SAFETY & ENVIRONMENTAL MANAGEMENT POLICY

AAE Engineering Services Limited

discover | design | engineer | deliver

11A Block C, North Nyamebekyere, off Len Clay - Neighbourhood Clinic Road, Obuasi

Post Office Box 694, Obuasi, Ashanti, Ghana

Telephone: +233 (0)24 423 8059, +233 (0)54 434 0788

Email: akwasiessandoh@gmail.com, aaeengservices@gmail.com

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1.0 PROJECT DETAIL

ORGANISATION DETAILS	
Business/Trading Name	**AAE ENGINEERING SERVICES**
Board of Director(s)	Akwasi Ankomah Essandoh, Kofi Asare Essandoh, Nana Twum Essandoh & Kobina Quansah Essandoh
Address	Post Office Box 694, Obuasi, Ghana
Company Secretary	Jaclyn Adwoa Essandoh
Phone	0544340788, 0244238059
Mobile Phone Number	0544340788, 0244238059
Email	aaeengservices@gmail.com

Introduction

AAE ENGINEERING SERVICES has developed this Environmental Management System (EMS) in order to implement the environmental policy of the organization. This document is a tool to outline objectives and actions required to specifically deal with regulatory requirements as well as address specific aspects of the operations of **AAE ENGINEERING SERVICES** in their building activities, which impact upon the environment.

Major categories of environmental issues associated with the **AAE ENGINEERING SERVICES** include: Dust emissions, Waste generation, Noise generation and discharges into water bodies.

The proposed projects encompass:

1. **Electrical Machines**
   - Supply of Electrical Machines;
   - Installation;
   - Testing and Commissioning of low-high Voltage electric motors (0.55kW to MW) and energy generating sets (500VA to 5000kVA);
   - Design, Supply, Construction and Commissioning of low and Medium Voltage Substation (415V to 35Kv).

2. **Power System**
   - Heavy Industrial Installations;
   - Design, Supply, Installations Testing Commissioning and Maintenance of low –High Voltage Panels, Cables and Transformers;
   - Erection of Low-High Voltage 3-phase 415V/11kV Substations and Overhead Lines. Erection, Testing and Commissioning of OCB,ACB, VCB and SF6 Circuit breakers and other Protective Equipment or Substations.

3. **Power Services**
   - Low Voltage (3Phase 415 Wire) Overhead Lines Installation and Maintenance;
   - Maintenance of all Engineering Workshop Machines including Overhead Cranes;
   - Professional Electrical Designs Services of Residential, Commercial and Industrial Estate;
   - Public Lighting Installations and Street Lighting- CFL, Induction, Solar and LED Lamps.

4. **Audit & Energy Management**
   - Inspection and Testing of all Electrical Systems;
   - Energy Saving Survey and Reporting;
   - Power Quality Management;
   - Power/ Load Flow Analysis and Studies;
   - Earthling- Earth Resistance Tests and Analysis.

5. **Mechanical**
   - Installation, Testing and Commissioning of Emergency Generating Sets, Compressors, Ventilation Fans, Main Pumps;
   - Alignments and Vibration Analysis of Rotating Equipment;
   - Predictive Maintenance Analysis.

6. **Underground Engineering**
   - Installing, Repair and Maintenance of all types of Cables in Shaft, Raises and on In-bye Drives (on Cleats, Hangers Catenary Wires etc.);
   - Installation and Maintenance of Mina Shaft and In-bye Substation;
   - Installation, Testing, Commissioning and Maintenance of Primary crushers, Conveyors and Vibratory Feeders, Dewatering pumps, Auxiliary and Boosters Fans, Drills Rigs and Jumbos, Rock breakers, Battery and Trolley Locomotives, Trucks and Loading of Chutes.

7. **Control System and Communications**
   - Fire Alarms, Smoke Detection and Suppression of Installation;
   - CCTV and Intrusion Detection Installation;
   - Access Control and Security System;
   - Automation-SCADA, Programmable Controllers & Digital Controls Systems;
   - Networking, Voice & Data Installation (LAN Cabling, Voice Cabling, Fibre Splicing) Computers, Services and Data Systems Installations.

8. **Projects**
   - Project Management and Consultancy;
   - Engineering Design and Drawing;
   - Site Inspection and Survey.

9. Training

- Electrical Wiring Practice, Commercial and Industrial;
- Electrical Principles and Technology;
- Basic and Industrial Electronics;
- Basic Instrumentation;
- Programmable Logic Controllers and SCADA Systems;
- Variable Speed Drives;
- Basic Hydraulics and Pneumatics;
- Occupational Health and Safety

Purpose and Scope

1. The EMP is to be demonstrating compliance with all the obligations of relevant Acts, Statutes, Legislation, Ordinances, Regulations, By Laws and any other such legal requirements that are applicable to the Contract are met. **AAE ENGINEERING SERVICES** will demonstrate that "due diligence" is performed for the duration of the Contract in accordance with the standards policies and regulations of the client in preventing the pollution of the environment or the unlawful disposal of waste.
2. The EMP is subject to audit – that is, it is used to assess conformance with environmental aspects, impacts and controls on the site.
3. The EMP addresses potential impact identified thorough an environmental impact assessment process. These management strategies are based on best practice of environmental management.
4. **AAE ENGINEERING SERVICES** will ensure that the mitigation measures identified in the environmental impact assessment documentation and the conditions of Approval are incorporated and detailed in this EMP. Specifically, the EMP will:
5. Identify statutory obligations which **AAE ENGINEERING SERVICES** is required to fulfil during construction, including all approvals and licenses.
6. Include a communication strategy and complaints management procedure
7. Identify an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the EMP.
8. Provide details of construction personnel induction and training program. This will include incorporation of the EMP into agreements with suppliers and subcontractors.
9. Outline emergency procedures and list contact details
10. Provide details of measures to avoid and control environmental impacts.

Objective of the EMP

The objective of the Environmental Management Program (EMP) to is to present the requirements of **AAE ENGINEERING SERVICES** in relation to Environmental issues. The EMP specifies how to manage any issue significantly to ensure that the environmental impact during constructional phase will be acceptable low level and that the working environment for **AAE ENGINEERING SERVICES** workers will be safe with impact to the Environment.

Objective of AAE ENGINEERING SERVICES

The core objective of AAE Engineering is to offer quality engineering and technical services in a positive closely controlled, well managed and professional manner.

Our Vision and Mission

AAE ENGINEERING is committed to become a leader in providing engineering services through the implementation of the latest technologies and industry practices using experiences, quality, dedication and professionalism thereby providing our clients with the solution needed for success in today's marketplace.

Environmental Management Plan

The goal of this EMP is to ensure full compliance with the project's policies and with mitigation, monitoring and other commitments made. It outlines the actions necessary to attain this goal, and describes the means, and designation of responsibility required for compliance and conformance. The provisional EMP provides the link for implementation of mitigation and monitoring actions.

The management plans of **AAE ENGINEERING SERVICES** concerning the environment are governed by a policy to ensure that standards are being followed accordingly.

Subcontractor Environmental Management Plans

The project will engage subcontractors to carry out project activities. The contractors are responsible for performing all works:

- In compliance with relevant **AAE ENGINEERING SERVICES** legislation and regulations, and with other requirements to which the project subscribes;
- In conformance with the project's EMS; and
- In accordance with contractual technical and quality specifications

The project will also provide specifications for environmental compliance and performance and as a contractual requirement, the subcontractor will develop and provide to the project its own specific management plans demonstrating how they intend to comply with the stipulated requirements.

The subcontractor management plans must conform to the requirements of the project's all-embracing plans. Subcontractor plans will be reviewed and approved by **AAE ENGINEERING SERVICES** and incorporated into, and form part of, the project's overall EMP.

As a contractual requirement, the subcontractors are required to provide sufficient resources to manage **AAE ENGINEERING SERVICES** aspects of the work to be performed. This includes providing adequate resources to monitor compliance of next-tier subcontractors and a process for emergency stop-work orders in response to monitoring triggers.

Table 1: EMP Hierarchy of Key Plan

The Name	Includes	Responsible Person	Indicative Timing
All projects	Overarching plan linking all the other plans to the project EMS	SHE Officer	Project Commencement
Site Monitoring	Inspections and audit on site safety	SHE Officer & SHE Representative	Weekly
Waste Management Plan	Project-related waste handling procedures for hazardous and non-hazardous solid wastes	SHE Officer	Annually
Emergency Response plan	Accident and incident investigation and reporting procedure. Investigation process to determine accident root cause and feedback for continuous improvement	SHE Officer & SHE Representative	Quarterly
Human Resources Strategy and Plans	Local hiring, training and development program and procedure	Human Resources Manager	Periodically

The subcontractor management plans must conform to the requirements of the project's all-embracing plans. Subcontractor plans will be reviewed and approved by **AAE ENGINEERING SERVICES** and incorporated into, and form part of, the project's overall EMP.

As a contractual requirement, the subcontractors are required to provide sufficient resources to manage Environmental aspects of the work to be performed. This includes providing adequate resources to monitor compliance of next-tier subcontractors and a process for emergency stop-work orders in response to monitoring triggers.

General Requirements

Introduction

Requirements for an EMP and guidance on scope and application are given in Ghana environmental regulations and in **AAE ENGINEERING SERVICES** performance standards.

AAE ENGINEERING SERVICES has committed to governing the execution of its projects following the expectations and operating philosophy of the Environmental Management System (EMS). This EMP is intended to be consistent with the elements and expectations of the project EMS. This includes addressing key elements of the EMS including the application of risk management techniques throughout the project to protect the environment and employees,

subcontractors and communities, and the establishment of environmental baselines and mitigation/action plans.

Appropriate procedures, plans and programs will be implemented during the course of the project to ensure that these management expectations are met. These will be based **AAE ENGINEERING SERVICES** policies and standards.

The EMS will include the organizational structure, responsibilities, policies, procedures and practices, and resource. In the context of accepted international frameworks for quality and environmental management systems the EMS process can be summarized as follows.

Plan

- Define policies and objectives for environmental and social performance;
- Identify environmental and social impacts and risks of the operations;
- Develop mitigations and operational controls to address impacts and risks; and
- Develop a management plan to achieve these objectives.

Do

- Implement management plan; and
- Implement mitigations and operational controls

Check

- Monitor performance against policies and objectives; and
- Check that mitigations and operational controls and effective.

Act

- Make corrections to plans, mitigation, or controls in response to performance monitoring or out of control events.

Figure 1: Environmental Management Process

Environmental Policy Statement

AAE ENGINEERING SERVICES is responsible for environmental management and leading environmental performance is integral to an effective and successful company. This will be achieved through the use of reliable formal management systems that support effective decision making, management of company risks and promoting continuous improvement.

To enable environmental objectives to be achieved, **AAE ENGINEERING SERVICES** commits to:

- Eliminate reduce or eliminate exhaust emissions, noise, dust and smoke to the environment;
- To prevent contamination of land and water;
- Promote the use of sustainable, recycled or renewal resources;
- Adopt a reduction, reuse and recycling approach to all our undertakings;
- To minimise waste and energy consumption.

AAE Engineering shall continually improve environmental performance through:

- Complying with existing and new environmental Legislation, Authorisations Standards and good practice;
- Allocating suitable resources to manage and advance the concepts;
- Training relevant personnel in Environmental awareness and Legal requirements.
- Promoting encouraging and strengthening an environmental response attitude by all employees;
- Comply fully to the ISO 14001 requirements
- Communicate this policy to our customers and other stakeholders.
- Periodically review and demonstrate continually improve the company's environmental performance, including areas not subject to regulations.

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Chief Executive Officer

Revision No 1	Effective/Revision Date 26/9/14
00	25/9/2014
Serial No	AAEES/PNO1/14

Planning
Environmental Issues, Controls, Objectives, Targets and Program

Impact Assessment
As part of the EMS, the project utilizes impact assessment as a tool in the planning process. Impact assessment will be conducted for the above projects.

The project will continue to use impact assessment as a planning tool for any future development activities including significant changes, additional development phases, expansions, or supplementary projects.

Risk Assessment
As part of the EMS, the project utilizes impact assessment as a tool in the planning process. Impact assessment has been conducted for building and constructional activities. The project will continue to use impact assessment as a planning tool for any future development activities including significant changes, additional development phases, expansions, or supplementary projects.

Impact Identification, Risk Assessment and Control
AAE ENGINEERING SERVICES will not commence construction work at a place of work unless:

- The principal contractor has provided **AAE ENGINEERING SERVICES** with a copy of the relevant parts of its workplace EMP Management Plan.
- **AAE ENGINEERING SERVICES** has undertaken an assessment of the risks associated with the work activities and has provided to the principal contractor/Client a written Daily/weekly Inspection Booklet and
- **AAE ENGINEERING SERVICES** has provided induction training to all employees.
- **AAE ENGINEERING SERVICES** identifies the potential impacts of the proposed work activities, assesses the risks involved and develops controls measures to eliminate, or minimize, the risks. The risk management process is carried out in consultation with employees.

Impact Identification
AAE ENGINEERING SERVICES breakdowns specific work activities into job steps to assist in identifying all potential impacts. These work activities are detailed in a Daily/weekly Inspection Booklet. The Daily/weekly Inspection Booklet is a list of job steps and other work related practices. For each of the work activities and associated job steps identified in the Daily/weekly Inspection Booklet, **AAE ENGINEERING SERVICES** has identified potential impacts and their risks.

To assist in identifying impacts and risks, **AAE ENGINEERING SERVICES** has considered the use of resources such as codes and standards, industry publications (i.e. safety alerts; hazard profiles for specific trade groups), workplace experience and consultation (i.e. Toolbox Talks).

Controlling Risks -The Hierarchy of Control

Having identified a hazard and assessed its risk, the need to consider what action/s can be taken to control the risk is considered. There are a number of control strategies available, and this is referred to as the "*Hierarchy of Controls"*.

The Hierarchy of Controls is the golden rule for reliably and cost effectively controlling impacts.
In high-risk situations, short-term control measures are considered while the most appropriate long-term controls are identified, designed and implemented. To apply the hierarchy of control, always start with the top - the best solution always is to try and eliminate the hazard. However, cost is a factor that must be considered.

Generally, the higher up controls in the hierarchy such as elimination and substitution are most cost effective in the long term as they are more reliable and require less maintenance to ensure effectiveness. PPE is a good example of a control measure at the bottom of the hierarchy - it's cheap to purchase a few pairs of goggles, gloves and overalls - but they need cleaning and replacing regularly. It would be more cost effective to implement other more long-term measures. Having decided on the control measure to be taken, you can complete your Risk Control Action Plan.

Elimination

Elimination of the hazard is the most effective means of hazard control. It involves the physical removal of the hazard for example, if employees are required to work high above the ground, the hazard can be eliminated by moving the piece they are working on to "ground level" to eliminate the need to work at heights

Substitution

The second most effective way impacts are controlled is substitution, which involves removing something that produces a hazard (similar to elimination) and replacing with something that does not produce a hazard.

Engineering Controls

The third most effective means impacts will be removed is engineering controls. Engineering controls will not eliminate impacts, but rather keep people isolated from impacts. Capital costs of engineering controls tend to be higher than those the less effective controls within the hierarchy, however they may reduce future costs.

Administrative Controls

Administrative controls are changes employees may work. Examples of administrative controls may include procedure changes, Employee training, and installation of signs and warning labels (such as those in the Workplace Hazardous Materials Information System). Administrative controls will not remove impacts, rather limit or prevent people's exposure to the impacts, such as completing road construction at night when fewer people will be driving.

Personal Protective Equipment

Personal Protective Equipment (known as PPE) is the least effective way of controlling impacts. PPE may include gloves, respirators, hard hats, safety glasses, high-visibility clothing, and safety footwear. PPE is the least effective means impacts will be controlled because of the high potential for the PPE to become ineffective due to damage.

The following register of supplied PPE to employees is specified as a control measure in the Daily/weekly Inspection Booklet. All items of PPE are manufactured, used and maintained in accordance with the relevant standard. Proof of Standard compliance will be provided, e.g. labeling. Each employee has been instructed and trained in the correct use of the PPE issued.

Employee Name	Date of Issue/ Replacement	Item Supplied	Signature of Recipient

Employers have duties concerning the maintenance and use of personal protective equipment (PPE) at work. PPE will be issued to employees to helps protect them against health or safety risks at work. They include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. It also includes respiratory protective equipment (RPE).

The following are considered when it comes to the use and maintenance of PPE(s)

PPE is used as a Last Resort

- If PPE is still needed after implementing other controls, employees are provided with PPE(s) free of charge
- Employees are trained to choose and use PPEs properly
- Employees are trained on how to detect and report any faults selection and use.
- Employees are trained to never allow exemptions from wearing PPE for those jobs that 'only take a few minutes'
- Employees are trained on how to maintain and store PPE properly.

Impact Categories

The following is a list of the impacts that has been identified arising from the contracted/agreed work activities. These impacts are addressed within the Daily/weekly Inspection Booklet(s).

Environmental	
Noise (hearing)	Confined/enclosed spaces
Hazardous material	Dangerous Goods (Oxy/other)
Demolition/dismantling	Electricity (power tools/other)
Hazardous substances	Fatigue (shift work/hours of work)
Formwork erection/dismantling	Fire/explosion
Debris	Work near/over water
Biological/bacteria	Hot/cold working environment
Lighting	Manual handling (lifting or twisting)
Machine/equipment guarding	Moving plant/traffic
Materials handling (crane/forklift/other)	Plant and equipment operation
Trenching/excavation	Structural alterations/support
Public (pedestrians/other)	Services (underground/overhead)
Young workers/unskilled labour	Stormwater/sediment control
Air quality (dust/emissions)	Bulk excavation/spoil
Concrete or paint wastes	Contaminated soil/water
Dewatering/pump out	Habitats (protected flora/fauna)
Heritage & Archaeology	Noise or vibration
Noisy work (neighbourhood)	Spills & response
Slurry or other discharges	Traffic & parking
Waste hazardous (paint sludge, synthetic fibre, asbestos/other	Dangerous Goods/Hazardous Substances (use/storage/spills)
Waste disposal	Other…….

Risk Matrix

AAE ENGINEERING SERVICES has identified a risk class/ranking for potential workplace impacts by referring to the categories in the matrix below.

Step 1: The organization identifies the consequence for each potential risk by using the table below. Note: If a combination of harm, loss or damage could occur the worst case consequence is selected.

Consequence	Likelihood/Probability		
	Likely	Moderate	Unlikely
High (1)	1	1	2
Medium (2)	1	2	3
Low (3)	2	3	3

Level	Description of Consequence
High (1) (High Level of Harm)	Potential death, permanent disability or major structural failure or damage. Off-site environmental discharge/release not contained and significant long-term environmental harm.
Medium (2) (Medium Level of Harm)	Potential temporary disability or minor structural failure/damage. On-site environmental discharge/release contained, minor remediation required, short-term environmental harm.
Low (3) (Low Level of Harm)	Incident that has the potential to cause persons to require first aid. On-site environmental discharge/release immediately contained minor level clean up with no short-term environmental harm.

Step 2: Using the following table, the organization determines how likely it is that the risk will occur and result in the consequence identified above.

Item	Job steps	Impacts	Risk Class / Ranking	Controls	Name of persons responsible for work

Step 3: Using the risk matrix below, the organization identifies the risk class/ranking.

Class/Ranking	Description / Requirements
1	Will require detailed pre-planning. Actions will be recorded on a Daily/weekly Inspection Booklet
2	Will require operational planning. Actions will be recorded on a Daily/weekly Inspection Booklet
3	Will require localised control measures

Organisation details			
Organisation Name:		Contact Name:	
ACN/ABN		Contact Position:	
Address:		Contract Phone No:	
Project details			
Project:		Area:	
Activity:		This SWMS has been developed in consultation with: Reviewed by: **AAE ENGINEERING SERVICES** Position: Managing Director Date: _ / __ /	
Resources / Trades Involved:			
Equipment Used:			
Maintenance checks:			
Materials Used:			

Level	Description of Consequence or Impact	Consequence	Likelihood/Probability		
			L Likely	**M** Moderate	**U** Unlikely
H (1) (High level of harm)	Potential death, permanent disability or major structural failure/damage. Off-site environmental discharge/release not contained and significant long-term environmental harm.	**H** (1) (High)	**1**	**1**	**2**
M (2) (Medium level of harm)	Potential temporary disability or minor structural failure/damage. On-site environmental discharge/release contained, minor remediation required, short-term environmental harm.	**M** (2) (Medium)	**1**	**2**	**3**
L (3) (Low level of harm)	Incident that has the potential to cause persons to require first aid. On-site environmental discharge/release immediately contained minor level clean up with no short-term environmental harm.	**L** (3) (Low)	**2**	**3**	**3**

Level	**Likelihood / Probability**
Likely	Could happen frequently
Moderate	Could happen occasionally
Unlikely	May occur only in exceptional circumstances

Item	Job Steps	Impacts	Risk Class / Ranking	Controls	Name of persons responsible for work

Qualifications and experience required to complete the task	Personnel, Duties and Responsibilities (Supervisory staff and others)	Training Required to Complete Work
Engineering Details / Certificates / Safe Work Approvals:		

Environmental Management Strategy

Based on the potential environmental aspects and impacts identified, the environmental risk register has been developed and the following environmental issues that require environmental management plans based upon the potential impacts of activities by **AAE ENGINEERING SERVICES** construction activities are as follows:

1. Air Quality Management
2. Waste management
3. Noise and Vibration
4. Hydrocarbon Management
5. Vegetation Management
6. Water Management
7. Energy Management
8. Other Community Related Issues
9. Public and other