



PACARAIMA BUILDING SUPPLIES INC.

PROJECT SUMMARY

Project: PBSI Concrete Block-Making Plant

Developer: Pacaraima Building Supplies Inc.

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INTRODUCTION

Incorporated on the 5th September, 2024, Pacaraima Building Supplies Inc. (PBSI) is a dynamic and emerging force in the world of concrete blocks and construction materials. As a company dedicated to innovation and quality, we are dedicated to delivering reliable products that support sustainable and durable construction practices. We take pride in our customer-focused approach, aiming to build long-lasting relationships through our commitment to excellence and environmentally responsible operations.

SITE DESCRIPTION

With approximately 2.5 acres of land located at Block "A" Lot 1 South Coverden, East Bank Demerara Guyana, PBSI's proposed project site will include the concrete block-making facility, storage and designated stockpiling areas for raw materials as well as support structures for water and fuel storage. The project will be established on the eastern side of the East Bank Public Road in an area comprised of mostly thickly vegetated land. However, access to the site is fairly easy via the access road heading east from the Public Road; this road can sustain considerable heavy duty traffic and can tolerate poor weather condition.

The topography of the area is generally flat with clayey soil. The area is built up, with an earthen drain at the northern perimeter to drain the land. The surrounding land use is a mix of industrial and naturally vegetated areas. The land is bounded to the west by a food-box factory and tire shop, whereas, the east and north adjoining lands are currently unoccupied, and the southern border is bounded by a crop farm.



Figure 1: Image depicting Google satellite imagery of the proposed block making plant's location



Figure 2: Image depicting Google satellite imagery of the proposed block making plant's location

PROJECT DESIGN

The project in itself is a simple concrete block-making facility. The plant is expected produce approximately 17,000 blocks of various types per day, operating 8 hours per day, 5 days per week. Moreover, the aforementioned production capacity is designed to meet both local and regional market demands.

A concrete-block enclosure of approximately 9204 square feet will be constructed, to house the project's block-making equipment and machinery. Two block-making machines will be strategically placed in the enclosed bond, ensuring the effective management of dust emissions and efficiency for the batching process.

Raw materials such as sand, aggregates (sifting and 3/8s), cement and loam will be stockpiled on the eastern end of the project site. The production process begins when these raw materials are initially moved by a front end loader from the storage stockpile area into the enclosed plant. The production of the blocks starts with filling a compartment of the concrete block maker with those materials. This compartment combines all raw materials at the optimal ratio for a good concrete mixture. This mixture is then moved down towards another part of the concrete block maker to be shaped into its "block" form. The mixture arrives at the part responsible for shaping, where it is put into cube-shaped molds to get the concrete mix into its "block" form. The wet blocks are still suboptimal in their consistency and so the blocks are moved to another machine to be strengthened.

After molding, the blocks are put on trays that are carriable by forklifts. These forklifts take the molded blocks over to another machine. This machine applies downward pressure to the blocks to increase density by removing air pockets and ensuring the mixture is tightly packed. Simultaneously while this occurs, the machine vibrates the mold, further enhancing the density of the concrete blocks. After this is completed, the blocks are left to dry for approximately two days.

Following the end of the two days, the blocks are transported to the soaking well to be submerged, in order to enhance the strength and durability of the blocks. This soaking process helps the concrete blocks achieve their intended strength and resilience over time. Once submerged for the appropriate duration—typically a few hours to a day depending on the block type—they are removed and left to air dry completely in the designated drying area.

Finally, the dried concrete blocks are inspected for quality assurance, ensuring they meet the company's standards before being packaged, wrapped and prepared for distribution, storage or sale. The transportation of the finished products from the drying area is facilitated via forklift.

Power Generation: The entire operational plant will be powered by a 250kW generator that will be located in the generator storage area towards the western end of the project site. A concrete power house structure will be designed and constructed on the western end of the project site to house the generator set to provide adequate ventilation, soundproofing, and safety features in order to ensure optimal operation and minimal noise pollution.

Water Tanks: Water required for the production process will be sourced via a GWI pipeline connection and stored in overhead tanks, ensuring a reliable supply of water for the plant.

Fuel Storage: A structure will be constructed to house an 8000L fuel tank, providing secure and weather-resistant storage for the fuel required to power the generator. The structure will include safety features such as spill containment and ventilation to minimize environmental risks.

PROJECT SIZE AND TIMELINE

The project will have an initial investment of 1,000,000 USD and will be completed in 3 phases, the Construction and Setup Phase, the Mobilization Phase and ultimately the Production phase. The project is expected to begin on October 1st, 2024 once all necessary authorizations and permits have been acquired. The company at this moment is approaching the Environmental Protection Agency to acquire the Environmental Permit needed for operations as all other requirements to this date have been obtained.

1. Construction and Setup Phase

This is the predicted first stage of development for this project. During this phase, all necessary construction and procurement will be ongoing. Necessary construction refers to the building of all infrastructure needed to ensure the safety of all parties that would be affected by this project as well as optimal production in the project's future. This includes building an enclosed space to house all machinery needed for the operations of the facility, building an enclosed area in compliance with EPA protocols to house the generator powering the operations of the facility and building an enclosed area to house all concrete blocks that need to be stored. As these blocks will undergo water curing, construction of a water curing pit will also be ongoing.

During this phase all machinery needed for production will also be sourced, this includes the concrete block-making machine, the curing station, the block compressor, the forklifts needed to move the trays of blocks, the heavy machinery needed to move the raw materials in and around the facility and the generator required to power the facility.

For this initial phase all labour would be outsourced and contracted. This phase would have approximately 30 contracted workers and should last for approximately 3 months.

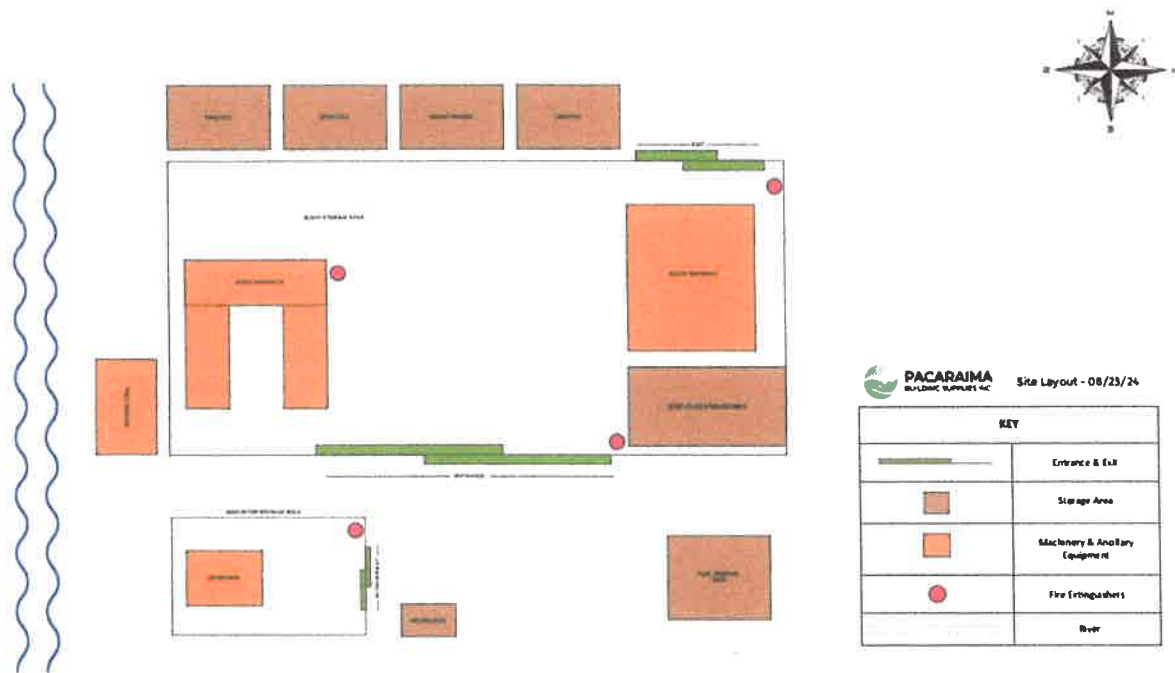


Figure 3: Planned Facility Layout

2. Mobilization Phase

Immediately following the construction and setup phase, the mobilization phase begins. The mobilization phase will focus on getting the plant operational and ready for full-scale production. During this phase, all machinery and equipment will be thoroughly tested and calibrated to ensure proper functionality and optimal performance. Blocks will also be undergoing lab tests at the Ministry of Public Works to ensure quality products are being made. Permanent staff will be hired and trained to operate the machinery and manage daily operations, with a strong emphasis on safety and operational efficiency. This phase will also involve the fine-tuning of production processes and the establishment of standard operating procedures (SOPs) and quality control measures. Additionally, reliable supply chains for raw materials will be established, and logistics for the distribution of finished concrete blocks will be set up. This phase is crucial for preparing the facility for seamless and efficient production and is expected to last for approximately 2 months.

During this phase we would begin hiring permanent staff to be trained in the usage of the machines by the contractors who were employed during the construction and setup phase. At this point, the company would have hired 10-15 local permanent staff members.

3. Production Phase

This would mark the beginning of the full-scale operational phase of the concrete block-making facility. During this phase, all contractual workers would have completed their duties. We would be moving on to a permanent workforce employed by the company. We would have the 10-15 workers trained in the previous phase and they would be equipped with the tools to pass their

knowledge on to the new staff members. This phase would be entirely focused on the acquisition of sales targets, the implementation of logistical practices to streamline sales, and overall optimal block production.

During this phase the facility would aim for an optimal production rate of 500,000 concrete blocks per month. The production phase would have approximately 50 locally hired permanent staff and no longer feature contractors.

POTENTIAL ENVIRONMENTAL IMPACTS

1. Air Pollution

There is the potential for the release of dust particles into the air during the construction of the project's base of operations, majorly from the wind erosion of building materials such as cement, sand and stone. Additionally, as the facility is responsible for making concrete blocks, it is imperative to acknowledge the potential impact to the air quality in the vicinity; this can be from the cement mix, the sand needed to make the concrete mixture and day-to-day operations involving the concrete-making machines.

Mitigation Measures

Concerning the air pollution during the construction phase, one way we plan to tackle the issue of dust levels down during operation is by a process known as water spraying. Regularly spraying debris, materials and soil with water helps keep dust at bay. As the water helps the materials to bind loose particles. In regard to the wind erosion mentioned, we plan on dealing with this by covering all exposed stockpiles of sand, cement and other friable materials with tarps and plastic sheets.

During operations, we plan on enclosing all operational areas where processes will take place, that is, where the concrete block production itself will be taking place. The same applies to all locations where blocks themselves will be stored. A 118ft by 78ft concrete block structure will be constructed to house the plant operations. This facility will provide a durable and stable environment for the machinery and production processes, ensuring the longevity and safety of the operations.

Similar to the construction phase, we would also be employing tactics focused on keeping the moisture levels of all materials controlled to minimize particle release.

2. Noise Pollution

As is to be expected with any project featuring heavy machinery, some levels of noise pollution are to be expected. This will be present from the early phases of construction to the production phase. This comes from the heavy machinery needed for the construction of the base of operations, the generator proposed to power to the facility and the concrete block-making machines themselves which inherently come with noise in its processing.

Mitigation

Mitigation of noise pollution will first begin before the construction and setup phase even starts. This is achieved by choosing a strategic location that offers little to no annoyance to residents. The location of the facility is set to be in an open area surrounded by little infrastructure, and what little infrastructure is around is quite a distance away from the base of operations. All equipment to be used will also be modern and well-maintained to minimize noise.

Relating to the operations process, similar to our mitigation efforts for air pollution, the same tactic would apply to noise pollution, the enclosed area that will house the block-making machines will be made of concrete blocks for optimal sound absorption. Similarly, the generator used to power the facility will be strategically placed in a hut made of concrete blocks.

Additionally, noise-generating equipment or machinery will be used with the necessary muffling apparatus, where applicable. The company plans to conduct routine inspection of equipment to ensure proper functionality of these noise and dust suppression devices.

3. Water Pollution and Spills

As the facility itself will be producing concrete blocks, there comes a high demand of water to be used in production. The potential impacts on include:

Fuel Spills: The use of fuels in the plant operations poses a risk of spills that could seep into the ground or nearby water bodies, leading to contamination.

Stormwater Runoff: During heavy rainfall, stormwater could carry dust, debris, and other pollutants from the site into nearby watercourses.

Mitigation Measures

Spill Prevention and Response Plan: A spill prevention and response plan will be implemented for fuel storage areas as detailed below. Regular inspections and maintenance of these areas will be conducted to prevent leaks. In the event of a spill, immediate containment and cleanup procedures will be followed. Fuel for the plant will be stored in an 8000L fuel tank, in an enclosed structure. This entrance of this structure will be bordered with concrete blocks to prevent the spreading of spilled fluids.

In the event of a fuel spill the following steps should apply:

1. Identify the substance spilled.
2. Stop work, and immediately notify supervisor.
3. Move personnel from the area.
4. Minimize and safely contain spill.

Then, contain spill by attempting to stop the flow at the source. Use pails, tarpaulins, or barrels, immediately once safe to enter spill area. A shallow excavation may be made to contain or stop the flow of the product. Once the area is safe and spill has been contained, start clean up. Sorbent materials may be used to both contain and cleanup spilled material.

Clean up Materials and Tools

1. Spill pads, absorbent materials
2. Shovels.
3. Sand, dirt etc.

4. Personnel.
5. Pails, tarpaulins, barrels
6. Safety gloves

Waste Handling

1. Remove waste material from spill site only with consent of supervisor.
2. If using barrels for storage of waste ensure barrels are empty and bungs are in.
3. Clearly mark the barrel or container of what residue or waste is inside.

Stormwater Management: The site will be designed with proper drainage systems to control and direct stormwater runoff. Vegetative buffers or silt fences will be installed around the site to filter runoff at the northern boundary and prevent sediment and pollutants from entering nearby water bodies.

Regular Monitoring: Regular water quality monitoring will be conducted to detect any signs of pollution early. This will include testing for suspended solids and other potential pollutants. Monitoring results will be used to adjust and improve mitigation measures as necessary.

4. Waste Management

Non-hazardous waste: For all non-hazardous waste material that will be produced, such as cement bags, wood and plastic, and domestic garbage, designated bins will be implemented in a secure location. It will be in an enclosed area, with a waste management company handling its disposal once every week, or more frequently should there ever be the need.

Hazardous waste: Hazardous waste, such as waste oil generated by the plant's operations, is temporarily stored in drums in the designated holding area. Interested individuals can collect the waste oil regularly, as it is made available for collection.

All hazardous waste will be stored in secure, clearly labeled containers that are compatible with the type of waste they hold. These containers will be placed in a designated, well-ventilated area. Storage areas for the hazardous waste will be covered to prevent exposure to rain, which could lead to leaks or spills.