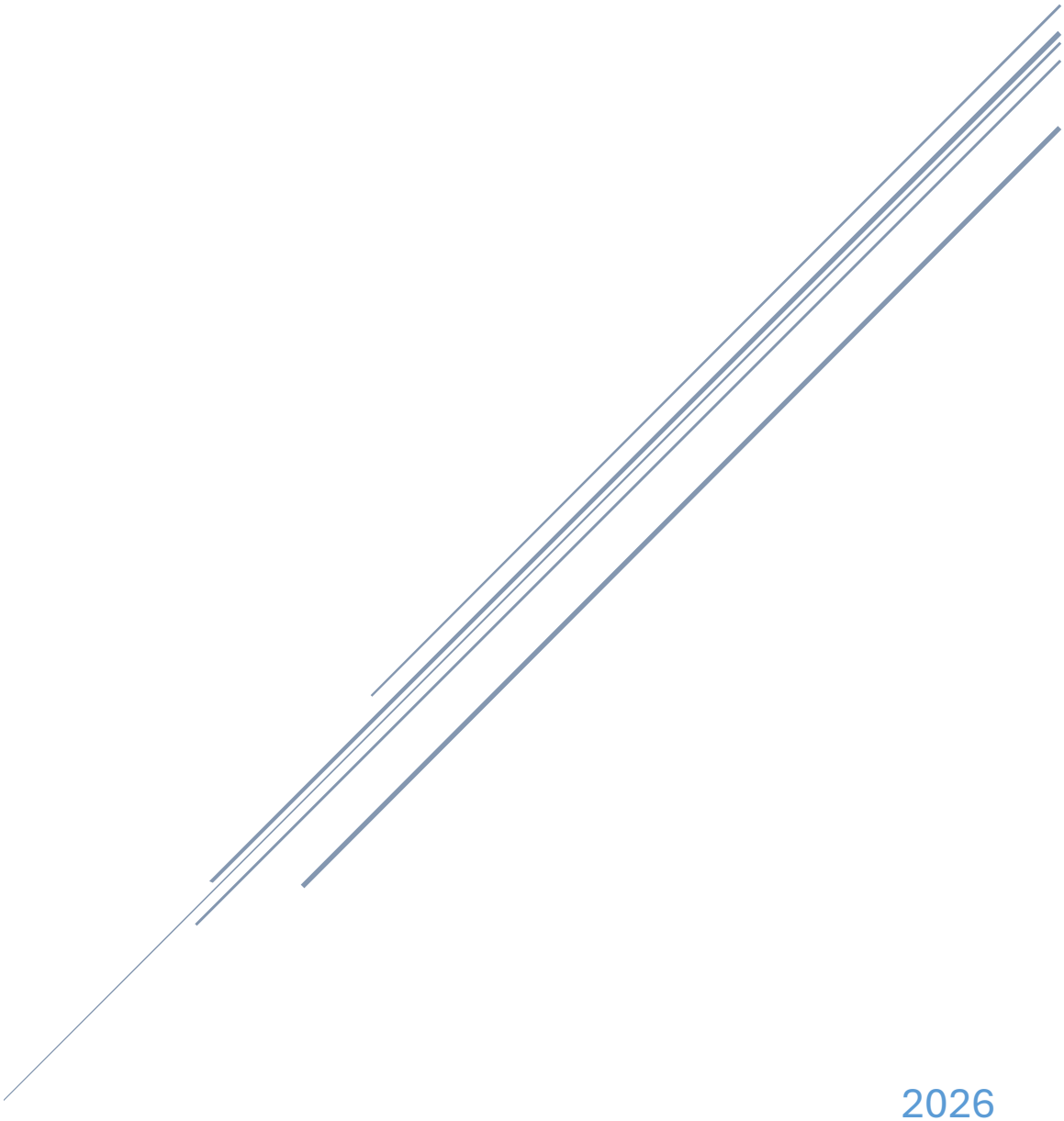
DEMERARA CEMENT COMPANY
PROJECT SUMMARY

Cement Grinding and Packaging Facility



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INTRODUCTION

Demerara Cement Company (DCC) is seeking environmental authorization for the construction, installation, and operation of a cement clinker grinding and packaging facility (hereafter referred to as "the Project"), to be located at 53-58 Alliance Road, Plantation Lana, Region 4.

As required by local regulations, the company has prepared an application for environmental authorization to submit to the Environmental Protection Agency (EPA). This comprehensive description of the Project (Project Summary) and Environmental Management Plans supports environmental application.

BACKGROUND

Demerara Cement Company is an incorporated company established in 2025 under the Companies Act of Guyana. The company's objective is to produce finished cement products by mechanically grinding imported clinker with gypsum and other approved additives, for distribution in Guyana and adjoining markets.

The Project will operate as a downstream cement processing plant and support national construction and infrastructure development by producing and supplying cement for commercial and industrial applications.

A wharf will support the Project to facilitate the importation and movement of materials via the Demerara River.

SCOPE AND OBJECTIVE OF THIS DOCUMENT

This Project Summary identifies and assesses the potential environmental impacts associated with the Project. It also identifies actions to prevent and mitigate adverse impacts to human health and the environment.

PROJECT LOCATION

The proposed Project will be located at 53-58 Alliance Road, Plantation Lana, Region 4. The total land area of the Project location is 100 acres, of which approximately 11.47 acres (233.35 meters in length x 198.122 meters in width) will be utilized for the Project. The Project site is currently devoid of infrastructure, with thick vegetation cover.

The Project area of influence (AOI) is relative to the immediate and surrounding areas and includes the area of direct influence (ADI) and the area of indirect influence (***AII***). The ADI is the area to be occupied by the Project, while the ***AII*** is the surrounding area. While different AOIs will have varying degrees of impact, a standard ADI of 500 meters (0.3 miles) was established for ease of reference. Land uses within the Project AOI may be defined as mixed, including farmland and residential areas.

The Project's ***AII*** includes residents and farms of the Alliance community, with the nearest resident situated 142 meters north west (upwind) of the project site, intersected by heavy vegetation; the Demerara River is approximately 34 meters west of the Project site; and the Laluni Creek is north-east of the project location boundary. To the east and south of the Project site, the vegetation remains undisturbed.

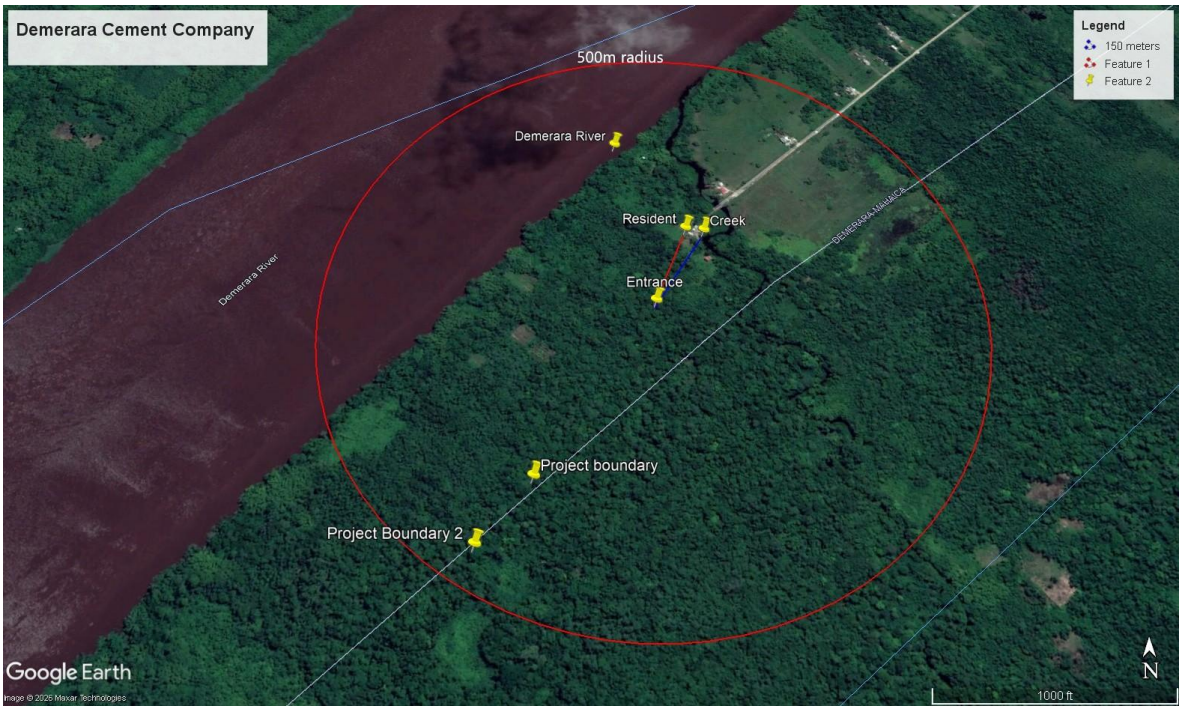


Figure 1: Google map showing the project location and a 500m radius

Figure 2: Google map showing the distance of the Project to the nearest sensitive receptors

Figure 3: Aerial View of the Project Site

Figure 4: Demerara River 34 meters west.

Figure 5: Alliance Community and nearest resident 500m North

Figures 6 & 7: Heavy Vegetation Areas to the East and South of the Project Site

The Project location can be accessed by land via the secondary asphalt road through the Alliance community. The secondary road and the bridges were constructed by the Project and shall be maintained during the operation of the Project, given that this road will be the primary route for trucks accessing the Project location.

Figure 8: Primary East Bank Road

Figure 9: Secondary Asphalt Road

The site can also be accessed via the Demerara River, which will be the primary route for bulk transport of ingredients and products to the Project site.

PROJECT DESCRIPTION

The Project will be implemented in two phases:

1. Construction and Plant Installation
2. Operation

CONSTRUCTION

The Project will be constructed in accordance with the engineer's illustrations in Figures 8-11, which show the various components of the Project. Building infrastructures identified in the illustrations will be pre-fabricated off-site and transported to the Project site for installation. Construction activities are expected to be completed within 6-12 months of commencement and include:

Mobilization of Materials and Equipment – construction materials, including but not limited to sand, stones, cement, and steel, will be sourced locally and stockpiled at the site. Given that the building infrastructures will be pre-fabricated off-site, construction materials will only be required for site preparation.

Site Preparation – The Project will be constructed on an industrially designated site selected based on accessibility, land suitability, availability of utilities, and compatibility with surrounding land use. Site development activities will include land clearing, grading, drainage installation, foundation construction, structural steel erection, and installation of mechanical and electrical equipment.

The site layout will be designed to ensure logical material flow from raw material receiving through grinding, storage, packaging, and dispatch, while minimising material handling distances and environmental impacts.

Internal access roads will be constructed to facilitate the movement of raw material trucks, finished product vehicles, and emergency response equipment.

Plant Installation – Infrastructures and buildings, such as enclosures and the components of the Plant, will be pre-fabricated off-site and transported to the site for assembly and installation.

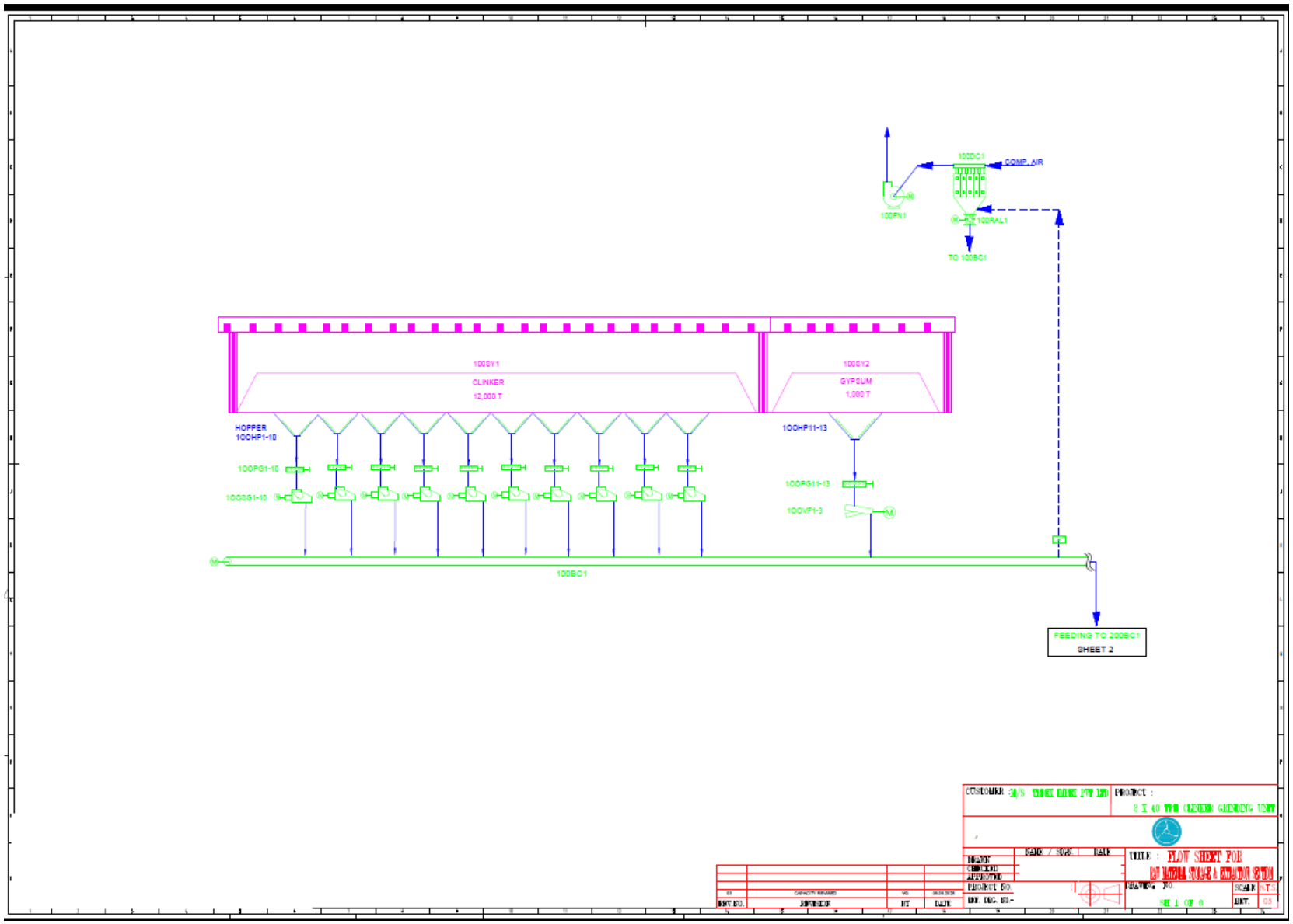


Figure 10-13: Engineer Drawing of the Project Components

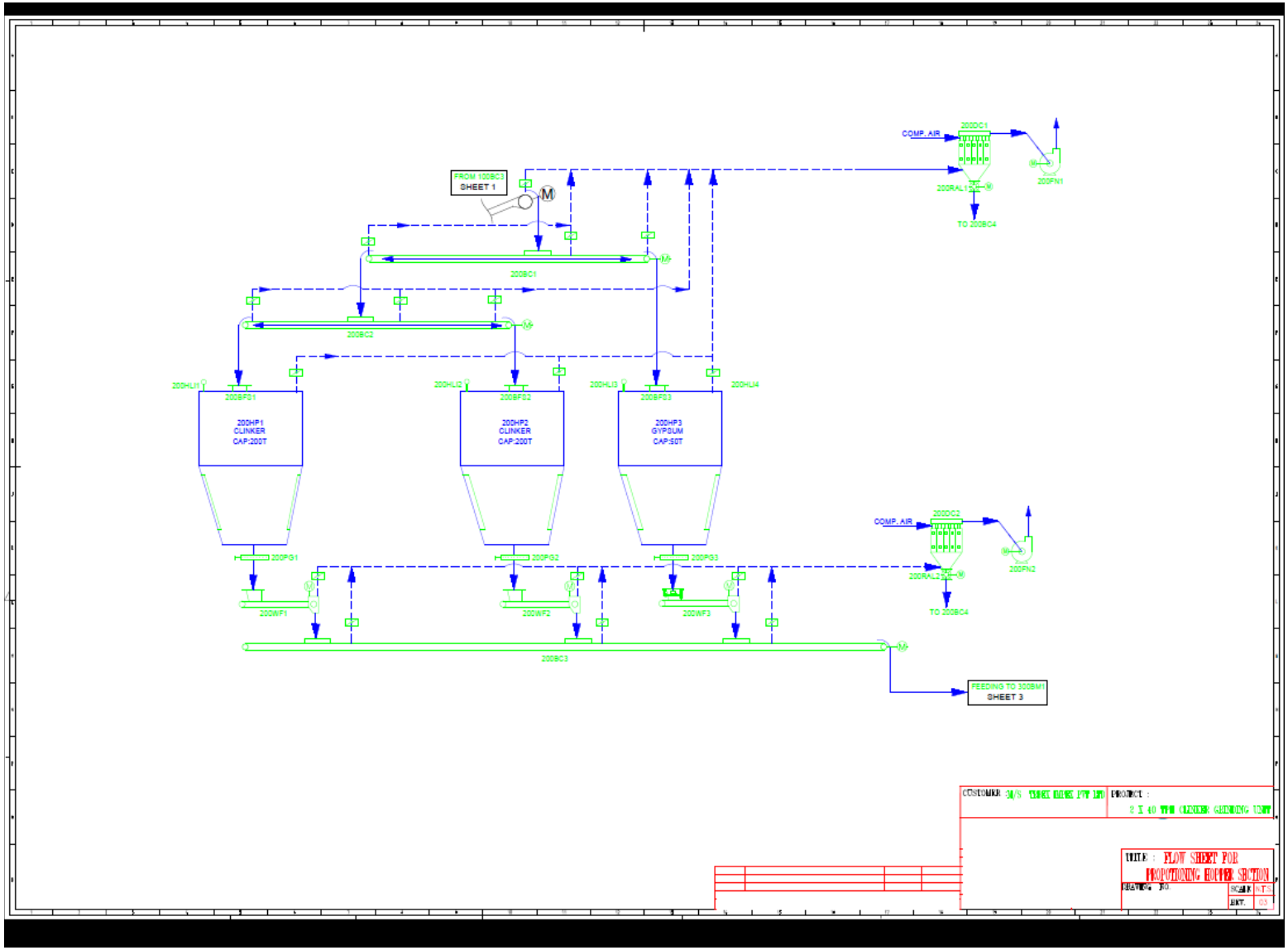

COMP. AIR
200DC1
200FN1
200RAL1
TO 200BC4
FROM 100BC3
SHEET 1
200BC1
200BC2
200HLI1
200BFD1
200HLI2
200BFD2
200HLI3
200BFD3
200HLI4
200HP1
CLINKER
CAP:200T
200HP2
CLINKER
CAP:200T
200HP3
GYPSUM
CAP:50T
COMP. AIR
200DC2
200FN2
200RAL2
TO 200BC4
200PG1
200PG2
200PG3
200WF1
200WF2
200WF3
200BC3
FEEDING TO 300BM1
SHEET 3
CUSTOMER : M/S
PROJECT :
2 X 40 TPH CLINKER GRINDING UNIT
TITLE : FLOW SHEET FOR
PROPORTIONING HOPPER SECTION
DRAWING NO.
SCALE : N.T.S.
REV. : 03

Figure 11

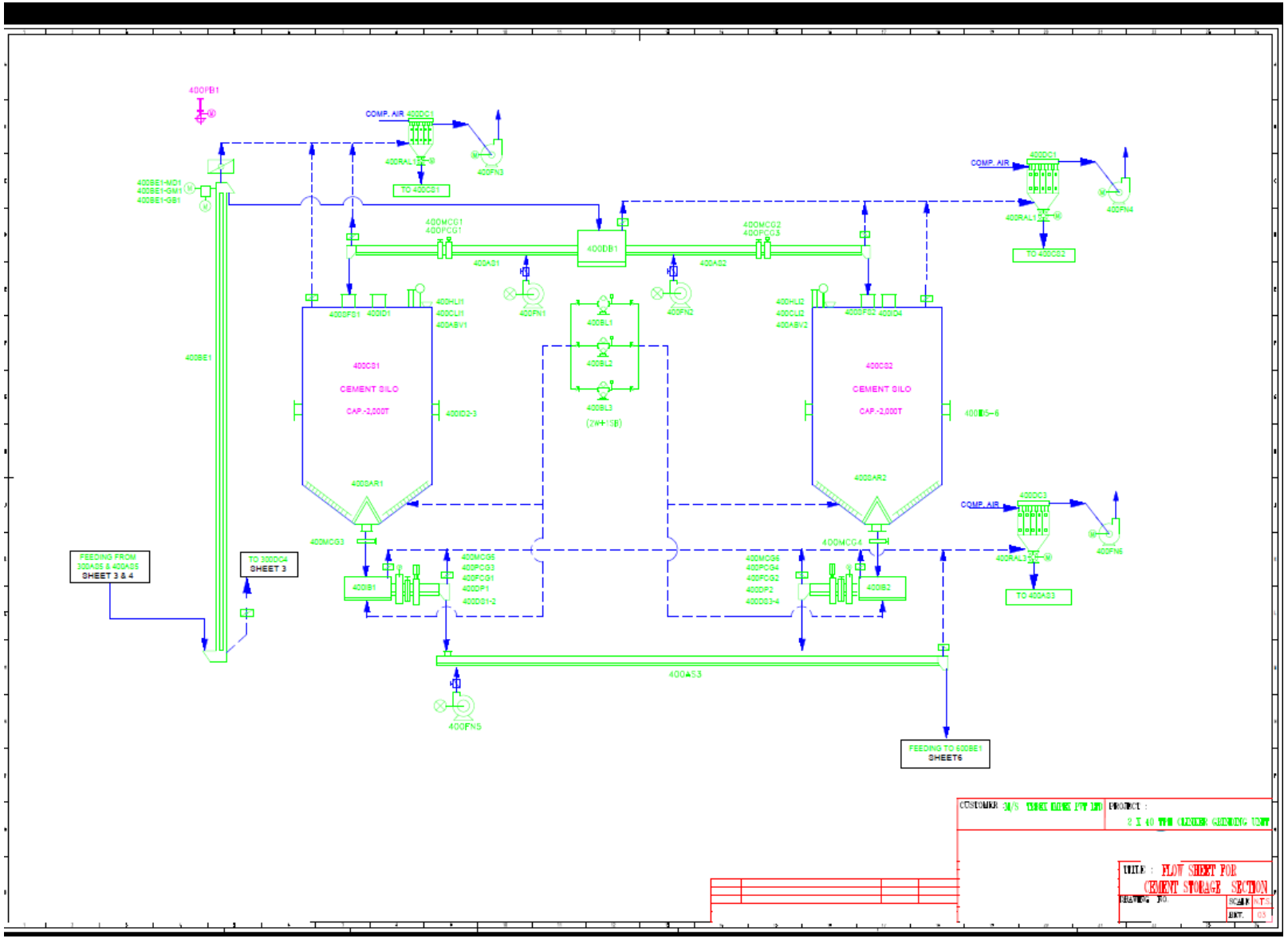

400FB1
COMP. AIR 400DC1
400FN3
TO 400CS1
400BE1-MD1
400BE1-GM1
400BE1-GB1
400MCG1
400PCG1
400DB1
400MCG2
400PCG3
400AS1
400AS2
400FN1
400FN2
400HLI1
400CLI1
400ABV1
400FS1
400DI1
400CS1
CEMENT SILO
CAP.-2,000T
400DI2-3
400BE1
400BL1
400BL2
400BL3
(2W+1SB)
400HLI2
400CLI2
400ABV2
400FS2
400DI4
400CS2
CEMENT SILO
CAP.-2,000T
400DI5-6
400SAR1
400SAR2
400MCG3
400MCG4
FEEDING FROM
300AS5 & 400AS5
SHEET 3 & 4
TO 300DC4
SHEET 3
400MCG5
400PCG3
400PCG1
400DP1
400DS1-2
400MCG6
400PCG4
400PCG2
400DP2
400DS3-4
400IB1
400IB2
400AS3
400FN5
FEEDING TO 600BE1
SHEETS
COMP. AIR 400DC2
400FN4
400RAL1
TO 400CS2
COMP. AIR 400DC3
400FN6
400RAL2
TO 400AS3
CUSTOMER M/S
PRODUCT :
2 X 40 TPH CEMENT GRINDING UNIT
TITLE : FLOW SHEET FOR
CEMENT STORAGE SECTION
DRAWING NO.
SCALE N.T.S.
REV. 03

Figure 12

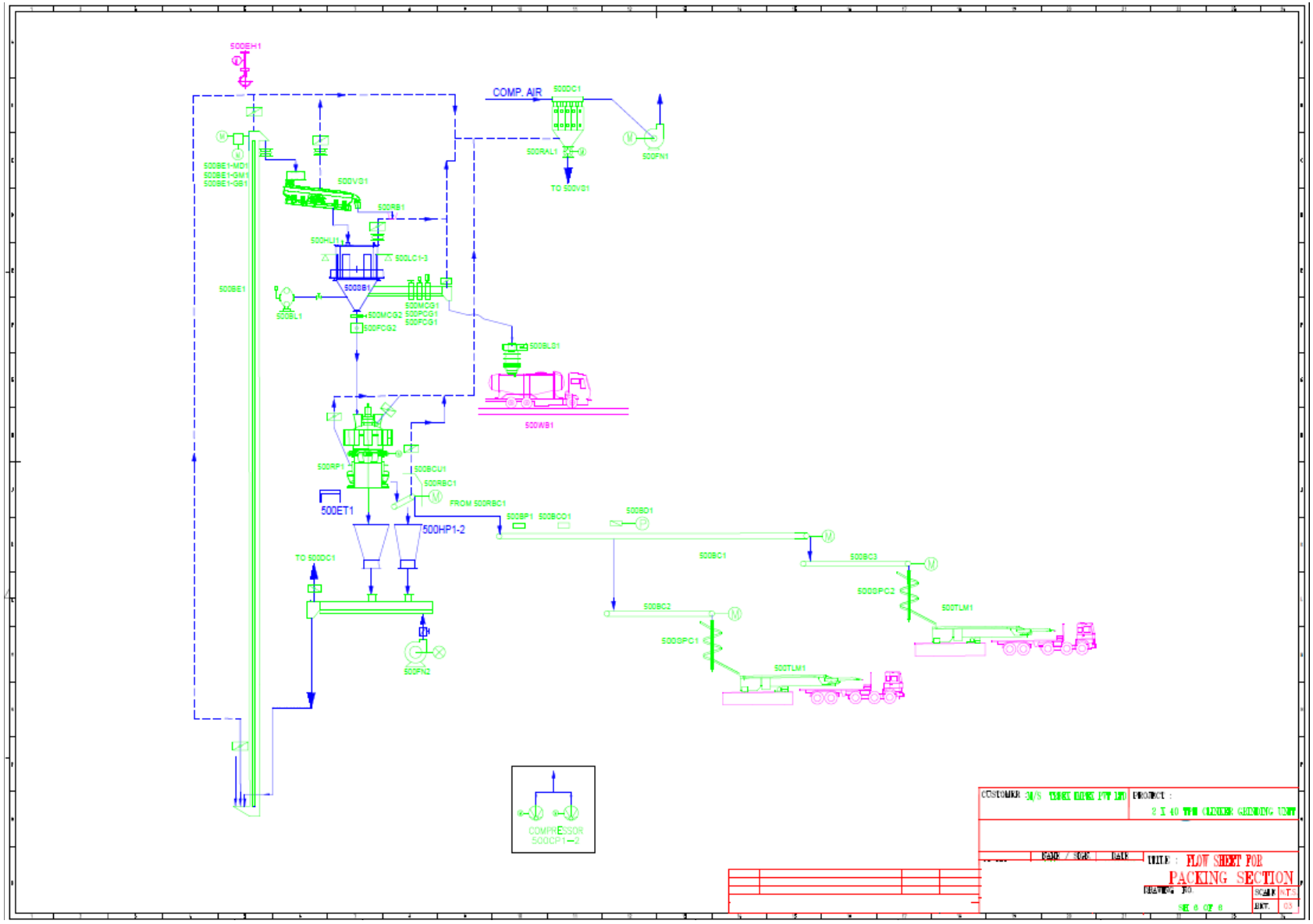

500EH1
COMP. AIR
500DC1
500RAL1
500FN1
TO 500VS1
500VS1
500RB1
500HU1
500LC1-3
500BE1
500BE1-MD1
500BE1-GM1
500BE1-GB1
500BL1
500MCG1
500PCG1
500PCG1
500MCG2
500PCG2
500BLC1
500WB1
500RP1
500BCU1
500RBC1
FROM 500RBC1
500ET1
500HP1-2
500BP1
500BCO1
500BO1
500BC1
500BC3
500GPC2
500TLM1
500BC2
500GPC1
500TLM1
TO 500DC1
500FN2
COMPRESSOR
500CP1—2
PROJECT :
2 X 40 TPH CLINKER GRINDING UNIT
TITLE : FLOW SHEET FOR
PACKING SECTION

Figure 13

Wharf Construction and Operation

The land area for the proposed construction of the Wharf is 8.084 acres. The wharf will be 889 feet in length by 121 feet in width. All infrastructure works for the functionality of the Wharf will be done according to international best practices, ensuring public safety and minimising impacts on the environment

The construction and operation of the wharf facility will follow the standard four-phased approach used in the construction sector. They are as follows:

- Design phase.
- Pre-construction phase
- Construction phase
- Operation phase

Design Phase

As with many construction projects, the conceptual design for the Wharf is an iterative process to balance cost, quality, and timely delivery of the project. Several architectural designs and construction materials will be examined during the design process, but the ultimate output will be reinforced concrete and timber.

The wharf will be supported by 1-foot by 1-foot by 85-feet pre-stressed concrete piles. The decking of the wharf will be reinforced concrete. The fender system of the wharf will utilize greenheart timber piles. Obtaining all essential construction permits from the Neighbourhood Democratic Council (NDC), Environmental Protection Agency (EPA), and Central Housing and Planning Authority is a crucial step in this procedure (CH&PA). The duration of this phase is expected to take five months.

Pre-Construction Phase

This phase will entail site development activities such as removing all vegetation, plants, and small trees from the site where the wharf will be constructed, as well as construction dredging as necessary for the pile foundation activities. All internal and external reinforced concrete drains will be built during this stage, allowing the plot to be backfilled to the necessary building levels.

As a result, sand trucks and small wheel loaders will be common on the job site during this phase. This phase is planned to last for six months.

Construction Phase

The wharf will be 107,569 square feet (889 feet (L) x 121 feet (W) and will utilize materials consistent with international standards and specifications, including but not limited to mass and reinforced concrete, concrete blocks, bricks, pavers, timber, structural steel, and composite materials. The pre-stressed concrete pile supporting the super-structure of the wharf will be driven approximately 80 feet in depth, reaching the corpina layer (zone of stiff clay).

The sub-structure and super-structure works will commence in this phase simultaneously with the external works. It is anticipated that during Construction 100 to 150 persons will be employed. The duration of this phase is expected to be 12 months.

OPERATIONS

This phase of the Project involves the production of cement via grinding and blending of imported raw materials; bulk storage of produced cement; and the bagging of the cement for distribution.

Description of the Process

Importation of Raw Materials – Raw materials required for cement production, namely clinker (60%) and gypsum (40%), will be imported into Guyana from international and regional countries, including Oman, Turkey, Dubai, and Brazil, by the Project. As referenced in Figure 8-11, imported raw materials will be stored in adequately ventilated, separate individual units within an enclosed facility built of concrete walls, steel structure, and pre-lacquered cladding and roofing, with a storage capacity of 18,000 tons. Table 2 describes the physical and chemical characteristics of the materials. Further, the estimated monthly quantity of materials required for the Project is 30,000 tons.

Table 1: Physical and chemical characteristics of imported raw materials; quantity imported monthly

Raw Materials	Physical Characteristic	Chemical Characteristic	Total Monthly Quantity Required by the Project
Clinker	Grey or white, granular inorganic solid material (powder)	**Danger- Health Hazard** **Hazard statements** H318 Causes serious eye damage H315 Causes skin irritation H317 May cause an allergic skin reaction H335 May cause respiratory irritation	18,000 tons

Gypsum	White or nearly white, odorless, crystalline solid	**Health Hazard** **Effects Resulting from Eye Contact:** Exposure to airborne dust may cause immediate or delayed irritation or inflammation. **Effects Resulting from Inhalation:** Gypsum may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease. **Carcinogenic potential:** Limestone is not listed as a carcinogen by NTP, OSHA, or IARC. It may, however, contain trace amounts of substances listed as carcinogens by these organizations. Crystalline silica, which is a component of limestone, is now classified by IARC as a known human carcinogen (Group I). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".	12,000 tons

Cement Production

The Project will produce cement via the physical processes of grinding and mixing of the raw materials. The chemical properties of the raw materials will not be changed or altered in any way.

Cement Production Process – Modular Cement Factory

The Modular Cement Factory comprises a cement grinding station with Feed Hoppers, a dosing system, a ball mill, and a classifier. The raw materials will be fed to the reception hopper via a front-end loader. The materials will then be transported via a conveyor belt to three independent bins (hoppers), ***designed to reduce dust emissions with a water inlet***.

The materials in the three hoppers will be dosed by means of weigh feeders in accordance with the required type of cement. This will generate a material mix which will be collected from the weigh feeders and transported into the Ball Mill through two belt conveyors. *The Ball Mill is provided with two chambers, separated by a diaphragm. At the Ball Mill outlet, a set of air slides and a bucket elevator lifts the ground aggregate mix to the separate chamber.*

The mixed materials from the Mill will then be transported to the Classifier and recirculate, thus making it possible to create a closed circuit in the grinding installation. The finished product (cement) exits the classifier together with the gas flow and is conveyed to cement storage silos.

An air slide will carry the rejected (coarse particles) material to the Ball Mill, where the required fineness is established by adjusting the speed of the separation rotor. Cement from silos is finally packed into 50kg bags using rotary packers.

The Bag Mill and the Classifier will be fitted with bag filters (with filter's internals, bags and cages);

a rotary airlock and filter fan to recover the fine materials suspended in the air that passes through the Mill and classifier.

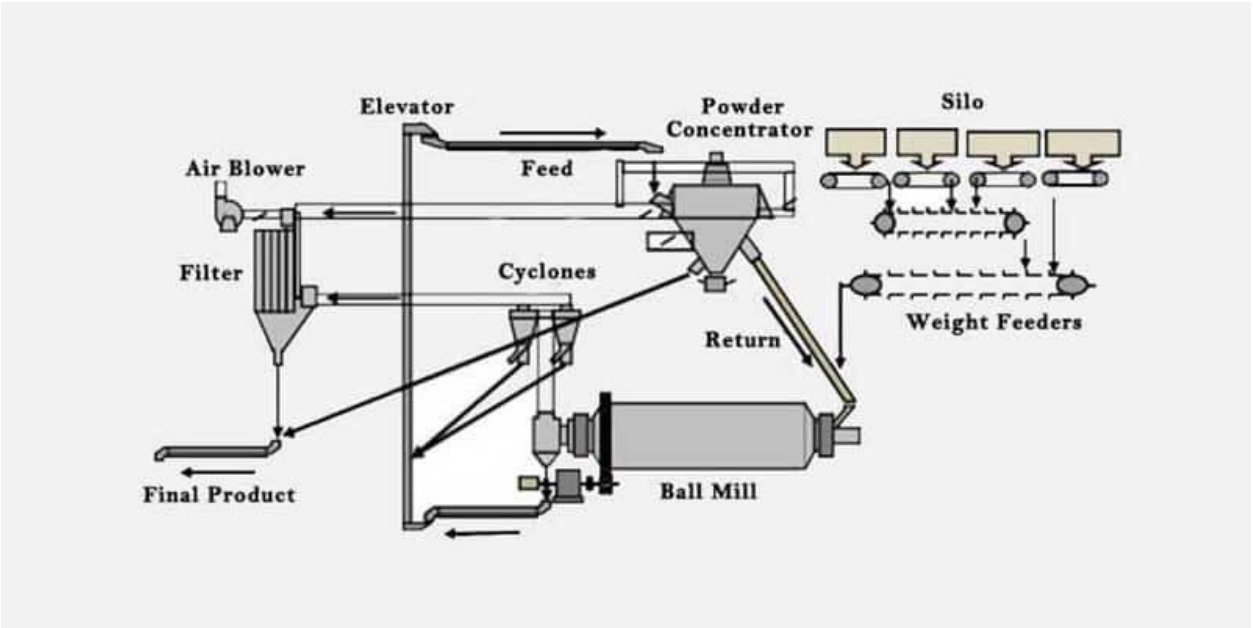
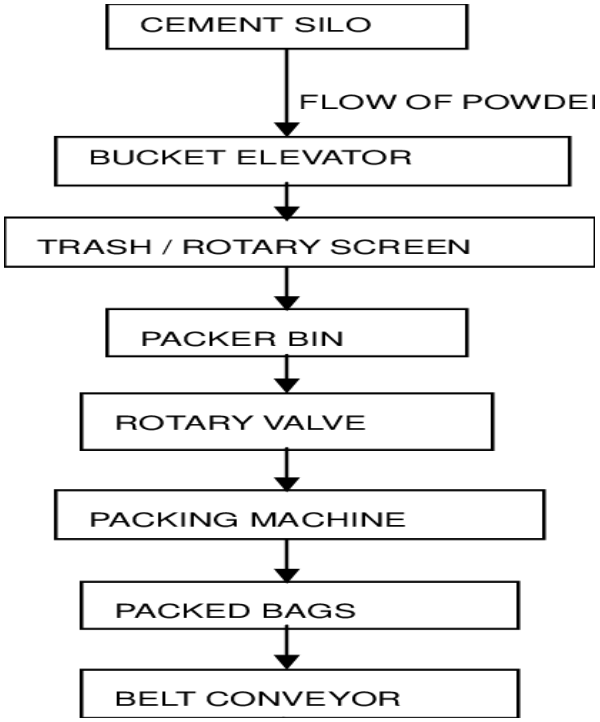


Figure 14: A simple illustration of the cement grinding and production process

Cement Storage and Packaging

From the Bag Process Filter, the cement will be conveyed by a pneumatic transport to two 2.000 tonns carbon steel silos for storage. The silos will be clad at the bottom part and include a closed penthouse at the top. Screw conveyors will transfer the cement from the silos to a bulk loading system, which, with the aid of air slides feed the cement to the vibrating screen, packing, palletizer, and wrapping machines. An estimated 37,500 tons of cement is projected per month.

Filled cement bags will be conveyed through radial discharge conveyors to truck loading stations for distribution. Bulk loading facilities and truck loading machines will be installed to support high-volume product dispatch operations.



Cement will be distributed via the company's distribution channel partners. Cement will be available in 40 KGS, 50 KGS, and bulk loading of 25-ton to 40-ton capacity trucks.

Estimated Noise Output from the Project

Table 2 below identifies the quantity of equipment and devices of the project that will generate noise and the estimated noise output. All sound-making devices will be situated within enclosed facilities of the project. Further, all equipment will be fitted with the relevant mufflers and silencers and will be maintained according to manufacturer specifications.

Table 2: Quantity of sound-making equipment

Sound-Making Equipment and Tools	Quantity	Decibels (dB)
Belt Conveyor	2	10.4
Fan (Bag Filter; Raw Material Feeding)	2	11.8
Process filter fan (Mill filter fan)	1	7.4
Bucket Elevator	2	13.4
Spillage Conveyor	4	0
Weigh feeder (Modular Grinding Unit)	3	0.4
Horizontal Ball Mill	1	33.6
Process filter fan (separator filter)	1	23.4
Separator	1	20.4
Main Mill Drive System	1	34.3
Auxiliary Mill Drive System	1	14.7
Fan for Filter Bag (Pneumatic transport system for cement to silos)	1	8.7
Fan for Bag Filter (Cement storage silos and bulk loading system)	2	11.8
Blowers for fluidification	1	14.7
Compressed air system	1	11.7
Standby 6MW Diesel Generator	1	52.4

In addition to what is listed above, the following vehicles will provide transportation support to the project:

Transport Vehicles	Quantity	Typical Sound Level at 50ft (dBA)
Wheeler Volvo Tractor Truck Units, equipped with 40 feet trailer	10	88
30 tonne Bulk Cement Tankers	5	85
Flatbed Trucks	15	85

Forklift for the discharging and packing of cement	4	88

Table 4: List of Equipment and Materials to be Imported

No.	Designation	Unit	Quantity
HAS	CEMENT SILO FEEDING AND EXTRACTION SYSTEM- TECHNICAL SPECIFICATIONS		
1	BAG FILTER FOR TOP VENTILATION OF CEMENT SILOS AND AEROSOLAR SLIDE	U	2
2	ROTARY AIR LOCK	U	2
3	FAN WITH MOTOR	U	2
4	MANUAL LOG FOR BAG FILTER CONDUIT	U	2
5	Ducts, chutes and vents for the above dust collector	Together	2
6	CONICAL SILO FOR CEMENT STORAGE	U	2
7	SILO VENTILATION SYSTEM	Batch	2
8	ROTARY BLOWER (2W + 1SB) FOR AERATING CEMENT SILOS	U	3
9	PNEUMATIC BUTTERFLY VALVE	Batch	1
10	MANUAL BUTTERFLY VALVE	Batch	1
11	AIR SUPPLY PIPING	Batch	1
12	CONTROL AIR PIPING	Batch	1
13	Ceiling-mounted silo inspection door	U	2
14	WALL-MOUNTED SILO INSPECTION DOOR	U	4
15	SILO PILOT WITH MOUNTING SOCKET	U	2
16	HIGH LEVEL INDICATOR WITH MOUNTING SOCKET	U	2
17	AIR BALANCE VALVE WITH MOUNTING SOCKET	U	2
18	SILO MOUNTING FRAME (ADAPTER BOX)	U	2
19	MANUAL CUT-OFF DOOR	U	2
20	PNEUMATIC ROTATING GATE	U	2
21	MOTORIZED FLOW CONTROL VALVE	U	2
22	OVERHEAD SLIDE FEED TO BUCKET ELEVATOR OVERHEAD SLIDE FEED	U	3
23	HIGH-PRESSURE FAN WITH MOTOR FOR OVERHEAD SLIDES	U	2
24	AIR SUPPLY PIPING	Batch	1
25	DISCHARGE CHUTE	Batch	2
26	AIR RECEIVER FOR HIGH AND LOW CEMENT SILO	U	2
B	LIST OF ELECTRICAL APPLIANCES		
1	VCB 6.6 kV CIRCUIT BREAKER PANELS	U	10
2	6.6 kV CAPACITOR WITH REACTOR	U	4
3	6.6 KV LIQUID ROTOR STARTERS	U	4
4	APFC WITH SEVERAL BANKS	U	2
5	LV AND MCCS SWITCHING EQUIPMENT	U	10
6	VVVF VARIATORS	U	8
7	START-STOP PUSH BUTTON	U	2
8	PUSH BUTTON FORWARD-STOP-REVERSE	U	2
9	CABLE ACCORDING TO SPECIFICATIONS	U	2
10	PLC SYSTEM WITH PC AND PRINTER	U	2
11	CABLE GLAND AND CABLE LUG	U	2
12	3KVA THREE-PHASE UPS SYSTEM	U	2
13	PROCESS INSTRUMENTS	U	2
14	LOCAL LUSH BUTTON STATIONS	U	2
15	33 kV SUBSTATION WITH ALL ACCESSORIES	U	2
16	30/6.6, 5 MVA POWER TRANSFORMER	U	2
17	6.6/0.415KV, 1250 KVA DISTRIBUTION TRANSFORMER	U	2
18	DESIGN AND ENGINEERING	U	2
19	GROUNDING OF THE OPERATING STATION AND THE INSTALLATION	U	2
20	LIGHTING FOR THE OPERATOR'S STATION AND THE FACTORY	U	2

C	RAW MATERIALS STORAGE AND FEED SECTION		
1	RAW MATERIALS COURT: THIS IS A "SILO" SERVED AS A STORAGE FACILITY FOR RAW MATERIALS	U	3
2	SLIDING GATE	U	5
3	PIN GATE (Manual)	U	1
4	DUST COLLECTOR	U	1
5	AIRLOCK	U	1
6	DUST COLLECTION TRAY	U	1
7	BAG FILTER FAN	U	1
8	FOOD WEIGHERS	U	6
9	BELT CONVEYOR FEEDING THE CRUSHER	U	1
10	JAW CRUSHER SIZE	U	1
11	BELT CONVEYOR FEEDING THE BALL MILL HOPPER	U	1
D	BALL MILL SECTION		
1	FEED HOPPER	U	1
2	BELT FEEDER	U	1
3	BALL MILL	U	1
4	Helical reducer for cement ball mill	U	2
5	THREE-PHASE MOTOR WITH SLIP RINGS (HT)	U	2
6	LIQUID ROTOR OPERATING UNIT	U	2
7	AUXILIARY TRAINING	U	2
8	COUPLINGS	Sets	2
9	CRUSHER DISCHARGE CHUTE	U	2
10	DOUBLE PENDULUM VALVE	U	2
11	MILL FAN	U	2
12	MILL DUST COLLECTOR	U	2
13	AERIAL SLIDE	U	2
14	ELEVATOR	U	2
15	STOP DOOR WITH NIB HATCH	U	2
16	AIR CLASSIFIER/SEPARATOR	U	2
17	DOUBLE FLAP VALVE	U	2
18	CYCLONE	Together	2
19	DOUBLE PENDULUM VALVE UNDER CYCLONE	U	4
20	DUST COLLECTOR SEPARATOR	U	2
21	BAG FILTER FAN	U	2
22	ROTARY AIR LOCK	U	2
23	AIR CIRCULATION FAN	U	2
24	ROTARY SIFT	U	1
25	COMPRESSOR	U	1
26	VENTS WITH REGISTERS AND EXPANSION JOINT	Together	1
27	DUCTS AND DUCTS	U	44

No.	Designation	Unit	Quantity
HAS	CEMENT SILO FEEDING AND EXTRACTION SYSTEM- TECHNICAL SPECIFICATIONS		
1	BAG FILTER/Dust Collector FOR TOP VENTILATION OF CEMENT SILOS AND AEROSOLAR SLIDE	U	2
2	ROTARY AIR LOCK	U	4
3	FAN WITH MOTOR	U	2
4	MANUAL LOG FOR BAG FILTER CONDUIT	U	2
5	Ducts, chutes and vents for the above dust collector	Together	2
6	CONICAL SILO FOR CEMENT STORAGE	U	2
7	SILO VENTILATION SYSTEM	Batch	2

8	ROTARY BLOWER (2W + 1SB) FOR AERATING CEMENT SILOS	U	3
9	PNEUMATIC BUTTERFLY VALVE	Batch	1
10	MANUAL BUTTERFLY VALVE	Batch	1
11	AIR SUPPLY PIPING	Batch	1
12	CONTROL AIR PIPING	Batch	1
13	Ceiling-mounted silo inspection door	U	2
14	WALL-MOUNTED SILO INSPECTION DOOR	U	4
15	SILO PILOT WITH MOUNTING SOCKET	U	2
16	HIGH LEVEL INDICATOR WITH MOUNTING SOCKET	U	2
17	AIR BALANCE VALVE WITH MOUNTING SOCKET	U	2
18	SILO MOUNTING FRAME (ADAPTER BOX)	U	2
19	MANUAL CUT-OFF DOOR	U	2
20	PNEUMATIC ROTATING GATE	U	2
21	MOTORIZED FLOW CONTROL VALVE	U	2
22	OVERHEAD SLIDE FEED TO BUCKET ELEVATOR OVERHEAD SLIDE FEED	U	3
23	HIGH-PRESSURE FAN WITH MOTOR FOR OVERHEAD SLIDES	U	2
24	AIR SUPPLY PIPING	Batch	1
25	DISCHARGE CHUTE	Batch	2
26	AIR RECEIVER FOR HIGH AND LOW CEMENT SILO	U	2
27	Belt Bucket Elevator		1
28	Chain Pulley Block with Rail		1
29	Diversion Box		1
30	Manual Cut-off Gate	U	2
31	Air Side	U	3
32	Silo Feeding Socket	U	2
33	Continuous Level indicator	U	2
34	Aeration System	U	2
35	Polyester Fabric		
36	Exhaust Fan	U	1
37	Rotary Piston Blower without Acoustic hood for Silo Aeration (2working + 1Standby)	U	3
38	Inlet Box	U	2
39	Flow Control Gate	U	2
40	High-Pressure Fan with Motor	U	1
41	Dust Collector for Auxiliary Venting with Exhaust Fan	U	1
B	LIST OF ELECTRICAL APPLIANCES		
1	VCB 6.6 kV CIRCUIT BREAKER PANELS	U	10
2	6.6 kV CAPACITOR WITH REACTOR	U	4
3	6.6 KV LIQUID ROTOR STARTERS	U	4
4	APFC WITH SEVERAL BANKS	U	2
5	LV AND MCCS SWITCHING EQUIPMENT	U	10
6	VVVF VARIATORS	U	8
7	START-STOP PUSH BUTTON	U	2
8	PUSH BUTTON FORWARD-STOP-REVERSE	U	2
9	CABLE ACCORDING TO SPECIFICATIONS	U	2
10	PLC SYSTEM WITH PC AND PRINTER	U	2
11	CABLE GLAND AND CABLE LUG	U	2
12	3KVA THREE-PHASE UPS SYSTEM	U	2
13	PROCESS INSTRUMENTS	U	2
14	LOCAL LUSH BUTTON STATIONS	U	2
15	33 kV SUBSTATION WITH ALL ACCESSORIES	U	2
16	30/6.6, 5 MVA POWER TRANSFORMER	U	2
17	6.6/0.415KV, 1250 KVA DISTRIBUTION TRANSFORMER	U	2

Electrical, Instrumentation, and Automation Systems

The Project will incorporate high-voltage electrical infrastructure, including substations, transformers, capacitor banks, circuit breaker panels, motor control centres, and variable frequency drives. Process operations will be controlled using programmable logic controllers connected to monitoring computers and instrumentation systems.

Backup power supply systems, uninterrupted power supply units, and plant-wide grounding systems will ensure operational continuity and equipment protection.

Utility Systems

Utility infrastructure will include compressed air systems for pneumatic equipment operation, water supply systems for dust suppression and equipment cooling, and air receivers to support aeration and packaging operations. A standby generator system will be installed to provide emergency power during outages.

Maintenance and Workshop Facilities

Maintenance workshops will be established to support routine and emergency equipment maintenance. Workshop equipment will include welding machines, cranes, forklifts, hoisting equipment, grinders, mechanical repair tools, and spare parts storage facilities. These facilities will support operational reliability and reduce downtime.

ENVIRONMENTAL MANAGEMENT CONSIDERATIONS

Construction Phase Environmental Impacts and Mitigation Measures

Construction of the clinker grinding and cement packaging facility will involve site preparation, civil works, structural erection, mechanical installation, and infrastructure development. These activities have the potential to generate temporary environmental impacts if not properly managed. The primary environmental aspects associated with the construction phase include air quality degradation, noise and vibration, soil disturbance, water contamination risks, solid and hazardous waste generation, traffic impacts, and occupational health and safety risks.

Mitigation measures will be implemented throughout the construction phase to minimize adverse impacts and ensure compliance with national environmental regulations and best management practices. ***Further, the thick vegetative buffer between the Project and sensitive receptors will be maintained by the Project***.

Air Quality Impacts

Potential Impacts

Construction activities may generate airborne particulate matter and dust emissions from:

1. Land clearing and excavation activities
2. Movement of construction vehicles on unpaved surfaces
3. Handling and stockpiling of construction materials such as sand and aggregate
4. Concrete batching and mixing operations
5. Cutting, welding, and grinding activities
6. Operation of diesel-powered construction equipment

Dust emissions may temporarily reduce local air quality and create nuisance conditions for workers and nearby receptors. Diesel engine exhaust emissions may also contribute to localised air pollution.

Mitigation Measures

To minimise air quality impacts, the following control measures will be implemented:

1. Regular water spraying of exposed soil surfaces, access roads, and stockpiled materials
2. Covering of trucks transporting loose materials
3. Speed restrictions for construction vehicles to reduce dust generation
4. Installation of dust screens or barriers in sensitive areas
5. Proper maintenance of construction equipment to reduce exhaust emissions
6. Limiting excavation and earthworks during periods of strong winds where practicable
7. Immediate stabilisation or covering of inactive stockpiles

Noise and Vibration Impacts

Potential Impacts

Noise and vibration may be generated from heavy equipment operations, including excavation machinery, concrete mixers, cranes, compressors, and transport vehicles. Prolonged exposure to elevated noise levels may affect construction workers and nearby communities.

Vibration generated from heavy equipment and structural installation may temporarily affect nearby structures or sensitive receptors.

Mitigation Measures

Noise and vibration impacts will be controlled through:

1. Restricting construction activities to designated working hours where feasible
2. Using equipment fitted with functional silencers and mufflers
3. Implementing preventive maintenance programs for construction machinery
4. Locating stationary noise-generating equipment away from sensitive receptors
5. Providing hearing protection for workers exposed to high noise levels
6. Monitoring vibration levels during heavy structural installation activities, if required

Soil Disturbance and Erosion

Potential Impacts

Site clearing, grading, and excavation may expose soil surfaces, increasing the risk of erosion, sediment transport, and land degradation. Improper handling of excavated materials may also result in soil contamination or sediment deposition in nearby drainage systems.

Mitigation Measures

The following measures will be implemented to control soil disturbance and erosion:

1. Limiting clearing activities to designated construction areas
2. Implementing phased clearing to minimise exposed soil surfaces
3. Installation of silt fences, sediment traps, and temporary drainage channels
4. Stabilisation of exposed surfaces using compaction, vegetation, or temporary coverings
5. Proper stockpiling and containment of excavated materials
6. Prompt restoration of disturbed areas following completion of construction works

Surface Water and Groundwater Protection

Potential Impacts

Construction activities may create risks of surface water contamination through:

1. Runoff containing sediments or construction debris
2. Accidental spills of fuels, oils, lubricants, or chemicals
3. Improper disposal of construction wastewater
4. Concrete washout and equipment cleaning activities
5. If not controlled, these contaminants may enter drainage systems, nearby water bodies, or groundwater resources.

Mitigation Measures

Water protection measures will include:

1. Installation of temporary and permanent stormwater drainage systems
2. Construction of sedimentation ponds or sediment control structures
3. Designate concrete washout areas with containment systems
4. Storage of fuels and chemicals in bunded and secured areas
5. Implementation of spill prevention and response procedures
6. Training of workers in spill response and pollution prevention
7. Prohibition of equipment maintenance activities near drainage channels
8. Routine inspection of drainage infrastructure

Solid Waste Generation

Potential Impacts

Construction activities will generate various non-hazardous wastes, including:

1. Packaging materials
2. Scrap metal
3. Wood and construction debris
4. Excavated soil
5. Domestic waste from workers
6. Improper waste disposal may lead to environmental pollution, visual impacts, and the attraction of pests.

Mitigation Measures

Solid waste management practices will include:

1. Segregation of waste at source
2. Recycling or reuse of scrap metal and construction materials, where feasible
3. Disposal of non-recyclable waste at approved disposal facilities
4. Provision of covered waste storage containers at construction sites
5. Routine waste collection and removal from the site
6. Implementation of housekeeping and waste minimisation programs

Hazardous Materials and Chemical Handling

Potential Impacts

Hazardous materials used during construction may include fuels, lubricants, hydraulic fluids, welding gases, and solvents. Improper storage or handling of these materials may result in soil or water contamination and pose health risks to workers.

Mitigation Measures

Hazardous material management will include:

1. Storage of hazardous materials in designated, bunded storage areas
2. Use of clearly labelled containers and safety data sheets
3. Provision of spill kits at storage and work areas

4. Implementation of safe handling and transportation procedures
5. Training of workers in hazardous material management
6. Proper disposal of used oils, lubricants, and contaminated materials through approved waste contractors

Traffic and Transportation Impacts

Potential Impacts

Increased traffic from the delivery of construction materials and the movement of heavy equipment may result in road congestion, increased accident risks, and deterioration of public roads.

Mitigation Measures

Traffic impacts will be minimised through:

1. Development of traffic management plans
2. Scheduling delivery of materials to avoid peak traffic periods where feasible
3. Implementation of speed limits within and around the construction site
4. Installation of warning signage and traffic control measures
5. Routine inspection and maintenance of access roads
6. Training of drivers in safe transportation procedures

Occupational Health and Safety Risks

Potential Impacts

Construction activities present risks, including:

1. Equipment-related accidents
2. Falls from heights
3. Electrical hazards
4. Dust and noise exposure
5. Manual handling injuries

Mitigation Measures

Health and safety management measures will include:

1. Implementation of a Construction Health and Safety Plan
2. Provision and enforcement of personal protective equipment usage
3. Worker training and safety induction programs
4. Routine equipment inspections and maintenance
5. Installation of safety barriers and fall protection systems
6. Emergency response planning and first aid availability
7. Restricted access to hazardous work areas

Community and Socioeconomic Impacts

Potential Impacts

Construction activities may result in temporary community disturbances, including noise, dust, and increased traffic. However, construction will also provide employment opportunities and stimulate local economic activity.

Mitigation Measures

Community impact mitigation measures will include:

1. Maintaining open communication with nearby stakeholders
2. Implementing grievance management procedures
3. Maintaining site security and controlled access
4. Scheduling high-impact activities during appropriate working hours
5. Maintaining cleanliness and minimising visual disturbances

Cumulative Impact Management

Although construction impacts are temporary, multiple activities occurring simultaneously may increase overall environmental pressure. The project will implement integrated environmental monitoring and management systems to ensure mitigation measures remain effective throughout construction.

Operation Phase Environmental Impacts and Mitigation Measures

The Project will produce cement via the physical processes of grinding and mixing of the raw materials. The chemical properties of the raw materials will not be changed or altered in any way. Cement production will occur in the Modular Cement Factory, which consists of a cement grinding station with Feed Hoppers, a dosing system, a ball mill, and a classifier.

The raw materials will be fed to the reception hopper via a front-end loader. The materials will then be transported via a conveyor belt to three independent bins (hoppers), designed to reduce dust emissions with a water inlet. The Bag Mill and the Classifier will be fitted with bag filters (with filter's internals, bags and cages); a rotary airlock and filter fan to recover the fine materials suspended in the air that passes through the Mill and classifier.

Potential Impacts on Air Quality

The equipment utilized to produce and bag the cement has key components that can potentially alter air quality. However, cement production will be done under circuit-depressed conditions; the dust created during the process is kept inside the circuit. This would reduce dust emissions to the atmosphere. Additionally, an airtight bag filter will be used to capture dust from the stage of this activity. The storage of cement in silos and the enclosed nature of the bagging plant will further reduce dust emissions. A dust collector (filter) will be employed to trap any particles generated from the silos during unloading operations. This material used for the filtration has a maximum of 10 to 15 mg/Nm^3 dust emission.

The Modular Cement units have filters mainly in the material transitions, as more dust is generated here. The dust collection system will be located at every point in the plant where cement will be conveyed and stored. Despite the introduction of this measure, there may be some dust emissions to the atmosphere. However, cement dust is relatively coarse with particle size averaging 40 – 50 micrometers and with a high density of approximately $3.3g/cm^3$. As such, cement dust is not expected to be dispersed over large distances (over 100 m). It should be noted that ***the Project will maintain the thick vegetative buffer between the Project and sensitive receptors***.

Currently, there are no communities or residents downwind of the project site. As such, even in a worst-case scenario where there is a spillage of cement, nearby residents will not be affected. Sources of gaseous emission to the air would be the operation of standby generators, operation of transport vehicles and machinery during the discharge and packaging of cement, including tractor trucks, bulk cement tankers, flatbed trucks, forklift. Release of carbon monoxide, nitrogen oxide, and Sulphur dioxide can further degrade current air quality.

Mitigation measures to reduce operational impacts on air quality:

1. Dust emissions will be controlled using bag filters, enclosed conveyors, dust collectors, and water-spraying systems.
2. Dust collectors (filter bags) will be cleaned constantly through a computer system. The dust collectors will be regulated via computerizes system which would provide cleaning cycles by injecting compressed air into the bags to separate the dust particles from the bags.

3. Silos will only be filled to 75% capacity
4. Closed trucks will be used to transport the bagged cement. In the absence of closed trucks
5. Cement bags will be plastic-wrapped to reduce dust emissions

Potential Impacts on Water Quality

Operational activities may impact the water quality of the Demerara River and the creek that borders the project site to the north-east. Activities associated with the operation of the wharf, such as the mooring of barges and loading and unloading of barges could impact the quality of water in the Demerara River and creek.

Any cement that escapes and is deposited in the project site could enter the aforementioned waterways as run-off, particularly during rainy events. Runoff into water bodies could alter water quality, including turbidity levels. Run-off carrying cement particles can alter the pH of the waterways. Altered water quality may temporarily impact the quality of aquatic habitats for organisms, including fish. Change in water quality can alter the composition of faunal communities, and this can interfere with the functioning of the aquatic ecosystem.

An increase in turbidity levels could affect light penetration in the receiving water, thereby affecting primary productivity. Decline in primary productivity can eventually lead to the death of aquatic vertebrate and invertebrate fauna. An increase in sediment loads in the waterways will have a negative impact on water quality.

During operation, fuel may be leaked from vehicles and be transported in rainwater to the water bodies. If allowed to flow into waterways, runoff contaminated with fuel would have a negative impact on water quality.

Mitigation measures to reduce operational impacts on water quality:

1. Vehicles will be monitored frequently to ensure there are no leaks
2. Sediment traps would be constructed on the perimeter drains to accommodate stormwater runoffs.
3. Site drainage will employ the use of a soak-away box and sediment trap before discharge to the Demerara River. This is to prevent wastewater containing cement dust from being discharged directly to the river. The soak-away box should be cleared at least once per week

Potential Impacts on Noise Levels

The operation phase of the project involves the production of cement via grinding and blending of imported raw materials; bulk storage of produced cement; and the bagging of the cement for distribution. During the operation phase, noise will be generated from different sound-making equipment and tools. The expected sources of noise were examined, and the noise level expected from their operation was determined. In Table 5, equipment and maximum noise output are presented.

EQUIPMENT	SOURCE MAX. LEVEL
Conveyor belts	< 85 dB(A)
Main Bag Filter	< 85 dB(A)
Other bag filters	< 85 dB(A)
Bag filters fans	< 85 dB(A)
Ball Mill	≈ 105 dB(A)
Mill drive	< 85 dB(A)
Main fan	< 85 dB(A)
Main fan drive	< 85 dB(A)
Rotary valves	< 85 dB(A)
Classifier drive	< 85 dB(A)
Dosing system	< 85 dB(A)
Compressor	< 85 dB(A)

Table 5: Equipment and level of sound produced within the Plant

Noise sources during the operation phase of the project include, but are not limited to:

- Operation of the belt conveyor, process filter fan of the mill, modular grinding units, bucket elevator, spill conveyor, and weigh feeder
- Operation of the auxiliary mill drive system, separator, blowers, and standby generators
- Operation of transport vehicles and equipment during the discharge and packaging of cement, including tractor trucks, bulk cement tankers, flatbed trucks, and forklifts.

Workers would be the main receptors of noise from the operation of the cement grinding and bagging facility. Operational activities are expected to increase noise levels in the project area. During the loading and transport of bagged cement, vehicles usually generate noise levels of 72-110 decibels, while power-generating plants can be expected to generate in the range of 90-105 decibels.

Exposure to noise levels above the internationally accepted level of 90 decibels can cause noise induced hearing loss, and noise levels above the tolerable threshold of 72 decibels can contribute to fatigue, tiredness, low morale, and decreased production levels and productivity. Since the cement bagging equipment is in an enclosed structure, noise emissions to the outside would be reduced and therefore, localized to the vicinity of operations. It should be noted that ***the Project will maintain the thick vegetative buffer between the Project and sensitive receptors***.

Some noise will be emitted by vehicles transporting raw materials to the site or finished products to customers. Noise will be generated during the operational hours of the facility and may affect workers and persons in the vicinity of the project. The cumulative noise levels due to the operation of the proposed facility and vehicle traversing the road have the potential to exceed the acceptable noise limits.

Mitigation measures to reduce operational impacts on noise level:

1. During operations, workers will be equipped with hearing protectors (earmuffs, earplugs (disposable or individually moulded), ear canal caps or semi-inserts).
2. Sound suppression devices (e.g. mufflers) will be installed on heavy equipment and machinery if this is not built into the equipment.
3. Machinery and equipment (including trucks and generators) will be checked to ensure that they are working efficiently and have installed the required muffler devices.
4. Generators will be completely housed in an enclosed structure with noise-abatement mechanisms installed. The generator is expected only to be used in instances of power outages. Generators will be sound attenuated.
5. Signage will be installed to remind workers of the proper use of PPE
6. Project operational hours should be between 6 a.m. and 6 p.m., including the offloading of bulk cement from vessels.
7. Vehicles/equipment will be switched off when not in use.

Potential Impacts from Waste Generation

During operations, it is envisaged that there will be little waste generated. The process is a dry mix process with minimal use of water; hence, no effluent is produced. The main potential sources of waste will be from office waste from the site office, used/damaged cement bags, cement which cannot be returned to the silo, septic tank, waste oils and lubricants from servicing and maintenance activities of machinery and plant.

Also, cement may be recovered through the suction/vacuum process. The quantities of such waste are expected to be small and localized, and as such will not pose a significant adverse impact

Mitigation measures to reduce the impacts of waste generation on the receiving environment:

1. Waste will be sorted through the provision of separate bins. Waste will be sorted according to liquid and solids, organic and inorganic, degradable and biodegradable.
2. Garbage receptacles will be placed at strategic locations within the plant, the admin building, and the eating area.
3. Bins will be cleared daily, and the content stored on site in large containers in a secure location before being removed every week to the waste disposal site.
4. Waste oils would be recovered, stored in containers, and arrangements will be made with suppliers for their collection and disposal.
5. Due to the number of employees, septic tanks will not require frequent disposal. When necessary, a waste disposal service certified to handle this waste type will remove sewage from the tanks.
6. Cement collected through the suction/vacuum process would be provided to residents through the Community Liaison Committee for construction and/or land filling.

Traffic

During the operational phase of the project, the volume of traffic on the secondary access road will increase. Approximately 40 Trucks will be transporting finished products to customers daily.

Additionally, the Project will move bulk ingredients and cement by barges through the Demerara River to the wharf for offloading to the silos. The section of the Demerara River within which the project falls has, at present, approximately 40 oceangoing ships traversing the area per month. This does not include smaller vessels such as trawlers. During the operational phase of the project, there will be the arrival of barges 2 -3 times a month to offload ingredients. This represents 0.05% of the existing traffic from large, oceangoing vessels and, as such, would not be considered significant to affect congestion in the Demerara River.

Mitigation Measures that would be put in place to reduce the impacts of the operation of the Project on traffic:

1. Briefing of all drivers on safe driving practices.
2. Installation of traffic warning signs on the project site and approaching the project site
3. Using traffic control, such as a traffic marshal, when heavy transport vehicles are entering and exiting the site.
4. Arranging distribution schedules to allow some larger vehicles to drive at night to reduce traffic during the day.
5. Working with the Guyana Police Force to ensure road safety, especially to access the project site. Collaborating with other neighbouring land users to ensure the access road is adequately maintained.
6. Managing traffic to avoid congestion.
7. Managing extra-long truck loads.
8. Informing stakeholders of the anticipated traffic flows during construction and the safety measures that will be put in place by the project.
9. Routine inspection and maintenance of secondary access roads and bridges

Occupational Health and Safety

The Project will implement a structured occupational health and safety management system, including worker training, use of personal protective equipment, emergency response procedures, and continuous monitoring of workplace hazards such as dust exposure, noise, and mechanical risks.

Project Benefits and Significance

The clinker grinding Project will enhance national cement production capacity, support infrastructure development, create employment opportunities, and reduce reliance on imported finished cement products. The project will contribute to economic growth while incorporating environmentally responsible industrial practices.

EMERGENCY PREPAREDNESS AND RESPONSE PLAN

Background to the Emergency Response Plan

This Emergency Response Plan (ERP) provides a compilation of emergency response measures and procedures developed after an assessment of the Project's potential impacts. Although all reasonable steps would be taken to protect the environment, health, and safety, and minimize risks, occasions can arise when an environmental or health and safety emergency can occur. In the event of an emergency, the objectives are to ensure a prompt and effective response and to minimize the effects. As such, this Plan outlines the response measures to ensure environmental protection and the safety of workers and all other personnel if an emergency occurs. The ERP addresses issues relating to emergency procedures to be executed during the construction and operational phases of the Project.

Structure of the ERP

This ERP describes the general types of emergencies and actions to be followed should an emergency occur. The ERP includes:

1. Emergency Contact Details
2. Emergency Procedures
3. Description of an Emergency
4. Authority of Control
5. Scenario Description and Response
6. Accident & Incident Reporting

The above information will be provided to employees and placed at strategic locations within the Project. This includes posting of the Emergency Response Procedures on the Safety and Health Bulletin Board to be erected at the Project. This is important to ensure that the emergency response plan and procedures are visible not only to permanent employees but also to persons who may be temporarily within the area.

As part of personnel orientation and training (see Safety Induction sheet), all staff would be made aware of the plan and emergency procedures. Emergency drills will be conducted on a regular basis, at least once every year, with the Environment, Health & Safety Manager (EHS) or designated personnel taking responsibility for the coordination and execution of these drills.

Identification of an emergency

An emergency would involve actual or potential destruction or contamination of the environment that calls for immediate action. Some examples of events that would require the instigation of an emergency response procedure include:

1. Fuel or oil spills
2. An explosion
3. Fire
4. Accident resulting in injuries to workers or members of the public

Emergency response philosophy

The company's emergency response procedure involves the following priorities for action:

1. Protect human health and safety
2. Contain the spread of material
3. Neutralize and render safe any noxious or hazardous materials; and
4. Commence clean-up activities and site remediation.

By their very nature, emergency response procedures deal with events either not foreseen or almost totally unlikely. Since emergencies are not a planned part of an operation, but can occur, Demerara Cement Company recognizes that it is necessary to plan for such events and take into consideration worst-case scenarios.

Emergency contact details

The Project is located within the jurisdiction of Administrative Region #4. As such, for purposes of emergency and emergency response, the regulatory presence and services located along the East Bank Demerara will be utilised as much as possible as a first point of contact and response. The following table (6) provides a list of emergency contacts:

Table 6: Emergency contact numbers

Organization	Contact / Telephone
Ambulance	913
Police	911
Fire	912
Timehri Police Station	261-2222
Diamond Diagnostic Centre	265-4681-5
Timehri Fire Station	261-2291/261-2211
EPA Emergency Response Team	225-0506
Ministry of Health- Centre for Disease Control	227-4986/223-7138-9
GPL (Emergency call centre)	226-4015/4016
GTT	0777/0908
Demerara Cement Company Representative	646 1377

Emergency Procedures

The procedure outlined below **(Figure 15)** will be followed in the event of an emergency occurring.

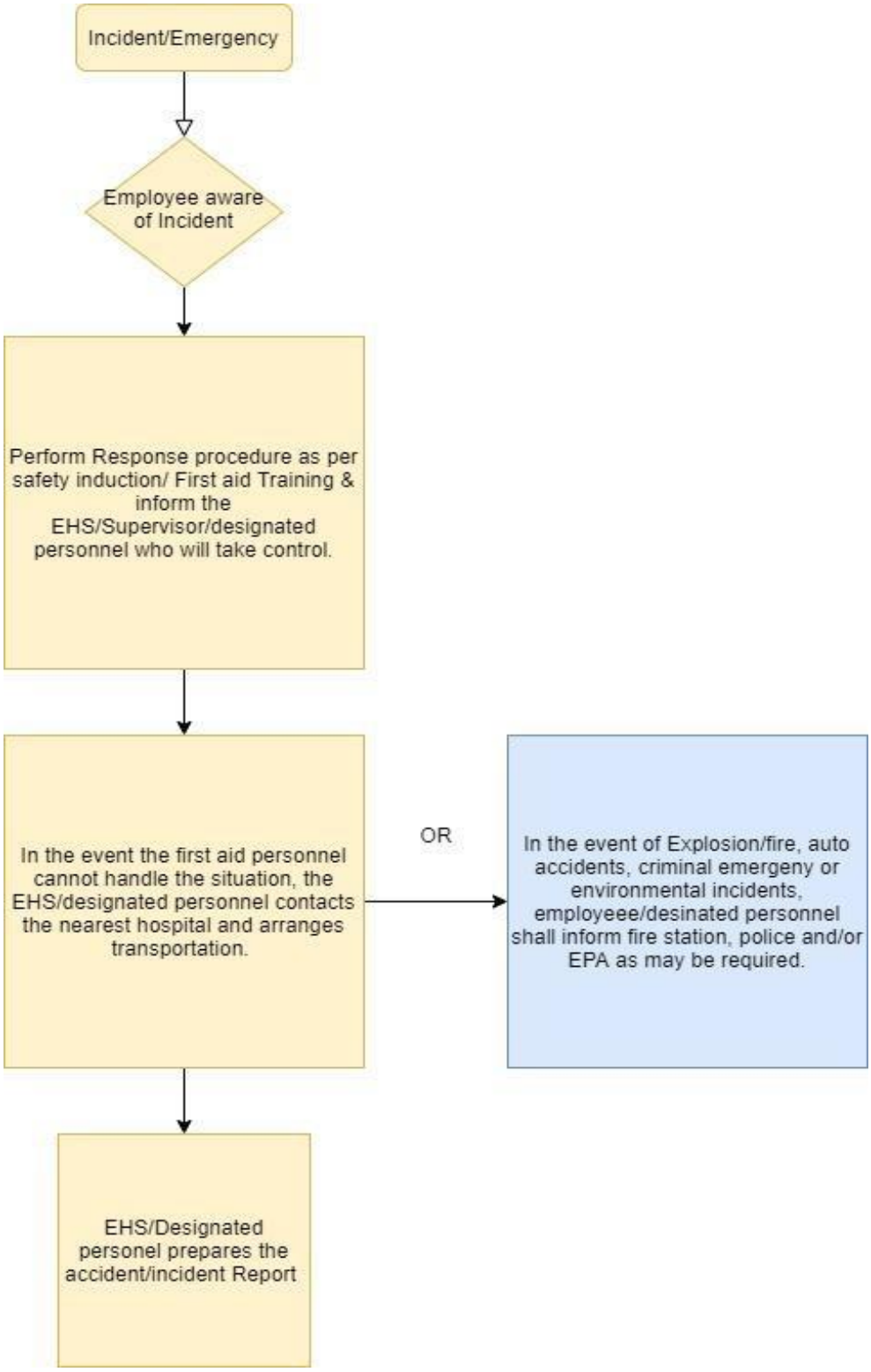
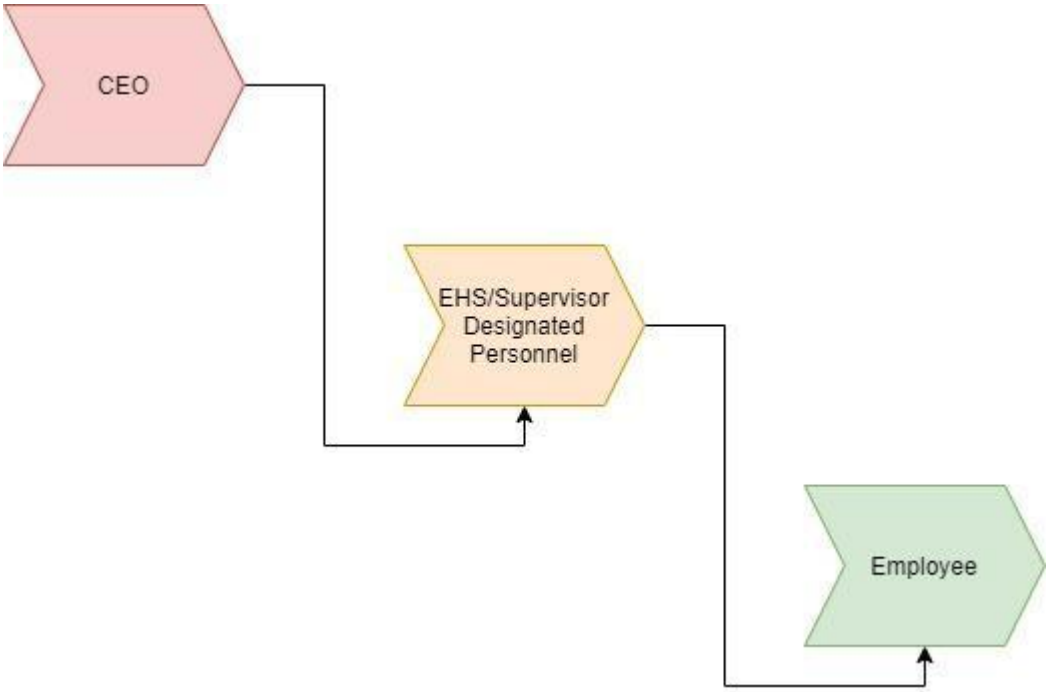


Figure 15: Emergency procedure for the Project

The EHS/ designated personnel will be immediately alerted of the incident (through telephone or word of mouth) with the basic details. Depending on the nature of the emergency, the EHS (or designated personnel) would alert the emergency services (Police, Traffic Department, Fire Service, and the EPA). Areas may warrant cordoning off with caution tape and, in some cases, barriers.

Authority of control

Figure 16: Chain of command within the Project



The Director and EHS/Supervisor/designated personnel have the authority to take control of any accident/incident, as illustrated in Figure 16. Supporting assistance will be sought from the firm's employees. The Director has the authority to decide to close all or any part of the operations following an incident or emergency. The above organizational chart (Figure 16) outlines the authority of control and chain of command.

Scenario description and response

Throughout the duration of the Project, several types of emergencies can arise, which can result in environmental contamination and degradation, injuries, damage to property, etc. It is essential that the types of potential emergencies be identified, along with the applicable response measures. This section of the ERP describes the type of emergencies and actions required to be followed should an emergency occur.

Spills

This section outlines the response measures to reduce impacts to the environment in the event of a spill by ensuring materials are available and that the established procedures are followed. It aims:

1. To reduce the risk of harmful exposure to individuals and the surrounding environment
2. To clearly outline the action to be taken if a spill should occur
3. To ensure that staff are aware of the correct response required

Types of spills

Minor spills

These spills have minimal health and safety risk and have no chance of migrating into the environment. Thus, minor spills will be handled by the persons causing the spill with supervision from the EHS or designated personnel.

Major spills

These spills have a greater potential impact than minor spills and have potential environmental, health, and safety risks and effects. These spills require a coordinated response to contain and clean up.

Response Method

The general response to spills will be as follows:

1. Report spill
2. Stop the source of the spill if possible
3. Contain spill with appropriate material
4. Protect the area
5. Remove material
6. Reclaim area; and
7. Prepare Incident Report

Spill Types and Specific Clean-Up Measures

Solid Material Spill in a Dry Area

1. This type of spill will be treated using specific tools (spade, trowels, brush, etc.) to clean up and recover the material.
2. Recovered material will be reused or disposed.
3. Preventive methods will be implemented

Liquid Material Spill in a *Dry Area*

1. This will be treated by containing the spill using earthen berms.
2. Appropriate protective gear, tools, and materials will be used to clean up and recover the liquid. Recovery may utilize pumps or absorbents (sawdust, sponge, and sand) as appropriate for the type of spill.
3. Recovered material will be stored in sealed containers /transported securely.
4. The area will be detoxified by bioremediation, which is the use of either naturally occurring

or deliberately introduced microorganisms to consume and break down environmental pollutants, to clean the polluted site.

5. Preventative methods will be implemented.

Solid Material Spill in an area Wet from Rain

1. This will be treated by covering the material with plastic.
2. Any drainage from the spill area will be isolated if possible, using earthen berms.
3. Downstream users will be notified if necessary.
4. Appropriate protective gear and tools will be used to clean up and recover the material.
5. Recovered material will be stored/transported securely.
6. Preventive methods will be implemented

Solid or Liquid Spill in a *Drainage Ditch*

1. This will be treated by containing the spill using earthen berms across the ditch as far downstream of the spill as possible.
2. Drainage from the spill area will be isolated, if possible, using earthen berms.
3. Material will be recovered, if possible, using protective gear.
4. Environmental monitoring of the downstream water will be conducted as soon as possible.

Fuel

For fuel spills, the following measures will be taken:

1. Berm will be constructed to contain spills on land
2. Spill will be pumped in drums or to storage tanks, if required
3. A quantity of sawdust will be applied as an absorbent to the spilled fuel in proportion to make it workable and transferable; and
4. The absorbent sawdust will be collected and stored within the earthen bund containment and will eventually be disposed of at the Haags Bosch Landfill (Hazardous Waste Cell).
5. Spills that have entered the waterways will undergo the following:
6. Channel will be blocked (if practical) with earth, loam, or sand to create a waterways barrier.
7. If the above is not permissible, then floatable containment (made of woven bagasse or rope floated on plastic bottles) will be utilized, and the effluent absorbed by sawdust or syphoned using a pump.

Spill Management Kit (SMK)

The following material will be included in the Spill Management Kit:

1. Rubber mat of minimum dimensions 1.0m x 0.45m
2. Plastic Drum (capacity 30 gallons minimum) with plastic cover
3. Rubber Gloves
4. 2 kg of cloth, preferably cotton of high absorption

5. Absorbent sponges
6. Skimmers or Woven rope with plastic bottles attached
7. Pairs of eye goggles
8. Disposable dust masks
9. High-density plastic garbage bags
10. Sawdust/white sand

Personal Protective Equipment (PPE)

The following protective gear would be required on-site:

1. Rubber Gloves
2. Goggles
3. Disposable dust masks
4. Coveralls

The container containing the absorbed liquids (or solids) will be transported and stored within an earthen bund containment and eventually disposed of at Haags Bosch Landfill. A Hazardous Waste Cell is currently being constructed at the said facility. All hazardous waste requiring disposal will be stored and disposed of at this facility when it becomes operational.

Preventative Measures

The following preventative measures would be implemented for spills at the site:

1. Filling the storage tanks to the recommended manufacturer's capacity.
2. Erecting a bund wall around the storage tanks.
3. Use of double-walled tanks for storage.
4. Routinely inspect tanks, hoses, and trucks involved in the transfer of fuel for evidence of leakage.
5. Use of drip trays if leaks are detected.
6. Training and careful handling of fuel by workers
7. An emergency shut-down valve for pumps and tanks.

Fire

If a fire is to occur, fire control will be exercised as follows:

1. On discovering a fire, immediately warn others by operating the nearest fire alarm.
2. The valves for the pumps and tanks should be immediately shut down.
3. If possible, tackle the fire using the appliances provided (fire extinguishers and buckets containing sand) to control the fire.
4. If the fire is small, fire extinguishers can be used. In the event of a large fire, water spray can be used.
5. In cases where control is difficult, the Fire Service should be contacted.
6. The occupants will leave the building by the nearest available exit.
7. The occupants will report to the person in charge of the assembly point. A register will be recited to ensure all persons are present.

8. Employees should not take risks by stopping to collect personal belongings or re-enter the building for any reason unless authorized to do so.

Types of Firefighting Equipment

The following types and quantities of firefighting equipment will be located at the facility:

Type	Quantity	Size
Fire Extinguishers (ABC Powder)	10	9.1 kg
Fire Extinguishers (foam)	5	9.1 kg
Fire bucket with sand	10	91

Table 7: types and quantities of firefighting equipment

Minor Injury/Accident

In the event of a minor injury/ accident, the EHS/designated personnel will be informed and then take the responsibility for on-site treatment utilizing First Aid. First Aid Kits will be available at designated areas in the facility. The following First Aid measures will be implemented:

Eye Contact: If toxic liquids (kerosene, acids, etc.) get into the eyes, they will be flushed thoroughly with water using light facial soap. If irritation continues, persons will be taken to a physician.

Skin Contact: Contaminated clothing will be removed. Exposed skin will be dry wiped and the area cleansed with waterless hand cleaner, followed by washing thoroughly with soap and water. Person rendering assistance will try to avoid contact and wear impervious gloves. Contaminated articles will be discarded.

Inhalation: Affected persons will be removed from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, immediate medical assistance will be sought from the nearest medical facility. If breathing is difficult or has stopped, ventilation assistance will be rendered, or Cardio-pulmonary resuscitation will be applied; and

Ingestion: Immediate medical attention will be sought.

Choking: Abdominal thrusts/ back blows will be applied to choking victims.

Unconsciousness: Cardio-pulmonary resuscitation (CPR) will be performed until the ambulance arrives

Minor closed wound: Apply direct pressure, elevate the injured body part (if it does not cause more pain), and apply ice/ cold pack for 20 minutes.

Minor open wound: Apply direct pressure, wash the wound with soap and water, apply triple antibiotic ointment, and cover the wound with a sterile dressing or bandage.

Thermal/Chemical Burns: Cool the burn with large amounts of cold water until the pain is relieved or until medical assistance arrives.

Electrical Burns: Turn off the power at its source and perform CPR if the victim is unconscious until medical assistance arrives.

Embedded Objects: Do not remove the object; bandage bulky dressings around the object to keep it from moving, and seek medical assistance.

Muscle, Bone, and Joint Injuries: The injured area should not be moved. Splint the injured part only if the person must be moved and it does not cause more pain. Apply ice to the injured area for a period of about 20 minutes.

Fainting: Lower the person to the ground, elevate the person's legs about 12 inches, loosen any tight clothing, and check to ensure the person is breathing. The person should not be given anything to eat or drink.

Seizure: Roll the person on his or her one side. Reassure and comfort the person until he/ she is fully conscious and aware of their surroundings.

Snake Bites: Keep the injured area still and lower than the heart, and seek immediate medical attention.

Asthma Attack: Help the person sit up, and if the person has medication for asthma, help him or her take it. If the person does not have medication or there is no change in the person's condition after administering medication, seek immediate medical assistance.

Nosebleed: The person should sit leaning slightly forward, pinch the nostrils together for about ten (10) minutes, apply an ice pack to the bridge of the nose, and if the bleeding persists, seek medical attention.

Major Injury/Accident

For accidents involving vehicles or for serious injuries, the following procedures will be initiated:

1. Inform the EHS/ Supervisor/Designated personnel
2. In the case of injury, First Aid treatment will be applied
3. The type of injury will be assessed, i.e., broken leg, conscious or unconscious
4. Transportation will be arranged to the nearest Health Centre or Hospital
5. In the case of accidents involving vehicles, the nearest Police Station will be contacted

Criminal Emergency

This procedure has been developed for events that may require Police assistance. The following procedure will be initiated for criminal emergencies:

1. Call 911 or Timehri Police Station to:
2. Report a situation or crime in progress (e.g., assaults, burglaries, motor vehicle theft, auto accidents with injury, disputes, etc.)
3. Provide the following information to the Operator/Police Officer:
    - Nature of criminal activity
    - Name
    - Location
    - Number of persons injured
    - Alert other workers if possible
    - Remain in a safe location and await the arrival of the Police.

Accident/ incident reporting

After every incident/accident, a report will be required. The EHS/designated personnel would have the direct responsibility for the preparation of the report within 48 hours of the incident/accident, detailing the events leading up to it. The report will provide the following details:

1. Date and time of the accident/incident
2. Location of the accident/incident and all affected areas
3. Damage done (e.g., material spilled and estimated quantity)
4. Cause of accident/incident
5. Action taken to contain the incident/ corrective action taken to prevent the recurrence of the accident
6. Persons notified
7. Details of the injured party
8. Vehicle particulars

Incident Reporting Form

Use this form to report any workplace accident, injury, incident, close call or illness.
Return completed form to the Operations Supervisor, or Management.

This is documenting an:

☐ Lost Time/Injury ☐ First Aid ☐ Incident ☐ Close Call ☐ Observation

Details of person injured or involved (to be filled in by person injured / involved if possible)

Person Completing Report:_____ Date:_____

Person(s) Involved:_____

Equipment or Truck ID:_____

Event Details

Date of Event:_____ Location of Event:_____

Time of Event:_____ Witnesses:_____

Description of Events (Describe tasks being performed and sequence of events):

_____

_____

_____

_____

_____

*If more space is required please use the back of this sheet

Was event / injury caused by an unsafe act (activity or movement) or an unsafe condition (machinery or weather)? Please explain:

_____

_____

TO BE COMPLETED ONLY IF LOST TIME/INJURY OR FIRST AID WAS REQUIRED	
Type of injury sustained:	
Cause of lost time/ injury or first aid:	
Was medical treatment necessary?	Yes_____ No_____ If yes, name of hospital or physician:

Signature of Employee:_____ Date:_____

Signature of Supervisor:_____ Date:_____

Training Officer: _____

Course: _____

Trainee Name	Trainee Signature	Date of Induction

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