# Expansion and Rehabilitation of the Bartica Secondary School Practical Instruction Department in Region 7.

Site ID: ICB No. GSDEP/2020/W5

The Project is Financed by the Caribbean Development Bank and the Government of Guyana.

The Project is being Implemented by the Guyana Skills Development and Employability Project (GSDEP) through the Ministry of Education the Telephone# 592-227-3533. or Email Address: gsdep.coordinator@moe.gov.gy

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### *1.4 Methodology*

The methodology applied for this project may be loosely categorized as follows.

- Site Reconnaissance Visit- March 12, 2019.
- Discussions with various stakeholders (, officials, and other groups). The project team commenced stakeholders consultation with the following persons:

– The Regional Chairman

– The Regional Educational Officer

– The Head Teacher

- Review of Secondary sources of information
- Observation of Land Use in the project area of influence.
- Assessment of Environmental problems and recommended actions associated with projects of similar nature.

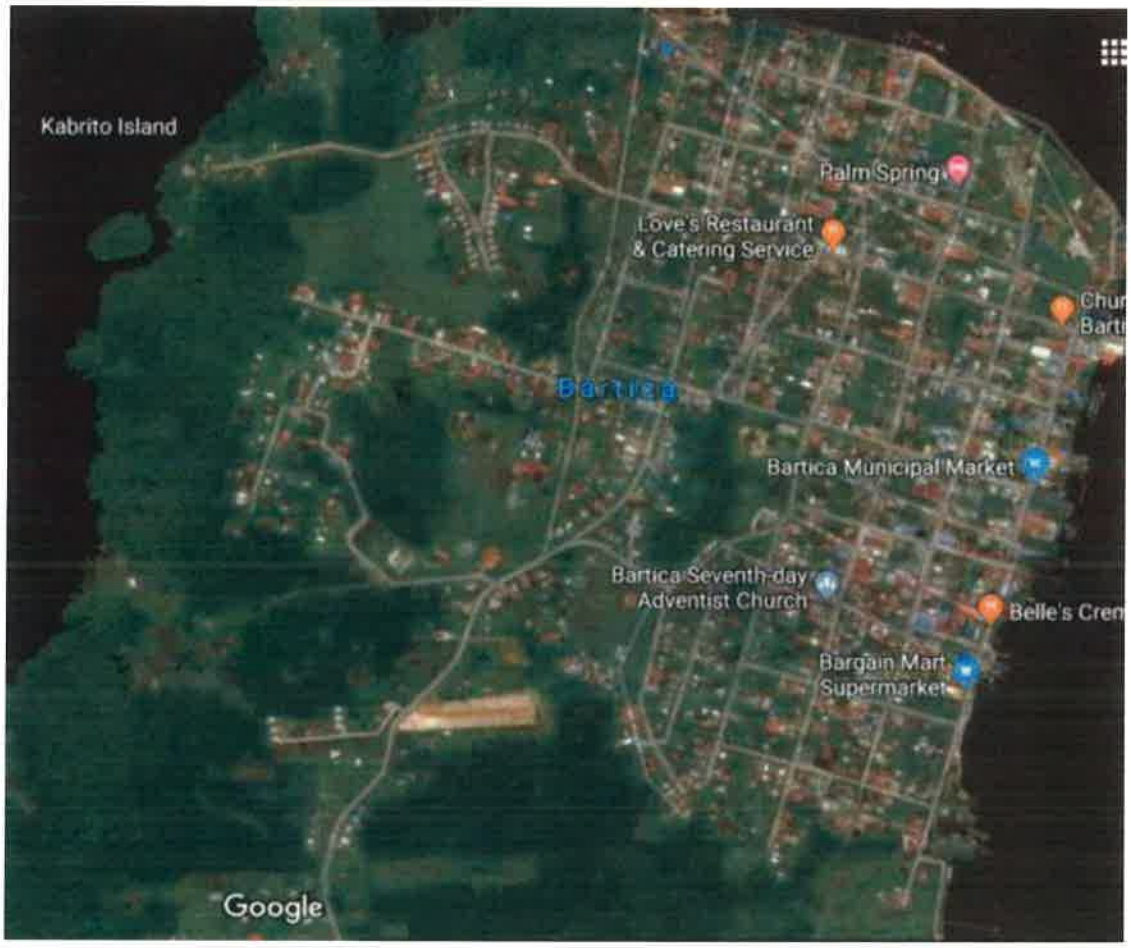


Figure 2: Depicting the site in relation to the surrounding areas.

A shown in Figure 2, the Bartica secondary School is located in an area with undulating terrain, comprising numerous hilly sections. The school itself is located on top of a hill. The surrounding areas comprise forest type vegetation, shrubs, small trees and grasses. Within the school compound itself many small shrubs are present. Contiguous to the school is a Guyana Water Inc. treatment plant facility, downhill of the school are the Bartica Primary School and staff facilities. The school is located on a turnoff uphill off the main carriageway. Areas outside of the school are very populated with residential homes and a myriad of commercial activities.

A review of secondary information has revealed that no threatened or endangered species are located within the demarcated school area. The wider town however, is home to a myriad of flora and fauna. Construction

## *4.0 ENVIRONMENTAL IMPACTS (ENVIRONMENTAL AND SOCIAL)*

This section describes the anticipated impacts and significance on the physical and biological environment, community and socio-economic environment. The existing secondary school has a number of surrounding buildings including Dorms, IT Centre, Staff quarters and Kitchen.

The general impact of The Guyana Skills Development and Employability Project (GSDEP) is deemed positive. The Project aims to increase enrolment and promote participation of both men and women in areas of Technical and Vocational Education and Training (TVET), and to facilitate more efficient matching of skills with job requirements.

Under the proposed interventions, considerations must given to proper environmental management throughout the construction phase of the project. Preparation of environmental and other plans also ensure that the construction phase of the project is controlled in a manner that minimizes negative environmental externalities.

The majority of Negative impacts are likely to occur during construction phase and is temporary. The most important impact should be dust and noise pollution within the site, this is likely to affect teacher and students since works might be conducted simultaneously with school activities. Traffic congestion during construction is not anticipated as the site is located off the main thoroughfare. The school is accessed through the main road which will only be temporarily impeded when materials are transported to site. Also, given that the school is located on a turn, appropriate traffic control measures will be required when materials are transported to site.

The other inconveniences created during the construction works consists basically of atmospheric pollution due to dust, noise from machinery and equipment, garbage and waste production increase, soil erosion and sedimentation and minor inconveniences due to the presence of workers and machinery. These inconveniences can be mitigated through the application of standard measures in engineering, construction and operation plans.

### *4.1 Potential Impacts during Construction Phase*

#### *4.1.1 Vegetation & Biodiversity*

The project area is almost completely dominated by man; the site houses the secondary school and ancillary facilities which has already altered the existing flora and fauna. The entire site comprises small shrubs, grasses and a few scattered large trees. Outside of the school boundaries, there are many larger trees as

Figure 4: Flora observed on the site.

***Mitigation Measures***

The CONTRACTOR should:

- not destroy, remove or clear trees and shrubs, or disturb or destroy farm areas or watercourses to any extent greater than is absolutely necessary for the performance of the work, or to any greater extent than has been authorized;
- ensure that machine operators take extra care when backing up or swinging around to avoid damaging overhanging limbs and nearby trees when working close to the boundary of the work zone;
- Retain existing vegetation where feasible by limiting the size of the disturbed area.

### *4.1.2 Wildlife & Impact on Threatened or Endangered Species*

As explained above, biodiversity has been greatly reduced in the terrestrial ecosystems in project area and surrounding. A few patches of vegetation and wildlife habitat should be lost due to this project. However, this

***Mitigation Measures***

In order to manage traffic effectively, the CONTRACTOR should:

- The Contractor should provide flagmen with "STOP" and "GO" signs to guide trucks transporting equipment and materials to the site
- The Contractor should, as a priority in all activities, undertakings and endeavours, ensure the continued and continuous safety of the public and all persons directly or indirectly associated with the Works
- The Contractor should keep roads and sidewalks affected by his operations free from soil and material spillage and ensure that construction areas can accommodate traffic safely at all times.
- The Contractor should take care at all times to ensure the convenience and safety of teachers, students and other stakeholders within the project area.

### *4.1.6 Construction and Domestic Waste*

A fair amount of waste should be generated during construction, this includes construction as well as domestic waste. Fuels and lubricants used by vehicles and equipment should generate used oil filters, waste oils etc.

Construction sites can generate significant amounts of domestic waste, including food boxes, water bottles and other types of waste.

***Mitigation Measures***

See section 5 for detailed waste management plan

### *4.1.7 Dust and Noise*

Dust pollution should be a short term impact during the construction phase. The soil type within the project area generate a significant amount of dust increased vehicular activity should exacerbate dust nuisance. Vehicle emissions should also increase the level of atmospheric pollution. Dust nuisance is likely to affect residents located downhill of school compound due to the difference in elevation and prevailing wind conditions. Dust nuisance is also likely to affect occupants of the dorms and staff quarters as they are all located within the school compound.

Noise pollution should be short term and limited to the construction phase. The use of heavy equipment and machinery during construction should increase noise levels.

***Mitigation Measures***

**Fugitive Dust**

In order to prevent wind erosion of stockpiled aggregate and cleared areas resulting in fugitive dust, particularly during the dry months, the CONTRACTOR should:

- use water trucks to dampen unpaved access routes and staging areas at regular intervals;
- Use plastic to cordon areas producing high levels of dust within the school compound;
- Ensure that trucks transporting material to site are covered with tarps to prevent fugitive dust.

***Noise***

During the construction phase, Contractor should mitigate the potential impacts from noise by:

- avoiding the creation of unnecessary or intrusive noise at the construction site;
- Scheduling construction activities so the noisiest activities are conducted, to the extent possible, outside of school hours, this can be arranged with the School's head teacher.

***4.18 Erosion and Sediment Control***

The movement of equipment within the site can result in erosion and sedimentation, the undulating terrain and dry conditions should result in top soil eroding and depositing in other areas. Clearance of the vegetation to facilitate construction of new buildings can potentially exacerbate erosion.

**Mitigation Measures.**

The following measures should be implemented to reduce the impact of erosion and sedimentation activities:

- To mitigate this impact the Contractor should avoid as far as practical to avoid construction in areas of relatively steep gradients.
- The Contractor shall monitor areas of exposed soil during periods of heavy rainfall to prevent slippages.
- The Contractor shall use appropriate machines for all earth works.

- Building may not be dismantled and utilities disconnected
- Construction waste stockpiles may not be removed and any ditches created are not graded.
- Construction site may not to be restored to its original state.

***Mitigation Measures***

- The Contractor should ensure that construction debris is removed from site after construction is complete
- The site should be restored to its original state or acceptable following construction.

### *4.3 Positive Impacts of the Project*

Apart from the major positive impact of the project resulting into the creation of employment during the construction phase, there are other positive impacts as follows:

- Improved Infrastructure
- Increased access to vocational training and possible employment creation following completion of courses.
- Spin off economic benefits.

## *5.0 SPECIFIC MANAGEMENT PLANS*

### *5.1 CONSTRUCTION PHASE (GENERAL CONSTRUCTION)*

#### *5.1.1 General Measures that shall be implemented*

The CONTRACTOR should be committed to implementing the recommendation stated in the ESMP and should be required to:

- dispose of sewage, refuse in a manner approved by all authorities having jurisdiction;
- conduct all operations in such a manner that there are no unauthorized discharges of any sort (liquid or solid) into waterways;
- ensure that habitat areas that are not within the work site are protected from disturbance; and
- ensure that appropriate spill kits are available.
- ensure that construction sites are watered twice daily to reduce dust nuisance. The Contractor should ensure that water is readily available on site to wet the entire area.

are employed Construction debris and other waste should not be allowed to accumulate on the construction site but should be collected promptly and regularly removed from the site by the Contractor. Construction debris should not be stockpiled longer than 30 days after initial placement.

The Contractor shall implement all measures possible to ensure that all waste generated is reused and recycled where applicable.

#### *5.2.2.2 Waste Oils and Special Wastes*

Waste oils, special wastes, and refuse generated during the servicing of equipment (e.g., air and oil filters, hydraulic fluids, and petroleum products) should be stored, transported and disposed of in accordance with recommendation of the RDC Office.

- All waste oil and petroleum products shall be collected in sealed five gallon containers. A special area at the contractor site office/storage facility should be designated to stored waste oil.
- Where possible, waste oil, lubricants and other waste materials generated during the servicing of equipment and machinery should be recycled.

#### *5.2.2.3 Domestic and Other Waste*

The Contractor is required to provide adequate numbers of waste collection receptacles on site. Receptacles should be strategically placed on site to ensure that waste is not haphazardly dumped on site. Waste should be disposed at an area approved by the local RDC. All food wastes should be collected and stored in containers and be regularly transported to the adjacent dumpsite.

Construction waste such as formwork and lumber should be reused where possible. Wooden materials that cannot be reused should be transported to the adjacent dumpsite.

Cement bags and other packaging material should be disposed at the dumpsite as well.

Steel end pieces and other waste that cannot be burned should be temporarily stockpiled and subsequently disposed.

In terms of sewage management, the contractor should explore the option of construction of a temporary facility, this should be discussed with the M&TC for formal approval.

#### *5.2.2.5 Disassembly of Construction Site.*

After completion of construction works at all sites the contractor should demolish and remove all temporary site offices, storage facilities and camps. Demolished material should be donated to the M&TC and nearby residents. Materials that cannot be reused should be burned or dumped at the local approved landfill site.

- Bags Containing white sand
- Plastic Spade
- Heavy Duty Garbage Bags
- Empty Five Gallon Containers with lids to store spilled materials.

### *5.4 Spill Conditions*

***The Contractor should initiate the following response for spills***

#### *5.4.1 Solid Material Spill in a Dry Area*

- Clean up and recover material with protective gear.
- The material should be Stored/transported to an area recommended by the local authorities.

#### *5.4.2 Liquid Material Spill in a Dry Area*

- The spill should be contained using earthen berms.
- Material should be recovered with protective gear. Material recovery may utilize pumps or absorbents as appropriate for type of spill.
- In cases where liquid is absorbed, the material that the liquid is spilled on should be removed.
- Area should be detoxified.
- Material should be Stored/transported to a recommended area of disposal.

#### *5.4.3 Solid Material Spill in an Area Wet from Rain*

- Spill material should be covered with plastic.
- Any drainage should be isolated from the spill area, if possible, using earthen berms.
- Clean up and recover material using protective gear.
- Store/transport recovered material.

#### *5.4.4 Liquid Material Spill in an Area Wet from Rain*

- The spill should be contained using earth berms.
- Drainage should be isolated, if possible, using earth berms
- Material should be cleaned up and recovered using protective gear. Material recovery may utilize pumps or absorbents as appropriate for the type of spill.
- Material should be Stored/transported to an approved area.

- Gasoline entering the ground can be recovered by digging sumps or trenches and pumping from below the water table

### *5.5.3 Petrol/ gasoline can be disposed of in the following manner:*

Evaporation or incineration under controlled circumstances.

### *5.5.4 Other Fuels and Petroleum Products*

Fuel and petroleum products spills should be contained using local earth materials and/or sandbags. Spill cleanup equipment specifically designed for petroleum products should be located at the Contractors site office.

### *5.5.5 Spills or leaks of all light and medium oils, including fuel oil at storage facilities, should be responded to by following these steps:*

- Identify the source of the leak or spill;
- Stop flow if possible
- Eliminate open flame ignition processes
- Contain the spill
- Notify the Supervisor's Representative
- Spilled diesel fuel should be recovered by using sand, sawdust or straw. If necessary, contaminated soil should be excavated.

### *5.5.6 Fuel spills on land should be responded to by the following procedures:*

- Construct a earth berm down slope of the running or seeping fluid;
- Plastic tarps may be placed at the base of the berm to allow the fuel to pool on the plastic for easy capture with absorbent pads;
- Pads may be squeezed into empty drums and re-used;
- Larger pools can be pumped back into drums;
- Special care should be taken to prevent the fuel from entering a body of water where it should; have greater negative impact;
- Contaminated soil and vegetation may have to be removed and disposed at an appropriate area.

### *5.5.7 Fire response methods for diesel fuel include:*

- $CO^2$, dry chemical, foam, or water spray;

- Ensure measures are in place to protect employees health and safety
- Ensure the provision and maintenance of construction sites that are lit, safe and without risks to health. When night work is done on the construction site, the contractor should provide adequate lighting to ensure the safety of workers and the general public.
- The execution of suitable arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage, transport and disposal of articles and substances. Spill response protocol should be communicated with all members of staff to ensure appropriate response during an emergency situation.
- Ensure the provision and maintenance of access to all places on the site are in a condition that is safe and without risk of injury. All access areas should be maintained as necessary.
- Ensure the provision of protective clothing and safety gear (hard hats, hearing protection, goggles and other devices for activities).The Contractor should procure all necessary safety gears for employees. All employees should be inspected on a daily basis to ensure that they are properly attired.
- First Aids Kits containing materials to treat minor injuries should be present on all active construction sites.
- Arrangements should be made with nearby hospital and health centers to deal with emergencies.
- The Contractor should provide and maintain adequate sanitation, refuse collection and waste disposal (as specified in the Site Environmental Management Plan). Provide continuous supply of fresh water on site.
- Designate as safety officer one of the contractor's senior staff who should have specific experience and knowledge of safety regulations on similar projects.
- Provide a suitable number of sanitary facilities on site.

**5.6.2 Cement Works**

Cement work/concrete manufacture can pose a risk to employees on site. Potential hazards for workers in concrete manufacturing:

- Eye, skin and respiratory tract irritation from exposure to cement dust;
- Inadequate safety guards on equipment;
- Inadequate lockout/tag out systems on machinery;
- Overexertion and awkward postures;

- Avoid working beneath cuber elevators, conveyor belts and stacker/de-stacker machinery.
- Stack and store materials properly to limit the risk of falling objects.
- Wear eye protection when chipping and cleaning forms, products or mixers.

#### *5.6.2.4 Poor Ergonomics*

**Hazard:** Improper lifting, awkward postures and repetitive motions can lead to sprains, strains and other musculoskeletal disorders.

**Mitigation Measures:**

- Use hand trucks or forklifts when possible.
- Lift properly and get a coworker to help if a product is too heavy.
- Avoid twisting while carrying a load. Shift your feet and take small steps in the direction you want to turn.
- Keep floors clear to avoid slipping and tripping hazards.
- Avoid working in awkward postures.

#### *5.6.2.5 Confined Spaces*

**Hazard:** Mixers and ready-mix trucks have confined spaces that pose safety risks for workers.

**Mitigation Measures:**

- Follow established procedures for confined space entry and work to assure safety.
- Guard against heat stress when cleaning truck mixer drums.
- Wear appropriate protective equipment to avoid silica exposure when removing concrete residues from inside truck mixer drums.

#### *5.6.2.6 Vehicles*

**Hazard:** Poorly maintained or improperly handled vehicles can lead to crushing injuries at the plant site or other injuries for truck drivers.

**Mitigation Measures:**

- Make sure back-up alarms on all vehicles are functioning.
- Avoid overloading cranes and hoists.
- Use care with the load out chute on concrete mixers to avoid injuries to hands and fingers.