Development Bank of Namibia

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DBN ENVIRONMENTAL AND SOCIAL MANAGEMENT GUIDANCE FOR THE CONSTRUCTION INDUSTRY

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a) Version Control

The table below serves to track the key revisions made to this document for change control purposes.

Date	Version	Change Description	Author/Editor
07/09/2016	0.01	Initial Draft	Manager: Environment & Social Development
28/02/2018	0.02	DBN Logo and update as per 07 April 2017 Kreditanstalt für Wiederaufbau (KfW) Development Bank Gap Assessment of the Development Bank of Namibia's (DBN) Environmental & Social Management System (ESMS)	Officer: Environment & Social Development
28/02/2018	0.02	DBN Logo and update as per 07 April 2017 Kreditanstalt für Wiederaufbau (KfW) Development Bank Gap Assessment of the Development Bank of Namibia's (DBN) Environmental & Social Management System (ESMS)	Officer: Environment & Social Development

1. DEFINITIONS, TERMS & ABBREVIATIONS

DBN	Development Bank of Namibia
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EOHS&S risks	Environmental, Occupational Health and Safety and Social
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EMP	Environmental Management Plan
HSE	Health, Safety and Environment
SEP	Stakeholder Engagement Plan
MDF	Medium Density Fibreboard
MSDS	Material Safety Data Sheets
PCB's	Polychlorinated Biphenyls (PCBs)
PPE	Personal Protective Equipment
VOC's	Volatile organic compounds

2. INTRODUCTION

This guideline is designed to be used by the Development Bank of Namibia (DBN) clients to understand the nature of environmental, occupational health and safety and social (EOHS&S) risks associated with existing or planned operations in this sector and suggested actions for businesses to manage these EOHS&S risks.

It also provides guidance for clients on potential due diligence questions to discuss with management to understand how their business is managing these EOHS&S risks. This guideline focuses on material EOHS&S risks; it is not an exhaustive list of EOHS&S risks. In managing EOHS&S risks, all businesses should be compliant with relevant EOHS&S laws and regulations and best practices.

This guideline focuses on building and construction activities with reference to the International Finance Corporation's Environmental, Health and Safety (EHS) General Guidelines. The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP).

3. SCOPE

This guidance is applicable to all the Development Bank of Namibia's (DBN) clients/customers who intends to or have set up operations in this sector category and, extends to associated activities at their assets, facilities, operations, projects and activities, including activities undertaken by any contractor on behalf of the Company, business units and managed operations including corporate/administration offices and other facilities located off site.

4. INTENT

The intent of this guidance note is to assist prospective clients to develop a thorough Environmental and Social Management Plan (ESMP) for their activities and merely act as a guidance and is not comprehensive nor exhaustive.

5. BACKGROUND TO THE SECTOR

Building and construction operations may take place on virgin/undeveloped sites, areas designated for township development or industrial development (often land with an industrial park) or at a site with existing or historic activities/Brownfield.

A typical sequence of events at a building/construction site could be as follows:

- Permitting;
- Site set-up and management, security;
- Construction worker camp (if any);
- Screening, fencing, setting up temporary offices;
- Demolition and site clearance;
- Ground works such as excavation, filling and the construction of earth structures e.g. embankments, bunds and cuttings;
- Construction of temporary roads, car parks, storage areas;
- Construction of foundations and structural works;
- Construction of the envelope of the building, principally the external facings, cladding and the fixing of windows;
- Mechanical/electrical installations and their interface with civil and building work;

- Associated trades i.e. joinery, painting, welders, plumbing and plastering;
- Landscaping reinstatement and habitat restoration or creation;
- Start-up operations and activities.

The servicing of land (installation of various municipal services on virgin/undeveloped land), demarcation of residential and business plots and several public erven are listed activities in the schedule of Government Notice No 29; List of activities that may not be undertaken without Environmental Clearance Certificate: Environmental Management Act, 2007 (EIA Regulations (2012). "Especially large areas that were previously open space or undetermined now to be re-zoned for the development.

This includes large township developments that are extensions of existing towns or large subdivisions within existing towns. Town Planning Ordinance 18 of 1954 and Townships and Division of Land Ordinance 11 of 1963 are applicable here. Large resettlement schemes are listed here. This means a project where informal settlement or settlement as in a rural set up was previously the case, and the inhabitants are to be resettled.

Therefore an Environmental Impact Assessment (EIA), Environmental Management Plan (EMP) as well as the Environmental Clearance (EC) should be done, obtained and submitted to the DBN.

If and when the activity only involves the construction of houses, industrial parks, office space etc. on already serviced land in urban and rural centers only an Environmental and Social Management needs to be submitted to the DBN addressing the aspects and hazards mentioned for the remainder of this guidance document.

6. KEY EOHSS RISKS

Below are the material EOHSS risks associated with this sector and key measures to manage them. Where gaps are found in the management of key EOHSS risks, the DBN E&S risk management measures may form part of a corrective E&S action plan agreed with clients.

6.1. Air Emissions and Dust

Atmospheric emissions, notably dust, resulting from demolition and other processes on site, may generate complaints from neighbours, and if significant, can result in the local authorities halting the operations and/or issuing a fine.

Emissions to air occur as a result of building and construction activities. These can include: fumes from welding, solvents used when applying paints, resins and related materials; volatile organic compounds (VOCs) from emissions from vehicles, fuel tanks and fuel systems and solvents; emissions of potentially toxic substances, for example, limestone dusts from construction materials.

Public/environmental health and nuisance issues associated with dust and vented fumes can arise from building and construction activities and may have a significant effect on neighbouring locations. This may be important if there are neighbouring residential and industry in the area.

6.2. Biodiversity

Construction projects, whether commercial developments, housing, infrastructure or public-sector projects, all have the potential to damage natural habitats, threatening wildlife and plant species.

- *Good practice starts with location.* As far as possible, construction should take place in areas where it will have least impact on biodiversity.
- During construction *habitat destruction* may occur where a habitat is removed to make way for a new development. Plants and animals in these areas are usually directly impacted generally resulting in

alteration or reduction in biodiversity. Mobile animals (especially birds and mammals) retreat into remnant patches of habitat.

- *Fragmentation*: Native habitats, which were once continuous, may become divided into separate fragments during construction. The extent and connectivity of remaining habitats are reduced, and species may or may not be able to survive as a result.
- Fragmentation may alter the distribution of populations, the migration rates among populations, or the size of local populations. Animals with large home ranges will be the most severely affected. Often habitat fragmentation doesn't present an absolute barrier to movement, but rather subjects animals to greater mortality as they try to cross the contrasting habitat
- *Disturbance*: There is the potential for noise from construction activities to disturb fauna resulting in their relocation and thus reducing the biodiversity of an area.
- *Pollution of watercourses*: Soil, waste concrete and toxins in runoff from construction sites or fuels, accidentally spilled during storage or delivery, can enter watercourses. Fine sediments from the bottom or sides of streams can be mobilised during in-stream construction. These pollutants can impact aquatic habitats, plant life, invertebrate and all life stages of fish.
- *Poorly timed construction*: This can have a negative impact on a wide variety of species including nesting birds.

6.2.1. Mitigation measures

- Time construction activities to avoid sensitive ecological periods and disturbance to people in local communities;
- Adopt sensitive strategies with regard to trees, water courses, plant or animal species or habitats, landscape or archaeological features on or around site;
- Undertake an archaeological and services assessment prior to site excavation.

6.3. Collision

Collision occurs on construction sites as a result of moving equipment and vehicles. A lack of designated vehicle and pedestrian paths can result in collision(s).

6.3.1. Mitigation measures

- Training and licencing construction vehicle operators in the safe operations of specialised vehicles such as forklifts, including safe loading and load limits;
- Ensure that drivers undergo medical surveillance;
- Ensure moving equipment with restricted rear visibility is outfitted with audible back up alarms;
- Establishing rights of way, site speed limits, inspection requirements, operating rules and procedures and control of traffic patterns and directions;
- Restricting circulation of delivery and private vehicles to defined routes and areas, giving preference to 'one way' circulation if possible.

6.4. Confined Spaces

A confined space is a space of an enclosed nature. On construction sites these can be excavations, storage tanks, drains or open topped structures. Dangers can arise because of a lack of oxygen i.e. where a chemical reaction takes place, or where spaces fill with vapours or liquids.

Confined spaces might be encountered either during demolition where old tanks and building basements are being removed or where plans require new excavations. Access to confined spaces must be managed and controlled.

6.4.1. Mitigation Measures

- Restrict access by using a suitable lock-out system;
- Implement Confined Space Entry Permit and Indicate with signage that there is 'Authorised Access Only;
- If mechanical ventilation is provided, there should be a warning system in place to immediately notify the worker in the event of a hazard or a failure in the ventilation equipment;
- Care should be taken to make sure the air being provided by the ventilation system to the confined space is 'clean' throughout the entire space;
- The use of mechanical ventilation should be noted on the entry permit;
- Work where a flame is used or a source of ignition may be produced (hot work) should not normally be performed in a confined space unless: All flammable gases, liquids and vapours are removed before the start of any hot work.

6.5. Contaminated Land

Land and water sources under or around the development site may be contaminated by either current or previous operations at or near the site. Contractual relationships between the contractor and the developer should address liability for environmental damage and clean-up of contaminated land.

Remediation standards may be set in regulations or specific agreements between the landowner and the Government-Ministry of Environment and Tourism.

Land with previous industrial, agricultural or storage uses that is being developed could be contaminated which can result in the need for disposal of contaminated soils. In addition, there could be health and safety risks to workers.

Site remediation may present major technical problems with significant associated costs where sites are contaminated or incorporate major natural features such as rivers. This can also result in time delays to a project.

6.5.1. Mitigation measures

- Undertake contaminated land surveys prior to excavation work commencing;
- Adopt working practices aimed at minimising disturbance of, and reducing spread of, any existing ground contamination.

6.6. Dust

Public/environmental health and nuisance issues associated with dust and vented fumes can arise from construction activities and may have a significant effect on neighbouring locations.

6.6.1. Mitigation measures

- Assess activities that can create noise or vibration and introduce equipment designed to reduce such emissions;
- Adopt techniques to minimise dust and vapour emissions e.g. air extraction equipment, hosing down road surfaces and cleaning of vehicles to control dust;

6.7. Electrical Hazards

On many construction sites temporary power supplies are often required. Where this is the case routing permission is required and vegetation clearance might be required to accommodate temporary access. In addition, temporary supplies might be less structurally sound and permits might be required to operate such equipment.

Where generators, power lines and cables are located on site there are increased risks of electrocution. Care should be taken when working around exposed electrical cables and qualified personnel should be employed.

6.7.1. Mitigation Measures

- Provide adequate safety training and periodic specialized electrical safety training programs on electrical hazard cognition and the avoidance of unsafe conditions at construction sites;
- On-site electrical safety procedures, safety meeting and electrical inspection should be enforced at construction site on a routine base;
- Electrical safety procedures and preventions should be thoroughly considered and improved at the construction planning stage.
- Guarding co-workers, warning signs and the supervisory guidance should be ensured from the onset of construction project.

6.8. Exposure to Extremes Temperatures

Workers are typically outside on a building or construction site and are susceptible to variations in temperature, either heat and the sun or cold. Appropriate personal protective equipment and awareness should be provided.

6.8.1. Mitigation Measures

Heat:

- Educate construction workers on recognising the symptoms of heat stress such as nausea, fatigue and dizziness;
- Schedule regular rest breaks in cool areas;
- Train first-aiders to handle heat stress

Cold Environment:

- Provide sufficient warm clothing to construction workers.
- Ensure that appropriate PPE such as thick warm gloves are provided
- Schedule regular rest breaks in warm areas.

6.9. Exploitation of Migrant and Casual Workers

Construction typically attracts a large number of casual/short term workers many of whom may be internal or foreign migrant workers. They may be hired directly or, more typically, through labour agents or by contractors. These factors make these workers more vulnerable to discriminatory treatment and/or exploitation.

6.9.1. Mitigation measures

- Check that labour standards, wages and working hours are in line with the Labour Act No 11 of 2007 and its Regulations and are consistent with the average for the sector**;**
- Ensure that hours, including overtime, are recorded and staff have received written details of hours worked and payment received;
- Implement a grievance mechanism which allows employees to raise workplace concerns
- Allow employees the freedom to form, or join, a worker's organisation of their choosing

6.10. Handling and Storage of Materials

Typical storage facilities include:

- Bulk storage tanks and drums, and containers of fuel, solvents, glues and paints
- Top soil storage
- Storage of construction materials, and
- Storage of construction waste, segregated by waste characteristics.

If not properly secured and contained these materials can leak and cause contamination.

6.10.1. Mitigation measures

- Carry out regular inspection of all bulk containment on site to prevent leakage and construction material loss;
- Provide secondary spill containment for storage vessels;
- Ensure that bulk storage areas are locked to prevent unauthorised use of materials or vandalism;
- Good housekeeping should be maintained at all times on site in order to reduce construction material loss and reduce the likelihood of health and safety incidents.

6.11. Hazardous Materials

Large quantities of hazardous substances such as cement can lead to contact dermatitis and cement burns, in addition, paints, solvents, lead and silica dust can all lead to occupational health and safety concerns.

6.11.1. Mitigation measures

- All sites must have copies of Material Safety Data Sheets (MSDSs) for each chemical or hazardous substance used on site.
- Appropriate personal protective equipment should be issued to potential impacted employees.
- Avoid the use of asbestos fibre as filler in cement, paper or board and sealant formulations;
- Avoid use of lead as a drying agent in sealant formulations;
- Use lead-free paint and primers, varnish and wood stain systems and replace with water based paints.
- Carry out regular inspection of all bulk containment on site to prevent leakage and construction material loss;
- Provide secondary spill containment for storage vessels;
- Ensure that bulk storage areas are locked to prevent unauthorised use of materials or vandalism;
- Good housekeeping should be maintained at all times on site in order to reduce construction material loss and reduce the likelihood of health and safety incidents.

6.12. Manual Handling

Construction activities can result in lifting of heavy or awkward shaped objects which can result in various musculoskeletal injuries.

6.12.1. Mitigation measures

- Where possible mechanical lifting aids should be introduced.
- Workers to assist each other in lifting heavy items
- Give awareness on the dangers of incorrect lifting

6.13. Noise and Vibration

Operation of earth moving equipment, generators, concrete mixers and machinery will create noise and vibration on construction sites which can lead to long term occupational health and safety problems.

In addition, processes used on site, such as, bitumen preparation, shot blasting, or pile driving may constitute a nuisance affecting neighbours. Noise can also create a public nuisance.

6.13.1. Mitigation measures

- To reduce the risk of noise exposure isolate noisy equipment and rotate tasks to minimise time spent in a noisy area over an eight hour period and provide personal protective equipment where people have to enter noisy areas;
- Time noisy activities to occur during times next door neighbours are at work or at school

6.14. Polychlorinated Biphenyls (PCBs) and Asbestos

PCBs are a group of substances which are good electrical insulators and lubricants. Typically, PCBs may be present as constituents of hydraulic oils or dielectric fluids in electrical switchgear, transformers, fluorescent light starters and hydraulic lifts.

Asbestos has been used on a large scale for many years as a fire proofing and insulation material and may be encountered in a wide range of forms including asbestos cement boards, tiles as fire retardant gaskets and lagging in pipe work and as fire retardant insulation around heating equipment in buildings.

Particular attention should be given when demolition or refurbishment of buildings constructed before the 1980's is taking place.

6.14.1. Mitigation Measures

- Develop and Implement and maintain Polychlorinated Biphenyls (PCBs) and Asbestos management Plan.
- Assess all premises for the potential presence Polychlorinated Biphenyls and Asbestos containing materials.
- Develop and maintain a register of the identified or suspected Polychlorinated Biphenyls and Asbestos containing materials, including its location, accessibility, condition, risk assessments and control measures.
- Ensure Risk assessments are conducted when working around/with areas containing Asbestos and Polychlorinated Biphenyls.
- Ensure that all required notices and labels are in place for Polychlorinated Biphenyls and Asbestos containing materials are on site.
- Ensure that personnel including contractors, suppliers, visitors and the public are informed or made aware of Polychlorinated Biphenyls and Asbestos specific site.

6.15. Site Security

A construction site is often subject to trespass, vandalism or theft. This can result in increased risks. Each site should be properly secured to prevent unauthorised access. Where used, security personal should not take action that is disproportionate to the risk.

6.15.1. Mitigation measures

- Ensure site security does not employ unacceptable methods to secure the site.

6.16. Slips, Trips and fall

Many people work on elevated areas on construction sites and falls are common. Use of ladders and scaffolding equipment increase the risk of falls. Uneven surfaces and poor housekeeping on a construction site can result in slips, trips and falls on the same level.

6.16.1. Mitigation measures

- Provision of personal protective equipment (PPE) that is fit for the task to prevent injury.
- Staff should be trained in the correct selection, use and maintenance of PPE;
- Train workers in correct use of machinery and safety devices;
- Restrict access to excavations and confined spaces through introduction of permit to work systems, lock outs and authorised access;
- Where possible, substitute more hazardous materials to be used on the site for those with less hazardous characteristics;
- Undertake cable/service surveys prior to excavation work;

6.17. Transport and Traffic Management

Building and construction, particularly on a new site, can bring heavy vehicles to congest residential areas, movement of materials to and from the site might lead to additional road noise, dust and traffic congestion.

6.17.1. Mitigation measures

- Traffic management studies should normally be carried out to identify risk, for example, proximity of traffic routes to schools, and mitigation measures e.g. restricting times of traffic, avoiding school arrival and departure times.
- Other safety measures may involve speed restrictions, parking areas, pedestrian crossings and so on.
- Employ dust suppression on site roads; Use tools fitted with water suppression to reduce dust;
- To avoid collision with structures or people plan the site vehicle route to avoid reversing vehicles. Where reversing is necessary ensure that a system is in place for a "spotter" (guide to provide direction for the driver);
- Install a one way system and/or designated turning area;
- Install designated walkways to separate people from vehicle movements to reduce risk of collision;
- Provide vehicles with a designated access route to avoid sensitive communities, such as, schools.

6.18. Waste Disposal

Transport and disposal of excavated soil and construction waste may be a significant issue notably on urban sites, and should be carried out in accordance with all legal requirements.

Hazardous and solid wastes may include contaminated soil, construction debris (including asbestos containing materials, lead based paints), waste fuel and lubricants, oil filters and batteries

Potential pollution problems include:

- Dumping of construction debris into or near watercourses or surface water drains;
- Storage, treatment and transportation of contaminated soils;
- Residual paints and solvents in containers.

6.18.1. Mitigation measures

- Develop a site waste management plan;
- Solid and hazardous waste must be separated, removed and disposed of by appropriate contractors at licensed waste facilities;
- Segregate waste that can be salvaged, re-used or recycled;
- Control or eliminate on-site burning of waste materials.

6.19. Waste Water Management

Waste water discharged from construction sites may include:

- Water from groundwater pumping (dewatering the site) and water used for cleaning and mixing, often this water can have a high volume of suspended solids.
- Runoff water from raw materials, washing equipment, vehicles and road surfaces and storm water run-off.

Earthworks and other processes on site may impact the hydrological balance of surrounding areas by:

- Causing pollution of water courses from run-off or pumping of contaminated groundwater;
- Adversely affecting surface drainage patterns; or

- Puncturing a natural impermeable layer or piling, thus permitting vertical migration of pollutants and leachates into underlying aquifers.

6.19.1. Mitigation Measures

- The construction activities should be limited to a smallest area as possible
- Control the quality of construction wastewater within the construction site through suitable drainage system with traps for arresting the sediment load.
- Implement suitable methods of sediment/construction debris in tune with the local condition to avoid water logging at construction sites.
- Proper drainage and sanitation facilities should be provided at the construction site.
- Formation of stagnant water pools should be eliminated to avoid soil erosion and breeding of mosquitoes.

6.20. Water Use

Sources of water may be from the mains supply or via abstraction from rivers or groundwater. Where abstraction takes place permits might be required which control the quantity of water removed so that it does not impact local communities.

6.20.1. Mitigations measures

- Recycle waste water to reduce consumption of mains water;
- Maintain integrity of the site drainage system to reduce accidental releases to groundwater;
- Use waste water treatment facilities, such as:
    - Settling tanks or other separators for silt laden material prior to any outflow into a water course;
    - Collection channels leading to oil and/or silt traps, particularly around areas used for vehicles washing or refuelling.
    - Sealing or removing abandoned drains to minimise the spread of contaminated water.

Key social, labour and community risk/liability issues

6.21. Noise

Processes used on site, such as, bitumen preparation, shot blasting, or pile driving may constitute a nuisance affecting neighbour. Noise may also create a public nuisance.

6.21.1. Mitigation measures

- Assess activities that can create noise or vibration and introduce equipment designed to reduce such emissions;
- Use noise control equipment, consider using equipment with mufflers and installation of temporary noise barriers;
- Plan work to reduce the occurrence of noise at sensitive times i.e. avoid night time working.

6.22. Dust

Public/environmental health and nuisance issues associated with dust and vented fumes can arise from construction activities and may have a significant effect on neighbouring locations.

6.22.1. Mitigation measures

- Adopt techniques to minimise dust and vapour emissions e.g. air extraction equipment, hosing down road surfaces and cleaning of vehicles to control dust;

6.23. Construction Worker Accommodation

Where this is required it can have a significant impact on the local community in terms of health and welfare, cultural integration, roads and local infrastructure.

6.23.1. Mitigation measures

- Conduct an initial assessment to determine the need for, and identify the potential impacts of the accommodation;
- Identify if existing local housing is sufficient;
- Ensure that national and local building regulations are adhered to;
- Ensure standards of living are maintained.

6.24. Excavation Works

Excavation is the process of moving earth, rock or other materials with tools, equipment or explosives. It includes earthwork, trenching and underground. Construction is one of the most common applications for excavation. Site excavations are necessary part of many construction projects, but can be an extremely dangerous job if workers are poorly trained if proper safety regulations are not followed.

6.24.1. Mitigation Measures

- Time works so that excavation does not take place during rainy events;
- Before the workers start digging they should be familiar with the whereabouts of underground utilities;
- Excavation work should be carried out carefully and follow recognized safe digging practises;
- Excavation works should be supervised at all times e.g. provision of banks men to guide vehicles;
- Place a shield between the side of the excavation and the work area
- Fence or barricade trenches

6.25. Hot works

Cutting, soldering, brazing and welding operations are commonly referred to as hot work. Potential health, safety, and property hazards result from the fumes, gases, sparks, hot metal and radiant energy produced during hot work. Hot work equipment, which may produce high voltages or utilize compressed gases, also requires special awareness and training on the part of the worker to be used safely.

6.25.1. Mitigation Measures

- Implement Confined Space Entry Permit and Indicate with signage that there is 'Authorised Access Only;
- Allow work to start only after safe procedures have been defined and all foreseeable hazards have been considered.
- Hot works area should be well ventilated
- Cutting, welding or grinding near flammable or combustible materials, liquids, vapours and dust should be highly prohibited
- Have appropriate fire extinguisher in place.
- Use only approved equipment in good condition and follow the manufacturer's instructions.
- Provide appropriate PPE which should include Eye protection to shield against sparks, molten metal and welder's flash, hearing protection, clothing made of heat-resistant materials such as an apron made of leather, safety boots, Gloves made of leather or other flameproof fabric, respiratory protection to protect against toxic chemicals gases.

6.26. Working at heights including ladder works

The most common work at heights activity in the hospitality industry involves ladders. Ladders are a common tool utilised by the maintenance and engineering staff in hotel and resort businesses. They enable personnel to reach higher places for a variety reasons such as hanging banners, changing light bulbs, checking sprinkler heads, dusting high areas, accessing roof areas and so much more.

6.26.1. Mitigation and Management Measures

• Ensure that workers working on heights wear proper footwear (e.g., non-slip flat shoes).
• Place the ladder on stable and level ground. Ladders should not be placed on an uneven surface.
• Prevent passers-by from walking under or near ladders in use by using barriers (e.g., cones) or have someone to act as a lookout.
• Maintain three points of contact at all times.
• Prohibit working from on the top rung of the ladder.
• Ensure that the right ladder for the job is used.
• It is recommended that the radius of the barricaded area should be approximately the same as the height of the ladder.

6.27 Financial Implications

- Contamination of the site or groundwater may result in fines, clean up expenditure or a reduced asset value.
- Public pressure against the construction project can delay a project start and can impact the project finance.
- Construction and maintenance of dedicated construction camps will require project finance.
- Penalties for adverse publicity resulting, for example, from nuisance complaints.
- Illegal waste disposal or impact on local surroundings, can result in fines. This may have negative effects on the company's reputation and may delay construction programmes;
- Disposal of construction waste or spoil may be a significant cost particularly if this includes hazardous waste;
- Loss or inefficient use of raw materials may significantly increase building costs;

- Injuries may lead to increased payroll costs to replace skilled workers and lost production time;
- Capital investment may be required to comply with new environmental, health and safety requirements;
- Fines, penalties and third party claims may be incurred for non-compliance with environment, health and safety regulations.

6.27.1. Mitigation measures

- Include in the business plan line items for Health and Safety, Environment and Social improvements
- Put in place financial investments/budget that relate to Health and Safety, Environment and Social issues
- Operational procedures to manage environmental, health and safety risks;
- Improvement objectives, targets and project plans;
- Training for personnel;
- Regular inspections, checks and audits with records to demonstrate achievement of the required level of performance against legal requirements and improvement action;
- Emergency plans for Health and Safety, Environment and Community accidents or hygiene non-compliance;
- Management review/demonstrated involvement in Health and Safety, Environment and Social and hygiene management;
- Monitoring programmes for Health and Safety, Environment and Labour conditions (as they relate to both employees and contractors).

7. PREVENTIVE AND PROACTIVE ACTIONS THAT CAN BE IMPLEMENTED

1) try to avoid causing social or environmental damage;
2) if not possible, then minimize the impact;
3) if not possible, then compensate or offset the damage.

7.1. RISK: Construction waste disposal

IMPACT
• Improper disposal of construction wastes causing land contamination and impacting local community
AVOID
• Establish and implement a construction waste management plan for all construction sites • Establish and implement procedures for reuse, recycle, and safe disposal of construction waste to a landfill site licensed to take such wastes • Train and periodically retrain all workers on proper demolition behavior and handling and disposal of construction and putrescible wastes • Locate and remove hazardous facilities such as underground storage tanks prior to commencement of demolition • Implement rodent elimination program prior to commencement of demolition • Conduct asbestos survey and if necessary prepare and implement an asbestos remediation plan prior to demolition • Conduct air monitoring for asbestos removal activity and other demolition exercises • Implement needed measures to prevent fugitive dust migration offsite • Deploy containers for collection and safe disposal of solid waste from the site • Deploy pest (rodent proof) containers for collection and safe disposal of putrescible waste from the site • Remove building demolition rubble and recyclable materials at least daily • Employ water mist to reduce production and offsite transport of dust and particulate from building demolition. Have this effluent drain to suitable collection points or to municipal sewers after been pre-treated to acceptable levels. • Transport dust generating wastes in covered vehicles. Periodically monitor effectiveness of dust covers during transport.
MINIMIZE
• Develop and deploy a grievance mechanism for local area residents to facilitate understanding of impacts and issues in a timely manner
OFFSET
• Remove accumulated waste materials • Immediately implement a rodent removal/destruction program • Compensate local residents negatively affected by uncontrolled activities • Provide physical and other health-related examinations for individuals claiming physical harm from demolition activity

7.2. RISK: Surface run-off from construction site

IMPACT
• Adverse impact on the wetlands water quality • Adverse impact on local fisheries and livelihood of local communities
AVOID

• Obtain and review the environmental impact assessment and management plan; adhere to the mitigation measures written into the documents, if any • Schedule works to avoid expected high rainfall • Mark the boundaries of the construction site; ensure soil disturbance occurs only within marked boundaries • Preserve existing vegetation cover as much as possible • Clear land in stages so as to avoid large scale barren areas • Plan ahead and limit the area of exposed soil at any one time
MINIMIZE
• Install silt fences downhill from bare soil to catch all runoff • Divert clean storm-water away from areas where soil is to be exposed by constructing intercepting drains/diversion berms • Construct temporary sedimentation ponds for storm water; direct drainage into the sedimentation ponds • Establish an adequate inspection, maintenance and cleaning program for sediment runoff control structures • Ensure that contingency plans are in place for unusual storm event • As soon as feasible, ensure seeding and re-establishment of vegetation on areas that were cleared or degraded prior to and during construction; provide temporary protection with mulch and matting until vegetative cover including grass is re-established
OFFSET
• Reconstruct overwhelmed, eroded or otherwise impacted surface facilities including drainage channels, sediment basins • Rehabilitate affected wetlands • Replant affected plant species • Ensure adequate replenishment and flow of uncontaminated water to wetlands • Provide alternative source of livelihood to the affected communities

7.3. RISK: Oil and chemical spills

IMPACT
• Contamination of water and soil • Adverse impact on public health
AVOID
• Carry out hazard and operability (HAZOP) studies for storage and dispatching petroleum products and hazardous materials; fully implement remedial measures to prevent unplanned events • Establish and implement procedures for safe handling of fuel and hazardous chemicals at site based upon the results of periodic HAZOP • Implement HAZOP recommendations for storage units to prevent accidents from moving equipment such as vehicles or fork-lifts • Provide secondary containment of a suitable volume for all liquid materials storage • Deploy automatic cut-offs for all fuel dispensers • Render all storage units highly resistant to vandals
MINIMIZE
• Actively manage materials procurement and inventories to receive infrequently used chemicals just prior to use; reduce quantities of chemicals and fuel stored on-site to minimum practicable levels • Assemble, train, equip and deploy a spill response team • Establish on-call contracts with hazardous materials and waste haulers and emergency responders for containment, removal and disposal of spilled material • Install bunds to prevent spilled hydrocarbons and other materials escaping and causing environmental damage • Design the height of bunds (secondary containment) walls considering essential construction materials, vehicular access and storm water management to minimize the impact of materials' spills
OFFSET
• Ensure environmental reclamation and ecological restoration is carried out for all environmental spills • Collect soil and ground water samples from material spill areas to ensure that complete clean-up and remediation has been carried out • Seek spill site clean-up confirmation from regulatory agencies or prime contractor environmental staff • Remediate affected properties and facilities to fully address complaints arising out of unplanned events and releases

7.4. RISK: Exposure to noise and vibrations due to heavy construction machinery

IMPACT
• Adverse health effects on local community
AVOID
• Fit and maintain appropriate mufflers on earth-moving and other vehicles on the site • Enclose noisy equipment at fixed facilities (e.g. electric power generators at crushing facilities) • Limit all crushing, drilling and material transfer to daylight hours; construction work during night shift should be limited to grading, compaction and similar low noise operations
MINIMIZE
• Prohibit the use of compression brakes close to sensitive facilities such as schools and hospitals and during evening hours; post warning signs "no engine breaks" around sensitive facilities • Schedule deliveries to the site so that disruption to local amenities and traffic is minimized • Provide appropriate training to workers for proper operation of vehicles and construction equipment and minimize unnecessary idling • Develop and implement a preventive maintenance schedule for all heavy construction equipment and machinery to minimize noise and vibrations • Advise local residents when unavoidable out-of-hours work will occur
OFFSET
• Assist community financially, to adopt noise insulation measures (.e.g. provision of sound insulation, erection of noise barriers, wall installation, etc.)

7.5. RISK: Exposure to dust and air emissions from drilling/crushing

IMPACT
• Respiratory illnesses among local residents/villagers
AVOID
• Obtain and review the environmental impact assessment and management plan; adhere to dust control mitigation measures written into the documents, if any • Identify and prevent all "non-necessary" movement of equipment and construction machinery • Reduce need for multiple transfer points (e.g. processing plants should be located in quarry areas) • Explore opportunities for "pre-fab" material and construction aggregates
MINIMIZE
• Suspend blasting or earthworks on windy days • Spray water on temporary/haul roads or apply surface treatment (e.g. dust-a-side and other binding agents) • Impose speed limits for trucks • Prohibit off-road driving outside designated areas unless specifically authorized • Cover loads on all construction vehicles • Use enclosed conveyors and belt transport instead of hauling material by trucks • Spray water on stockpiles • Spray water mist on crushing operations and vibrating screens • Develop and implement maintenance schedule for all heavy construction equipment and machinery to minimize noise and air emissions
OFFSET
• Engage with affected communities to identify areas affected by high particulate deposition and initiate feasible cleaning and removal activities • Support community health clinics to diagnose and treat local people affected by upper respiratory illnesses attributable to exposure to dust and air emissions from the construction site

7.6. RISK: Use of scaffolds; Absence of health and safety committees

IMPACT
• Injuries/fatalities due to falling from heights and falling objects • Incident reoccurrences due to the lack of identification of risks by health and safety committees and implementation of corrective actions
AVOID
• Develop occupational health and safety policy regarding the installation and use of scaffolding; communicate policy to managers, supervisors and workers • Hire a specialized company to install scaffolding • Have a qualified professional check that scaffolding has been set up correctly and in compliance with SANS, ISO18001 or other international standards; ensure instructions for scaffolding installation are available at the workplace • Regularly train workers on scaffolding installation practices and procedures: o Install guardrails during erection of scaffolding; guardrails should remain in place until that section of the scaffolding is dismantled o Install full deck of planks at each floor o Install an appropriate access system (i.e. stairway or ladder progressively installed as scaffolding is erected) o Inform employees that climbing the scaffold framework is not acceptable o Barricade areas below if there is a chance of items falling from scaffolding o Deploy canopies or safety nets to contain falling objects o Honour clearance distances required between power lines and scaffolding; de-energize the lines if mandatory clearances cannot be met
MINIMIZE
• Establish and implement systems (and documentation) for regular inspection of scaffolding; inspection must be performed by a competent worker • Regularly train workers on safe scaffolding use procedures and practices: Do not carry materials when climbing scaffolding; use a hoist or rope to move materials to upper levels o Do not accumulate tools, materials or debris on the platform o Do not overload the scaffolding with too many people or materials in any one area o Do not work on scaffolding during storms or high winds o Use appropriate PPE (hard hats and steel-toed footwear) when working on scaffolds or around them o Use personal fall protection equipment (safety harness) when working over a void or leaning out from the scaffold without the protection of a guardrail • Ensure that safety signs in local language are posted and understood by the workers • Assign supervisor to record all OHS incidents • Assemble joint management-worker health and safety committee to investigate and analyse incidents, propose corrective actions and confirm that appropriate action to prevent reoccurrence has been taken
OFFSET
• Provide medical assistance for cases of workplace related injury • Compensate injured workers for wages lost • Compensate for treatment and recovery, loss ability to work, and loss of life

7.7. RISK: Use of earth-moving/heavy equipment

IMPACT
• Injuries/Fatalities due to being struck by heavy equipment
AVOID
• Develop occupational health and safety policy regarding the use of heavy equipment; communicate policy to managers, supervisors and workers • Plan a drive-through site to eliminate the need for vehicles to back up • Establish designated pedestrian routes through worksites and use signs to indicate them • Prevent unauthorized workers or bystanders from entering a danger zone; when appropriate, install barricades and signs around the danger zone
MINIMIZE
• Permit only qualified and authorized personnel to operate heavy equipment • Ensure that mobile equipment backup alarms are audible above ambient noise levels • Regularly train workers on procedures and practices for safe work around heavy equipment: o Ban cellular phones and headphones unless special permission is granted for work purposes o Mobile equipment operators must be directed by a worker (i.e. spotter, traffic controller) with an unobstructed view of the area that the vehicle is reversing into o Spotters and drivers must agree on hand signals before backing up o Spotters must always maintain visual contact with the driver while the vehicle is backing o Drivers must stop reversing immediately if they lose sight of the spotter o Spotters must not perform additional duties while they are acting as spotters o Workers must wear high-visibility clothing, especially during night operations o All employees shall be familiarized with the worksite and all vehicle operations; make sure workers are aware of blind areas • Ensure that safety signs in local language are installed and are understood by workers
OFFSET
• Provide medical assistance for cases of workplace related injury • Compensate injured workers for wages lost • Compensate for loss of life or loss ability to work

7.8. RISK: Use of crane suspended personnel platforms

IMPACT
• Injuries/Fatalities due to unsafe crane operations
AVOID
• Develop occupational health and safety policy regarding the use of cranes; communicate policy to managers, supervisor and workers • Use conventional means of access (e.g. scaffolds and ladders) if feasible; use work platforms suspended by crane only when conventional means present greater hazards • Ensure that only skilled and trained employees are assigned the operation and maintenance of cranes • Regularly inspect all critical components of the crane and emergency stop button functions • Ensure that wire ropes comply with the required minimum safety factor for the maximum intended load • Use only crane-suspended work platforms in full compliance with SANS, ISO18001 or other international requirements
MINIMIZE
• Ensure the platform is not loaded in excess of its rated load capacity • Perform a trial lift with the unoccupied work platform throughout the entire range of travel immediately before workers enter the platform; the platform must be loaded at least to its anticipated lift weight; commission inspections and repairs by qualified, competent workers if the lift trial exposed any defects • Ensure that no employees work under suspended loads • Hold a meeting with all employees involved in personnel hoisting operations to review SANS and ISO18001 standards on crane suspended personnel platforms; this meeting must be held before the trial lift and must be repeated for any employees newly assigned to the operation • Ensure that safety signs in local language are posted and understood by the workers
OFFSET
• Provide medical assistance for cases of workplace related injury • Compensate injured workers for wages lost • Compensate for treatment and recovery, lost ability to work, and loss of life

7.9. RISK: Lack of appropriate sanitary facilities

IMPACT
• Gender discrimination and potential health and safety impacts for female employees due to unclean sanitary facilities
AVOID
• Develop occupational health and safety policy regarding the provision of clean drinking water and clean sanitary facilities; communicate policy to managers, supervisors and workers • Provide adequate number of sanitary facilities for male and female workers (e.g. one separate toilet for each 20 male employees and each 10 female employees) and ensure privacy (e.g. sanitary facility can be locked from the inside) • Hire cleaning staff and maintain a cleaning schedule for sanitary facilities at all construction sites • Provide/maintain adequate supplies of potable water • Arrange for adequate number of clean temporary/portable facilities separated for male and female workers in all short term construction sites
MINIMIZE
• Establish employee grievance mechanism for reporting concerns related to drinking water and sanitary facilities • Communicate to workers how to file complaints • Task Occupational Health, Safety & Environmental (OHSE) committee with the responsibility to identify and address workers' concerns on access to drinking water and sanitary facilities at site; the committee must include female employees and members of management
OFFSET
• Introduce health check-up/treatment for female workers who may have been infected in the past due to inadequate sanitary facilities • Compensate for wages lost during ill-health treatment

7.10. RISK: Male dominated environments

IMPACT
• Sexual harassment of female employees
AVOID
• Develop clear policies against sexual harassment conforming to national laws and requirements of key clients; communicate policies to managers, supervisors and workers • Modify labour contracts to state that the company's projects are staffed by men and women, and that the company has a zero tolerance policy toward any form (verbal or physical) of sexual harassment • Ensure that new employee orientation includes briefing on this issue and emphasizes that this behaviour constitutes grounds for immediate dismissal
MINIMIZE
• Periodically conduct mandatory training on sexual harassment policies and gender sensitivity issues for all managers, supervisors and workers • Train managers, supervisors and workers on how to recognize and prevent sexual harassment • Establish and communicate disciplinary procedures against sexual harassment cases • Inform workers on how to respond to incidents of sexual harassment • Implement a risk-free communication channel for reporting openly or anonymously sexual harassment cases • Establish an anti-sexual harassment committee to detect, report and assist in the redress of all sexual harassment cases. The sexual harassment committee must include 50 percent female members and members of top management • Investigate all sexual harassment cases quickly and thoroughly; maintain accurate records of the investigations, findings, and remedial measures undertaken • Regularly communicate to employees on the gender related complaints and the status of corrective and preventive actions initiated by the company
OFFSET
• Take immediate action when sexual harassment is discovered, suspected or reported to protect affected employee • Make sure employees who present charges do not face retaliation • Enforce zero tolerance policy; dismiss employees found to have engaged in sexual harassment

7.11. RISK: Use of labour intermediaries to recruit seasonal migrants

IMPACT
• Forced labour due to indebtedness owed to labour intermediaries • Non-payment of minimum wage • Curtailing freedom of movement
AVOID
• Develop policies on remuneration, working conditions and workers' accommodation for migrant workers conforming to national labour laws • Communicate policies to labour intermediaries and make sure they understand • Make policies contractually binding under the service agreement with labour intermediaries • Appoint a team of company's supervisors to physically observe payment of wages to migrant workers by labour intermediaries and inspect workers' accommodations
MINIMIZE
• Ensure that workers are informed (in all applicable languages) on their rights including wages, benefits and deductions • Ensure all workers receive contracts and periodic clear records of pay calculations in English and translated in their native language • Implement a risk-free communication channel to receive workers' complaints openly or anonymously on labour rights violations including payment of wages • Set up periodic formal meetings between workers and company managers to document workers' concerns; distribute minutes/results of meetings and review issues raised during management meetings
OFFSET
• Reimburse workers for illegal deductions made by labour intermediaries • Retroactively pay workers whose compensation did not meet legal minimum wage (or agreed contract value if higher than legal minimum) • Establish ongoing dialogue with local labour NGOs, trade unions and other interested parties to review labour risks and company's initiatives in addressing those risks

7.12. RISK: Use of contractors and subcontractors

IMPACT
• Labour legal non-compliances at the contractor and subcontractor level
AVOID
• Develop and disseminate among company's procuring officers and potential tenderers company's policy on OSHE and workers' rights including freedom of association conforming with national labour laws and international conventions; extend policy to workers of contractors and subcontractors in company's construction sites • Include labour and OSHE criteria for the prequalification of contractors • Require tenders to itemize labour costs to ensure sufficient allocation of funds (i.e. wages and benefits, accommodation, sanitary facilities, canteen, drinking water, transport, workers' insurance, etc.) • Require tenders to itemize OSHE costs (i.e. PPE, training, etc.) and to present OHSE costs in a separate, standalone proposal accompanying the financial/technical proposal • Include labour and OHSE policies in labour contract agreements with contractors • Appoint a qualified, experienced contractor to develop an OHSE action plan with implementing procedures and clear allocation of responsibilities, mandatory training course content, definition of appropriate PPE, etc.
MINIMIZE
• Make sure that all workers are informed on their rights including wages and benefits and on their fundamental right to associate freely under the law • Appoint a team of supervisors to physically observe payment of wages and inspect welfare facilities and OSHE practices in company's construction sites • Develop OSHE training tools on high risk activities (i.e. falls from heights; falling objects; electrocution; caught-in by machinery); make periodic training mandatory for all workers and supervisors • Prohibit site entry to workers without documented OSHE training and appropriate PPE • Develop pictorial posters and booklets on OSHE and workers' rights; post them in all construction sites and distribute to all workers • Request contractors to identify subcontractors with colour coded hard hats; make zone managers responsible for identifying at-risk behaviour from subcontractors • Set up a hotline to receive workers' complaints openly or anonymously via voice, email or SMS; hotline must be accessible to workers of contractors and subcontractors
OFFSET
• Retroactively compensate workers for lost earnings at legal minimum wage and overtime premium • Compensate for injuries and recuperation, loss of ability to work, and loss of life • Require contractor to re-instate fired worker

8. REVIEW

The principles contained in this standard will be reviewed on an annual basis to facilitate improvement.

9. GENERAL REFERENCES FOR STANDARD METHODS

- IFC Environmental, Health & Safety (EHS) Guidelines. General EHS Guidelines: Construction and decommissioning. http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS_4/$FILE/4+Construction+and+Decommissioning.pdf
- International Organisation for Standardisation (ISO) www.iso.org ISO14001:2004: Environmental Management Systems – Requirements with Guidance for use. Geneva: ISO.
- UK Health and Safety Executive (HSE) http://www.hse.gov.uk/construction/index.htm
- US Occupational Safety and Health Agency (OSHA) http://www.psha.gov/dcsp/compliance_assistance/quickstarts/construction/
- IFC/EBRD Workers Accommodation: Processes and Standards. A Guidance Note by the IFC and the EBRD. http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/p_WorkersAccommodation/$FILE/workers_accomodation.pdf