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S.JAGMOHAN
HARDWARE SUPPLIES & CONSTRUCTION SERVICES

PROJECT SUMMARY FOR CONCRETE BATCHING PLANT AND MANUFACTURING OF PRESTRESSED CONCRETE MEMBERS

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Project Summary for Concrete Batching Plant and Manufacturing of Prestressed and Precast Concrete Members

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PROJECT SUMMARY

Introduction

Concrete technology over the years has evolved from plain in-situ to reinforced, from reinforced in-situ to precast and pre-stressed concrete. Precast concrete is a construction product produced by casting concrete in a reusable mold or "form" which is then cured in a controlled environment, transported to the construction site and lifted into place. Pre-stressed products are compressed during production, in a manner that strengthens it against tensile forces which will exist when in service In contrast, cast-in-place concrete is poured into site-specific forms and cured on site. Concrete is the most versatile and widely used construction material in the whole world.

S.Jagmohan Construction and General Supplies Inc. is now gearing to venture into the production of prestressed and precast concrete products. It is the direction in which construction work is headed in the past years in many developed countries.

The project consist of the construction of a concrete products plant. The products include what is known as pre-stressed and precast products or members for the construction sector. It involves the setting up of a concrete batching plant for mixing of the aggregates and the installation of various formwork into which the concrete would be poured to manufacture the products. It would also include quality assurance testing since these products are meant to be structural members of civil works.

This venture will see the Company investing over $237M on plant and infrastructure development to make the production of such concrete components a reality. The Company hopes to add more choices to designers of civil works that will enable more design scope, faster project delivery time and quality materials that are consistent for every batch.

This investment will provide much needed job opportunities for Guyana. It will bring new technology to more persons since training is essential for its success.

Prior to the commencement of this project, the developer is required to apply for and obtain an Environmental Permit from the Environmental Protection Agency (EPA). In compliance with this requirement, the developer therefore submits an application. The following document presents a summary of the above project and contains the necessary details that may complement the attached application in all efforts to ensure a smooth and timely processing.

Project Location

Proposed Location

The proposed location is along the East Bank Road corridor, specifically within the Little Diamond Industrial Area (as indicated on the Survey Plan, figure 1, "Land Registration Area Block No. VIII". The choice of location is based on proximity to raw materials and the availability of at least Two (2) acres of land in an industrial area where similar activities are being undertaken. The size of the land is approximately 1.98 acres.

Figure 1 – Google Earth Image of the Little Diamond Industrial Area (Block No. VIII)

Surrounding Land Use

The surrounding land use is industrial, primarily manufacturing which includes concrete products. The land is bounded to the north by another Concrete Batching Plant and to the south there is a laydown yard. The East and West adjoining lands are currently unoccupied but allocated to manufacturing companies (See Appendix 1). Operations will have no impact on residency since the nearest residence is more than 1000km away. No threat to biodiversity or waterways is envisaged due to the Company's operations.

Please see **Appendix 1** with Map showing the surrounding land uses for Little and Great Diamond Industrial And Commercial Zone.

Description of Project Phases

Preoperational Phase

The project will first entail the clearing, filling, levelling and compaction of the land immediately after receiving necessary approvals. Infrastructure such as internal roads and drainage will follow.

Construction Phase/Infrastructures

The infrastructure facilities for setting up of the plant for the manufacturing of precast and prestressed concrete elements is proposed to be completed within a period of 12 months.

Civil Works

A two story steel frame and concrete factory building will be constructed at the northern side of the land parcel. This building will be approximately 205 feet wide by 60 feet long. To the western side the developer will construct several ancillary buildings such as fuel station, staff quarters, Storage yard and a 178 kva 430 volts 60 cycle generator set. A machinery parking to the southern side and to the extreme south of the land parcel would be the concrete plant. A detail layout of these facilities can be observed in appendix 2.

Roads

As can be depicted from the site plan, internal roads will be constructed in order to gain access to and from the various locations around the complex. These roads will be mostly made of asphaltic concrete 4 meters – 5 meters wide which will reduce the noise and dust generated by vehicles and machinery traversing compound.

Energy

The main source of energy for this project will be obtained from the Guyana Power and Light Inc. (GPL). This will be supplemented by a 178 kva, 430 volts 60 cycle generator which will only operate during power outage/failure from the GPL source. The Generator will be housed in a self-enclosed area with sound attenuating materials, under a concrete shed and on concrete base. Fire extinguisher will be placed nearby for any emergencies. Exhaust will also be installed approximately 3 to 4 feet in the air.

Project's Capital Investment

The project’s capital investment is approximately $237,000,000 GYD, of which will be solely funded by the Developer - Suresh Jagmohan of S.Jagmohan Construction and General Supplies Inc. The projected annual turnover for this development is $300,000,000 GYD.

Possible Employment:

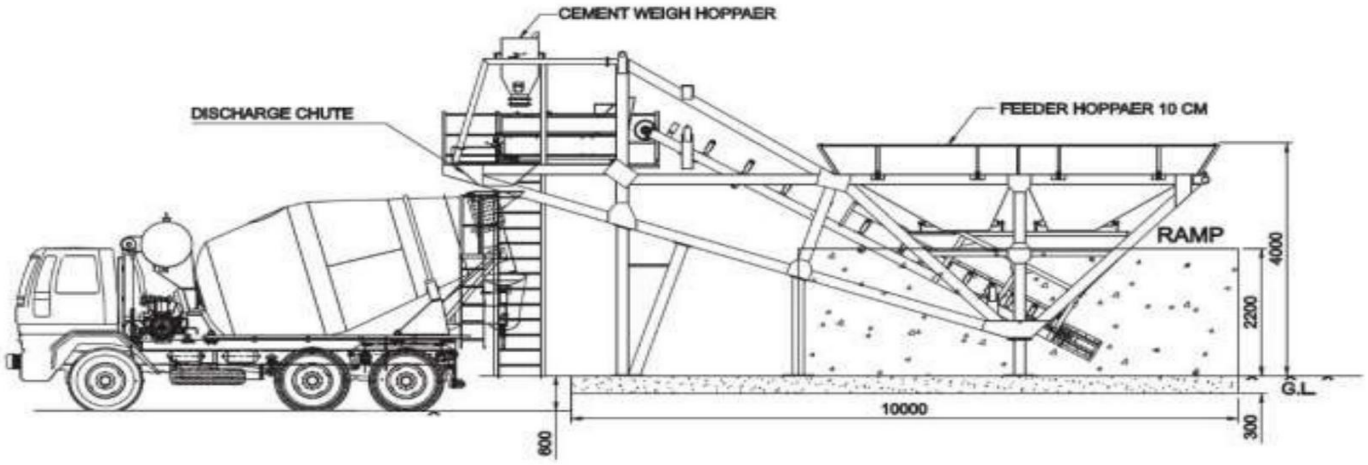
Staffing requirements for this project will range from technical to highly skilled, semi-skilled and labourers. There will be requirements for at least 2 qualified civil engineers to deal with mix design, interpretations of drawings, prestressed components, quality control and concrete batching. Other skills will include machine operators, drivers, delivery clerks, clerk of works during batching and materials delivery. Management and finance persons will also be needed. The nature of this technology is more or less mechanized as such a direct staff component for this facility will be about 20-25 persons at peak. Construction phase will see additional staff being utilized.

Project's Life Span:

The lifespan of this development is difficult to anticipate since it is highly dependent on the demands for the finish products, its accompanied markets as a preference over other supplies in Guyana and the availability of raw materials. Nevertheless, this development is envisioned to be sustained for at least fifteen (15) to twenty (20) years or as long as possible, given its enormous capital investment

Overview of Batching Plant Operation and Specification

Side View



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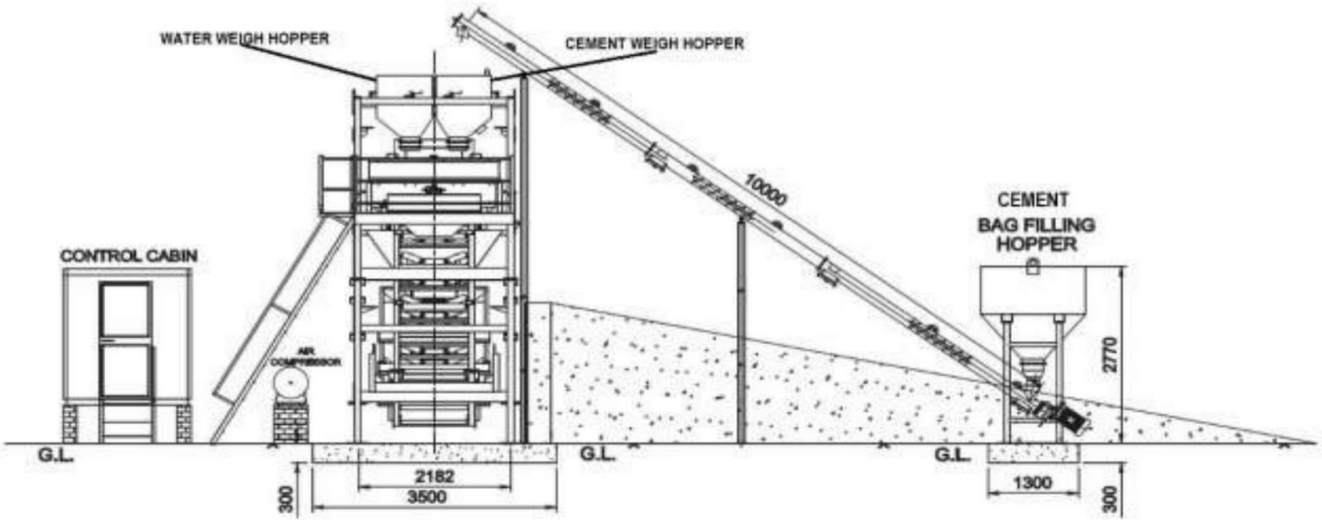
Front View



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Operations of the Plant

The materials used in the batching of the concrete would be cement, sand, stone and water. The Batching Plant will be placed on a cast-in -place concrete foundation to evenly distribute the load of the plant across a wider area and to ensure the minimal vibrations given off by the plant during operations.

The sand and stone are loaded into the Feeder Hopper and is then weighed and transported to the truck via a conveyor belt. The Cementitious materials are loaded into the Cement Bag Filling Hopper and is pumped via a sealed pipe to the Cement Weigh Hopper where it is weighed and then discharged into the truck for mixing with the aggregates (sand and stone). The water is pumped into the Water Weigh Hopper, measured and discharged into the mixer to facilitate mixing of the cement and aggregates.

The entire Batching Plant would be operating under a semi-closed shed to mitigate the blowing of dust particles from the conveyor belt. The openings for the batching plant would be to the minimum only allowing the loading of aggregates into the hopper and the loading of the cementitious mixture into the mixing trucks.

The concrete mixture would have an admixture (DYNAplas SP-449) which is non-hazardous or toxic to the environment. Spilling Clean-up for this admixture would be absorption via white sand and wash down with copious amounts of water. Admixture will be safely stored in drums in a bond and managed by a trained personnel. See appendix 3 for Technical Data Sheet on Admixture.

See appendix 4 for Batching Plant Specification.

List of Equipment:

2 No. Front End Loaders
2 No. Excavators
2 No. Skid Steer
2 No. Forklift
6 No. Mixing Trucks
4 No. Dump Trucks
3 No. Canter trucks
2 No. Pick-up Trucks
2 No. Lifting Cranes
1 No. Fuel Truck

Possible Environmental Impacts and Mitigation Measures

Impacts to Air Quality (Noise and Dust)

Air emissions from cement, stone and sand will be generated via two phases of the project which are construction and operation phases.

- ***Construction Phase***

Potential impacts to air quality will be experienced through construction of the facility and related plant; however, these impacts will be short term, localized and insignificant. The following are ways by which air quality will be impacted:

- Dust from land clearance associated with construction activities and constant movement of equipment; and
- Noise from the operation of equipment used during the construction of facilities and access roads.

- ***Operational Phase***

The localised air quality within the confines of the project area will be affected during the course of operations; however, these impacts are localized, avoidable and can be mitigated. The following are ways by which air quality will be impacted:

- Generation of sand and cement dust during storage, mixing and transporting;
- Noise from the operation of equipment such as generators, batching plant and other noisy equipment;
- Noise from loading and offloading of materials and finished products.

Mitigation of Impacts on Air Quality

The following mitigation measures will be implemented to manage impacts to air quality:

- Ensure that machinery and equipment are working efficiently and have the required silencers/mufflers installed;
- Generators will be equipped with silences and housed in an enclosed area;
- Dust collection system will be installed and attached to all equipment which generates dust and particles;
- Dust screens made of geotextile fabric will be installed 12 feet above the fence which will be above the level of the stockpile and batching plant to prevent dust from being airborne.

- Material Stockpiles will be covered with Tarpaulins and the wet suppression method will also be employed to reduce dust from being airborne.
- Project proponent will implement mitigation measures recommended by the EPA for management of impacts to air quality.

Impacts to Socio-Economic Environment

- ***Health and Safety of Workers***

Workers health can be impacted during the construction and operation phases of the project. The major impacts are:

- Risks of accidents during the establishment of infrastructure and operation of equipment;
- Risks of accidents during the operation of phase;
- Exposure to excessive noise generated from equipment during construction and operation phases which can result in auditory ailments; and
- Exposure to excessive dust during construction and operational phases which can result respiratory ailments.

Mitigation of Impacts on Health and Safety of Workers

The following will be implemented to prevent or minimize impacts to workers' health and safety:

- Workers will be mandated to wear appropriate PPE in accordance with the Occupation Health and Safety Guidelines and the Company policies relating to occupational health and safety; and
- Training will be provided on occupational, health and safety.

6.3 Impacts from Hazardous Materials

Hazardous materials are categorised as fuel, lubricants and other materials of similar nature. .Impacts can arise through the accidental introduction of these materials into the environment through spills onto land and in water ways. Hazardous materials spilt on land can enter groundwater reservoirs through seepage via soil strata.

Mitigation of Impacts from Hazardous Materials

To prevent or minimize potential environmental effects from hazardous materials, storage tanks will be designed with a one hundred and ten (110) percent capacity secondary containment bund, which will create a temporary holding area in the event of spills.

Fuel Storage and Handling

Fuel will be stored in an above ground metal tank with a capacity of four thousand five hundred (4500) liters located to the eastern side of the compound.

In accordance with the guidelines of the Guyana Fire Service, the following will be put in place:

- ✓ The tank is set on a concrete trestle that is about 60cm high. There will be adequate concrete bund wall that is more than a meter away from the outer edges of the tank that is capable of retaining the capacity of the tank plus 10% and controlled drainage facility.

- ✓ Adequate safety signage are in place such as "Highly Flammable", "No Smoking". These are plastered on the wall of the tank. There is also a danger sign that is prominently displayed giving warning.
- ✓ Two 9kg Chemical Fire Extinguisher will also be provided in the vicinity of the tank

Waste Management

During project implementation several types of waste can be generated from a number of sources. Each waste stream may or may not require different disposal methods. The main categories of waste generated are (a) solid waste (b) liquid waste; and (c) hazardous waste.

1) Solid waste

During both phases of the project several categories of solid waste will be generated and are discussed below, these are:

1. **Construction Waste** – includes materials generated from construction of buildings, ancillary facilities and internal roads. Materials will be sorted and reused where possible. For materials deemed as non-usable, disposal will be undertaken by Puran Brothers Disposal Company at the Haggs Bosch landfill site.
2. **General Waste** – include waste such as office waste (paper and cardboard), domestic waste (plastics and styrofoam boxes), kitchen waste (food), cement bags, plastic containers etc. Collection bins will be placed at strategic points to be used by workers and will be emptied on a regular basis. Disposal will be undertaken by Puran Brothers Disposal Company at an approved landfill site.

2) **Liquid Waste** – includes two types of effluent streams (grey and black water from sinks, bathrooms and sewage). Sewage will be disposed of in septic tanks constructed in accordance with GNBS Code of Practice for the Design and Construction of Septic Tanks and Associated Secondary Treatment and Disposal Systems. Grey water will be channelled into a soak away system before being discharged into drainage systems and finally into the environment.

Plant Wash Down/Portable Sedimentation Pond

To facilitate the wash down of the batching plant a portable dumpster bin (sedimentation pond) will be built to facilitate the catching and trapping of all waste products from the wash down. The bin will be equipped with a filter system to trap all sediments in the bin and discharge the water appropriately to be reused. The solid debris remaining would then be appropriately discarded as landfill material. The bin will be built twenty (20) feet long by eight (8) feet wide and would have a depth of four (4) feet. This size of portable sediment pond was derived by calculating the required water for wash down and adding a percentile factor for the solid waste coming forth from the wash down.

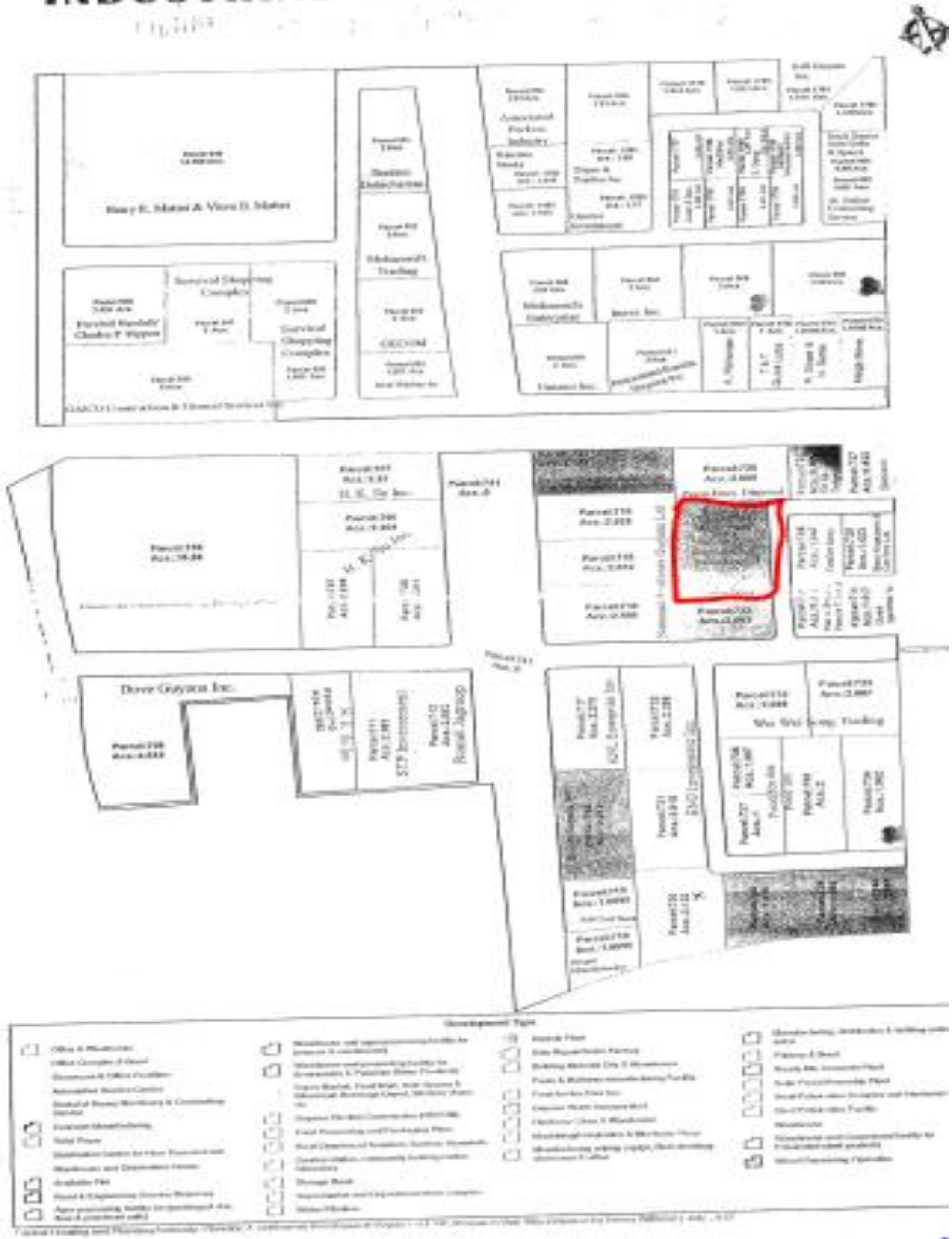
3) **Hazardous Waste** – includes waste oil, used filters and oily rags. Waste oil be collected and stored in containers. Efforts will be made to reuse waste oil, either in chainsaws or will be given to chainsaw operators. Used filters and oily rags will be disposed of in a manner approved by the EPA.

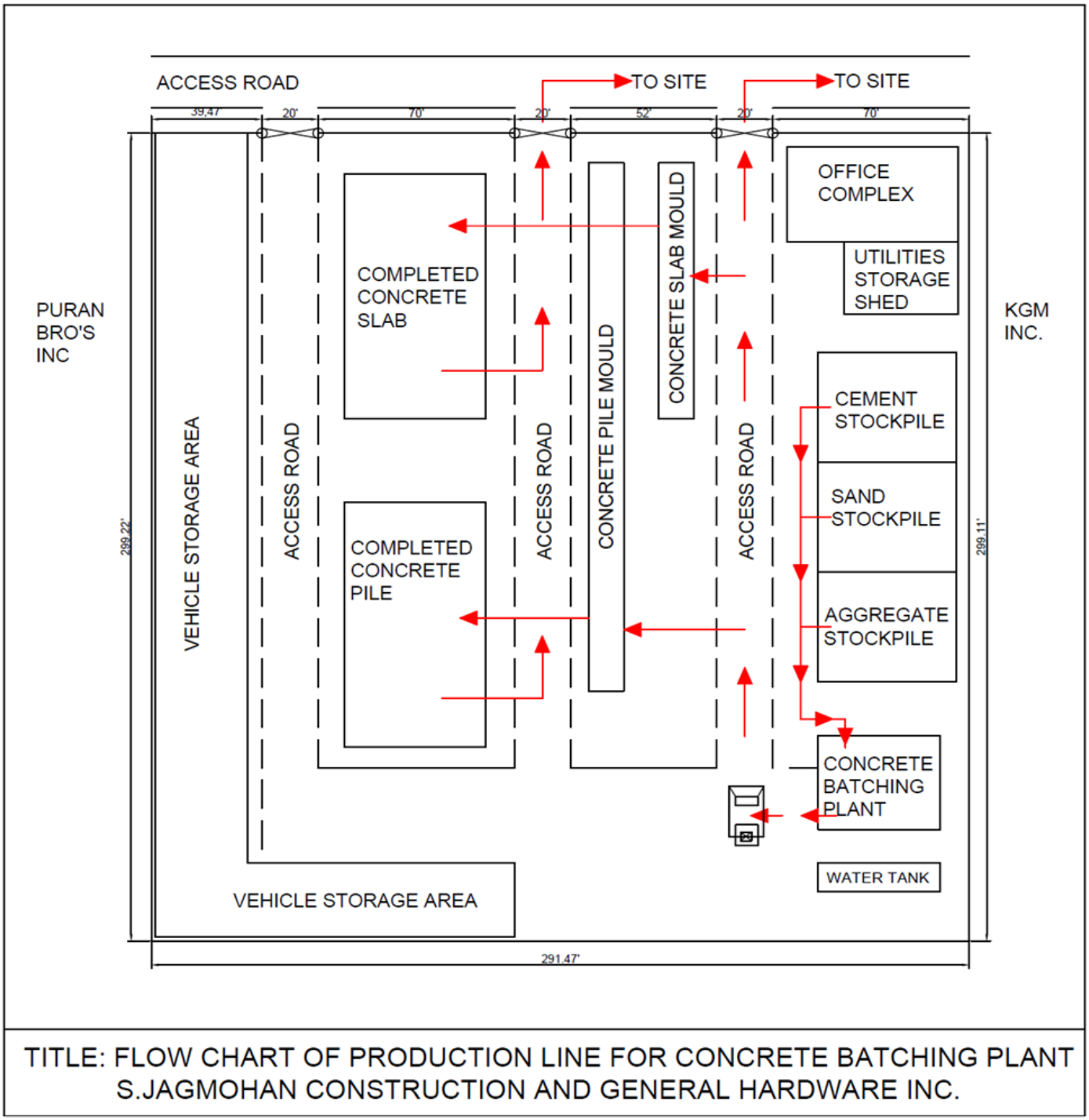
6.5 Environmental Compliance

The developer intends to comply with all regulations and guidelines prescribed by the EPA as well as, those prescribed by other governmental entities, in all efforts to ensure good environmental practices are maintained throughout the various phases of this operation. To this effect, an application will be made to the Guyana Environmental Protection Agency (EPA) for the issuing of an environmental permit to operate the facility.

ANNEX

INDUSTRIAL & COMMERICAL ZONES





TITLE: FLOW CHART OF PRODUCTION LINE FOR CONCRETE BATCHING PLANT
S.JAGMOHAN CONSTRUCTION AND GENERAL HARDWARE INC.

CONCRETE BATCHING PLANT SPECIFICATION

Subject : Brand New **One Unit** of **VINAYAK - Concrete Batching / Mixing Plant** (Fully Automatic) **with "SICOMA" - Twin Shaft Mixer, Model No. CCBP - 30, Capacity of 30 Cu.m / Hour,** generally summarized in the commercial offer and as technically illustrated in the technical offer and documents attached.

: OUR SCOPE OF SUPPLY :

1) An Imported **"SICOMA" - Twin Shaft Mixer MAO Series – "Italian Design Make"** Mounted on a steel frame, made from heavy duty steel structure.

   Input / Out Put Cap. : **500 Litter.**
   Dry Filling Capacity : **750 Litter.**

2) The mixer is driven by an imported Gearbox with **25 HP (12.5 x 2) Electric Motor**. The Mixer is lined with wear resistant plate (HARDOX 500) from bottom & side. **The batch size is 0.5 m^3 & cycle time is 60 Sec.**

3) A sturdy design chassis made from heavy duty steel structure.

4) **4 Nos (2 x 2) of Aggregate Storage Bins** of Total Capacity of 20m^3 with Pneumatically Operated Discharge gate. Below Each Bins 4 Nos. – "S" – Type Load Cells of Cap. 2000 Kgs Each.

5) **Discharge Conveyor** of 800 mm width x 3 Ply with **12.5 HP Electric Geared Motor** with Digital Loadcell Based Weighing System for Calibrating the raw material to feed the material from aggregate bins to **"SICOMA" – Twin Shaft Mixer.**

6) **Cement Storage Hopper** Capacity of 40 Bags (1000 Kgs). Digital Loadcell Based Weighing System For **Cement** with PLC based control & with separate weighing hopper of 300 kg. capacity and 0.25 HP Cement Weighing Hopper Vibrator Motor.

7) Digital Loadcell Based Weighing System For **Water** with PLC based control & with separate weighing hopper of 200 kg. capacity, Water Connection of 75 mm (3" Inch). 3 HP Water Centrifugal Pump with other accessories.

8) Digital Loadcell Based weigh Batching system for **Chemical Additive** with PLC based control & with separate weighing container of 10 kg. Capacity.

9) An Imported **"WAM – Italian Design Make"** Heavy Duty **Cement Screw Conveyor** with **10 HP Electric Motor** for directly feeding of cement into weighing hopper.

10) **Air Compressor** Powered by 3 HP Electric Motor.

11) **Control Cabin (8 Feet x 6 Feet)** Fitted With Air Conditioner.

12) **Computerised SCADA - Based PLC Control Panel** with **"B&R – Austria Make" - 7.0" HMI** Colour Touch Screen TFT display with **Printer**. It comes with following feature.

- Easy to Calibrate Scale.
- Gate Inching facility for more weighing accuracy.
- Auto - Manual and Manual - Auto Operation.
- Inbuilt Printing System and Pen drive.
- Software which is very user friendly ensures top notch performance.
- Proxy switches for each controls. Display of the entire process of control parameters.
- Provision for printing entire data like mix proportion, batch weigh, total no. of batches, sub total, gross total, etc.
- Pre-set batch controls the number of batches for transit mixer.
- Provision to store, edit production details, and mix proportions up to 99 recipes.
- **MPCB** are provided for all electrical motors safety.

13) Pre-wired with Main Cables, socket, plugs, junction box to inter connect the units. Including Main Cable from Genset to Control Cabin.

14) Fast Moving Spare Parts For 1 Year Normal Running Operation of Concrete Plants.

: ADVANTAGE OF VINAYAK - CONCRETE BATCHING PLANT :

- ✓ Quick and easy installation and operation 3 to 4 days to start concrete production and one day for disassembling.
- ✓ Less space required for Installation due to its compact design.
- ✓ Less foundation costs (80% less than conventional stationary concrete batching plants)
- ✓ Mobility System for Concrete Plant with king pin attachment and pneumatic braking system. Single chassis mounting of the whole plant. (Optional)
- ✓ Less transportation costs.
- ✓ Minimized concrete transportation costs.
- ✓ The plant comes with fully prewired with Junction Box (Complete with internal cabling).
- ✓ The plant comes with **"SICOMA" MAO Series – Italian Design Make" Twin Shaft Mixer.** Most advance mixing solution capable of handling from high to zero slump concrete.
- ✓ The plant comes with **SCADA Based PLC Control Panel with "B & R – Austria Make"** HMI display with **Computer and Printer.**
- ✓ **MPCB** are provided for all electrical motors safety.
- ✓ The plant comes with Separate **Control Cabin size of "8 x 6 Feet"** with **Air Conditioner.**
- ✓ Single weighing and conveying belt for faster cycle time for more output.
- ✓ Direct feeding of mixed material into transit mixer.
- ✓ Inbuilt auto admixture dozing system.
- ✓ Separate weighing of cement for better accuracy.
- ✓ Cover is also provided to every electrical motor and conveyor belt for protection against dust and water.
- ✓ Quick exhaust valve fitted with all Pneumatic Cylinders to maintain accuracy in weighing system.

TECHNICAL DATA SHEET

DYNAplas SP-449F

High Performance Super Plasticising and High Range Water Reducing Concrete Admixture

DYNAplas SP-449F is a powerful multifunctional superplasticiser, that depending on the dosage used, performs effectively as a Normal Water reducing Admixture (ASTM C-494 Type A) as a High Range Water Reducer, as well as a powerful superplasticiser. (ASTM C-494 Type F)

USES

- **High Strength and High Early Strength development** – The powerful water reduction properties of **DYNAplas SP-449F**, allows the design of concrete with very low water cement ratios, thus generating higher early and ultimate strengths.
- **High Slump and Workability** – The addition of **DYNAplas SP-449F** in a well-designed concrete mix will increase or significantly increase the slump and workability of the concrete.
- **Improved durability of concrete** – The ability to produce quality concrete with low water/cement ratios and high workability and rheology, significantly improves the durability and WaterProof properties of the concrete.

ADVANTAGES

- Chloride Free – Safe for precast, pre-stressed and steel reinforced concrete
- High levels of Water Reduction allows major increases in early and ultimate strengths.
- Earlier stripping for precast units
- Earlier turnaround for tunnel form or formed systems.
- Lower cement contents to achieve stated concrete strengths.
- High workability & "Flowing" concrete allows quicker and easier placing with better finishing & appearance.
- Increased workability retention over other superplasticisers.
- Can be used in conjunction with **DYNAplas SP-440G** to produce a wide variety of slump, workability retention and retardation to suite almost all Readymix and Precast concrete requirements.

STANDARDS

DYNAplas SP-449F complies with ASTM C494 Type A, and Type F depending on the dosage used.

DOSAGES

The dosages of **DYNAplas SP-449F** should always be tested and verified and approved in a suitably equipped lab facility, using the actual materials and site conditions that will be used in practise. As a guide, the following ranges may be considered recommended starter ranges for trial purposes.

TECHNICAL DATA SHEET

- For Normal Water Reduction (Type A), the normal dosage range is between 0.15 litres and 0.35 litres/100kg of cement
- For Highly Workable concrete, the normal dosage range is between 0.50 litres and 1.25 litres per 100 kg of cement
- For high strength, highly water reduced concrete, the normal dosage range is between 0.5 litres – 2.0 Litres per 100 kg of cement.

Please note that performances will vary depending on the types of cement, and additives used, such as Microsilica, fly ash, etc.

DYNAplas SP-449F can be used at dosages outside of these guidelines, provided that suitable trials have been done to verify the performance at these dosages. Higher dosages may result in retardation and bleeding or segregation of the concrete.

In the event of an overdose of **DYNAplas SP-449F** and subsequent possible retardation, ensure that the concrete is properly cured. Once cured, the ultimate strengths of the concrete should not be affected, and in most cases will be improved.

DYNAplas SP-449F gives best performance when added after at least 2/3rd of the gauging water.

DYNAplas SP-449F can be used in the same mix with other admixture combinations. It is always advisable to add every admixture separately to the mix, and to confirm the performance by the use of suitable site trials.

TYPICAL PROPERTIES

Appearance :- Brown liquid instantly miscible in water
Specific Gravity :- 1.2 at 20 degrees C
Solids Content :- 40%
Chloride Content :- Nil
Additional Air Entrainment :- less than 1%

Packaging

DYNAplas SP-449F is packaged in 18 Litre, 210 Litre and 1000 Litre plastic containers.

Storage & Shelf Life

DYNAplas SP-449F should be kept in cool dry and well ventilated areas. Keep out of direct sunlight unless in use. In such storage conditions, the shelf life of **DYNAplas SP-449F** should be in excess of 12 months.

Health, Safety & Environmental

DYNAplas SP-449F is not toxic or hazardous. Do not however allow to be ingested, or to come into contact with skin and eyes. In such an event flush skin and eyes with copious amounts of clean water & seek medical attention id needed. Do Not induce vomiting and seek medical attention.

Spillages of **DYNAplas SP-449F** should be absorbed with sand vermiculite or other approved absorbent. Wash down the area with copious amounts of water.

TECHNICAL DATA SHEET

DYNAplas SP-449F is an SCL/IAI product produced in Trinidad and Tobago under licence by SCL.

SCL also offers the following quality concrete admixtures :-

- Concrete Plasticisers and Superplasticisers
- Concrete retarders
- Concrete accelerators
- Polycarboxylate Superplasticisers
- Rheology modifiers and anti-bleed admixtures
- Anti washout admixtures for underwater applications.
- Corrosion Inhibitors Waterproofing admixtures
- Air entraining agents.
- Admixtures for flowable fill