
NPV	(3,273,341) Rs (40,917) USD					

According to JE report: NPV in USD should be \$0.1M

Assumptions for the CFTC Downside as follows:

- ✓ 20% extra to source and procure appropriate machinery
- ✓ A 75% contingency built in (Yr. 3 and Yr. 5) due to higher servicing costs, parts replacement and more frequent breakdowns (could be due to a number of issues such as power spikes damaging equipment etc.)
- ✓ Worse than budgeted revenues of PKR 5.5 million achieved in Year 1, which cannot catch up with costs despite 20% increase in receipts year-on-year
- ✓ Civil works (budgeted at 20% increase in 2012 and 2014) may be understated if significant re-work needs to be done
- ✓ Operating costs (including labor) increasing at 10% per year
- ✓ Transportation savings constant at PKR 2,076, 923 and remaining flat for the five years
- ✓ Same 10% discount rate applied
- ✓ Negative NPV due to inefficiencies of USD 40,917

Despite being a needed offering from PASDEC as the estate ‘guardian’, the CFTC has a negative NPV in the downside case due to the assumption of greater inefficiencies and cost over-runs.

8.5 MARBLE BRANDING

8.5.1 MARBLE BRANDING – OPTIMISTIC CASE

One of the most difficult decisions for any corporation (e.g. cashed up) or small business (e.g. cash poor) is how much to spend (time and money) on promoting their goods or services on domestic and/or international platforms. One of the ‘big’ assumptions is the ability to generate projected sales from any roadshow or targeted public exhibition. Prior to an established ‘network’ of proven buyers and the establishment of trusted relationships, the shotgun approach to attending trade fairs and exhibitions is likely to yield ‘hit and miss’ results.

The SWOG report (2006) assumed great success could be derived from attendance at trade shows and subsequent entries in the order book. As most businesses know, the decision to promote themselves and offerings at public forums (even targeted and well-researched) is fraught with risk. The decision to attend is often subjective and spur of the moment decision. There is often little ‘science’ attached.

Table 19: Marble Branding Optimistic

Branding - Optimistic							
Upfront Costs							
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Trade Fairs / Exhibitor	(20,000,000)	(20,000,000)	(20,000,000)	20,000,000	20,000,000	20,000,000	20,000,000
Public Relations & Pro	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
Ongoing Costs							
Rev's Thru Sales Completed		90,000,000	117,000,000	146,250,000	182,812,500	228,515,625	285,644,531
Operating Costs		(80,000,000)	(100,000,000)	(125,000,000)	(156,250,000)	(195,312,500)	(244,140,625)
Other		-	-	-	-	-	-
Cash Flows	(21,000,000)	(11,000,000)	(4,000,000)	40,250,000	45,562,500	52,203,125	60,503,906
Discount Rate	10%						
Exchange Rate	80 Rs to USD						
NPV	85,110,316 Rs 1,063,879 USD						

According to JE report: NPV in USD should be \$8.8M

Assumptions for the Marble Branding Optimistic Case are as follows:

- ✓ Cash flow jumps by 30% in 2013 (assuming Yr. 0 = 2011) to coincide with PASDEC and industry estimates of ~USD 2 billion by 2013 for the industry as a whole
- ✓ Appearances at Trade Shows, Exhibitions and Stone Fairs estimated at a constant PKR 20 million per year over 6 years. These assumptions are in need of further interrogation. Significant costs are factored in to include booth cost, stone transportation costs and all associated on-costs. The assumption includes attendance at 1-2 international shows per year
- ✓ Public Relations & Promotions adding a further cost at PKR 1 million per year to let strategic partners and qualified buyers know about PASDEC and representative stone businesses attending or displaying
- ✓ Revenues through completed sales require 100% follow up and should not be booked without accurate justifications and review. The assumption is for ~USD 1 million to be



- booked due to the marketing and promotions activity (PKR 90 million)
- ✓ The NPV is healthy (+1,063,879) in the Optimistic case, but is shakier than the quarry and CFTC modeling due to its 'intangible' and often unquantifiable nature
- ✓ The original SWOG (2006) estimated an unrealistic return of \$8.8M, and shared little of the assumptions underlying this claim

8.5.2 MARBLE BRANDING – COMPANY CASE

Assumptions for the Marble Branding Company Case are as follows:

- ✓ Cash flow jumps by 30% in 2013 (assuming Yr. 0 = 2011) to coincide with PASDEC and industry estimates of ~USD 2 billion by 2013 for the industry as a whole. 25% increase year on year thereafter.
- ✓ Appearances at Trade Shows, Exhibitions and Stone Fairs estimated at a constant PKR 20 million per year over 6 years. These assumptions are in need of further interrogation. Significant costs are factored in to include booth cost, stone transportation costs and all associated on-costs. The assumption includes attendance at 1-2 international shows per year
- ✓ Public Relations & Promotions adding a further cost at PKR 1 million per year to let strategic partners and qualified buyers know about PASDEC and representative stone businesses attending or displaying
- ✓ Revenues through completed sales require 100% follow up and should not be booked without accurate justifications and review
- ✓ Revenue in Year 1 is PKR 80 million due to lower operating costs (to match less activity created to achieve certain revenue figures)
- ✓ Operating costs increase steadily at 25% year-on-year
- ✓ The NPV is healthy (USD +715,989) in the Company Case, but is shakier than the quarry and CFTC modeling due to its 'intangible' and often unquantifiable nature
- ✓ The original SWOG (2006) estimated an unrealistic return of \$8.8M, and shared little of the assumptions underlying this claim

Table 20: Marble Branding Company

Branding - Company Case								
Upfront Costs								
	Yr 0 (2011)	Yr 1	Yr 2 (2013)	Yr 3	Yr 4	Yr 5	Yr 6	
Trade Fairs / Exhibitions Show	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)
Public Relations & Promotions	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
Ongoing Costs								
Revs Thru Sales Completed		80,000,000	104,000,000	130,000,000	162,500,000	203,125,000	253,906,250	
Operating Costs		(60,000,000)	(75,000,000)	(93,750,000)	(117,187,500)	(146,484,375)	(183,105,469)	
Other		-	-	-	-	-	-	
Cash Flows	(21,000,000)	(1,000,000)	8,000,000	15,250,000	24,312,500	35,640,625	49,800,781	
Discount Rate	10%							
Exchange Rate	80 Rs to USD							
NPV	57,279,147	Rs						
	715,989	USD						
According to JE report: NPV in USD should be \$8.8M								

8.5.3 MARBLE BRANDING – DOWNSIDE CASE

Assumptions for the Marble Branding Downside Case are as follows:

- ✓ Yr. 0 (~2011) Revenues through sales completed are discounted by one third as marketing and targeting fail to meet expectations (e.g. Branding Optimistic = PKR 90M; Branding Downside = PKR 60M)
- ✓ Cash flow still jumps by 30% in 2013 (assuming Yr. 0 = 2011) to coincide with PASDEC and industry estimates of ~USD 2 billion by 2013 for the industry as a whole (based on market assumption of exponentially greater public/private involvement in the sector as a whole)

- ✓ Appearances at Trade Shows, Exhibitions and Stone Fairs estimated at a constant PKR 20 million per year over 6 years. These assumptions are in need of further interrogation. Significant costs are factored in to include booth cost, stone transportation costs and all associated on-costs. The assumption includes attendance at 1-2 international shows per year
- ✓ Poorer targeting and market research do not achieve the sales predicted (e.g. Florida Exhibition and Trade Fair is chosen over a European show and buyers fail to show)
- ✓ Public Relations & Promotions adding a further cost at PKR 1 million per year to let strategic partners and qualified buyers know about PASDEC and representative stone businesses attending or displaying
- ✓ Revenues through completed sales require 100% follow up and should not be booked without accurate justifications and review. The assumption is for ~USD 1 million to be booked due to the marketing and promotions activity (PKR 90 million)
- ✓ The NPV is extremely poor (USD -1,966,773) in the Downside Case, and inefficiencies and poorly targeted opportunities to showcase the new ‘Pakistan Natural Stone’ industry fail to convert into meaningful completed sales. If this case becomes reality, one of the reasons may be local competing countries do a better job marketing their stone to targeted buyers and crowd Pakistan out
- ✓ The original SWOG (2006) estimated an unrealistic return of \$8.8M, and shared little of the assumptions underlying this claim

Table 21: Marble Downside

Branding Downside							
Upfront Costs							
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
Trade Fairs / Exhibitions Show	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)	(20,000,000)
Public Relations & Promotions	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
Ongoing Costs							
Revs Thru Sales Completed		60,000,000	78,000,000	97,500,000	121,875,000	152,343,750	190,429,688
Operating Costs		(70,000,000)	(87,500,000)	(109,375,000)	(136,718,750)	(170,898,438)	(213,623,047)
Other		-	-	-	-	-	-
Cash Flows	(21,000,000)	(31,000,000)	(30,500,000)	(32,875,000)	(35,843,750)	(39,554,688)	(44,193,359)
Discount Rate	10%						
Exchange Rate	80 Rs to USD						
NPV	(157,341,832) Rs (1,966,773) USD						
According to JE report: NPV in USD should be \$8.8M							

8.6 COMMON USER INFRASTRUCTURE ESTIMATED COSTS AND PRIORITIZATION

Table 22: Cash Flow Projections – Plot Installment Payments

Plot size (Kanals)	Nos	Price of plot (PKR)	Revenue (PKR)	Revenue (US\$)
	8	102	4,500,000	459,000,000
	4	50	2,500,000	125,000,000
	2	41	1,300,000	53,300,000
Total		193		637,300,000
				7,771,951

Cash Flow Projection

Date of Acceptance 30-Apr-10

	Due Date	Amount		Amount Collected (PKR)	Amount Collected (US\$)
Down Payment	30-May-10	10%		63,730,000	777,195
Installment 1	26-Nov-10	10%		63,730,000	777,195
Installment 2	25-May-11	10%		63,730,000	777,195
Installment 3	21-Nov-11	10%		63,730,000	777,195
Installment 4	19-May-12	10%		63,730,000	777,195
Installment 5	15-Nov-12	10%		63,730,000	777,195
Installment 6	14-May-13	10%		63,730,000	777,195
Installment 7	10-Nov-13	10%		63,730,000	777,195
Installment 8	9-May-14	10%		63,730,000	777,195
Installment 9	5-Nov-14	10%		63,730,000	777,195
		100%		637,300,000	7,771,951

Every successful business in the world pays attention to balancing receivables (incoming receipts) with payables (outgoings). For a large majority of private sector businesses, the aim is to secure receipts as quickly as possible while having the longest possible time allowance for when they have to pay a creditor.

Cash flow is the lifeblood of any business, and PASDEC will need to carefully prioritize and allocate its spending to the correct budget items. The installment plan of 10 equal payments lasts for over four and a half years until November 2014. As expenditures will be overweight in favor of capital items (servicing infrastructure), poorly budgeted items will quickly erode any expected surplus' or 'breathing space'. Cost over-runs due to inefficient operations will require the PASDEC Board of Directors to go to creditors (such as the GoP) for excess funds within that time, especially if cash flow projections from common facilities underperform (e.g. CFTC facility fee-for-use services).

It is suggested that USD \$8M to service a Greenfield broad acre industrial estate such as Marble City with all of its 'better than standard' infrastructure requirements and land use planning restrictions and caveats on development, the revenue generated from installment payments will not be able to achieve the Capital Works Program (CWP). If this is the case, PASDEC will need to strike commercial profit sharing deals with joint venture partners (including foreign interests and specialists such as Italians with respect to quarrying).

Joint Venture & Profit Sharing Considerations

If PASDEC calculates short falls in its cash flow projections and receivables, it may wish to consider joint venture agreements with 'specialists' such as the Italians where quarry expertise and equipment are traded against minimum future cash flows from quarrying operations

PASDEC is acutely aware of the need to provide timely and usable service infrastructure. As a result of working group meetings (February – May 2010), the following priority list was collated. Note that costs are estimates only, and will likely change, but to include them gives the reader some understanding of the scale and scope of intended activity.

If equipped as envisioned by PASDEC, to appropriate standards and quality, some of the items below will be catalytic and critical pieces of service infrastructure differentiating Marble City from other haphazard industrial estates.

Table 23: PASDEC Common User Infrastructure Estimated Costs & Prioritization

Item Description	Cost Estimates	PASDEC Responsibility	Time Period	Revenue Stream
Machinery Pool <i>(Cost of 1 set= PKR 150 Million or US\$1.75 Million. Cost of 8 sets = PKR 1200 Million or US\$13.95 Million)</i>	PKR 1200 Million US\$13.95 Million	Provide developed land, required infrastructure, responsible for sustainable operation and maintenance of equipment	Have the potential for financing by Institutions, from the onset	To be rented out to mine owners for making rectangular blocks. 1 set of machinery is sufficient to serve 4 quarries. Average life of 1 set is 10 years.
Common Facility & Training Center and Training of Trainers	PKR 300 Million US\$4.49 Million	Provide developed land. PKR 150 Million US\$1.74 Million	More than five Years are required to make it viable for commercial banks	Fee can be charged to meet operational and maintenance cost of the facility
Marketing, Participation at fairs, and Consultants	PKR 13 Million US\$0.15 Million	To involve TDAP		Sharing Basis
Business and Display Center <i>(having provision for Video Conferencing)</i>	PKR 20 Million US\$0.233 Million	Provide developed land	More than three years.	
Mosaic, Handicrafts, and Inlay (MHI) Development Center	PKR 20 Million US\$0.233 Million	Provide developed land	More than four years	Sliding basis, initially provide financial support to trainees on a declining basis, and by year five start charging fee from them
Training institution/Overseas technical training	PKR 50.00 Million US\$0.581 Million	Provide developed land, and Buner Center	More than five years	Sliding basis, initially provide financial support to trainees on a declining basis, and by year five start charging fee

Item Description	Cost Estimates	PASDEC Responsibility	Time Period	Revenue Stream
				from them
Laboratory for testing of Marble and Granite	PKR 35.00 Million US\$0.41 Million	Provide developed land, infrastructure, responsible for sustainable operation and maintenance of equipment	More than five years	Shared cost.
Warehousing	PKR 30 Million US\$0.35 Million	Provision of developed land	Have the potential for financing by financial Institutions, from the onset.	Fee or Rent can be charged for the use of services

8.7 RISK PREMIUMS AND ARRIVAL AT DISCOUNT RATE – RATIONALE AND CONSIDERATIONS

Given the assumptions used in the financial models, the discount rate was given at 15%, 20%, 25% for the best, company and worst cases respectively. These varied discount rates reflect the degree of risk investors consider as the evaluate investment into:

- Pakistan – from a likely basket of countries they are considering return maturation rates for (including typical exit appetite). This includes their tolerance of countries considered higher risk, where investments are seen as relatively illiquid
- Marble and Granite Sector – from a likely basket of similar industries in Pakistan where ‘hockey stick’ projections (such as the stone industry in Pakistan growing from USD \$40M in revenues in 2009 to USD \$2B in revenues by 2013) are not uncommon
- Company Specific – The individual investor would need to consider many of the ‘micro’ factors outlined in this business plan, and the degree to which particular dimension stone companies are affected in relation to their role in the supply chain and other factors such as their geographical location

Action 28: *PASDEC to internally review the assumptions in this business plan against internal company assumptions as they predict internal rates of return for the various practices they wish to grow in Pakistan, such as quarrying, common facilities and developing a global brand.*

9. MARKET FACTORS

There is a lot of discussion across many of the promising sectors in Pakistan and their ‘blue sky’ future statements of net revenue and re-investment into growing these sectors. The sectors include gems and jewelry, dairy, leather and various food products. Statements in the media should be digested with caution as, depending on the credibility of the data source and the style of journalism, a thread of conflicting statements appear over time.

If and when serious investors conduct their due diligence across and within targeted sectors, not only will they apply a country and market risk premium to their analysis, but also a company risk premium. This can be particularly damaging to the image of emerging industries and stellar performers as it can potentially limit their appeal. The global marketing of the dimension stone industry and the subsequent market expectations of the quality delivery of goods is the central piece to this section.

9.1 LOCATION FACTORS FOR MARBLE CITY BUSINESS TENANTS

The operating location of a business can be an important issue as they choose where to be. The ‘softer’ requirements of a business or facilitators such as access to key customers, major suppliers, a reliable and skilled workforce, and quality premises are valued highly.

The 185Ha site at Marble City had negligible land acquisition costs due to its creation by government. Infrastructure servicing will be completed by PASDEC through a budget allocation, but businesses will undertake certain site works and build their workshops and premises to the satisfaction of the development authority within specified time frames.

It is presumed the majority of the businesses who bid for plots considered the following when choosing the location:

1. Accessibility (to labor/markets/key suppliers – inputs and services/capital) – Risalpur is a central and connected location
2. Cost (of labor – skilled and unskilled/key inputs and services from suppliers/capital) Labor across all skill levels is apparently sufficient; Marble City businesses may actually increase the draw of workers to the region if they know there is sufficient work being generated in the sector.
3. Major road access – Marble City enjoys access to major haulage routes and secondary roads are in good condition. Given this, the ‘Dry Port’ option with direct road and rail access to Karachi or Gwadar may become a strong differentiator.
4. Proximity to customers and clients – Marble City may initially rely on the established centers in Pakistan (95% local patronage of product), but build the export component of demand from approximately 5% to 30%. One major marble processor based in Punjab quoted 30% as a better and balanced number for international buyers. Given this, the proximity of Risalpur to major markets in Peshawar and Islamabad is a strong positive for the estate.
5. Attractiveness and appeal of the estate as set out in the Marble City Master Plan – If the over subscription of the plots is any indication of appeal, there seems to be significant investor and owner/manager interest in the estate. The only issue will be the determination the percentage of speculators who bought in hoping for a quick rise in land prices, and who would subsequently hope to exit.
6. Reliable hard and soft infrastructure including gas, water and power – These issues are country wide, and any estate able to deal successfully with the outstanding supply issues will be in a strong position to attract and retain export-oriented companies.

Due to the bulky goods nature of the marble and granite sector, the importance of proximity to freight terminals, major transport routes and trade customers are paramount. The cost of final goods landed in other countries can be disadvantaged if transportation costs escalate. If significant time and cost restrictions are added to the total cost of exportable goods, an potential competitive advantage is diminished in real and net profit terms. The 1600km road journey from Risalpur to Karachi is also a significant and potentially costly way of goods movement to the port.

Marble City Risalpur companies need to measure certain advantages and disadvantages as they consider the capital cost of land acquisition and building construction on site, transportation costs and wages costs.

Table 24: Business Location Factors

Business Location Factors	Metrics
Market	Proximity to markets Local customer purchasing power
Transportation	Land transportation Water transportation Ability to move goods cost-effectively
Labor	Availability of general employees Availability of engineering and other technical employees Labor unionization Productivity losses through stoppages
Site Consideration	Cost of land acquisition and payback periods Cost of plant construction Cost of maintenance (under Marble City guidelines)
Raw Materials & Services	Availability of raw materials Availability of business services (e.g. within full processing cycle)
Utilities	Energy generating capacity (of plot/of estate) Total Energy cost to business – fair metering and monitoring Waste Disposal – cost of collection services (how the levy is calculated – e.g. by plot size or type of business) Fuel availability Water availability Renewable energy options
Government and Governance	Transparency of PASDEC operational budget and disbursements Cash position of oversight body (PASDEC) Taxes (owing and any relief) Provincially supported workforce training and development Quality and value of Board of Management (if/when set up)

Business Location Factors	Metrics
Community Environment	Housing availability Basic and further education Health & medical service availability Human services Security Environmental considerations and cost of waste minimization caveats Cost of living in Risalpur Business climate (macro and micro) Physical climate (combination of a number of variables)

One of the most striking and noticeable revisions to the existing project positioning of Marble City Risalpur is the name. Given the background of the project and the desires of its executive with respect to environmental concerns is the branding and naming of the project. One recommendation of this document is the renaming and rebranding prior to launch and the first breaking of ground.

Given the strategic importance and prominence of the development the following names would enhance the ‘sellability’ of the project. The ‘Green print’ would align with the names:

- Marble Eco City Risalpur
- Marble Eco Park Risalpur

As an example of thinking about the global appeal of the marble and granite industry in this country, the Pakistan Trade Project has purchased the high level domain www.pakistanmarblecity.com for a period of five years. Examples of how to leverage such a simple web address will be demonstrated in later sections of this plan.

The ability to draw a stronger and wider set of legitimate stakeholders will help increase the interest of a number of groups namely:

- Targeted industry niche’s in international target markets
- Government agencies and support networks
- Private investors – including donors and potential land owners
- Media and associated public relations outlets

9.2 MAPPING THE VALUE CHAIN AND IDENTIFYING DISINTERMEDIATION

This section will offer a snapshot analysis of the key and core components of the marble and granite industry, and step through the various ways value is added along the way.

According to work in the Pakistan Dimensional Stone Strategy (Square Blocks) report of 2006, the value chain consists of four separate but synergistic parts:

1. Quarrying
2. Processing
3. Wholesaling
4. Retail of Finished Goods

The discovery in this section is where levels of effort are working efficiently and maximizing their input into the overall scheme, and where they may need some adjustments to improve operating efficiencies.

Table 25: Key Value Chain Inputs and Role of PASDEC

Key Value Chain Inputs	Positive	Negative	PASDEC Role
Quarrying	<ul style="list-style-type: none"> • Introduction of square blocks • Reduction of ‘potatoes’ – which lead to high levels of waste 	<ul style="list-style-type: none"> • High levels of wastage • Uncontrolled blasting • Basic machinery and equipment unavailable • Lack of good prospecting practices – including topographical mapping, geological surveys, environmental management planning, physical testing of the stone 	<ul style="list-style-type: none"> • Broker for machinery and equipment at the mine site • Broker of professional services – to enhance prospecting services
Planning	<ul style="list-style-type: none"> • Master plan offers a fresh and innovative way of planning industrial estates • Attempt at high level of service integration at the master plan level 	<ul style="list-style-type: none"> • Governance mechanisms for controlling the built environment may be immature and become ill-directed if not controlled 	<ul style="list-style-type: none"> • Opportunity to work with the local planning authority to implement, audit and monitor built form and adherence to codes and regulations of the structure plan

Key Value Chain Inputs	Positive	Negative	PASDEC Role
Transportation	<ul style="list-style-type: none"> • Road layout and design of industrial estate • Provision of sufficient loading and unloading bays in plan 	<ul style="list-style-type: none"> • Increasing costs of diesel and oil • Heavy traffic areas in the estate will need sufficient budget and oversight 	<ul style="list-style-type: none"> • Provision of quality truck stops and service areas within MCR • PASDEC training – packing and distribution to promote efficiencies
Processing	<ul style="list-style-type: none"> • A large concentration of processing firms within one location – creating a cluster and competitive environment • Clustering to attract all levels of skill to MCR – making it a creative and competitive environment 	<ul style="list-style-type: none"> • Short cuts by inefficient businesses can have a detrimental impact on other business owners as they break rules and short-circuit estate planning regulations to save money 	<ul style="list-style-type: none"> • Provision of the Common Facility Training Center (CFTC) – allowing processing companies access to quality equipment leading to improved manufacturing techniques
Wholesaling	<ul style="list-style-type: none"> • Efficiencies gained by this added layer of reaching out to the market 	<ul style="list-style-type: none"> • Added layer of cost to the supply chain as extra margins are charged and not regulated or monitored • Corruption can creep at this level of the supply chain as unnecessary higher charges make Pakistan stone uncompetitive against competitors 	<ul style="list-style-type: none"> • Opportunity to disintermediate to save producers/processor money
Retailing	<ul style="list-style-type: none"> • Opportunity for a unified global message for the dimension stone industry • Opportunity to attract 	<ul style="list-style-type: none"> • Added charges in an unregulated and un-monitored environment (commissions/bonuses etc.) • Corruption can creep at this level of the supply chain as unnecessary 	<ul style="list-style-type: none"> • Marble City elected board of management can form a sub-committee to transparently review and publish sales prices for all stone varieties in the open marketplace

Key Value Chain Inputs	Positive	Negative	PASDEC Role
	<p>higher prices and net yields at market</p> <ul style="list-style-type: none"> • Opportunity to showcase rare and abundant Pakistani stone to international buyers 	<p>higher charges make Pakistan stone uncompetitive against competitors</p>	

Sub-optimal mining and quarrying techniques, infrastructure especially road network, accessibility to bank finances for lease due to uncertain land tenure, low investment in modern and precise technology and techniques, scale of operations not justifying heavy investment, dearth of skilled work force and lack of stone certification & mismatch of stone quality and stone use are constraining marble and granite from realizing its potential.

9.3 ANALYSIS OF MARBLE AND GRANITE INDUSTRY–TOP TEN LOCATION ADVANTAGES & DISADVANTAGES

Table 26: Top 10 Location Advantages & Disadvantages

ADVANTAGES	DISADVANTAGES
Proximity to customers	No perceived disadvantages
Central location	High cost of rent
Proximity to freeways/highways	Insufficient space/area
Proximity to a central business area	Lack of parking/amenities
Proximity to home	Lack of visibility/exposure
Provides good visibility/exposure	Traffic congestion
Industrial area zoning	Distance from home
Proximity to transport & freight	Not central
Proximity to suppliers	Distance from suppliers
Expanding area	Distance from customers

9.4 COMMERCIAL ACCREDITATION - INVESTIGATING THE VALUE

The decision can be taken by PASDEC to institute national accreditation at the company level. Similar to the efforts of the Marble Institute of America (MIA), companies can earn certain awards. One example is ‘Accredited Natural Stone Commercial Contractor’ where certain criteria need to be met. The MIA award requires companies to demonstrate the following:

- At least 10 years experience installing stone in commercial settings
- Have completed 3 non-engineered cladding installations less than 30ft high with a minimum of 2,000 sq.ft of dimension stone or
- Three commercial building lobbies with at least 3,000 sq. ft of dimension stone
- Demonstrate the completion of five (5) installations including – large residential projects, site work, walls, paving, cladding
- Pass a facility inspection and an inspection of a completed commercial installation

The value of professional accreditation is one way of raising the expectations and the standards of the commercial installation industry. As approximately 90% of the industrial sites at MCR will be occupied by processing companies, there will be a great opportunity for service-level firms to be involved as demand for professional installations increases. Site expansion plans of MCR (and the development of future Marble Cities) may consider incorporating these types of value-adding firms as the industry grows. In the American example, the awarded company displayed the MIA Accreditation Seal in their office, on their trucks and on all of their marketing material.

Action 29: PASDEC to initiate the ‘Pakistan Natural Stone Commercial Contractor’ or similar accreditation. This will set the benchmark for commercial stone installation industry and raise the level of consumer and commercial confidence in the professional handling of the material.

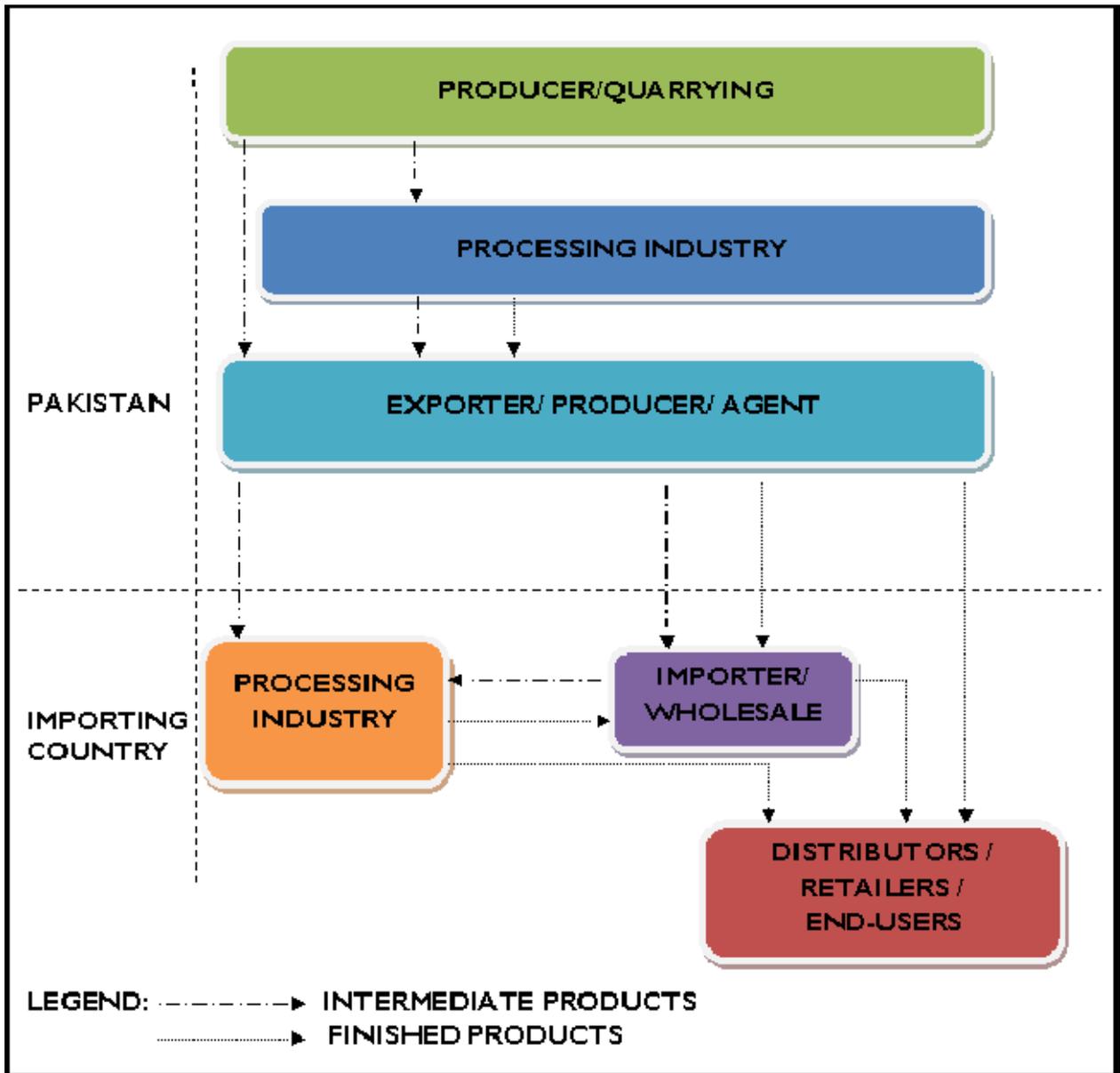
A 2008 PASDEC and Technology Upgradation and Skill Development Company (TUSDAC) global announcement of a partnership to introduce new technologies in quarry development, mining, cutting and polishing was met with interest. The establishment of the Peshawar Engineering Support Center (PESC) was a step in the direction of commercial respectability through accreditation.

9.5 MARKETING CHANNELS

Accurate market channel selection and execution can benefit dimension stone companies greatly as they seek to open international markets to their products. Contemporary trends relating to stone color and design are evolving quickly. The ability to deliver the right product through the right channel is can create new markets and either maintain or increase gross margins.

Figure 9 demonstrates the way in which raw material is transformed through various high level process steps with the ultimate aim of reaching a consumer in a number of international markets.

Figure 10: Marketing Channel Flow Chart



Product standardization and conformity with international standards remains a challenge for Pakistani stone producers, exporters and intermediate sales channels.

The various trade channels are replete with layers of the following:

9.5.1 IMPORTING AND WHOLESALING

The market place for marble & granite is reasonably established and most of the importers/wholesalers in the marketplace know each other. They should carry sufficient inventory of intermediate or finished products.

9.5.2 DISTRIBUTORS

It is difficult to differentiate between the distributor and wholesaler/importer. In most cases the importers/wholesalers also play the role of distributor who operate in the retail space.

The role of the distributor is to warehouse the product and maintain a team of sales representatives and possibly a showroom(s) to display and sell to retailers, manufacturers, and contractors.

9.5.3 PROCESSING INDUSTRY

Blocks and slabs are transformed into finished products at processing units. Islamabad has some processing units, These processing units produce such things as tiles, tombstones, and custom-made kitchen countertops. Large firms in the processing industry are likely to have a direct link to the quarries in NWFP or Baluchistan, while small firms are more likely to purchase blocks or slabs from the network of wholesalers/importers or distributors.

To reinforce the point made it in the box here, PASDEC can assist the processing industry by promoting the ‘tree free’ paper option or ‘stone paper’. By increasing the amount of mineral ‘additives’ in paper production, greater percentages of the marble dust can be sold to paper producers for use in their publications.

Waste for Opportunity or Wasted Opportunity for Stone Paper?

As ‘glossy’ magazines make use of Calcium Carbonate (found in marble waste) to thicken their front covers, PASDEC can pitch Marble City businesses as key suppliers of this ‘eco friendly tree-free’ paper alternative

9.5.4 RETAILING AND THE END USER

For Pakistan stone to achieve the export figures it is aiming for, significant inroads will need to be made into the ‘lifestyle product’ category. It is easy to think of Italian Marble in those terms, but ‘premium’ customers expect certain standards such as finishing, an areas PASDEC can assist its small business network at marble cities to overcome.

Retailers and end-users can include such professions as building contractors and stone masons. Exporters rarely deal with this trade channel due to two reasons:

- Pakistani exporters are not selling their products in the finished form. This gives little room for retailers to contact them directly and also excludes them from higher priced contracts
- Even if the margins for retailers are small due to competition, the industry can be developed if a more active position is taken on behalf of the retailing and sales arm of the industry.

To illustrate the power of creating interest at the consumer level, an extract from a successful Western Australian stone retailer aimed primarily at the domestic market is included:

Figure 11: Marketing Messaging – Stone Retailer

“GRANITE”

Natural stone, and granite in particular, provides organic beauty, indisputable strength and ultra durability. Granite is one of the oldest and most respected building materials. Traditionally, it is the ideal material chosen by architects and engineers when permanence, enduring color and texture, and complete freedom from deterioration and maintenance are paramount.

Granite can be used indoors and outdoors. Both eye-catching and ageless, **granite** is available in a slew of striking colours, textures and finishes that will complement any décor. **Granite** is the ultimate material for interior design on bench tops, bath vanities, reception desks, conference tables, fireplaces, pedestals and bistro tables. As an architectural stone, **granite** is used extensively for paving, can be installed on stairs, copings, window sills, moldings, columns, interior and exterior cladding panels. **Granite** can hold up in the most demanding situations, such as commercial kitchens in restaurants and institutions. Its inherent strength makes it highly resistant to wear and tear on interior flooring applications. When used outdoors, **granite’s** mineralogical composition can endure freeze and thaw cycles. The diamond-like hardness of **granite** makes it impervious to extreme heat, ultraviolet light, acids, and abrasions. However, it is somewhat porous and requires a penetrating sealer to deter stains. Granite and Stone Gallery sells the stone care products for all its product range for you to carry out this annual maintenance procedure.

Granite is dense and coarse grained and one of the hardest materials on earth, ranking close to that of quartz and diamonds. **Granite** is an igneous rock, which means it was

(Retrieved May 11, 2010 <http://www.graniteandstonegallery.com.au/granite.html>)

9.6 DISTRIBUTION CHANNELS FOR EXPORTERS

Mostly intermediate products are exported from Pakistan and the most appropriate distribution channel for the quarry owner, processor, or trader is the wholesaler/importer channel. Even finished products are channeled through by wholesaler/importer as it accounts for the largest turnover.

The other distribution channels, e.g. the processing industry and the retailer/end-user, mainly work through wholesalers as they have warehouses for stocking the marble and granite products in different variety and quantities.

The marble and granite market is characterized as open and highly competitive and Pakistani exporters will need to improve efficiencies in order to absorb price fluctuations. Exporters need to be proactive and present themselves in the market place visiting and displaying at selected trade fairs, and be interested building their network at PASDEC organized events. A long-term business relationship can decrease the risk of such things as bad quality products or problems with delivery.

Action 30: PASDEC to initiate a series of networking events for members with each meeting devoted to a particular topic such as quality control, expanding and maximizing market channels, pricing in international markets, controlling costs.

Table 27: Roles & Responsibilities – Export Development

PROPONENT	PASDEC ROLE
<p>Exporter/ Quarrying Owner/ Others</p>	<ul style="list-style-type: none"> • Awareness campaign for local stakeholders about marketing channels in importing countries; • Participation in international trade fairs, arrange out going delegations, importer’s site visit – for better understanding of the trends and consumption patterns in the importing markets; • Training on market access requirements, environmental and social production norms, industry specific challenges, product trends & consumption patterns and other export marketing tools; • Serves as Focal Point between exporters and international trade by helping in formalizing contracts and providing technical support; • Opportunity to serves as One Window Stop Shop for providing marketing intelligence on trade and buyer’s profiles; • Common Facility Training Center (CFTC) – allowing processing companies’ access to quality equipment leading to improved manufacturing techniques and product quality;
<p>Importer/ Wholesaler, Distributor, Processing Units & Retailers</p>	<ul style="list-style-type: none"> • Invite leading trading houses to Pakistan to showcase rare and abundant Pakistani stone; • PASDEC website should be the “handy notebook” for guiding importer/wholesaler, distributor, processing units and retailers; • Explore and promote investment opportunities for foreigner investors such as opening warehouses, joint ventures in quarrying excavation, technical skills up gradation etc.; • Establish a warehouse in main hub of stone trading for Pakistani exporters for stocking – Trade Development Authority of Pakistan is an opportunity for collaboration; • Serves as Focal Point between exporters and international trade by helping in formalizing contracts and providing technical support;

9.7 KEY DOMESTIC AND INTERNATIONAL PARTNERS

The effect of globalization on the value chain has added layers of complexity to traditional roles and relationships. For example, Marble and granite extracted in Pakistan is processed in Italy, marketed in France and installed in a kitchen in Belgium. Sustaining such complex processes are widespread due to the availability of technology and communication, the free movement of capital and labor and the level of involvement of both domestic and international partners. Partner participation becomes a critical factor in the success of an industry and of firms within that industry.

The following table presents a list of domestic and international partners associated directly and indirectly with Marble City Risalpur.

Table 28: Marble City Domestic & International Partners

DOMESTIC PARTNERS	INTERNATIONAL PARTNERS
<ul style="list-style-type: none"> • Ministry of Industries & Production • Ministry of Petroleum & Natural Resources • Ministry of Commerce • Ministry of Environment • Federal Board of Revenue • Pakistan Customs • Board of Investment • Pakistan Industrial Development Corporation • Trade Development Authority of Pakistan • Small and Medium Enterprises Development Authority • Pakistan National Accreditation Council • Pakistan Council of Scientific & Industrial Research • National Industrial Park Development & Management Company • National Productivity Organization • Pakistan Industrial Technical Assistance Centre • Geological Survey of Pakistan • Pakistan Railways • Director General, Mines & Mineral, NWFP • Sarhad Development Authority • Federation of Pakistan Chambers of Commerce and Industry (FPCCI) • All Pakistan Marble Industries Association • Frontier Mine Owners Association • FATA Mine Owners Association • Industrialists (having industries in MCR) • Labor Force (both Skilled & unskilled) • Research Institute & Academia • Financial and Banking Institutions • Logistics Companies & Transporters • Freight Forwarders & Clearing Agencies • Shipping Lines 	<ul style="list-style-type: none"> • Marble & Granite Processing Industry • Building/Construction Industry • Funerary Industry • Buyers • Importers/Wholesaler/Distributors • Retailers/Brands • International Consultants • Machinery & equipment Manufacturers • Trade Promotion Organizations • International Federation of Natural Stone Industries • Association of Marble & Granite of respective country • International Certification & Accreditation Agencies • International Environment Protection Agencies • International Testing & Standardization Laboratories • Child Protection and Bonded Labor Association • Donor Agencies • Research Institutes & Academia • International Trade Fairs • Internet Websites dealing in Marble & Granite • Magazines • Online News Portal • International Freight forwarders • Shipping Lines • Social Networking Websites, e.g., Facebook, Twitter & You Tube

It is worth noting the potential value of posting quality informational videos online. When an interested party does a quick search on www.youtube.com for PASDEC material, a 5:13 promotional video uploaded on February 25, 2010 comes up. It is of good quality and is a positive way of giving some assurances to interested partners, whether strategic or financial, as to the marble and granite

sector and its significant potential. This type of international marketing and communications will become more important over time, as this type of promotional video can be quickly searched for, and played in any forum such as a trade show or within a high level government meeting in an international setting. The power of this type of multimedia presentation can rapidly create interest from potential stakeholders.

Action 31: PASDEC to review and add to Table 27 & investigate ways and means of expanding their market message through the coordinated use of quality promotional videos on the world's most used media such as YouTube (assuming they are able to be viewed in Pakistan on a regular basis). As expansion is considered, the type of video clip and message need to be considered and, if necessary, budgeted for.

9.8 ALIGNMENT VALUE WITH TRADE DEVELOPMENT AUTHORITY (TDAP)

Many opinions exist as to the value of working with trade promotion agencies such as the Trade Development Authority of Pakistan (TDAP) to further develop market penetration and customer base.

Through the Ministry of Commerce, the Government of Pakistan has attempted to extend its reach into international markets with commercial offices in more than sixty (60) cities including all the major global trading hubs. The main aim is to promote Pakistani products, facilitate foreign buyers and to act as a gateway for Pakistani exporters.

Commercial offices assist exporters as well as importers and provide a unified platform for the dissemination of market information. Trade opportunities are facilitated through networking, market surveys and trend analysis. A key advantage offered by TDAP is that its commercial section employs native Pakistani's in its trade section. The language barrier can often be a negative factor. The advantage of working with TDAP is the use of bi-lingual staff that is cognizant of Pakistani business customs as well as international practices.

PASDEC and its members can access a range of assistance from TDAP including:

- Market intelligence
- Market access requirements
- Assistance with market delegations
- Organizing attendance at international trade fairs
- Insight into industry specific challenges
- Insight into specific industry opportunities & threats
- Reports and analysis on consumption patterns and trends
- Assistance with marketing channels

Action 32: PASDEC to internally investigate specific areas of interest to the organization; compile a list of specific questions and forward to TDAP for response and assistance. Specific target areas and small defined projects of interest to both groups likely have the greatest chance of success.

9.9 PROMOTION TOOL – MARBLE CITY WEBSITE

Websites can be powerful business tools. Accurate and regularly updated information are key ingredients for success as a business promotes its product or services. PASDEC should consider Raisalpur Marble City the establishment of independent and distinct domain name as suggested above, i.e., www.pakistanmarblecity.com.

Given that Marble City Risalpur is the first estate of a number of planned marble cities, the basic principles of in creating an interactive and simple website should be followed. This would attract and retain visitors, as they learn about the benefits of marble city as well as encouraging them to take some type of action. The website should provide a platform for visitors to interact freely, share views and ask questions. Depending on the level of sophistication of the website, PASDEC could use it to gather important data and build a database of interested followers willing to receive notifications of product launches, pricing, stone business training courses and events in Risalpur or at PASDEC headquarters in Islamabad. All of this would assist PASDEC to figure out its customer and end-user expectations.

“Sorry I don’t know anything. We just thought it would be really cool to build this high-tech information kiosk”

Source: International Institute of Communication and Development

10. SKILL DEVELOPMENT AND TRAINING ASSISTANCE

The current status of the dimension stone industry is in rudimentary shape as conventional practices are prevalent in all links of the value chain i.e. quarrying, processing, marketing etc. Though PASDEC has endeavored to improve the quarrying industry, however still a lot need to be done in processing and marketing where a significant value is added. Section 9.1 below has mapped the current situation in terms of capacity of human resources.

10.1 SKILL ASSESSMENT- INDUSTRY WIDE AND PASDEC SPECIFIC

According to an assessment most of the quarries are still using rudimentary methods of quarrying i.e. blasting and extracting irregular shaped blocks. The processing industry is dependent on the output of the quarries and it is non-competitive and expensive to process irregular shaped blocks as compared to the squared blocks, moreover the machinery used for processing is also limited in terms of processing capacity and quality of the output. Later in the value chain for marketing of the output age old practices are used and the knowledge about the market is almost restricted to a few exporters thus inhibiting the opportunity for new entrants, as well as the R&D and the market information is sparsely available at institutional level. The table below provides a situational analysis of the industry in terms of capacity and skills.

Table 29: Industry & PASDEC Capacity – By Component

Component	Industry Capacity	PASDEC Capacity
Prospecting (Prefeasibility)	Non-existent	Have the capacity but not sufficient to cater all the industrial requirement
Quarrying	Conventional	Have the resources but the resources are inadequate to meet the requirement of the industry
Research and development	Non-existent	PASDEC has a limited capacity to undertake research
Transportation	Have the capacity to handle, but needs improvement	PASDEC have sufficient capacity to transport large blocks
Processing	Limited capacity	PASDEC is planning to build the capacity through common facility training center
Sales and Marketing	Close to non-existent	PASDEC only coordinate for marketing of the marble products but due to their limited resources they are unable to provide financial support to the local industry
Equipment Manufacturing	Limited capacity to operate, maintain, and calibrate	No capacity

Component	Industry Capacity	PASDEC Capacity
	machines to produce quality products	
Planning	Hit and run approach is use	Need to be supported
Testing	Limited capacity not recognized, not available to everyone	No capacity, dependant on other labs which are also not accredited as they lack the necessary skill and infrastructure to meet the prerequisite for accreditation
Communication for Marketing	Very few	Needs to be strengthened
Advertising	Limited	Needs to be strengthened
E-Readiness	Limited	Needs to be strengthened
Quality assurance	Limited	Limited

There is a need to make concerted efforts on developing overall capacity of the industry in the area identified above where there is a capacity gap or improvement in that area can contribute to a significant value addition in the products.

10.2 LINKS TO TECHNICAL AND FURTHER EDUCATION- DOMESTIC AND INTERNATIONAL

As an industry grows, so too does the demand for higher levels of learning, innovation and skill in the development of its products and services. One of the key drivers of sustained growth within any industry is the ability to build on the institutional knowledge and the continual search for improvement and enhancements. PASDEC and the Marble City development will need to create and maintain genuine working relationships with domestic and international academia in the following areas;

- Industrial Planning
- Industrial Management
- Environmental Planning & Management
- Geology
- Marketing Management
- Information Technology
- Technical & Vocational Education
- Quality Control Systems, Processes and Procedures

The linkage with academia will benefit both PASDEC and its education partners. The opportunity to apply quality research and development from the laboratory to the factory floor will not only validate practical applications, but also give rise to serious research within the dimension stone industry. As export dollars are realized, and the number of jobs within certain segments of an industry increases, so too does the level of attention and budget from all levels of government. PASDEC needs to

understand the triggers of how to secure public and private investment as it grows the industry. One of the key drivers of its ability to do so will certainly be domestic and international technical and further education.

Action 33: PASDEC to conduct a survey of Pakistani Institutions to gauge possibilities of collaboration in the areas of stone research and development and technical analysis of regions and their stone varieties. The outcomes can be mapped to specific overseas markets and buyer requirements

10.3 LINKAGES WITH INTERNATIONAL RESEARCH-INCLUDING SENDING PAKISTANI PHDS ABROAD

Research and development holds key post in the dimension stone industry, as it can add to the competitive advantage. Various organizations are engaged in R&D like Marble Institute of America, ASTM, Natural Stone Council, Leadership in Energy and Environmental Design (LEED), University of Padua etc.

Currently there is a dearth of professionals who have exposure to the modern techniques in quarrying and processing, however there is a potential in the form of qualified professionals, a pool of mining and mechanical engineers is available. A step towards capacity building of the aforementioned group will result in creation of indigenous pool of resources, which can serve the industry and add to its competitiveness.

PASDEC's linkages with international research institutions can help in removing the weaknesses in the local stone market and developing an indigenous resource base of professionals equipped with current knowledge and familiar with international trends.

A strong 'fit' for PASDEC would be to explore the possibility of teaming with Curtin University in Western Australia, as operates a world class 'Western Australian School of Mines' (WASM). The school operates on two sites, the regional Kalgoorlie Campus (about 6 hours drive from the capital city Perth) in the heart of Australia's mining industry and the Bentley (Perth) Campus of Curtin University of Technology.

The depth of study at WASM cannot be understated and includes:

- ✓ Mining Engineering
- ✓ Metallurgical Engineering & Extractive Metallurgy
- ✓ Applied Geology
- ✓ Spatial Sciences
- ✓ Exploration Geophysics

(Retrieved May 14, 2010; http://wasm.curtin.edu.au/about_us.cfm)

Local knowledge development and sharing is also key to the growth of any indigenous industry, and short term foreign expertise is no substitute for the development of local talent. Medium to long term knowledge transfer cannot be achieved if the volume of local people with expertise is low.

Pakistani PhDs Abroad:

Curtin University in Australia operates the world class 'Western Australian School of Mines'. Due to the explosion in mining activities in that State, PASDEC should explore linkage programs with such institutions for an exchange program

If PASDEC can prove that excellence exists within its emerging discipline, best practice foreign research institutes and mining engineering schools will be interested in developing a relationship.

Action 34: Establish a relationship with the Higher Education Commission Pakistan for the purpose of setting up a scholarship program in areas that will benefit new knowledge to industry

Action 35: PASDEC to explore linkage programs with 'best practice' mining engineering schools in highly regarded universities to develop a local Pakistani expertise base.

11. GOVERNANCE STRUCTURES

11.1 CURRENT MANAGEMENT MECHANISMS

PASDEC was established under the guidance of the Ministry of Industries and Production, Government of Pakistan, as a Public Private Partnership. The company has significant funding from the Government of Pakistan. It is a not for profit organization incorporated under section 42 of the Companies Ordinance, 1984 as a subsidiary of the Pakistan Industrial Development Corporation (PIDC).

The Board of Directors of PASDEC is drawn from representatives of both the private and public sectors. The majority of directors are from the private sector. According to the articles of association of the company, the chairperson must always be from the private sector. The composition of the Board of Directors can be one of the key success factors with respect to their contribution toward the success of PASDEC and its interventions.

Marble City Risalpur is a project of PASDEC and strategic support is provided by the Board of Directors. The day to day management and the separate advisory committees are established. Committee composition are as follows:

- ✓ Provincial Development Authority (1)
- ✓ Executing Body Members (2)
- ✓ President/member of association (1)
- ✓ District Coordination Officer

The Advisory Committee structure is responsible for setting the strategic course and overseeing operations in a manner that facilitates the stakeholders. This structure is responsible for carrying out day to day operational matters and conducts the following activities:

- ✓ Policy implementation
- ✓ Identify and formulate new policies
- ✓ Produce a five year strategic plan and operational plans on an annual basis
- ✓ Deals with any urgent matters which, in the opinion of the management committee, need to be resolved before the next board meeting

11.2 GOVERNANCE STRUCTURE – STRATEGIC BUSINESS DEVELOPMENT

Table 30: Governance Structure – Strategic Business Development

Board Composition	Role	Relevant Experience	Connectivity	Experience	
				Local	Regional
Chief Executive Officer and Chairman	Oversight and Connections	Corporate roles; high visibility; ability to influence; strategic partner generation and relationship development	Private and Public	✓	✓
Board Members	Push targeted offerings of	High connections across range of	Private (high) & public	✓	✓

Board Composition	Role	Relevant Experience	Connectivity	Experience	
				Local	Regional
	PASDEC	industry sectors	(lower)		
Business Development	Work to bring 'live' investors and buyers into the PASDEC family and convert into sales	A sense of strategic direction, but main focus on exposing Marble City concept nationally and internationally	Private	✓	✓
Marketing and Communications	Push 'market message'	Corporate communications and liaison with business development	Private (high) & public (lower)	✓	✓
Administration	Activity co-ordination – including infrastructure, installment collection and reconciliation; contract management; other revenue collection	Corporate co-ordination for Marble City – to show clear and transparent process and the provision of timely reporting	Private (higher) & public (lower)	✓	✓

As Marble City is activated and businesses begin to pay further installments and develop their lots, a strategic business development approach should be considered as the project gains greater visibility in the public arena and attracts more interest and enquiries from suppliers, buyers, investors and government officials.

A coordinated message needs to be prepared prior to this occurring. At the current rate of development, 2011 and 2012 will be critical years for the Greenfield development in Risalpur.

12.SUSTAINABILITY CONSIDERATION

Throughout this business plan, a number of issues have been raised and addressed (see section 3.0 actions and risks) regarding the level of effort needed to produce the numbers contained within the projections.

The key global differentiators for the marble and granite sector will be:

- Perception of the stone quality (from extraction to end use)
- Perception of attempts to comply with best practice extraction, handling, testing and quality control
- Perception of reliable and trustworthy sources of supply
- Ability to brand Pakistan stone in ‘lifestyle products’ category to achieve noticeable entry into world markets
- Market perception (international) that Pakistan is a ‘trusted’ producer of high quality stone and stone products. Show sufficient investments are being made in all areas of production (infrastructure/emissions, quality) and management (expertise/transparency/contracts).

How to Differentiate Pakistan Stone:

Market perception (international) that Pakistan is ‘trusted’ producer of high quality stone and stone products. Show sufficient investments are being made in all areas of production (infrastructure/emissions/quality) and management (expertise/transparency/contracts). Consistency will build credibility

12.1 CREATING A SUSTAINABLE VENTURE

This section quotes directly from an email from a potential (and significant) buyer in the land development industry in Australia (excerpt from April 2010 email correspondence). The global land development industry is a strong candidate as a target market (see Appendix II, Article #13 for Hong Kong comments regarding demand from their construction industry), for the residential and commercial uses of marble and granite.

The emergence of a few key words from the message; those of trust and reliability cannot be understated when new business is being sought and created.

Prospective buyers are also interested in the results of 'test' shipments. This should not be considered a challenge or issue, but as a positive sign of increased dollar and volume orders, leading to a sustainable outcome for the industry. If and when the stage of greater scale is reached, the economic and commercial benefits for all parties will become apparent.

Here are the key points of the correspondence. Please note the thread of sustainability throughout.

1. The structure of PASDEC and the level of 'guidance' and influence USAID have over their operations

2. How quality of selected & pre-shipped product is measured and guaranteed
3. Who is responsible for making sure of the accuracy of all levels of documentation - port to port?
4. The accreditation steps for the small companies in the 'PASDEC family'
5. How businesses are 'endorsed' or act independently of PASDEC once they commence operations in Marble City Risalpur
6. How many other potential international buyers are being sought/placing orders from marketing efforts at Marble City presently?
7. At what point USAID exits from its role as mentor and guiding partner?
8. The credibility of the firms exporting from Marble City and other industrial estates in Pakistan - does PASDEC have a role here?
9. How does the Pakistan product compare to product of similar quality from other countries and other suppliers?
10. The competence of Pakistani suppliers of semi-finished/finished goods in the stone industry, and the role PASDEC would play/plays in this if any
11. The reliability and trustworthiness of people/companies to deliver on a deal, once it is agreed and the potential risks, delays, quality issues.

PASDEC needs to consider the relevance of these statements to their operation, and how, if at all, they would act to overcome any concerns from foreign investors or buyers.

13. CONCLUSIONS & RECOMMENDATIONS

The sections in this business plan have shown the Pakistan marble and granite sector to have great potential. The momentum of the SWOG and the PASDEC has continued to the point of take-off. The idea behind any business plan is for it to be actioned when and as needed.

Attention to key focus areas will result in satisfying results for Marble City Risalpur. There is always a danger in expecting to replicate one blueprint in another location, but the lessons and remediation may serve as a benefit to other marble cities and model quarries as they are developed.

1. The Master Plan should hold one consideration above all; the ‘Movement Economy’. The success of Marble City will be determined by the movement of goods and people within the estate and infrastructure connections to the immediate surrounding area. Without a strong planning authority and strict governance mechanisms, the ‘best practice’ potential will look and feel like much of the other industrial estates around Pakistan. If loose regulation and controls are exercised, the ability to achieve global standards would be problematic if not almost impossible.
2. 100% occupancy is not, and should not be, a key measure of success. Land speculation is a common practice, and one which can destroy estate value if pure profit motives lie within the decision to invest in the first instance.
3. If a strong emphasis on clean green inputs in the form of efficient quarrying practices, research and development focus to improve stone quality and durability, waste minimization (from industries and from stone) exists and builds, the chance of success is high.
4. Price, variety, quality and time to market considerations should be priorities for PASDEC and the member organizations. However, effective monitoring, evaluation and interventions at appropriate times will be needed.
5. Employment generation focused on the creation of ‘smart jobs’ as the industry matures in step with export requirements and demands is critical. This includes adequate training and process refinement at the processing stage prior to shipment.
6. Focus on shared infrastructure facilities for economies of scale with the aim to increase levels of technical expertise at critical stages of production is needed. Again, PASDEC or the Board of Management on site needs to work on matching infrastructure needs to expected output, as bottlenecks and blockage will otherwise occur.
7. A sharper focus on target markets such as the land development industry in the global market. A better understanding of their requirements and tolerances will lead to sustainable export orientation and develop the culture of excellence in Pakistan. Possibilities of foreign direct investment could be possible if relationships and quality shipments are made.
8. Breaking down the marble and granite supply chain into areas for improvement allows PASDEC to focus attention where weakness has consequences up the chain.

9. The professional presentation of the industry as a whole with highlights on particular excellent businesses allows prospective investors, strategic partners and research partners to take comfort in the sincerity of collaborative efforts and the guarantee of outputs.
10. True valuation of the land and its projected prices through 2025. The ability to understand true market forces will minimize distortions caused by under-pricing government-owned land. This in turn distorts the total cost of ownership for firms entering Marble City Risalpur as the land acquisition cost does not represent market prices. Once the speculative rush is over, investors will leave, and the industrial wasteland scenario may unfold.
11. A true match of the supply side with product demand in order to predict and fulfill orders on time especially if they involve aggregating the supply of many small producers. A focus on scaling the industry will be vital to assure potential investors, partners and buyers.

APPENDIX I: DRAFT BRIEFING PAPER ON COBBLESTONE OPPORTUNITY

RATIONALE FOR COBBLESTONE CONSIGNMENT

The opportunity to export cobblestone from Pakistan to Australia under a MoU between Yanchep Beach Joint Venture and Pakistan Stone Development Company (PASDEC) can help in developing a better understanding about the whole value chain of dimension stone from quarry to consumer, associated issues, problems, and constraints. The improved understanding can help in devising strategic business plan for the dimension stone industry, and can open doors to a new market for local stone industry provided the prices are competitive and acceptable to the buyer.



BACKGROUND

Pakistan is endowed with dimension stones as according to an estimate there are more than 300 billion tons of dimension stones reserves in Pakistan. A significant volume of stone is wasted at quarrying even with most modern quarrying techniques, and in Pakistan where predominantly rudimentary quarrying methods are in practice wastage is around 73%¹. The waste can be brought to use by transforming it into value added products, and cobblestone is one of the products which can be made from this quarry waste. There is a market for cobblestone in local as well as international market due to its durability, eco-friendliness, uniqueness and usability. Till now there is a little information about the market potential of cobblestone and the skills required to produce cobblestone mechanically is also lacking. Focus on two primary areas can help in establishing

cobblestone production as an industry are; *market access & information*, and *capacity building to produce quality cobblestones*.

PASDEC is managing projects of model quarries and under this project they have a joint venture with quarry owners which give them access to the quarry waste- the raw material required for producing cobble stones. For a test shipment of cobblestones PASDEC can setup the required machinery in one of the model quarry, and the facilities like electricity and trained manpower can be utilized for this purpose. This will reduce the setup time and cost.

MACHINERY REQUIREMENTS

The process for producing cobblestone is fairly simple as only one machine is required for producing cobblestone i.e. hydraulic stone splitting machine and the remaining machines will be dependent on the required finish by the buyer/customer. (Figure 1)

One cobblestone facility can provide employment to three to four people, and the following machinery is required for that;

1. Hydraulic Stone Splitter 60 Tones or above
2. Generator
3. Miscellaneous tools



LEAD TIME TO IMPORT THE REQUIRED MACHINERY

8-12 weeks starting from the date of order (depending on the manufacturing country)

COST OF MACHINE

Machine Make	Price US\$
Stone Splitting Machine - <i>Chinese</i>	12,700
Stone Splitting Machine - <i>USA</i>	35,000

Note: Prices quoted above are FOB. According to the local industry’s experience US made machines are considered to be expensive but superior in terms of reliability and consistent quality of the output as compared to the Chinese machines.

TRAINING REQUIREMENTS

The machine operator(s) are required to be trained in machine operation, stone splitting techniques and occupational safety. The required expertise for the machine operation and aforementioned areas is available with the manufacturer of the equipments and this can be procured as a separate service. Major components of the cost of the training are as below;

- Trainers’ Fee
- Trainers boarding lodging
- Training venue
- Misc Costs

In order to make the training cost effective the number of trainees should be more than 10, the proposed duration should be 3-4 days, and the first training can be arranged close to one of the model quarry. As a result of the training master trainers will be developed who can train others if the need arises.

Estimated Cost of the training US\$ 10,000 for US Trainer

ACTIVITY, RESPONSIBILITY ASSIGNMENT AND RISK RESPONSE MATRIX

A matrix on the page 3 elaborates the activities, corresponding responsibilities, time lines, associated risks and ways to mitigate risks. In this whole process Pakistan trade project will act as a facilitator/monitor so that activities take place according to the plan.

CONCLUSION

The cobblestone is a viable option only if the landed price of the cobblestone is acceptable to the buyer and is competitive in the Australian market. The table below provides a comparison of various choices available and their corresponding effect on price of the cobblestone.

Attributes	Option 1	Option 2	Option 3
Cost per cobblestone US\$	0.34	0.31	0.25
Cost per Ton US\$	108.08	99.85	78.95
Cost per square Meter US\$	14.66	13.54	10.71
Total Surface area which can be paved with one container (Square meters)	117.96	117.96	117.96
Cost per Container of Cobblestones US\$	1,729.25	1,597.57	1,263.22
Time required to produce one container load of cobblestones (Rounded days)	13	13	13*

Notes to the table above:

1- All cost are FOB Karachi and cost like packing, training and quality assurance have not been added in the comparison above if they are added the cost estimate may further be escalated by 10%



2- Option1-Generator coupled American machine

3- Option 2- Chinese machine with separate generator though machine is cheap but additional cost has to be incurred on generator

4- Option 3-Manual production

5- In order to have the container ready within the same number of days, as given in other choices, no of workers have to be increased to over 3

6- The profit margin of supplier has not been yet in the above analysis and table above only represent direct costs.

ACTIVITIES & RISK RESPONSE MATRIX

ACTIVITIES	PRIMARY RESPONSIBILITY	TIMELINE	RISKS	RISK MITIGATION
Signing of MoU	PASDEC-YBJV	Week 0	Delay in the approval of MoU from respective ministries or changes in the contents of MoU may further delay the process	Follow up on MoU and parallel work on other activities which are independent of signing of MoU
Nomination of authorized focal person for cobblestone from PASDEC	PASDEC	Week 0	Authority of the person to decide	Identify the person who can give time to this activity and has authority or authority delegated to him
Nomination of authorized contact person on behalf of YBJV	YBJV	Week 0	Authority of the person to decide	Identify the person who can give time to this activity
Cost sharing mechanism for the procurement of the machinery	USAID-PASDEC	Week 0	Procedural delay due to the approval of partners i.e. USAID, and PASDEC	Follow-up
Finalization of Machinery	PASDEC	Week 0	Delay in finalizing machinery, and cost sharing formula	Follow up and decision about the cost sharing formula
Provision of information to PASDEC related to Australian market regulations	PTP	Week 0	Market regulations are not properly complied	Handholding of PASDEC throughout the process and proper communication between both the parties

ACTIVITIES	PRIMARY RESPONSIBILITY	TIMELINE	RISKS	RISK MITIGATION
Product Testing Information	PASDEC	Week 0	Internationally recognized testing facilities are not available in Pakistan; getting the product tested from foreign lab will add to the cost of the product, and might make it economically unfeasible	Establishing the capacity of a local laboratory to testing as per international standards, and get it internationally accredited.
Production of samples, preparation of necessary documentation and reports about the chemical composition of stone and dispatch to the buyer	PASDEC	Week 2	Test reports provided along with samples are not acceptable because testing is done by non-accredited organization	Test could be validated again in Australia
Products received in Australia and consensus is reached on the material, product, price, and other specifications	PASDEC-YBJV	Week 3	Approval from YBJV about the product specifications may be delayed or samples may not meet their requirements in terms of usability and price	Increase the number of choices, and sharing the pictures and information with buyers or their representatives, and through proper market research
Contract for the supply of cobblestone signed	PASDEC-YBJV	Week 4	Delay in agreement on the terms and conditions of the	Direct communication between both the parties so that expectations can be

ACTIVITIES	PRIMARY RESPONSIBILITY	TIMELINE	RISKS	RISK MITIGATION
			contact	shared prior to the formal contract
Placement of order for Machinery	PASDEC	Week 4	Procedural Delays	Identification and short listing of supplier of machinery prior to this and it can be done simultaneously with activity at serial no 5
Machine will be ready to be shipped, lead time for the production of machinery (4 weeks for US machine)	Machinery supplier	Weeks 8	Delay in getting the machine ready to be shipped	Choosing a reliable supplier
Machine received on the destination; transit time from factory to the destination where machine is to be installed is 6 week		Week 14	Delays at ports, or inland transportation	Follow-up, scheduling, and choosing reliable partners i.e. shipping line, clearing agent, and freight company.
Setting up the Machinery	PASDEC	Week 14	Delay in getting the machinery installed at location due to the delay in shipment or inland transportation	Choice of the shipping line and inland transporter can significantly reduce the risk

ACTIVITIES	PRIMARY RESPONSIBILITY	TIMELINE	RISKS	RISK MITIGATION
Training	PASDEC	Week 14	The resource person is unable to travel to Pakistan due to security situation or visa for the resource person is denied	Training through audio video means and learning through doing
One container load of cobblestone will be ready	PASDEC	Week 20	Irregular electricity supply, and law and order situation may disrupt the production schedule and supply of raw material	Alternate power back up, and addition of extra time to meet the supply schedule
Packing	PASDEC	Week 20	Required type of packing which can adhere to Australian regulation may be costly and may make the price of the finish product non-competitive in international market	In the long run develop packing material locally and identifying low cost packing material
Compliance Certification from respective agencies e.g. ISPM 15 ⁱⁱ	PASDEC	Week 20	Required level of expertise not available or too expensive to afford will add to the price of the product and may make it uncompetitive in international	Alternate packing which do not require ISPM certification

ACTIVITIES	PRIMARY RESPONSIBILITY	TIMELINE	RISKS	RISK MITIGATION
			market	
Inland Transportation and goods reach Karachi port	PASDEC	Week 22	Delays in Inland Transportation	Selection of a reliable transportation company
Custom clearance	PASDEC	Week 23	The consignment is selected for random check for drug	Incorporate this event in the schedule, and plan accordingly with this in mind
Shipment loaded for destination	PASDEC	Week 23	The shipment miss the ship due to the delays in preceding activities, have to wait for the next ship	
Shipment reach the port in Australia, in this case Fremantle	YBJV	Week 27		
Custom Clearance	YBJV	Week 28		
Goods received at destination	YBJV	Week 28	Delays in the preceding steps can have a cascading effect here. Goods do not conform to the buyers' standard	Follow-up in previous steps and adopting strict quality assurance procedures, Pre-shipment inspection at the cost of the buyer

APPENDIX II: SAMPLE OF RELATED MARBLE AND GRANITE NEWS ARTICLES (PRINTS MEDIA) 2007-2010

The marble and granite sector has enjoyed strong and constant exposure of its message in the Pakistani print media over the past 4 years. This table seeks to give the reader a quick overview of headline messages in the press and the type and scale of initiatives over that period. There is clearly interest from private and public stakeholders from a local and international level.

Related Media Articles	Article Title	Content
1. The Nation, April 13, 2010	Marble City in Karachi	PASDEC to establish a marble city in Karachi with Sindh Government assistance. MOU signed with Sindh Board of Investment.
2. The Nation, February 23, 2010	PASDEC Auctions Marble Block	PASDEC auctioned regular and irregular stock of square blocks. Local and foreign bidders participated; received and accepted higher bids and sold out.
3. The News, February 7, 2010	Marble Exports Rise to \$38.5M Despite Violence	Phenomenal growth over past 3 years as exports rose to \$38.5M from \$26M annually. NWFP is only province where over 1,500 registered marble factories are functioning at 17 clusters providing 50,000 jobs. Clusters in other settled districts include Mardan Industrial Estate where 63 factories are operational; Nowshera Industrial Estate 35 factories; Jehangira 112 chip and marble factories; Kairabad 35; Hayatabad 35. Marble City Risalpur plots are non-transferable until establishment of units for approved purpose only.
4. Daily Times, February 3, 2010	PASDEC Allocates 199 Industrial Plots to Stakeholders	Balloting at Marble City Risalpur for total of 199 plots of various sizes including 8/4/2 Kanal against 409 applications. Request to government for 5 year tax holiday after resumption of production to units. Karachi

Related Media Articles	Article Title	Content
		marble industry accounts for 90% of export target. Export figure of ~\$60M by Dec 2010, with export to USA estimated ~\$5.9M. Swat district, Bajaur agencies and NWFP millions of tons of deposit of marble and chromite; black color stone contains around 55% steel properties & used in steel-making and steel material for tank making. China is largest importer of chromite. Due to disturbances in tribal areas, exports are hit hard.
5. Daily Times, January 26, 2010	PASDEC Expects \$44M Exports By End of 2009-10	Exports of marble and granite goods during 2008-09 were \$36M and expected to rise to \$44M in 2009-10. PASDEC Chief Executive gave a presentation to Federal Minister for Industries and Production Dr. Durrani. Establishment of 10 model quarries throughout Pakistan approved in PC-1; only 2 operational at Khuzdar and Chitral; machinery for 3 rd at Bunir deployed.
6. The Statesman, December 13, 2009	PASDEC to Launch 45 Projects for Marble Sector	45 projects to transform traditional stone sector into modern, competitive and knowledge-based industry; re-engineering stone production chain and up gradation of technology skills. Another Marble City FATA (Mohmand Agency) of 300 Acres is also set for ground breaking. CFTCs will offer common facility services for nominal rental charges and training to private sector entrepreneurs.
7. Business Recorder, October 7, 2009	Modernizing Marble and Granite Sector	Survey reveals approx 296 B tons of marble and granite reserves. Uncontrolled blasting is ruining natural resources; only 15% is usable. Italy, Turkey, China, Brazil and Spain are the major players in world market. Model quarry in Khuzdar had 6 million tons of extractable marble reserves and approximately 30,000 tons could be extracted annually for Rs 6M.
8. Daily Times, July 18, 2009	Initiatives Afoot to Develop Marble, Granite Sectors in Balochistan	Mining and quarrying contributing about 0.5% to GDP of Pakistan; global trade in marble and granite estimated \$41 Billion annually. Ministry of Industries invested around Rs 1.36B; PASDEC imported dozers, wire cutting machinery, loaders, excavators, block movement machinery, wire saws and other machinery

Related Media Articles	Article Title	Content
9. Daily Times, May 19, 2009	Government Committed to Developing Marble, Granite Sector	Government realized and committed to develop sector on modern and scientific methods, which would collect huge amount of foreign reserves from international market. Proper measures (Marble City) were taken to prevent environmental pollution by setting up a water treatment plant for water recycling and reuse. 50% of total investment from local investors; remainder from Government
10. Daily Times, February 12, 2009	Model Quarries to Generate Rs 12 Billion Annually: Wattoo	Government to complete establishment of 10 model quarries in 18 months (circa August 2010) & help generate Rs 12 Billion annually; 3 quarries each in Balochistan, KPK, FATA and 1 in Northern Areas. Khuzdar machinery imported from Italy at cost of Rs 90M. Economic Coordination Committee of Cabinet approved Rs 400 Million to PASDEC. Commercial banks to provide this amount, and the Government would pay the 'mark-up' on this amount; the principal to be paid back by PASDEC within 7 years. Marble City to generate 10,000 direct and 25,000 indirect jobs & establishment of 121 units.
11. The News, November 19, 2008	Italy to Invest in Energy, Marble, Agriculture Sectors	The Italian Government expressed interest in investing in Pakistan's sectors including energy, textiles, agriculture and marble. An MOU had already been signed to boost bilateral investment. Law & Order situation affecting Foreign Direct Investment (FDI) but opportunities exist in marble and granite sector.
12. Daily Times, November 7, 2008	Italy to Invest \$100M in Marble Industry	Board of Investment Chairman comment "Italy would invest \$100M in Pakistan marble industry' during visit to Overseas Investors' Chamber of Commerce & Industry (OCCI). "Many agreements would be signed within a few days...major multinational companies (FIAT and Nestle) want to invest in Pakistan.'
13. Pakistan Observer, October 31, 2008	Sweden, Hong Kong to Import Marble, Granite	Sweden and Hong Kong are keen to import black granite from Pakistan, which has 'rich reserves of first rate black granite in the world.' A delegation of Swedish buyers and

Related Media Articles	Article Title	Content
		MD Cable Group Hong Kong in meeting with PASDEC at Expo Pakistan 2008 (Karachi). Sweden and Hong Kong delegates stated both “could be a major market of Pak black granite (construction sector). Swedish cooperation offered to quarrying, processing, workforce development & market research.
14. Daily Times, October 28, 2008	PASDEC for Uplift of Marble Granite Sector	PASDEC set up 4 stalls in Expo Pakistan 2008 exhibition to ‘attract foreign traders and capture new markets in the world.’ Federal Minister for Commerce stated ‘Ministry would recommend marble mosaic and handicrafts in duty free item list for enhancing exports.’
15. Business Recorder, June 30, 2008	Islamabad May Earn \$15B Through Export of Marble: PASDEC Chief	Pakistan could earn \$15B annually by exporting world class marble, onyx, granite. Export quality material needs good finish and gloss. Invitation to Prime Minister to see new method of extracting slabs of marble at Khuzdar mountain quarry.
16. Regional Times, June 5, 2008	Italy to Support Pakistan in Marble Sector	Ambassador of Italy, Mr. Vincenzo Prati offering ‘Every possible assistance’ to marble sector.
17. Dawn, May 31, 2008	Mosaic Artwork on Display	Exhibition of marble mosaic depicting Islamic calligraphy and images of nature and national figures offering viewers different perspective to mediums of expression. Result of mosaic training program to support women’s entrepreneurs activities & production of value-added products of inlay and carved handicrafts. Joint effort PASDEC and Staff Welfare Organization (SWO).
18. Pakistan Observer, April 30, 2008	Turkish Consultants Invited to Develop Training Curriculum	Delegation of Turkish consultants headed by Professor Erdogan of Torbali Technical Vocational School of Higher Education visited PASDEC pilot project of Marble Mosaic Workshop at Ladies Industrial Home Islamabad. The team analyzed present conditions for training (curriculum development), vocational training programs & development of TORs for establishment of quarry institutions. Turkish delegation expressed keen interest in finished marble mosaic products.

Related Media Articles	Article Title	Content
19. The Nation, February 9, 2008	Mineral Exploitation to Streamline Economic Uplift	Certificate ceremony for skill development (women) in mosaic marble – Minister emphasizes need to carefully exploit mineral resources. Derive maximum benefit only when local expertise is developed to mine, cut and polish by applying modern technology and techniques. Bad road conditions hindering efforts to extract resources on a larger scale.
20. Business Recorder, Islamabad January 18, 2008	PASDEC Plans to Raise Marble Exports to \$500M in 3 Years	PASDEC plans to increase exports of marble products from \$23M to \$500M in 3 years. PASDEC implementing an action plan at a cost of Rs 2B to exploit full potential of sector.
21. The News, November 23, 2007	Pak Marble Has Edge Over India, China	Federal Minister for Industries, Production and Special Initiatives assured PASDEC delegation of government cooperation to promote marble cities. Pakistan has 64 marble types while China and India lag behind. Underlined need for proper disposal of marble waste to check pollution and save nearby lands. PASDEC initiated efforts to import machinery from Italy. Requests to Minister to help investors get collateral loans; need to establish Mineral Development Bank in FATA; sales tax issues discussed.

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