

## **Project: Manufacturing of Pre-Stressed Concrete Piles**

**Pile Pro Inc.  
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### **A NON-TECHNICAL SUMMARY OF THE PROJECT**

Pile Pro Inc. intends to produce concrete piles that will be used in the construction of wharves, bridges, buildings, etc. Currently, only a handful of companies produce concrete piles and with the booming construction sector, a shortage of concrete piles arises. As such, PPI intends to help bridge this gap.

### **INTRODUCTION**

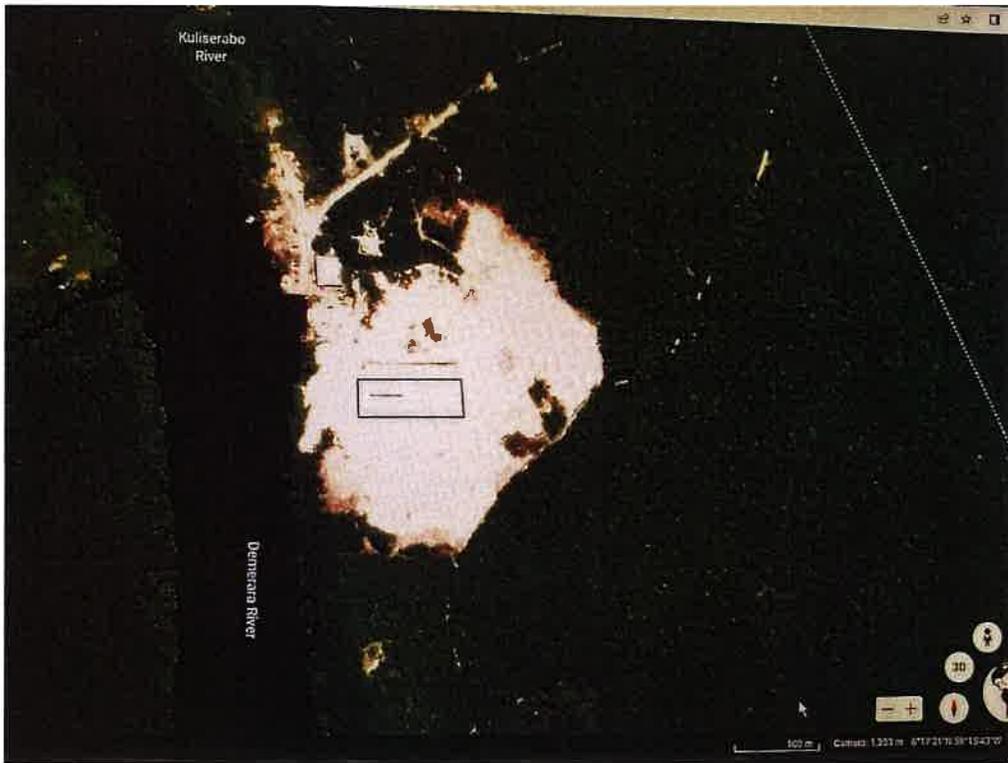
Pile Pro Inc. (PPI) is a new company Incorporated in June 2021. It is a wholly owned Guyanese company formed to take advantage of the emerging construction market in Guyana. The

company intends to produce Pre- Stressed Concrete (PC) Piles. PC Piles is a construction product produced by casting concrete together with wire stands and hardeners in a reusable mold which is then cured in a controlled environment. These piles, being strengthened by the steel wire strands, are generally used for foundation purposes for buildings, bridges, wharves etc.

### PHYSICAL LOCATION

The project will be located at Dora, approximately five km in from the Linden Soesdyke Highway. The GPS Coordinates are as follows: Point A – 360158, 696207, Point B – 360240, 696221, Point C – 360271, 696120 and Point D – 360159, 696115.

To the Northern and Eastern sides of our mines, there is just vegetation. To the Western Side lies the Demerara River and the Southern side mostly vegetation with the Dora Primary School located some 3000ft and the Dora Health Centre located some 2600ft from us. There are no houses in close proximity to our mines and as such we do not anticipate that our proposed project will affect any individual.



Google Maps link to site: <https://goo.gl/maps/KJzF1eEbTm4Pbca56>

## **BASELINE AND ALTERNATIVES TO PROPOSED LAND-USE**

The land in its virgin state was covered with tropical trees with a top-soil of black sand, below which lay silica quartz sand. Where the land meets with the river, the baseline/alternative, judging by the usage evident along other parts of the river, is characterized by intermittent and secluded settlements. Since travel is primarily by water, land further away from the river remains untouched. The intended land has already been mined out by PPI's sister company Silica Sandport Inc. during the past ten years. In its current state, overburden extracted prior to mining of the silica sand has been re-administered as the top soil on intended site.

## **PROJECT IMPLEMENTATION AND OPERATION**

As stated earlier, Pile Pro Inc. (PPI) is a new company Incorporated in June 2021. It is a wholly owned Guyanese company formed to take advantage of the emerging construction market in Guyana. The primary product of PPI is Pre-stressed Concrete (PC) Piles to be used as foundation piles for bridges, buildings, wharves etc.

**Project Size:** The project will require an estimated startup capital investment of US\$2 million which will be geared towards funding three phases of the project:

### **Construction and Establishment**

- (i) Stage 1 - Land Leveling of existing mined out area by use of bulldozers. The estimated workforce for this phase is six persons, with a duration of two months.
- (ii) Stage 2- Installation of foundation for concrete batching plant and moulds. The estimated workforce is ten with duration of four months.
- (iii) Stage 3- Production and Storage of Concrete Piles. The estimated Workforce is eight and this phase will carry on indefinitely.

## **Pile Production Process/Operation of the Plant**

PPI intends to utilize raw materials such as sand, aggregates, cement, hardeners and wire strands to produce its PC Piles. The company will utilize some five acres of the mined out areas in Dora to produce and stockpile its piles. It will have immediate access to construction grade sand, one of the main raw materials for the production of piles. PPI is situated close to a wharf which it will use to secure its other raw materials, namely aggregates, cements and wire strands.

*Working principle of concrete batching plant* is dependent on five primary functions as below:

- Aggregate feeding – Aggregates and sand have to be fed into the individual feeder bins.
- Powder feeding – Powder here refers to cement and additives such as hardeners. These are important components for binding of material.
- Water – Water will help cement bind evenly with aggregates. Specific quantity of water is must for any ready mix.
- Storage and conveyance – Storage and conveyance here refer to storage of cement, fly ash, etc. They have to hold up quantity in bulk and transfer small quantity by screw conveyor to the weighing hoppers.
- Control system – Control system is very critical for any advanced machine. It makes operation fast and accurate.

Concrete batching plant process flow will start from the feeding of aggregates into individual bins. Size wise, aggregates have to be fed into individual bins. These aggregates will be weighed individually as per the design set in the control panel. After weighing they will be transferred to the mixing unit. Above the mixing unit there are weigh hoppers for cement, additives and water. The job of the weigh hopper is to weigh and then transfer the contents into the following mixing unit. Cement is transferred to the weigh hopper by means of screw conveyor. Water is pumped up into the weigh hopper. After mixing for a specific time as set in the mixing unit, the mixer will discharge the contents into transit mixer.

All the above processes are carried out carefully and systematically. Each process is carried out for a specific time frame. The time frame starting from the weighing of aggregates to the discharge of the ready mix material is known as a batch time.

The production process continues as this ready-mix material is transported to nearby concrete moulds. The preparation of these moulds involves wire strands being pulled to a high tensile strength within the steel moulds. This process is done with one end of the strand being connected to a stable and secure point with the other being connected to a tensioning machine that 'pulls' the strands. When the correct tension is achieved, concrete is poured into the mould that contains the strands and left to set and harden for two days. The piles are removed after the concrete is hardened, left to cure in stockpile and the process is repeated.

Piles will be produced to thirty meters long, a feat unmatched in Guyana. This of course will create transportation difficulties traversing Guyana's roads but the company will use the existing port facilities of SSI to move its piles via the Demerara River to the market place. The method of transportation will therefore be via river.

### **Materials**

With the existing limited capacity for PC Plies production in Guyana (companies have been importing PC Piles) coupled with anticipated construction boom, PPI has already procured the moulds capable of producing four pieces of 14 by 14 inches by 30 meters and four pieces of 16 by 16 inches by 30 meters long piles every two day.

The anticipated volume of production per month for PPI is around 2500 meters of PC piles. This would require raw materials of per month of: 200 tons of sand, 120 tons of cement, 250 tons of stone, 10 tons of steel and half a ton of hardener. Water supply for production will come from the Demerara River (at 10m<sup>3</sup> per day) and electricity will be provided by the power-generation facilities of Silica Sandport Inc., a company that lies adjacent to the proposed location for PPI. PPI's production facility will require 50kw of power daily to operate.

### **List of Equipment**

- One Complete Concrete Batching Plant
- Two Screw Conveyors
- Two Silos

- One Generator
- One 4x4 Pick-up truck
- One Front End Loader
- One 80-ton Rough-terrain Crane
- One 150-ton Crawler Crane
- One 12 cubic yard Concrete Truck

## **POTENTIAL IMPACTS AND SIGNIFICANCE**

The geographic area to be utilized for the location of the concrete batching plant and the actual production of the PC piles is on land that has already been cleared and mined out (as PPI is located in close proximity to a sand mine) so PPI makes use of land that would otherwise have remained unutilized. Therefore, potential impacts on the physical environment, in terms of forest destruction, clearing of land, and dumping of excess material are not applicable to the establishment of the project.

There are however some risks as it relates to the operation of the plant via the concrete batching plant, the support equipment, potential spillage of raw materials and ready-mix cement, problems of garbage (cement bags), and handling of human effluent. The following breaks down these risks into impacts and provides PPIs plan to mitigate these risks and incorporate good environmental practices into the work philosophy.

### **Noise and Air Risks**

- (i) Noise – Noise will be created by the equipment such as the front-end loader, excavator, this will not impact social activities or individuals as the plant is more than 2600ft away from the nearest noise sensitive receiver i.e. neighbouring settlements. However to help suppress the noise, mechanical equipment will be equipped with mufflers/silencers and good site practices maintained. With these measures in place, noise levels will comply with noise requirements.

- (ii) Dust – There are risks of air pollution when handling materials such as sand and cement, especially as it relates to the finer particles. Transporting and transferring such material give rise to such possibilities. However, the impacts will be mitigated through controlled and standardized environments and proper handling by employees.

Cement would be bought in bulk and pumped into storage silos in controlled settings with due regard for dust escaping. From the silos, equipped with air filters, it will be fed via enclosed screw conveyors to the batching plant in an enclosed process. This would limit external exposure to the air and reduce impacts. These controlled loading and offloading of cement to and from silo will mitigate potential dust pollution.

Sand will also be mined in controlled environments. Naturally occurring sand, containing between six to eight percent moisture, will be mined as needed thereby reducing the incidence of dust pollution.

### **Water Pollution**

Sources of water pollution include release of cement materials with rain wash, wash water from dust suppression sprays, and fuel, oil and other lubricants from maintenance of construction vehicles and mechanical equipment.

Mitigation measures should be implemented to control construction site runoff, and to minimise the chances of introducing sediment and pollutants into the nearby coastal waters. With the implementation of adequate construction site drainage and the provision of sediment removal facilities, it is expected that unacceptable water quality impacts would not arise.

### **Waste Management**

#### 1) Non-Hazardous:

- Liquid Effluent: Domestic Waste-water – Domestic sewage would be generated from the workforce during the production and construction phases. It is unlikely that sewage generated from the site would have a significant water quality

impact. Sanitary facilities such as toilets will be used on-site and be properly maintained. A Septic tank system will be used for sewage storage and disposal.

- Empty Cement Bags – These will be burned or buried in mined out site in the initial phases of the operation after which bulk cement will be trucked to site which will eliminate the creation of cement bag refuse.
- Steel Wire Ends – This excess material will be stored and recycled as used for lifting straps or if there is much excess, will be sold.

## 2) Hazardous:

- Chemical Waste and Fuels: The other waste arising during the operational phase would be chemical wastes, such as fuel and lubrication oils, used by the loaders and trucks.

Diesel fuel will be stored in drums and in a completely bunded area as per government safety regulations. Used oils will be stored in containers and will be used to oil the moulds prior to pouring concrete, allowing for easy release of piles.

Provided that the storage and disposal of chemical wastes are in accordance with the requirements, adverse environmental impacts are not expected.

## **Ecological and Social Impacts**

Both Ecological and Social impacts – impacts on the flora and fauna are negligible due to proximity from such environments that might be affected. PPI's plant will be located in a mined out area about 500ft feet away from any vegetation.

As mentioned earlier, the nearest sensitive receptor to our project is some 2600ft away to the Southern side and coupled with existing mitigation policies for noise, dust and way in addition to the thick vegetation that lies between plant and receptor, there will be very limited impacts on people and social activities/communities.