TERMS OF REFERENCE

CONSULTANCY SERVICE FOR ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF TRANSFER STATIONAT GAEC

1.0 BACKGROUND

General Context

The Government of Ghana has secured funding from the World Bank to finance the Greater Accra Resilient and Integrated Development (GARID) project. The project aims at supporting critical investments to deal with Climate Change impacts in the Odaw Catchment in the Greater Accra Region. The key interventions will focus on dealing with challenges with drainage and solid waste management in the Odaw Channel.

Sectoral Context

Solid waste collection and transfer in the GAMA is saddled with many challenges that hamper efficient and timely evacuation of solid waste from points of generation. Some of the challenges are long distances from the generation point to final dumping sites resulting in high haulage cost and operational difficulties due to heavy daytime vehicular traffic.

A downstream effect of the operational difficulties is irregular waste removal from house-to-house receptacles and communal containers when they are full leading to over-spillage of refuse causing unsanitary conditions at these sites. This overflow of refuse containers is a major source of garbage ending up in open drains, water courses and streams, exacerbating risks of flooding in heavy rain events.

In addition, some households avoid pay-as-you dump at container sites, “hoard” refuse, only to dump it into drains during rains. Smaller waste collection vehicles (including hand-drawn carts, motorized tricycles and Borla taxis) used for collection predominantly in low-income communities, typically dump the collected wastes in open drains and other unauthorized places.

The flooding disaster of June 3, 2015 was exacerbated by the blockage of drains by non-degradable solid waste materials and silt.

Research shows that direct haulage of waste generated in the Accra Metropolitan Area is uneconomical for travel distance in excess of 17.7 km and 25.9 km for the skip trucks and compaction trucks respectively (AMA, 2013).

The increased travel distance is a disincentive to some of the smaller waste collection vehicle operators who dump their contents at unauthorized places.

The Government of Ghana acting through the Ministry of Sanitation and Water Resources (MSWR) is seeking to invest in the construction of a transfer station in the Greater Accra Metropolitan Area (GAMA):

- To receive domestic and commercial waste from neighbourhoods within GAMA for onward transportation to final disposal sites;

Project Location and Land Size

The proposed Waste Transfer Station (WTS) will be located on Ghana Atomic Energy Commission (GAEC) land in the Ga East Municipality. MSWR has a memorandum of understanding (MoU) with the GAEC to collaborate on waste management, including research, through the development and operation of the WTS.

The size of the proposed site is 9.82 acres (3.97 ha), as indicated on the site plan (Annex 2). The proposed project site is largely flat and can be accessed from the Haatso – Kwabenya road.

The proposed project site shares boundaries with the Haatso-Kwabenya road, some residential properties and the Onyasia stream. The site is currently a farmland for the cultivation of vegetables by some members of the BNARI Land Vegetable Growers and Marketing Cooperative Society.

2.0 OBJECTIVE OF ASSIGNMENT

The objective of the assignment is to carry out detailed engineering designs, including preparation of tender documents and supervision of construction of the works for a state-of-the-art waste transfer station.

3.0 DESCRIPTION OF PROPOSED WASTE TRANSFER STATION

The MSWR intends to design and construct a Solid Waste Transfer Station (WTS) to serve the GAEC and surrounding municipalities within a 5-7 km radius (which will include the Ga East, Adentan, La Nkwatanang Madina and Ayawaso West Municipalities). The WTS will receive and haul only domestic waste from both public and private waste trucks. The transfer station will not receive medical, construction or industrial/hazardous waste.

Composition of Municipal Solid Waste (MSW)

The three significant components within MSW are organics (51.59%), plastics (16.69%) and inorganics (14.90%). The various components of a typical municipal solid waste and their percentage weights are shown in figure 1.

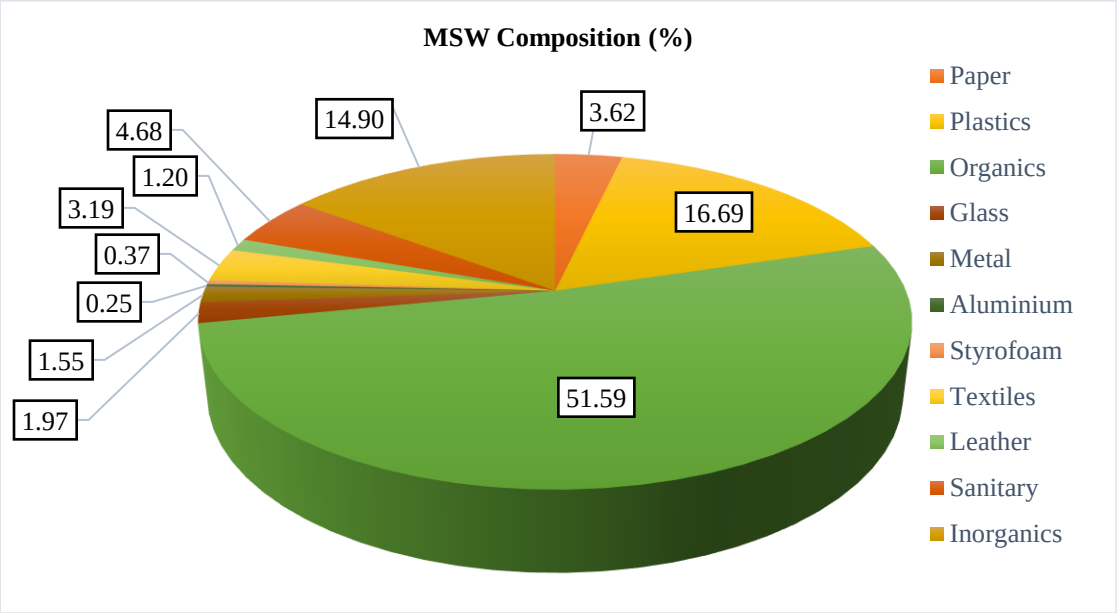


Figure 1: MSW composition of the municipalities within the Odaw Drainage Basin (GARID SWM Strategy, 2021)

The capacity of the transfer station will be between 600 and 750 tons per day. The design capacity of the transfer station was primarily influenced by the receiving rate, load-out rate and storage amount. The WTS will have a flow-through capacity of 400 tons per day, which is equivalent to waste generation of the service area, and a storage capacity of 200 to 350 tons per day. As waste is generally not delivered to a transfer station at a uniform rate throughout the day, the storage space permits the station to handle peak delivery rates that exceed the rate that transfer vehicles can be loaded. The storage will also increase the reliability of the facility by mitigating the impacts of equipment failures or other problems.

Table 1: Key Design Factors

s/n	Design Factors	Client's Proposal
1	Types of waste accepted at transfer station	Municipal waste. This excludes industrial, construction, medical and all hazardous waste
2	Types of vehicles to access transfer station	transfer station will receive waste from public and private haulage trucks and mini trucks or tricycles
3	Additional functions to be carried out at the transfer station (i.e., material recovery programs)	No material recovery and composting.
4	Type of transfer technology to be Used	Direct Discharge with surge pit for storage. The pit can store peak waste

		flow, thus reducing the number of transfer trailers needed.
5	Mode of waste collection	Transfer trailers
6	Flow through capacity	400 tons per day
7	Peak flow capacity	750 tons per day

Key Components of the Waste Transfer Station

The key components of the WTS project are as follows:

a) Construction of waste transfer station main buildings and foundation including unloading, storage and loading levels, hopper and trailer;
b) Construction of gate control buildings and foundation including works to house weigh bridge equipment for incoming collection trucks and outgoing transfer trucks;
c) Construction of support buildings and foundation including offices for supervisors and support staff, room for training, canteen, worker accommodations for washing/changing/resting;
d) Construction of drainage systems, leachate and waste water treatment and sanitary systems;
e) Provision of fire protection systems, including water supply and extinguishers to put out fires;
f) Construction of asphalt access roads from the main Haatso - Kwabenya road to the reception area within the site including on-off ramps to meet design standards for large capacity transfer trucks.;
g) Construction of site roads and parking areas for loading and turning of large capacity transfer trucks;
h) Construction of workshops, including bays for repair and maintenance of transfer trucks;
i) Washing and cleansing facilities for transfer trucks and collection trucks; and
j) Other ancillary works.

Waste Transfer Station Layout

The main sections/components of the WTS are as follows:

- Main WTS infrastructure, including:
  - Weighing bridges;
  - Ramp in and ramp out;
  - Tipping area;
  - Loading area (with containers to receive load);
  - Transfer area.
- Parking area;
- Workshop (for repair and maintenance of transfer trucks);
- Administration building and ablutions;
- Containment and treatment of emissions;
- Washing area (for transfer and collection trucks); and
- Entrance and exit points.

4.0 SCOPE OF SERVICES

The scope of services to be provided includes but not limited to:

Phase One: Pre-Design Services

Task 1.1 – Assess suitability of site

Advise if the proposed site meets the best practices Siting Criteria for transfer stations such as:

- Central location to collection routes
- Access to major transportation routes
- Site size requirements
- Sufficient space for onsite roadways, queuing, and parking
- Space for recycling, composting, and public education
- Buffer space
- Access to utilities
- Zoning Designations and Requirements

Task 1.2 - Review of Available Information

Review the relevant solid waste feasibility studies to determine the range of waste loads and waste characteristics the WTS is capable of handling. Review the recommended methods of transfer of waste to the WTS. Any missing or outdated data points identified should be generated by the Consultant.

Task 1.3 - Compile Site-Specific Information

Compile and review information available from private and public sources, to the extent feasible, which will provide an understanding of physical conditions within the vicinity of the sites, including topographical characteristics, soil bearing capacity, geological characteristics, surface and groundwater hydrology, drainage and sanitation conditions, water supply, fire protection and hazards, electrical supply, road conditions and traffic.

Task 1.4 - Develop Site-Specific Data

Perform, as needed, property surveys, topographic surveys, soil borings, geotechnical tests, identification of all underground facilities (including among others cables, drains, gas lines, telephone lines and electrical lines), and traffic studies.

Task 1.5 - Analysis of Pre-design Data

Analyze the information gathered and data generated in the above tasks 1.1 to 1.3 and evaluate design conditions. Provide a report on the engineering analysis, complete with identification of design issues and needs.

Task 1.6 - Develop Alternative Design Concepts

Develop a minimum of three alternative layouts and process design schemes for the transfer station site. Consider alternative waste storage and unloading/loading concepts, ensuring that concepts address the different categories of vehicles which are likely to bring waste to the site including the three-wheelers. The layout should show road entrances/exits, traffic flow routes, queuing areas, scale house, primary

functions at the station, buildings, parking areas, public conveniences, space for future expansion, green buffer and holding areas.

Provide preliminary engineering cost estimates for each alternative scheme. The design concepts should include anticipated operating costs based on inter alia maintenance costs, replacement of vehicles and plant as well as utility costs (water, electricity, sanitation, and communications) and manpower resources. Costs should be based on rationalized to unit cost per ton of waste processed.

The MSWR also intends to hire the services of another consultant to undertake Environmental and Social Impact Assessment (ESIA) of the WTS. It will be essential for the Engineering Design Consultant and the ESIA Consultant to liaise with each other to ensure that the ESIA is informed by the technical engineering design and vice versa. There will therefore be the need for close collaboration and regular information flow between the ESIA and the engineering design studies.

Task 1.7 Stakeholder Consultation

Meet with the Client, ESIA Consultant and select key stakeholders to discuss alternatives and select a recommended scheme. Conduct public participation hearings and workshops with key technical stakeholders to solicit inputs from diverse stakeholder groups. The Design Consultant will be expected to present alternative designs and support by providing relevant technical information during the consultative meetings.

It is expected that community consultation processes will be initiated as part of the assignment. This should involve initiation of specific and targeted contact with key members of potential host communities to solicit their direct input, and identification of community specific conditions that need to be considered to engender community support for the proposed facility.

Task 1.8 - Finalize Design Concepts

Finalize design based on input from the public participation hearings, ESIA and workshops, as well as reviewed comments from associated agencies as appropriate. Include the relevant mitigative measures for identified risks in the final design.

Phase Two: Detailed Engineering Design Services

Task 2.1 - Process Design

Develop detailed process design considering all parameters and requirements stipulated by the client and incorporate findings, conclusions and decisions developed during tasks 1.1 to 1.7 of the Pre-Design Services to include:

- safe and efficient vehicular flow in and out of the station and during unloading and loading operations, including total long-haul transfer vehicle, small trucks/tricycles and removable

containers required in the fleet and overnight parking and storage dependent upon final disposal facility operational hours.

- management of drainage and wastewater including potential leachate.
- ventilation, emissions, vector and odor control systems.
- space for future expansion

Task 2.2 - Engineering and Civil Works Design

a) Undertake engineering and civil works design to include the following:

- site preparation (such as clearing, draining, filling, grading and consolidation, as needed)
- all-weather access and internal roads to the relevant design standards including on-off ramps, parking areas, interchanges etc. as needed.
- all-weather ramps from the on-site roads to the unloading floor of the transfer station to meet design load and turning radius standards for large capacity collection trucks.
- Transfer station structure (including unloading, storage and loading levels, as appropriate).
- Gate control building and foundation (including works to house weigh bridge equipment) for incoming collection trucks and outgoing transfer trucks, as well as outgoing collection trucks whose tare weight has not previously been recorded.
- Support building(s) and foundation (including offices for supervisors and support staff, room for training and meetings, canteen, on-site first aid box, worker accommodations for washing/changing/resting).
- Structural designs for all foundations
- Leachate control and treatment, drainage and wastewater system.
- Emissions, noise, odour and vector control
- Engineering services, water supply, sewers, electricity and communications
- Fire protection system, including water supply and extinguishers to put out fires.
- Workshop, including bays for repair and maintenance of transfer trucks.
- Washing facilities for transfer trucks and collection trucks, including proper discharge of wastewater into drainages for further treatment.
- Storage/parking area for long-haulage vehicles and containers.

Task 2.3 - Electro-Mechanical Works Design

a) Perform engineering and undertake design of the following electro-mechanical works:

- electrical power and distribution system
- ventilation and deodorizer system
- traffic management controls
- weigh bridges
- communication system
- fire alarm/protection system
- workshop overhead crane

- relevant ancillary works.

Task 2.4 - Vehicle and Container Specification

Provide complete technical specifications which allow competitive bidding evaluation for each component, feature, and performance requirement for the transfer vehicles and containers. Specifications should address spares and service requirements as well as replacement timeframes.

Task 2.5 - Architectural Design

Design the facilities to be compatible with the existing and planned structures within the immediate vicinity of the station. Design the facilities to be functionally effective, enable economic operations, and require minimum maintenance. Design should include future expansion of facility.

Task 2.6 - Operation and Maintenance Manual

a) Provide an operations and maintenance manual to cover:
    - Facility operating schedule
    - Staffing plan
    - Description of acceptable and unacceptable waste
    - Operating methods for each component of the facility, including truck-weighing procedures, tipping floor operations, transfer vehicle loading, onsite and offsite litter cleanup, and wastewater collection system operations
    - Description of maintenance procedures for each component, including the building, mobile equipment, vehicles, utilities, and landscaping. Also include the operating/running costs of the mechanical equipment and replacement requirements and frequencies
    - Employee training
    - Employee Health and Safety measures
    - Safety rules and regulations
    - Recordkeeping procedures – to include daily weather information as well as all operational requirements and outcomes
    - Contingency plans in the event of transfer vehicle or equipment failure, or if the disposal site is unavailable
- Interacting with the public
- Emergency situations such as power failure, unavailability of transfer vehicle or scales, fire, spill containment, identification of hazardous material, injuries to employees or customers, robbery etc.
- Specifications of plant and equipment for Recordkeeping
- Maintenance requirements

b) Provide an Environmental Management and monitoring plan to include the responsibilities of the stakeholders, managers and operators as well as the frequencies and costs of the environmental monitoring requirements and process. These shall be coordinated with, and consistent with, the mitigation measures proposed by the ESIA consultant.

Task 2.7 - Quantity and Cost Estimates

Prepare detailed bill of quantities for all works and cost estimates.

Task 2.8 - Tender and Contract Documents

Prepare a Request for Bid (RFB) Open - International Tender Document for Construction of Transfer station to include, but not limited to:

- instruction to tenderers
- complete set of final construction drawings
- technical specifications for all facilities including installed stationary equipment
- technical specifications for transfer trucks, including yard gates and maintenance equipment and tools
- bill of quantities
- conditions of contract
- form of contract
- bidding form with sections on Environmental, Social, Health and Safety (ESHS) Management

Assist the client during the bidding process with queries and provide clarification of issues raised by the bidders.

Phase Three: Supervision of Construction

The consultant shall execute continuous supervision of all works including the monitoring of work progress and adherence to specified work standards (quality control). Specifically, these services will include, inter alia:

- Providing Contractors with the necessary data, benchmarks, coordinates and any other relevant information for setting out the works; and subsequently checking and approving the detailed setting out;
- Checking and approving the contractors' work plans and implementation for the most efficient and expeditious methods of carry out works and in line with the E&S management plans and instruments.

- Provide technical support/guidance to contractors and continuously supervising the work to ensure that they are carried out in accordance with the contract documents, including the Contractors Environmental and Social Management Plan (C-ESMP);
- Carrying out inspection of all working areas and installations during including the execution of the works; aforementioned workers accommodation for washing/changing/resting/;
- Checking and approving materials used and examining contracts' installations, accommodation, construction equipment and laboratories to ensure that these conform to agreed specifications and proposals;
- Checking and approving all workshop drawings prepared by contractors;
- Checking contractors' work measurements and certifying payment claims;
- Continuously check whether the contractor abides by the World Bank occupation, health and safety guideline under OP 4.01.
- Negotiating with contractors any contractually permissible changes in price or rate for which the need may arise and making recommendations on these to the client;
- Informing the client of any problem which arise or might arise in connection with civil work contracts and making recommendations for their solution;
- Evaluating all claims during the works contract period for additional payments and time extensions submitted by contractors, and making recommendations on these to the client and;
- Assisting the client in any dispute during contract periods that may arise with contracts and giving all the elements on which the judgments are based;
- Organise monthly site meetings and submit minutes of meetings one week after site meetings;
- Prepare and submit to the MSWR, five (5) copies of monthly progress reports one week after the reporting month. Progress report should also include a section covering environmental and social performance of the contractors in managing the C-ESMP and the ESMP.
- Prepare a Commissioning Plan identifying the systems to be commissioned, a schedule of activities for each stage of the process and associated documentation
- Prepare a Commissioning Report incorporating all commissioning documentation

Post Contract Services

During this phase, the Consultant shall perform the following:

- Inspection of works prior to the expiry of the Contractor's 6 months defect liability period, preparation of a final deficiency list, if required, supervision of remedial works and recommendation to the Client as to the date of the Final Inspection of Works;
- Carry out final inspection of the works together with representatives of MMA, the Ministry of Sanitation and Water Resources and the Contractor;
- Preparation and issuance of Final Acceptance Certificate;
- Preparation of Final Payment Certificate.

5.0 DELIVERABLES

The following will be the deliverables:

a. Inception Report

This report shall be submitted not later than two (2) weeks after commencement of the assignment. The report shall include:

(i) The progress of work done to date and preliminary findings from the field investigations.
(ii) Detailed work programme for remaining studies/designs and staff proposals for the tasks.
(iii) Arrangement for coordination with other relevant agencies.
(iv) Stakeholder engagement plan, including regular updating with MSWR, WB, other relevant government agencies (such as local assemblies), ESIA consultants the surrounding community and others deemed appropriate.

b. Conceptual Report

This report will be submitted not later than 8 weeks after commencement of assignment to include:

i) Comparative evaluation report of alternative schemes for the design concepts shall be submitted for review and approval of the Government before proceeding to the detailed engineering design works.

ii)Outline of proposed design concepts and standards to be applied to the project with necessary justifications.

c. Draft Design Report and Tender Documents

This report shall be submitted not later than twenty (20) weeks after commencement of the assignment. The report shall include:

(i) Draft design report covering engineering design and drawings,
(ii) Process designs
(iii) Specifications
(iv) Bills of quantities,
(v) Cost estimates,
(vi) Draft tender documents (Request for Bids Works)
(vii) Baseline report, outlining details of existing situation in the area/town/community to enable performance indicators to be measured after completion of the project.
(viii) Project work schedule and the progress of work done to date and the anticipated timeline.

The Client shall review Draft Detailed Design Reports and provide comments within two weeks. Drafts of the reports shall be discussed with the Client in a presentation meeting before incorporating the comments in the final versions of the reports.

d. Final Detailed Design Report and Tender Documents

The detailed design report and tender documents shall be submitted not later than twenty-six (26) weeks after commencement of the assignment. The report shall include: Five sets of bid documents incorporating all comments.

e. Monthly Reports

The key issues that will be addressed in the monthly reports will be the safety at work, the quality of the work, the progress of the work, the work program, the resources, challenges and their resolution, unresolved issues, contract management and the control and approval of the Contractor's expenses as well as the description of the works and adequate interim payments. Below is a list of some outputs expected in the construction and defects liability stage:

- Signed contracts
- Approved construction program
- Construction documentation
- Progress reports
- Record of meetings
- Financial control reports.
- Valuations for payment certificates.
- Progressive and draft final account(s)
- Certificate(s) of practical completion and coordination of defects list
- All statutory certification and certificates of compliance as required by the Local and other Statutory Authorities
- Facilitate and expedite receipt of occupation certificates
- Report on Environmental Social Health and Safety
- Commissioning Plan

f. Final Report on Works

The Consultant will submit a final report not later than one month after the Completion Certificate is issued. The report shall contain at least:

- Copies of requests for issuance of a takeover certificate;
- A list of approved As-Built Design submitted by the Contractor showing all the modifications in relation to the Main design elements or surveyor of performed works;
- Quality assessment of materials and workmanship;
- Data on the technical difficulties encountered and how they were solved;
- Comment on the As-Built Design
- List of Instructions for Use and Maintenance

- Final Report on Contractor's ESHS performance (Code of conduct, compliance with EMP, EIA, consent/permits and other relevant project requirements.
- Commissioning Report

g. Defects Liability Period Report

This report will contain all the details of remedies performed by the Contractor to correct the observed defects and failures noted, including all ESHS issues occurred during the Defects Liability Period. This report is to be submitted no later than 2 weeks after the issuance of the end of the Defects Liability Period.

TABLE OF DELIVERABLES

Report	**Time for Submission**	**Number of Hard Copies**
PHASE 1 (Conceptual and Pre-Design)		
Inception Report including	2 weeks after commencement	5 hard copies and 1 soft copies
Conceptual designs	8 weeks after commencement	5 hard copies and 1 soft copy
PHASE 2 (Detailed Design)		
Draft Detailed Design Report and Tender Documents	20 weeks after commencement	5 hard copies and 1 soft copy
Final Detailed Design Report and Tender Documents	26 weeks after commencement	5 hard copies and 1 soft copy
PHASE 3 (Construction Supervision and Defects Liability period)		
Monthly progress reports, describing the progress made on the works	Monthly	5 hard copies and 1 soft copy
Final Report on Works	End of construction period	5 hard copies and 1 soft copy
Defect Liability Period Report	Six months after construction completion	5 hard copies and 1 soft copy

6.0 SCHEDULE

The services of the pre-design and detailed engineering design services shall be completed within a period of six months. The duration for Supervision of construction is 9 months plus 6 months for defect liability.

The first phase is a lump sum contract whilst the second phase is time-based.

7.0 CONSULTANT STAFFING

The consulting company or consortium should have significant experience in delivering the objectives of this assignment. The company / consortium should have at least ten years of experience in municipal engineering services, solid waste sectors, environmental and social impact assessments; preparation of environmental management plans, preliminary and detailed designs, cost estimates, bidding documents and project implementation schedules as well as having successfully worked on at least 5 similar projects in the context of developing countries. The team is not expected to work continuously full time over the duration of the contract. Team members shall be mobilized as needed for particular tasks.

It is envisaged that the key staff in the following disciplines would be required for the assignment:

Phase 1& 2

Project Manager

The Team Leader must be a professional civil/environmental engineer, an environmental scientist or possess an equivalent qualification. Postgraduate qualifications in solid waste management will be an added advantage. He/she must have at least 10 years of cumulative experience related to solid waste management.

Sanitary/Solid Waste Engineer

He/she must be a professional civil/environmental engineer, an environmental scientist or possess an equivalent qualification and have at least 10 years relevant experience. Strong experience in Solid Waste Management - design and/or operation of transfer stations. At least 3 assignments of similar nature in a developing country. Postgraduate qualifications in waste management will be an added advantage.

Drainage/Hydraulic Engineer

He/she must be a professional civil/drainage/hydraulic engineer or possess an equivalent qualification and have at least 5 years in drainage design, construction and management. Postgraduate qualifications in a similar field will be an added advantage.

Geodetic Engineer

He/she must be a professional geodetic/geomatic engineer or surveyor or possess an equivalent qualification and have at least 5 years in surveying. Postgraduate qualifications in a similar field will be an added advantage.

Structural Engineer

He/She must be a professional graduate engineer (civ) with relevant postgraduate experience in structural engineering. Should have a minimum of ten years' experience of which six years shall be in structural design of concrete and steel structures. Should be experienced in protection of structural elements in a mechanically harsh and corrosive environment.

Quantity Surveyor

He/she must be a professional quantity surveyor or possess an equivalent qualification and have at least 5 years in quantity surveying. Postgraduate qualifications in a similar field will be an added advantage.

Electro mechanical Engineer

He/She must be a professional Mechanical/Electro-Mechanical Engineer with previous experience design and/or operation of solid waste facilities, construction and infrastructure.

Environmentalist/Sociologist

The Environmentalist/Sociologist shall have a degree in environmental management, sociology or related discipline. He/she must have cumulative experience of at least eight (8) years in environment and social impact assessments or similar. He/she should possess a certificate and experience in Occupational Health and Safety.

Occupational Health and Safety Specialist

She should have Bachelor's degree in engineering, construction, occupational safety and health, or related field. He/She must possess a professional qualification (NEBOSH IGC, IOSH, OSHA or better) in Health and Safety. At least 3 years of previous experience in comprehensive workplace safety and compliance programs. Should possess solid knowledge of state and local statutes and ordinances on fire safety and prevention, loss control, building, electrical, noise pollution and the environment.

Phase 3

Project Manager/Team Leader

Same as above

Resident Engineer

He/she must be a professional civil/construction engineer or possess an equivalent qualification and have at least ten (10) years in project management and construction supervision of reinforced concrete and steel structures as well as civil engineering works. Postgraduate qualifications in a similar field will be an added advantage.

Quantity Surveyor

Same as above

Clerk of Works

He must a minimum qualification of a Higher National Diploma in Construction Management or similar and have at least five (5) years' experience in supervision of construction of reinforced concrete and steel structures as well as civil engineering works and/or working in the management of transfer stations**.**

OHS Specialist?
Same as above

8.0 CLIENT'S INPUT

The client shall make available to the consultant all data and reports in his custody relevant to the study.

a) GARID Project Appraisal Document & Environmental and Social Management Framework
b) GARID Solid Waste Characterization Report, 2020
c) GARID Solid Waste Strategy, 2021
d) National Environmental Sanitation Strategy and Action Plan (NESSAP), 2010

ANNEXES

ANNEX 1: OVERVIEW OF THE GARID PROJECT

The Government of Ghana has secured funding from the World Bank to finance the Greater Accra Resilient and Integrated Development (GARID) Project. The Bank's support would be financed by an IDA Credit of US$200 million. The development objective of the project is to strengthen flood and solid waste management, and provision of public services to targeted vulnerable communities in Odaw basin in Greater Accra Region. The project involves a phased approach to improvement of drainage and solid waste management in the Odaw basin, focusing on improving the resilience and living conditions of targeted low-income urban dwellers. Specifically, the project will support the following components:

Component 1: Climate Resilient Drainage and Flood Mitigation Measures

This component, led by Ministry of Works and Housing (MWH), includes structural improvements of drainage systems, and flood water management through upstream water conservation, development of flood retention areas, as well as improving early flood warning and response capacity in Greater Accra Region. Specific activities to be implemented under this component include:

- Improvements in urban drainage and flood management in Odaw drainage basin through dredging and de-silting of the Odaw channel;
- Improvement of drainage systems (i.e. widening of Odaw river mouth; lining of major drainage channels; and construction of selected secondary channels in the Accra Metropolitan Area);
- Development of flood water retention areas; and
- Improvements in flood response systems through better infrastructure for flood forecasting and warning systems.

Component 2: Solid Waste Management Capacity Improvements

Activities under component 2, which is under the purview of MSWR, are community-focused, targeting areas that have been selected for investment in drainage and sanitation. Sub-activities under this component include:

- Improving community-level solid waste management through provision of waste bins and skips and technical services for solid waste collection;
- Community mobilization and awareness raising;
- The application of a results-based incentive approach to enhance waste management and good sanitation practices; and
- Improving solid waste management capacity in Greater Accra by identifying, assessing and improving waste recycling, treatment and disposal facilities.

Component 3: Participatory Upgrading of Targeted Flood Prone Low-income Communities, and Local Government Support

This component is led jointly by Ministry of Zongo Development (MICZD) and Ministry of Local Government and Rural Development (MLGRD). The first part of the component, to be implemented by MICZD, will identify highly flood-prone informal settlements and Zongos to benefit from participatory community upgrading. Sub-activities under this component include:

- Participatory community upgrading in selected flood prone areas within the Odaw drainage basin through upgrading of basic infrastructure and services through geospatial and social vulnerability diagnostics;
- Improving city integration by improving access roads between inner cities and CBDs;
- Identifying and improving flood warning preparedness activities; and
- Participatory resettlement involving low income informal settlements aimed at providing support for safe housing.

Component 4: Project Management and Planning

This component supports project management activities of implementing entities and preparatory studies for subsequent phases of the GARID project.

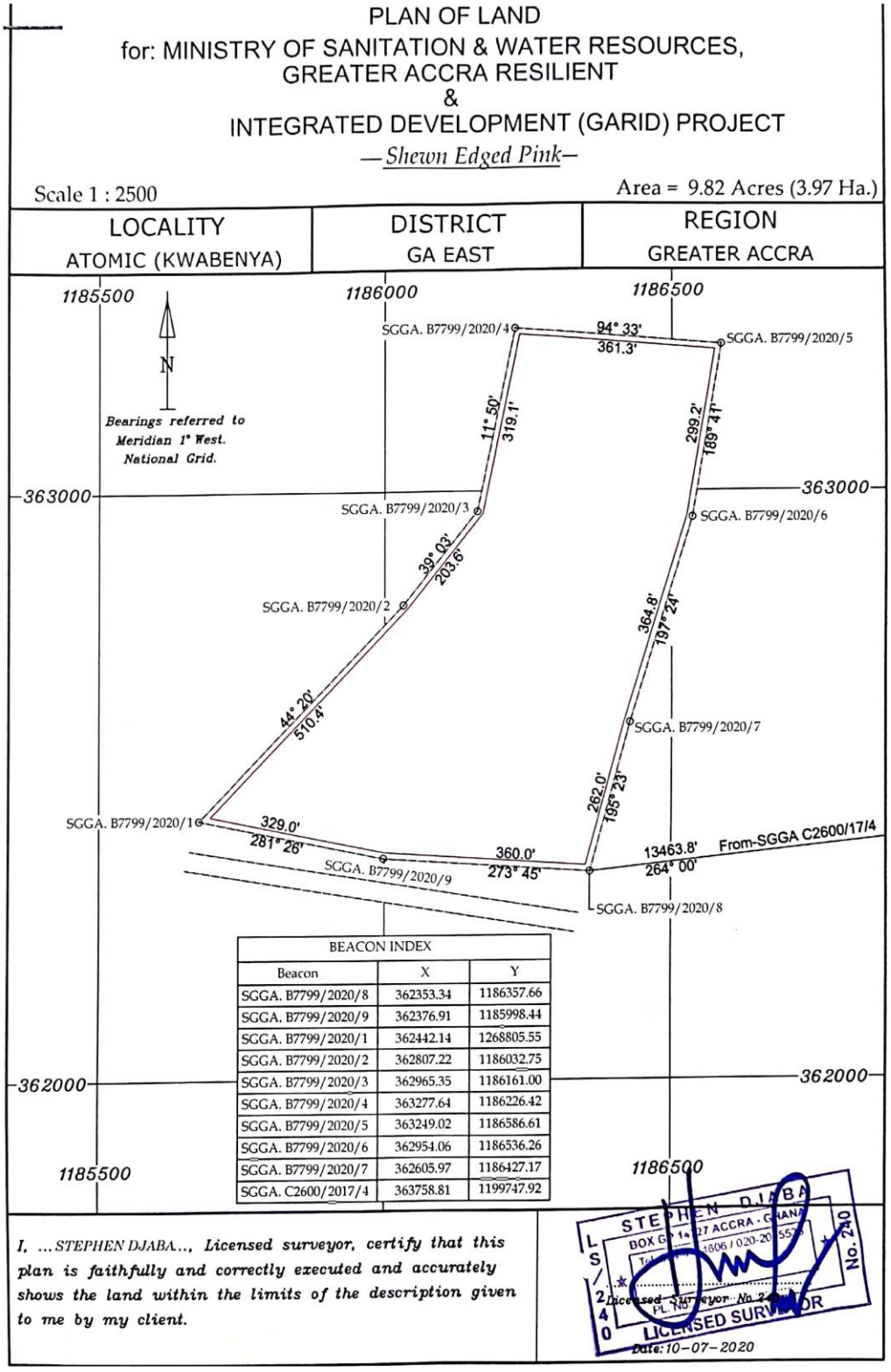
Specifically, this component will support activities including:

- Technical assistance, equipment, training and operating costs for the Project Coordination Unit (PCU), Project Implementation Units (PIUs) in implementing agencies, and Municipal Planning and Coordination Unit (MPCUs) in MMAs;
- Establishing and implementing a comprehensive monitoring and evaluation (M&E) system;
- Training of the implementing agencies in environmental and social management, grievance redressal, procurement and financial management; and
- Provide funds to undertake feasibility studies and prepare detailed designs for implementation and other studies identified and agreed during implementation.

Component 5: Contingent Emergency Response Component (CERC)

The CERC allows for the rapid reallocation of funding between Project components, following an emergency. CERC will strengthen the level of disaster preparedness by eliminating the need for time-consuming bureaucracy in the immediate aftermath of a crisis, when the government is in urgent need of quick liquidity.

ANNEX 2: SITE PLAN OF LAND



ANNEX 3: Google Earth Map showing location of the proposed WTS Site