CONTRACTOR

CLIENT

PROYECTO /*PROJECT*

ACWA POWER SOLARRESERVE REDSTONE
SOLAR THERMAL POWER PLANT

DOCUMENTO/*DOCUMENT*:

H&S PLAN

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1. INTRODUCTION

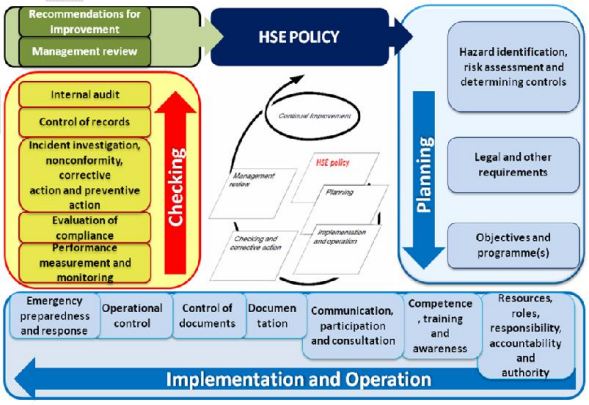
1.1. Works´Details

1.2. Location and access

2. TERMS AND DEFINITIONS

The following acronyms and definitions shall apply to this document:

- Contractor: ACCIONA Industrial
- Subcontractor: Any person or company having a contract directly or indirectly with Contractor for carrying out any part of the work and including each tier of subcontractor, sub-subcontractor and so forth.
- HS & E: Health, Safety & Environment
- HSE Management System: Part of an organization's management system used to develop and implement its HSE policy and manage its HSE risks. A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives. A management system includes organizational structure, planning activities (including, for example, risk assessment and the setting of objectives), responsibilities, practices, procedures, processes and resources.
- Hazard: Source, situation, or act with a potential for harm in terms of human injury, ill health, damaged to the environment, or a combination of these.
- Incident: Work-related event(s) in which an injury, ill health or damaged to the environment (regardless of severity) or fatality occurred, or could have occurred. An incident where no injury, ill health, or fatality occurs may also be referred to as a "near-miss", "near-hit", "close call" or "dangerous occurrence". An emergency situation is a particular type of incident.
- Accident: An accident is an incident which has given rise to injury, ill health or fatality.
- HSE policy: Overall intentions and direction of an organization related to its HSE performance as formally expressed by top management. The HSE policy provides a framework for action and for the setting of HSE objectives.
- Risk assessment: Process of evaluating the risk(s) arising from a hazard(s), taking into account the adequacy of any existing controls, and deciding whether or not the risk(s) is acceptable.
- Continual improvement: Recurring process of enhancing the HSE management system in order to achieve improvements in overall HSE performance consistent with the organization's HSE policy.



3. SCOPE AND OBJECTIVE

3.1. Health and Safety management PHILOSOPHY

Triple Zero is the main philosophy on which ACCIONA supports all it does in terms of Health and Safety. It consists of three major concepts:

Zero shifting: we understand "shifting" as "changing", when change is not focused on improvement, or changes to established standards. In this regard, "shifting" and improvisation are not allowed, and will not be tolerated.

Zero incidents: we work our best in order to prevent incidents and any events that could cause injuries to people and/or damages to property, equipment and assets

Zero fatalities: we do all in our hands to manage serious hazards on all those operations and/or activities that could result in fatal wounds.

3.2. HSE management system

ACCIONA has implemented and certified H&S and environmental management systems, both certified under OHSAS 18001 and ISO 14001 standards. The procedures and operational controls set within them shall be considered as the main reference to control identified hazards and environmental impacts for every operation to be performed within the scope of the project.

H&S management is based on the **four basic safety rules**:

- **No job will be accepted as "good to proceed" without a method statement**. All processes (construction, installation, testing, maintenance, repair, etc.) must be covered with a method statement. Hence, method statements are required to be used as the main reference for planning, analysis, risk assessment and execution of any activity.
- **Every interface (interference) must be assessed and managed according to the specific project requirements.** An efficient interface management process is designed to ensure every interface (and every resulting interference) is reviewed and properly assessed before moving the work forward for authorization.
- **No job will start without a permit to work (PTW).** All activities shall be covered with a PTW. The PTW system is the base for Last Minute Risk Assessment (LMRA), work preparation and work supervision. A PTW management process is designed in order to ensure every activity has been reviewed, assessed, planned and authorized as required. *(see diagram 2 for PTW management sequence)*
- **No job will start if any form of energy is not properly identified, assessed and controlled**. A process for energy management (complementary to the operational controls), set to ensure that every work is carried out considering the best options and works methods in terms of energy management.

3.2.1. Contractor and subcontractor's HSE plan

ACCIONA expects all contractors to adhere, support and actively participate in every HSE strategy, programme and/or schedule set for the project, in order to ensure that all involved personnel is committed to HSE according to her/his responsibilities, position and duties. Hence, every contractor shall drive all their set controls towards both "triple zero" and 50:50 strategies.

Each contractor shall prepare a project specific HSE plan based on the HSE requirements and the minimum requirements as set in their awarded contract within 20 days from the contract award date.

The HSE plan shall be applicable for the entire duration of the awarded activities and any basic requirement set in the contract, and must comply with local regulation, ACCIONA's HSE specifications (including HSE plan and HSE management system), and best industrial practice. It must be reviewed as required, as the project moves forward.

The Contractor shall include a copy of its corporate organisation HSE management system(s) or manual(s) within the HSE Plan. The HSE plan must include the HSE development of critical tasks and key processes (confined spaces, work at heights, waste management, HAZMAT/COSHH management, etc.). In addition to method statements, these processes will set the basis for work management at site.

The HSE Plan shall be reviewed and approved by the final client/project owner, ans any changes must be submitted to ACCIONA for review and approval. The HSE plan must be managed and coordinated by a full-time specifically designated HSE manager. Every contractor must appoint and coordinate as much HSE personnel as necessary to support the HSE manager and any effort focused on HSE. The HSE manager is responsible of updating the HSE plan as required to ensure that changes in site conditions, stages transitions and any other situations generating new hazards are considered and properly managed.
In addition, each subcontractor shall write its HSE plan according to these HSE requirements. If the contractor has any operation not included here, it shall be reflected within their HSE plan, and a method statement as required.

The specific contents of the contractor's HSE plans are the following:

- Introduction
- Project Title and Brief Scope of Work
- 4 Safety rules and triple zero strategy
- HSE Organisation and Organisation Chart
- Brief description of HSE management system –if any
- Site Map and Key Plan
- HSE Hazard Identification Plan
- HSE arrangements, procedures, instructions and other HSE directives, as applicable.

3.2.2. Administration and office works

Every contractor which has been awarded with a contract covering mainly administration and office activities (engineering, design and other activities performed within their HQ) shall ensure the following:

- Full compliance with all legal requirements applicable to the location of their HQ – including all those related to occupational health, medical care, ergonomics, fire and preservation of life in case of fire, emergency preparedness and response and any other HSE standard that affects or could affect their activities in any way.
- Full commitment with any initiative and/or strategy against hiring children or any form of slavery
- Full compliance of all site HSE requirements whenever they visit the projects sites or facilities for whichever the reason (including non-technical visits, which must be informed and previously authorized by the site/project management). Examples of these are:
    - Previous visit communications
    - PPE
    - Project induction (including sending previous information whenever it is necessary)
    - Specific certifications and documentation (method statements, permits to works, etc.) whenever –for technical and justified reasons- the contractor's personnel must perform any high risk activities such as work and heights, confined spaces, etc.
- Any other requirement related to health, safety and environmental protection when at site.

3.2.3. Pre-mobilization HSE review

Every contractor shall conduct a pre-mobilization health, safety and environmental review prior to commencement of any work on the site, and all necessary actions identified by such review shall be performed prior to the commencement of works on the site.

3.2.4. Working hours

Every contractor shall plan site working hours (shifts are permitted as long as they are set according to local regulation and project requirements), and inform this to ACCIONA management staff and HSE staff as soon as possible. Working organization (maximum working hours, rest periods, special conditions, working restrictions when necessary, etc.) must be strictly aligned with local regulation and labor law. The Contractor's Health, Safety and Environment Plan shall address how hazards associated with working outside normal hours will be managed, including supervision, authorization processes, work preparation and conditions required for execution, and medical/health and safety supervision, when necessary.

3.2.5. Language and cultural issues

All contractors shall align themselves with the official language of projects. When an official language is not defined, the standard language will be English unless stated otherwise. Contractors shall consider the following:

- Every contractor shall ensure that all documentation and technical information is set, submitted and managed according to the project official language
- Every contractor shall ensure that all technical personnel and all those persons with relevant positions/responsibilities (from foreman upwards) has a good level of proficiency in the official language of the project.
- All signposting, warnings, written communications/safety alerts, training and training materials, instructions, etc., shall be written in english, and the official language of the project if different than english.

- When necessary, contractors shall provide an interpreter when translation of verbal/written communications is required. This is particularly important with regards to:
  - Site HSE plan
  - Method statements
  - Risk assessments
  - Procedures and operational controls
  - PTW and LO/TO procedures and authorizations
  - Toolbox talks, and any similar method of massive communication
  - Unsafe acts, unsafe conditions, near misses and incident reporting

4. PROJECT BRIEF DESCRIPTION

The Redstone Solar Thermal Power Project features Solar Reserve's world-leading molten salt energy storage technology in a tower configuration with the capability to support South Africa's demand for energy when it's needed most - day and night. The 100 MW project with 12 hours of full-load energy storage will be able to reliably deliver a stable electricity supply to more than 200,000 South African homes during peak demand periods, even well after the sun has set. Fueled completely by the sun, with no back up fuel required, the project also features dry cooling of the power generation cycle as an important element to minimize water use.

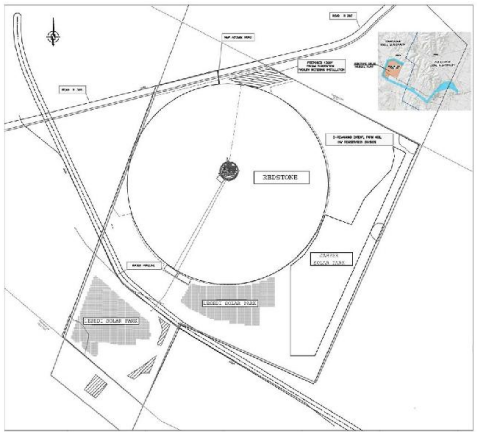
The Redstone Solar Thermal Power Project will be located in Postmasburg, near Kimberley in the Northern Cape Province.

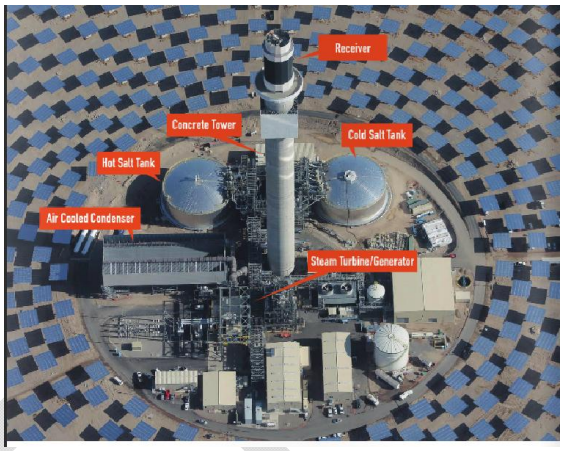
Project overview

- Location: Postmasburg, Northern Cape Province, South Africa
- Technology: SolarReserve's proprietary CSP tower technology with Molten Salt Thermal Energy Storage
- Size: 100 MW facility output
- Storage: 12 hours of full load storage
- Electricity Production: 480,000 MW-hours annually – twice the generation of an equivalent sized photovoltaic (PV) project
- Investment Partners: SolarReserve & ACWA Power Homes
- Powered: more than 200,000 homes during peak demand
- Dry cooling: Significantly reduces the use of water

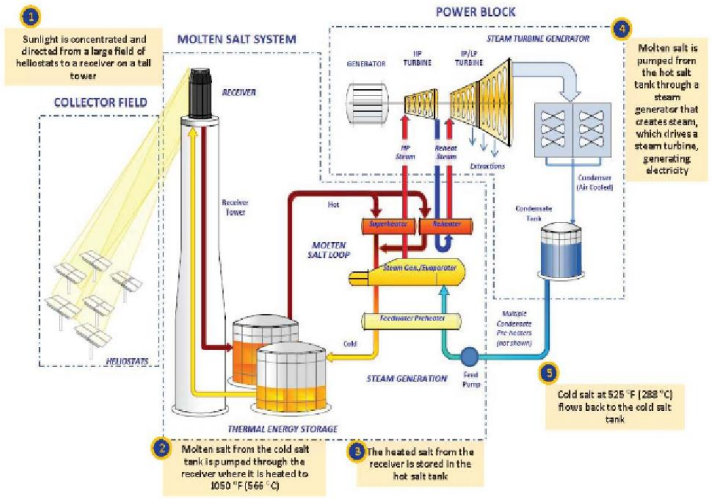
4.1. Works Descriptions

Site Layout Plan





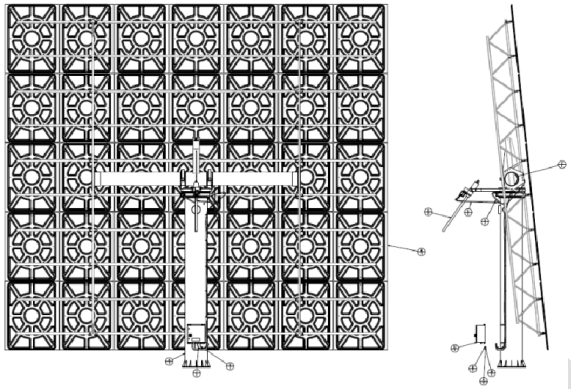
Performance



- Sunlight is concentrated and directed from a large field of heliostats (mirrors that track the sun) to a receiver on a tall tower.
- Liquid salt from the cold salt tank is pumped in piping up the tower and through the receiver where it is heated to 566 ºC
- The heated salt from the receiver travels back down the tower through piping and stored in the hot salt tank
- Hot salt is pumped from the hot salt tank through a steam generator to create steam, which drives a steam turbine generating electricity.
- The molten salt, now cooled to 288 ºC flows back to the cold salt tank
- Condensed steam (water) from the exhaust of the steam turbine is recirculated for reuse.

Collector System (CS)

The Collector System consists of a circumferential field of sun tracking Heliostats with an approximate total mirror surface of [1.05-1.15] Mm2 that redirect and focuses solar light onto a central solar receiver.



Heliostat Mounting Design: Back (left) and Side (right). To be adapted to final heliostat design.

Source: Solar Reserve

Molten Salt System (MSS)

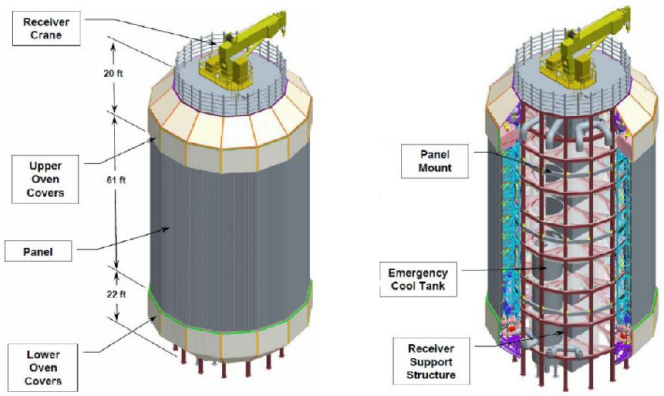
The Molten Salt System (MSS) is a closed loop thermodynamic system using nitrate salt as heat transfer and thermal energy storage medium.

The main function of the MSS is to convert the concentrated solar flux collected by the CS into thermal energy by increasing the temperature of molten nitrate salt flowing through the Receiver panels from a temperature between 288 °C and 298 °C (550 °F) to 566 °C (1050 °F). After passing through the Receiver, the hot salt is stored in an insulated tank (hot tank) and pumped through a series of salt-steam heat exchangers to produce steam to power the Turbo-Generator. After passing through the heat exchangers, the cold salt is returned to the cold storage tank.

The Molten Salt System (MSS) includes the Receiver (including all interconnecting hot and cold molten salt piping, valves and mechanical equipment), the insulated Hot and Cold Molten Salt Storage Tanks (placed at ground level), the Molten Salt Pumps, the Steam Generator System (SGS), and the instrumentation and controls necessary for operation and health/status of the systems. It also includes all associated civil works, buildings, steel structures, electrical systems (e.g., wiring and cabinets) and protection systems (e.g., earthing, lightning protection and fire fighting systems). The MSS will be equipped with adequate thermal insulation and electrical heat tracing to minimise thermal energy losses in the system and to prevent the existence of cold spots that might cause the solidification of the salt in the system.

Receiver

The Receiver system consists of a cylindrical tube wall heat exchanger with associated components (e.g., piping, valves and fittings) that receives solar energy from the heliostat field and transfers it to the molten salt, increasing the salt temperature from 288 ºC to 566 ºC. The Receiver is mounted on the top of the central tower. After absorbing solar energy, the hot molten salts are pumped to the thermally insulated Hot Molten Salt Storage Tank ("Hot Tank") for storage until the energy is required to generate superheated steam.



Receiver System Drawings

Source: SolarReserve

Thermal Energy Storage System (TES)

The Thermal Energy Storage (TES) is a system consisting of [two (2)] molten salt thermal storage tanks, namely the "Hot Tank" (Hot Molten Salt Storage Tank) and the "Cold Tank" (Cold Molten Salt Storage Tank).

Once molten salt has achieved an adequate temperature level at the Receiver, molten salt is pumped and stored in the Hot Tank. The "hot salt" is pumped from the Hot Tank through a series of salt-steam heat exchangers (SGS) to generate superheated steam to power the coupled Steam Turbine-Generator systems. As a result, the molten salt temperature is reduced and the salt is directed from the SGS outlet to the Cold Tank for storage and subsequent recirculation through the Receiver during the next sunny day. Electrical power can be generated on demand provided sufficient "hot salt" has been stored in the Hot Tank during sunny periods.

The Hot Tank is to be constructed from stainless steel, whereas the Cold Tank is to be made of carbon steel. Each molten salt storage tank shall have sufficient capacity to store the total amount of salt employed in the power plant,Both tanks will be constructed on a concrete foundation outfitted with a cooling system to prevent the tank foundations from exceeding the temperature limits of the concrete.

Molten Salt Pumps

The molten salt mixture is circulated through the MSS by means of special molten salt pumps. The Cold Tank is equipped with pumps that circulate the molten salt mixture throughout the MSS. The pumps are installed to operate in parallel and located at a certain height above the Cold Tank upper fluid level.

The Hot Tank is equipped with salt pumps that circulate the molten salt mixture from the tank to the Steam Generator System. The pumps are installed to operate in parallel and located at a certain height above the Hot Tank upper fluid level.

The design foresees the use of tri-functional cold salts pumps to blend cold and hot salt for attemperation during transient stages (start-up, load changes and shutdown).

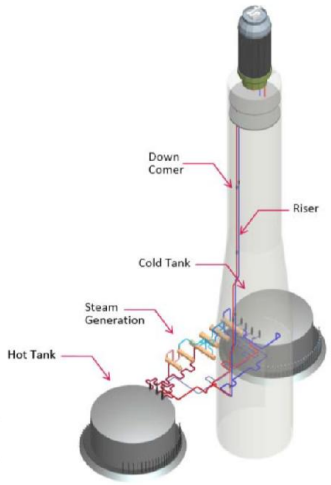
The salt pumps shall have a vertical design and will be driven by variable frequency converters.

Steam Generator System (SGS)

The Steam Generator System (SGS) consists of [two (2)] salt-steam heat exchanger trains that use the thermal energy of the molten salt pumped from the hot tank to produce superheated steam to power the Steam Turbine.

Tower

The central Receiver will be located on the top of the concrete Tower. The molten salt will be directed from the Cold Tank to the Receiver through the pipe named "riser", and once it has achieved an adequate temperature, it will be directed to the Hot Tank through the pipe named "downcomer". The Tower will contain all of the necessary equipment (electrical, I&C and mechanical), as required to support the process.



Plant Tower general drawing

Source: SolarReserve

Steam Turbine and Generator

The conversion of thermal energy into mechanical energy that can later be used to generate electricity in the Generator takes place in the Steam Turbine, which consists of a number of stages at different temperature and pressure levels:

- The superheated steam generated in the Superheater module of the SGS is led to the HP (High Pressure) stage of the Steam Turbine, where it expands - converting the thermal energy of the steam into mechanical energy in the rotor.
- The steam extracted from the HP stage of the Steam Turbine, at reduced temperature and pressure levels, is heated again in the Reheater module of the SGS and directed to the IP (Intermediate Pressure) and LP (Low Pressure) stages of the Steam Turbine, where it is further expanded generating additional mechanical energy in the rotor.

Air Cooled Condenser (ACC)

The steam extracted from the Steam Turbine and The By-Pass System shall be cooled down and condensed at the Air Cooled Condenser (ACC), which shall be designed to enable the operation of the power plant in the most adverse weather conditions, as defined for the Facility.

Auxiliary Systems and Facilities

A number of additional auxiliary systems and facilities will be required to commission and operate the power plant, amongst others:

- Auxiliary Cooling System
- Condensate System (LP Preheaters and Deaerator)
- Feed Water System (Feed water Pumps and Heaters)
- Raw Water system (including water pipeline and pumping station)
- Water Demineralization System
- Waste Water Treatment System
- Evaporation Ponds
- Instrument and Service Air System
- Sampling and Analysis System
- Chemical Dosing System
- Site Offices and Buildings
- HVAC
- Fire Fighting System

Control System

A Distributed Control System (DCS) based on SCADA architecture (Supervisory Control and Data Acquisition) will integrate the logic controllers of all the systems in the power plant, enabling a centralized operation of the power plant from the Control Room.

Electrical Systems

Amongst others, the following electrical systems and facilities shall be designed and constructed:

- Switchyard to be located in the Power Island including Transformers: One (1) Step-Up Transformer (11/132 kV) and Two (2) Auxiliary Transformers (11/6.9 kV)
- Underground line from the switchyard to the new Switching station (Azinza) to be built in the North-East of the site and out of the heliostat field boundaries (the Point of Interconnection)
- [132 kV OHTL (approx. length of 35 km) connecting Azinza Switching Station to the terminal point at the 132 kV Olien Substation (owned by Eskom)]
- [132 kV OHTL (approx. length of 15 km) connecting Azinza Switching Station to the terminal point at the 132 kV Karats Substation (owned by Eskom)]
- Medium Voltage (6.6 kV) and Low Voltage System (400 V)
- Switchgears (MV and LV) and MCC
- DC and UPS System
- Emergency Power Supply
- Lighting System
- Earthing and Lightning
- Communications and CCTV system

5. WEATHER CONDITIONS

The weather of the area where the works are located is dry and warm; the scarce rainfall concentrates between December and April. The area normally receives about 108 mm of rain per year.

6. HEALTH, SAFETY & ENVIRONMENTAL POLICY

ACCIONA is committed to the effective management of Health, Safety and Environment (HSE) matters as an integral part of its business.

Our goal is that our operations should cause no harm to employees or others, while minimizing damage to the local & global environment.

The company management has overall responsibility for HSE. The implementation of the HSE management system is delegated throughout our management organization, which is responsible for ensuring that adequate resources are made available in order to achieve the objectives of this policy. Every employee will support and be fully committed to its implementation.

Working together with our clients, ACCIONA is committed to achieving the highest standards of HSE through:

- Complying with or exceeding all applicable laws, regulations and codes of practice.
- The application of an integrated approach to HSE in design, planning, procurement, construction and commissioning, to achieve the objectives of maximizing the effectiveness of health & safety, and minimize adverse environmental impacts.
- Aiming to introduce improved processes, control systems, hardware, raw materials, construction and energy management systems and operating and maintenance procedures to continuously improve HSE performance.
- Providing all the necessary information, training and supervision to allow the work force to control of risks on health and safety, and minimise impact on the environment.
- Ensuring that every company on the construction site fulfil and maintain an HSE management system that meets Client requirements, and actively encourage suppliers to comply and maintain their own HSE policy.
- Establishing a healthy and safe working environment, both in the offices as on the construction sites, for all personnel.
- ACCIONA and its subcontractors shall establish, implement and maintain procedures for the ongoing hazard identification, risk assessment, and determination of necessary controls.
- Monitoring HSE performance and review the operating procedures as necessary, in order to achieve a continual improve. The Site HSE Manager shall report on the performance of the HSE management system to top management.
- ACCIONA shall ensure that safe working conditions are maintained and that all applicable regulations and HSE Project requirements are being complied with.
- Only the joint efforts of the Company, subcontractors, staff and labour workers will make it possible.

There follows a description of those policies to be applied during the execution of the project:

6.1. HSE Policy

HSE POLICY

During construction activities ACCIONA is working to achieve the following HSE objectives:

- *Zero injuries or fatalities to personnel*
- *Zero material or property loss*
- *Zero impact on the Environment*
- *An efficient Emergency Response Management System.*

To achieve the objectives in our HSE policy the following areas will be prioritized in all our construction activities.

- *The management will demonstrate its corporate responsibility and commitment to promote occupational HSE by preserving and developing human and physical resources.*
- *The management ensures the deployment of financial resources required to implement and promote the HSE policy on each new construction site.*
- *The management will actively demonstrate and promote the HSE policy through its daily work.*
- *HSE shall be considered in all decisions taken.*
- *All construction activities shall as a minimum meet the applicable national laws and local regulations.*
- *All employees shall receive the required training enabling them to do their work safely.*
- *Sub-contractors and suppliers shall be evaluated on their HSE performance and shall comply with our HSE policy. This is a part of the subcontract agreements.*
- *It is the responsibility of all employees to work within the objectives of our HSE policy.*

Project Director

6.2. Substance Abuse Policy

SUBSTANCE ABUSE POLICY

Policy statement

ACCIONA recognizes that an employee, who admits to alcohol or drug abuse dependence, should be offered support and a reasonable opportunity at rehabilitation. The organisation's policy is to support processes that will allow for rehabilitation, and to ensure a uniform and consistent approach to dealing with incapacity caused by substance abuse. It is also to provide guidelines for dealing with employees who are found to be under the influence of alcohol or drugs whilst performing their duties. It should be noted however that being under the influence of alcohol or drugs whilst performing duties is a serious disciplinary breach. The organisation cannot condone such breaches and, where dependence is not proved, the disciplinary procedure will be invoked.

It is strictly forbidden to bring alcoholic beverages (commercial and/or homemade), drugs and any kind of narcotic into the site. Prescribed medication is not included in this ban, but any person using prescribes medication must inform such condition to her/his direct supervisor as soon as possible in order to avoid or limit their assigned activities when required, especially when using or operating tools, plant, equipment and/or vehicles of any kind.

Definition

- *The types of substance referred to in substance abuse include alcohol, solvents, prescription drugs such as analgesics, cough syrups, diet preparations and stimulants, which may or may not be taken with direct medical supervision, as well as illicit drugs such as marijuana, cocaine, ecstasy, etc.*
- *For the purpose of this policy, workplace is deemed to include all organisation property, as well as any situation, inside or outside of normal working hours, where the employee*
- *is identified as part of, or acting as a representative of the organisation, e.g. off-site work functions, public relations functions, etc.*

General principles

- *The organization does not condone the use by any employee of illegal substances, including drugs and narcotics at any time.*
- *Any employee who is under the influence of alcohol or drugs at the workplace is a potential danger not only to him/herself, but also to fellow employees and clients of the organisation.*
- *The organization may assist an employee who is willing to accept diagnosis and/or co-operate with treatment procedures. Such assistance may include counselling and time off, within reasonable limits, for rehabilitation. The cost of the rehabilitation should be borne by the employee.*
- *An employee who is undergoing treatment for substance abuse, either through the employer's Employee Assistance Programme or through private programmes, shall not be exempt from normal disciplinary action arising out of any substance abuse*
- *Related offences, including being under the influence of alcohol or drugs whilst on duty, abusing sick leave or time-keeping abuses.*
- *Leave entitlement shall be in terms of the EAP Policy document.*

Guidelines/procedures for managing substance abuse

In the eventuality that management suspects that an employee may be under the influence or involved in taking drugs/alcohol at work, the following procedure will apply:

<u>Prohibit ongoing work</u>

If management or any member of staff is of the opinion that an employee has diminished responsibilities, and is failing to carry out daily duties as a result of being under the influence of drugs/alcohol whilst at work, the employee will be prohibited from continuing work.

Under no circumstances should the employee be allowed to perform his/her duties when under the influence of any intoxicating substance. Special precautions should be taken where employees drive vehicles, and operate machinery.

Indications of Debilitation and Related Procedures

Attempts must be made to establish the employee's (in) ability to perform his/her duties due to drug/alcohol influence and/or consumption at work.

The employee's physical appearance e.g. blood-shot eyes, slurred speech, unsteady on feet, smell of alcohol on breath and impaired co-ordination are all important indicators. Should the employee not give reasonable and acceptable explanation for these physical signs, it must be recorded and used as evidence in an enquiry.

The supervisor/manager needs to obtain a second opinion to support his/her perception that the employee appears to be under the influence of drugs/alcohol. The second opinion can come from a fellow employee.

Where management has breathalyser facilities, the employee should undergo the test. A shop steward or fellow employee should be present when such a testy is performed. The test is strictly compulsory.

Should an employee refuse to take a breathalyser test, he/she must give reasons for his/her refusal. He/she must be warned that an adverse inference could be drawn from the refusal. A medical examination may be arranged where blood and/or urine tests may be undertaken.

As a breathalyser is not able to record drug usage, a medical doctor's urine/blood tests may be required. If a doctor's test is not possible, the opinion of an independent observer regarding the employee' physical appearance may serve to inform management's suspicion of alcohol/drug influence.

Disciplinary procedures

Disciplinary procedures are followed when the employee's conduct and/or performance is unsatisfactorily due to substance abuse. Such conduct may include abuse of sick leave, time-keeping abuses, consuming or being under the influence of alcohol or drugs whilst on duty. It may also relate to the employee's failure to respond satisfactorily to the rehabilitation.

The employee will be given notice in terms of the Disciplinary Procedure to attend an enquiry where the alleged offence will be considered.

The enquiry may only take place once the employee is sober, i.e. the enquiry cannot take place immediately in the case of an employee who is being charged with being under the influence of alcohol or drugs.

In the event that an employee admits to substance dependency during the course of the disciplinary enquiry, the chairperson must take this into account in relation to the penalty imposed on the employee.

In the event that the penalty is not dismissed, the employee shall be referred to the EAP programme for treatment and rehabilitation.

Attendance at such a programme shall not exonerate the employee from further disciplinary action should similar offences arise during the period of treatment.

Incapacity procedures

Should an employee admit to a substance abuse problem during the course of counselling for incapacity/poor performance, the employee shall be referred to EAP for treatment and rehabilitation.

This treatment shall form part of the intervention in improving the employee's performance, and agreed performance targets and time frames shall be set for the employee.

Should the employee renege on the treatment programme or relapse into substance abuse at a later stage which impacts on his/her performance, he/she may face dismissal for incapacity

Project Director

6.3. Sexual Policy

SEXUAL HARASSMENT

Policy statement

All employees, job applicants and any other person who have dealings with the company have the right to be treated with respect and dignity. Sexual harassment will not be permitted or condoned and will be regarded as serious misconduct in terms of the disciplinary code of the employer. Employees or any other person who have been subjected to sexual harassment have the right to lodge a grievance or lay a formal complaint. The employer has an obligation to investigate the circumstances of each case and to take appropriate action, including disciplinary action in particular circumstances.

Policy objective

Sexual attention becomes sexual harassment if:

- *The behaviour is persistent, although a single incident of harassment can also constitute sexual harassment depending on the gravity of the incident.*
- *The recipient has made it clear that the behaviour is considered offensive.*
- *The perpetrator should have known that the behaviour is unacceptable*

Guidelines / process

Definition and scope of sexual harassment

Sexual harassment is defined as unwanted conduct of a sexual nature. The unwanted nature of sexual harassment distinguishes it from behaviour that is welcomed and with mutual consent.

Commitment by management

- *Management undertakes to deal with any allegations of sexual harassment speedily and without favour. Management will deal with the allegations in a confidential manner.*
- *Any person who brings allegations of sexual harassment to the attention of management will be protected against victimisation. Whilst management will act against anyone who commits acts of sexual harassment it will also protect employees against false accusations and the principles of the presumption of innocence rule will be applied to all cases.*
- *Subject to an investigation management may suspend employees on full pay but this is to be regarded as a precautionary measure only and does not in any way imply that the employee is guilty of any wrongdoing.*

Project Director

6.4. Environmental Policy

ENVIRONMENTAL POLICY

- *ACCIONA is fully committed to the protection of the environment throughout its on-going operations.*
- *The operation encompasses the construction of ACCIONA Solar Plant 100 MW.*
- *ACCIONA will manage the operations in compliance with the following standards:*
- *To comply with the rules, regulations and local governmental environmental laws and to adopt exacting standards in areas where laws and regulations do not exist.*

    - *To establish and comply with the National Environmental Management Act 107 of 1998 (NEMA)*
    - *To encourage individual awareness and respect for the environment through comprehensive training and instruction.*
    - *To control and reduce pollution emissions to below harmful levels, and to minimise the generation of wastes during the operation of the company marine units.*
    - *To establish and to comply with the Company procedures for the safe handling, storage and disposal of hazardous and waste materials.*
    - *To comply with the applicable sections of the following:*

        - *National Environmental Management Act 107 of 1998*
        - *National Water Act 36 of 1998*
        - *National Forest Act 84 of 1998*
        - *National Parks Act 1976*
        - *Atmospheric Pollution Prevention Act 45 of 1965*

    - *To ensure that emergency response procedures are developed, and complied with, in order to be able to respond in a timely manner to incidents that may result in harm to the environment.*
    - *To regularly review and evaluate the effectiveness of the Environmental Policy on a regular basis, or after any incident that resulted in harm, or potential harm to the environment.*
    - *The responsibility and necessary authority for the implementation of the Company Environmental Plan is assigned to the ACCIONA HSE Manager, who is directly responsible to the ACCIONA.*

Project Director

6.5. AIDS Policy

AIDS POLICY

ACCIONA recognizes its responsibility to provide a safe and healthful work environment for all its employees, whether employed directly or indirectly, to protect human rights and give moral support in the event of an Employee becoming, infected with Human Immunodefiency Virus (HIV) or Acquired Immune Deficiency Syndrome (AIDS).

ACCIONA therefore has the following policy with regards to HIV/AIDS.

- ACCIONA does not include, or require HIV/AIDS testing as a pre-employment screening, but encourages testing in the annual physical examination on a voluntary and confidential basis.
- ACCIONA treats all Employees, whether infected with HIV/AIDS or not, in an equal and non-discriminatory manner. This includes job application, selection, hiring, advancement, discharge, training or other condition and privileges of employment.
- ACCIONA allows Employees infected with HIV/AIDS to continue working provided he/she complies with the Company's accepted work performance standards, and medical authorities indicate that he/she condition and presence at work does not threaten themselves or other employees.
- ACCIONA undertakes to create a positive, supportive work environment for its Employees infected with HIV/AIDS, and will maintain a flexible and reasonable attitude to employment condition, unless it may impose an undue hardship on the business or operations. In the case that Employee is per doctor's order unable to work, it may consider terminating the employment in accordance with ACCIONA rules and procedures, and as per Labour Laws.
- ACCIONA keeps all medical information, medical records or related information in absolute confidence, and will request its sub-contractors to do so. An employee infected with HIV/AIDS is not required to inform ACCIONA, except at his/her own discretion.
- ACCIONA undertake to provide education, training, orientation and information for all Employees in order to equip them with the knowledge, understanding, right attitude and awareness of HIV/AIDS problems including the encouragement for Employees to contribute to an HIV/AIDS programme.
- ACCIONA provides consultation, information and help through the Human Resources/ Personnel Department to give understanding of the illness, or recommends appropriate organisations that provide such services.

Project Director

6.6. Weapons policy

These rules must be highlighted during the induction training.

Except for army forces, police and other authorities, security and protection authorized personnel (when these last are deemed necessary) weapons of any kind are not allowed inside the site including all accessory areas (office, laydown, warehouses, parking areas, mess halls, compounds, etc.).

Any person identified carrying a weapon will be immediately expelled from the site and reported to local authority, regardless of her/his position or role.

Examples of weapons are:

- Firearms or shooting weapons, regardless of the caliber or the action system (powder, compressed air, nitrogen, pumping systems, etc.), including sports/recreation weapons (hunting, paintball, airsoft, etc.)
- Bows/arrows and any throwing/launching device
- Any kind of defensive gas.
- Knives, blades, and any cutting/perforating device when it is not specifically designed for a working purpose. Multipurpose tools and similar working devices are allowed as long as they are carried inside a visible holster.
- Electric shock devices (such as Taser shock guns, electric sticks and similar devices)
- Sticks, bludgeons, extensible canes and any other kind of personnel control device.
- Ironfists (boxer fists) or any kind of handheld aggression device

Security checks will be implemented in order to detect any weapon, so all personnel carrying a bag, backpack or any kind of self-carrying device must go through an inspection procedure every time they enter the site.

It is possible to use powder-powered tools or devices to perform work (clad welding, riveting, nailing, etc.) although alternate methods shall be considered first option instead. Where these are necessary, the contractor shall provide a list of items and tools including type, quantity, weight, purpose and authorized personnel 20 days before entering these into the site. All these items must be stored within a secure and locked area that could be inspected at any moment.

6.7. Smoking policy

Every contractor shall adhere to the following rules (these must be highlighted during the induction training):

- Smoking is not allowed within the construction site, except for designated areas. Any person identified smoking outside these areas will receive a 3 day suspension.
- Smoking areas:
  - These areas must be properly signposted, have an ashtray and a fire extinguisher or some other mean of controlling fire.
  - Must be set at least 10 meters from any access of any occupied building in which they may smoke (if this does not contravene the client site rules, or specific legal requirements state different).
  - Must not be located in the proximity of any system which stores or transports flammable substance

- Must be regularly checked and cleaned to help prevent the fire hazard

Additional information should be given to personnel regarding the effects of smoking on health.

6.8. Bullying and harassment

ACCIONA considers bullying to be absolutely intolerable and, as such, both shall be immediately reported to ACCIONA. Disciplinary action will be taken against any person found guilty of bullying or harassment. Bullying/harassment behavior will only be defined as bullying if a "reasonable person" observing the situation would consider it to be bullying. The reasonable person is defined as an objective third party.

Every contractor shall support and enhance non-bullying and non-harassment environments and any focused effort as well.

Instances of workplace bullying have the deliberate intent of causing physical and psychological distress to others and can include behavior that intimidates, offends, degrades or humiliates a worker, possibly in front of co-workers, clients or customers.

It might include one or a number of the following behaviors:

- Any form of racism or segregation regarding race, religion, physical condition, sexual preferences, wealth and any other circumstance
- Manipulation
- Intimidation
- Belittling remarks
- Unreasonable persistent criticism which is not part of a managing performance process
- Loud and aggressive attacks or more subtle intimidation such as constant criticism of a trivial nature
- Verbal and physical abuse, for example, shouting and throwing objects
- Isolation from colleagues
- Refusing to delegate or the withholding of information employees need to perform their job
- Removing responsibility and/or imposing menial tasks

These behaviors are not considered bullying:

- Occasional differences of opinion, and non-aggressive conflicts and/or problems in working relations.
- Workplace counselling, managing under performance and other action in accordance with site policy and procedures.

These policies shall be updated whenever the initial circumstances which gave rise to them change in accordance with technical developments and amendments in the applicable regulations. For the review of such policies, the results of the audits to be carried out, both internal and external, will be taken into account so as to verify compliance with the same.

7. MANAGEMENT SYSTEM

7.1. General Requirements

The management of HSE issues shall be based on the following:

- Meeting the requirements of ISO 14001:2004 and OHSAS 18001:2007.
- Ensuring that the requirements of the contract are met.
- Contractor´s HSE Policy.
- HSE issues must be integrated in all business areas.
- All incidents can be prevented. We are all responsible for our own safety and that of others. If we witness at risk acts or conditions we must act. Safe behaviour must be promoted & rewarded in order to continuously improve working conditions.
- Establishing performance standards to eliminate or minimize risks to the Health Safety & Environment, resulting from the work to be done.

ACCIONA shall ensure that:

- Before carrying out that work, notify the provincial director in writing of the construction work if it includes:
  - the demolition of a structure exceeding a height of 3 metres; or
  - the use of explosives to perform construction work; or
  - the dismantling of fixed plant at a height greater than 3m.

- before carrying out that work, notify the provincial director in writing when the construction work
  - exceeds 30 days or will involve more than 300 person days of construction work;
  - and includes excavation work deeper than 1m; or
  - includes working at a height greater than 3 metres above ground or a landing.

- The Project's HSE Policy, Objectives and Plan must be communicated to everyone.
- HSE risks associated to our activities must be understood and managed effectively.
- Workers must be competent to carry out their designated work.
- to provide any subcontractor who is making a bid or appointed to perform construction work, with the relevant sections of the documented health and safety specification.
- Subcontractors will be required to approve the relevant environmental and health and safety plans, which must be reviewed and approved by the Contractor before the activities start.
- They must have in place a suitable and sufficiently documented health and safety plan, based on the client's documented health and safety specification.
- The effectiveness of the HSE Management System, compliance with expectations, Legal and contractual requirements, must be assessed and measured and opportunities for improvement shall be identified and implemented.
- Conduction of internal audits so as to identify any possible deviations of the Management System, detect improvement opportunities and carry out the appropriate follow-up of the results from previous audits.
- Corrective and preventive actions must be implemented.
- HSE shall not be compromised in order to achieve any objective.
- Our performance must be openly reported.

7.2. Project Specific HSE Goals

The main HSE goal of the Project is the prevention of accidents or incidents, unwanted spills, discharges or emissions of materials hazardous to the environment, damage to property, the minimization of the consequences of any potential incident by means of an Emergency Response Plan, and the establishment, implementation and coordination of an effective HSE Management System.

The proposed objective is that there are no incidents. This applies to both the construction site as a whole and the contractors' village.

To achieve this, every collaborator on the project is expected to report near-misses and at risk conditions or behaviour. The aim of this is to be able to implement corrective action and anticipate the behaviour of those carrying out the work, before an event occurs.

In addition, each intervening party is expected to take the time to familiarise themselves with the risks in advance and to keep these risks to a minimum. This must be borne in mind during each phase of the project.

To this end, each party involved must, among other things:

- Follow the health, safety and environment regulations.
- Work defensively.
- Intervene if an at risk operation is noticed.

7.3. Legal and Other Requirements

When HSE regulations differ from the levels and measures presented in other HSE requirements, it is expected to achieve whichever is the more stringent.

7.3.1. HSE Owner´s Requirements

- Health and Safety Specification

7.3.2. National Requirements

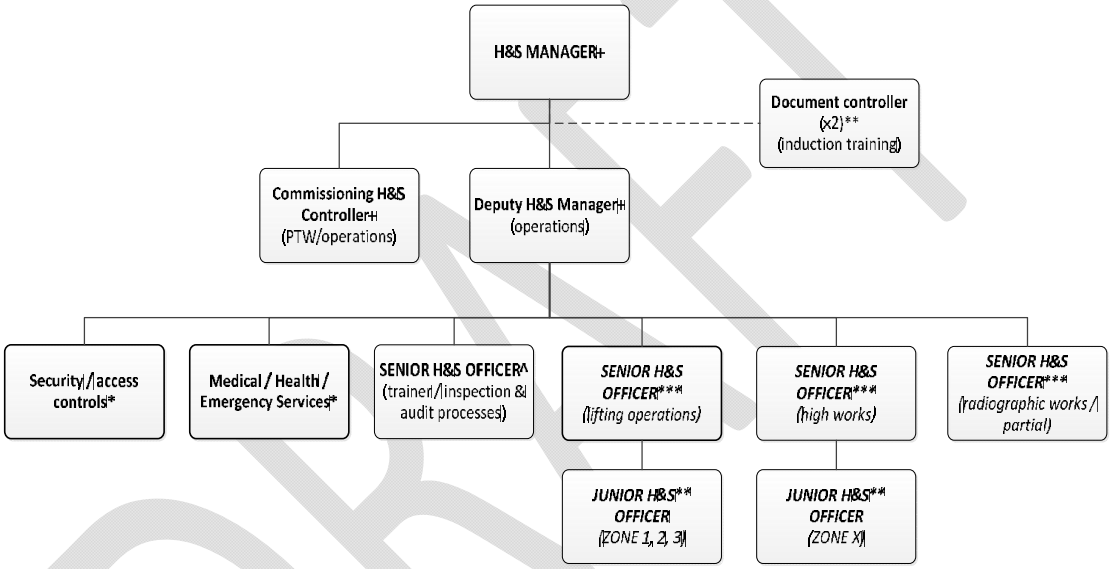
Each intervening party is entirely responsible for complying with all regulations that apply to its activities or intervention, in particular:

- Occupational Health and Safety Act Nº. 85 of 1993,
- Construction Regulations Nº RG. 10113 of 7 Feb 2014
- General Safety Regulations, Nº R1031 dated 30 May 1986.
- Requirements of the Driven Machinery Regulations, Nº R295 dated 26 February 1988.
- Electrical Installations Regulations Nº R2920 dated 23 October 1992.
- Electrical Machinery Regulations, Nº R1593 dated 12 August 1988.
- Environmental Regulations for Workplaces, Nº R2281 dated 16 October 1987
- Facilities Regulations, Nº R2362 dated 5 October 1990.
- Explosive Regulations GNR.109 of January 2003.
- Noise Induced Hearing Regulations Nº GNR.307 of March 2003.
- Pressure Equipment Regulations Nº GNR.734 of 15 July 2009.
- Regulations Concerning The Certificate Of Competency Nº GNR.533 of 16 March 1990.
- Hazardous Chemical Substances Regulations Nº GNR.1179 of 25 August 1995.
- National forest Act No. 84 of 1998
- National Heritage Resources Act No. 25 of 1999

- National Road Traffic Act 1996 (as Amended by the national Traffic Amendment Act 2003)
- National Water Act No 36 of 1998 (as amended by the National Water amendment Act 45 of 1999)
- Water services Act No. 108 (as Amended by the Water Service amendment Act. No 63 of 2008)
- Compensation for Occupational Disease Act No. 130 of 1993 (COID)
- South African Council for the project and Construction Management Professions act No 45 of 2008.
- Basic Conditions of Employment Act of 1997

7.4. Roles, Duties & Responsibilities

Organization chart



Managers and supervisors are responsible for providing assurance that their work units are following the HSE Plan.

Site management team will exhibit HSE management behaviours as detailed below:

- Line Management is responsible for confirming that each person for whom they are responsible attends HSE orientation training and complies with the requirements of this document and any other HSE procedure.
- Demonstrate commitment and leadership through active participation and the clear communication of expectations.
- Demonstrate that HSE is a core value and establish a work environment that facilitates active caring for individuals.
- Establish a work environment which fosters a team approach and embrace mutual respect, open and honest communication, and collaboration.
- Provide appropriate resources for effective HSE management.
- Positively influence subcontractors and their programs so they may progress toward an incident free workplace.
- Establish a work environment which engages workers and sets an expectation for seeking out and implementing safety solutions.

- Use a structured management of change process which focuses on recognizing and adapting to changes in plans, processes, procedures, and the work environment.
- Reinforce desirable behaviours and celebrate accomplishments.
- Facilitate organizational knowledge and growth through the capture and implementation of lessons learned and best practices.
- Comply with local regulations and utilize Company, industry, and/or reasonable standards where such regulations do not exist.
- Clearly communicate the expected arrival on site of any new or existing service providers or sub-contractors to the HSE Department.
- Ensure that every new service provider or sub-contractor, submits a complete Safety File and all necessary documentation to the HSE Department for vetting and acceptance one week prior to the service provider or sub-contractors arrival for performance of contractual work duties.

Role	HSE Responsibilities
Project Manager	▪ The Project Manager is ultimately responsible for compliance with all health, safety and environmental (HSE) requirements. ▪ Approves the HSE Plan and all upgrades. ▪ Visibly supports key HSE work processes. ▪ Endorses and actively supports the HSE Plan. ▪ Understands the requirements and objectives of the HSE Plan. ▪ Ensure resources (personnel and financial) are provided to prepare and implement the HSE Plan. ▪ Facilitate proactive communication between all role-players in the interest of effective HSE management. ▪ Implement temporary work stoppages where serious HSE infringements and noncompliance occur. ▪ Enforce compliance with HSE Plan and all legal regulations. ▪ Ensure all employees undergo HSE training. ▪ Employ a dedicated and experienced HSE Manager at all times on site.
Project HSE Manager	▪ Provides HSE management support to the Project Management Team and to the subcontractors Management Teams. ▪ Coaches and facilitates the safety processes. ▪ Ensures that HSE requirements are communicated throughout the organization and effectively implemented. ▪ Provides periodic feedback to Construction & HSE Corporate Functional Management. ▪ Reports HSE performance to the Project Team. ▪ Supports development, implementation, monitoring, verification, and approval of each subcontractor's construction HSE Management Systems and Site HSE Plans, if and as applicable. ▪ Performs periodic construction inspections and monitoring activities. ▪ Investigates at risk conditions or behaviours or safety queries raised by Site team and tracks them through to closure. ▪ Assists with incident investigations. ▪ Participates in Site HSE activities as required. ▪ Supports capture and implementation of lessons learned and best practices. ▪ HSE Team has sufficient authority, access to work areas, and organizational freedom, to identify HSE problems, initiate, recommend or provide solutions, and verify the implementation of the solutions. ▪ Monitoring waste management and maintaining and filing the documentation relating to its management.

Role	HSE Responsibilities
	▪ Exercise line accountability for HSE at the site. ▪ Communicate HSE expectations and desired results to project personnel. ▪ Support development, implementation, monitoring, verification, and closeout of the HSE Plan. ▪ Lead Kick-off Meetings and Alignment Sessions with subcontractors. ▪ Allocate sufficient resources to ensure compliance and effectiveness of HSE Plan. ▪ Ensure subcontractors have a copy of the HSE Plan and are aware of their HSE obligations. ▪ Verify subcontractors HSE performance. ▪ Ensure HSE training is undertaken. ▪ Maintain document registers for training, incidents, waste management and other related HSE reporting requirements. ▪ Enforce environmental measures on lower levels. ▪ Ensure compliance with HSE Plan directly on site. ▪ Communicate HSE aspects with the HSE Manager and lower level management and personnel. ▪ Report all incidents and non-compliance to the HSE team. ▪ Support lessons learned and best practices processes. ▪ Ensure development of a Site Emergency Response Plan.
HS Officer	▪ Inspect the work and compliance with the HSE requirements. ▪ Stop the work if in his/her opinion, equipment, tools and/or working methods themselves or the method of performance involve unacceptable risks for persons, equipment or environment. ▪ The work may then only be resumed once the ACCIONA or subcontractor has proven it is possible to work in safe conditions. ▪ To take the necessary measures relating to health, safety and the environment, if the ACCIONA or subcontractor in question fails to properly satisfy its obligations. ▪ To remove from site any and each person who fails to comply with the HSE Plan and safety regulations, endangers other persons or is under the influence of alcohol or other narcotic substances, and refuse them access to the construction site. ▪ Perform internal as well as sub-contractor audits. ▪ To do site inspections and report writing, including close-outs reports. Maintain document registers for training, incidents, waste management and other related HSE reporting requirements. ▪ Enforce environmental measures on lower levels. ▪ Ensure compliance with HSE Plan directly on site. ▪ Communicate HSE aspects with the HSE Manager and lower level management and personnel. ▪ Report all incidents and non-compliance to the HSE team. ▪ Support lessons learned and best practices processes. ▪ Ensure development of a Site Emergency Response Plan.
Subcontractors	▪ Implement the requirements of the HSE Plan. ▪ Ensure necessary documentation for the induction of personnel or vehicles as per the HSE Plan requirements. Allocate the necessary resources to ensure compliance and effectiveness of the HSE Plan. ▪ To supply and maintain a Project Safety File for the duration of the contract and to return this file to the ACCIONA EPC HSE Department after said contract completion. ▪ Cooperate with the HSE team to ensure that site inspections, audits and training is conducted. ▪ Comply with the observations and requirements for corrective

Role	HSE Responsibilities
	actions, which are issued by the inspectors. ▪ Report all incidents and non-compliance to Site manager/ HSE Manager. ▪ Notify the Construction Manager or the Site Manager of any change in the program, construction method that may affect the control of risks and the ability to comply with the HSE Plan and regulations. ▪ Maintain a register of incidents and waste management for future audits. ▪ Maintain a register of complaints and correction actions. ▪ Supply any and all documentation required by the ACCIONA ACCIONA as regards any HSSE matters.
Construction Supervisor	▪ Makes daily safety observations of the work area and corrects unsafe behavior and reinforces safe behavior ▪ Arranges for development of Job Safe Analyses (JSA) ▪ Develops a workable housekeeping program ▪ Ensures the introduction of new employees ▪ Develops protective clothing requirements, according to occupation; and makes field spot checks to determine compliance ▪ Reports all injuries or illness of employees to HSE manager, prepares accident and incident reports together with the HSE Manager ▪ Participates in investigation of all accident and serious incidents ▪ Initiates corrective actions after incidents and accidents ▪ Conducts scheduled and assigned HSE training ▪ Reviews unsafe conditions and unsafe behavior and directs daily HSE activities to correct these causes ▪ Makes daily inspections of assigned work areas and takes immediate steps to correct unsafe or unsatisfactory conditions; reports to department manager those conditions which cannot be immediately corrected; instructs employees on housekeeping standards ▪ Enforces that all employees are competent and have received the required training or hold certificates to perform duties ▪ Enforces wearing of Personnel Protective Equipment (PPE) ▪ Sees to it, in case of serious injury, that injured employee receive prompt medical attention, isolates area or shuts down equipment, as necessary; and immediately reports to the Project manager and HSE manager ▪ Instructs personally or provides on-the-job instruction in HSE and efficient performance of assigned jobs ▪ Makes daily toolbox meeting instructing employees in HSE rules and regulations; records instruction
Workers	▪ Each individual is responsible to attend and to constructively participate in the HSE orientation and complying with the requirements of this document and any other HSE procedures. ▪ To perform his or her duties to the best of his or her ability in the safest manner possible, complying with the Site HSE Plan. ▪ In case of any incident or breach, the worker must report it immediately to the foreman.
Service Providers	▪ All service providers will report to the ACCIONA EPC HSE Department and receive a Service Provider ID Card before proceeding to site. All service providers must comply with the HSE Plan, must receive an induction before entering the site and must comply with the instructions given by site staff. ▪ Are not allowed to perform any other work except that which they

Role	HSE Responsibilities
	have been contracted to do while on site and to be accompanied contact person from within the Site, Contractor or sub-contractors. ▪ Sub-contractors will be guided from the HSE department to the site of work and then guided back to HSE office on completion of work. The Service Provider ID Card must be returned to the ACCIONA EPC HSE Department.
Visitors	▪ All visitors will report to the ACCIONA EPC HSE Department and receive a Visitor ID Card before proceeding to site. All visitors must comply with the HSE Plan, must receive an induction before entering the site and must comply with the instructions given by site staff. ▪ Are not allowed to perform any work while on site and to be accompanied contact person from within the Site, Contractor or sub-contractors. The Visitor ID Card must be returned to the ACCIONA EPC HSE Department.

7.4.1. Main responsibilities of contractors

- Every contractor must ensure a strict following to the specifications provided to control all identified hazards in order to ensure proper risk management in all areas under their responsibility.
- Contractors' project management, site supervisors and safety management team are the main responsible people regarding the safe execution of any activity under their scope. They must:
  - Ensure all activities are performed under an approved method statement
  - Ensure all activities are planned, scheduled and performed under an authorized working permit.
  - Follow and ensure proper following of any HSE control or preventive measure.
  - Provide training and support any communication and/or training strategy related to HSE management.

- Every member of the contractor´s technical/supervision staff (supervisors, foremen, etc.) is responsible to manage every work under her/his responsibility according to the rules and procedures set within this document and/or any other document related to HSE management. At the same time, they have the responsibility and duty to stop, suspend or delay the start of any activity when conditions are not proper to ensure a safe performance, or when they have changed in such way that the established control measures are not or could not be enough for the newly identified risks
- All personnel: They are the main responsible people regarding their own safety, and the other's safety. To ensure this, they must strictly follow all the health and safety instructions and specifications in order to ensure protect their integrity and health.. For each specific case, please refer to the EHS master plan.
- Non-qualified people (visitors, inspectors, consultants and any other person not directly linked to a project as "regular staff"): They must follow every procedure and/or instruction related to H&S management under any circumstances.

7.5. Method statements, Hazard Identification, Risk Assessment and Determining Controls

ACCIONA & the subcontractors must develop Method Statements for every new task to be performed. These Method Statements will detail all the steps necessary to perform each task, highlighting tools, staff involved, materials to be used and any other special procedures needed to perform the task. All Method Statements will be reviewed by the ACCIONA ACCIONA for approval before work commences.

ACCIONA & the subcontractors must use the Method Statements work steps to identify hazards capable of adversely affecting the health and safety of persons or damage to property or to the environment and adequate mitigation measures to be implemented to reduce these risks. These Risk Assessments must be reviewed regularly to determine the efficiency of the assessment and if deficiencies are detected, the correct controls and mitigations are to be applied and implemented. This must not be a paper exercise. All Risk Assessments will be reviewed by the ACCIONA ACCIONA for approval before work commences.

When determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy:

- Elimination
- Substitution
- Engineering controls
- Signage/warnings and/or administrative controls
- Personal protective equipment (PPE).

Risk shall be evaluated taking into account the probability of accidents occurring and the severity of injuries in the case of potential accidents.

Risk assessments shall be reviewed whenever new activities start in any workshop or construction site or when working methods change or when a new risk is detected by regular safety inspection, etc.

Risk assessments shall be planned, carried out and used as a tool for preventing harmful effects on people, the environment or material assets.

Even if it is not possible to eliminate all risks connected with the scope of work, risk-reducing measures shall whenever possible follow up the assessments.

Each Risk Assessment will have a Risk Assessment Matrix through which a numeric value is obtained, denoting the RAM Score. The Risk Assessment format will be a minimum requirement as it is indicated in point 8.1 Qualitative risk ranking. Risk Assessments to have attached a Risk Assessment Register for all workers performing the task listed in the assessment. This register must be filed in the Safety File.

For the risk assessment will be used form *001_JOB SAFETY ANALYSIS WORKSHEET*

7.5.1. Method statements (MS) review/acceptance

Every MS will be requested to be delivered by each contractor within a reasonable period of time before their arrival so the site, and will be reviewed by all interested parties in ACCIONA (normally the discipline manager, the work supervisor and H&S department, although any other group or person could be included in the process when necessary). Once all involved parties have agreed and satisfied with the contents (technical and H&S related) the MS will be accepted as "good to proceed".

Every MS must include the following as basic contents:

- Cover sheet including the signatures of the author, at least one reviser and one approver. There should be space for revisions control with dates stated on them as necessary.
- An index and a general summary of the activity
- A "terms of reference/abbreviations" section

- A description of the full process, including all technical information / method statements / programme.
- A description of the vehicles, vessels, plant, machinery, tools and any other equipment to be used during the activity
- A complete risk assessment using a comprehensive methodology, covering every stage of the process.
- A section containing all the safety measures to be implemented in order to control all the identified hazards/risks (this section must not include PPE)
- A list of the PPE to be used
- An emergency response section –as applicable- including any specific procedure (s) to be followed by all those involved in the activity.
- Any documentation regarding personnel qualifications, certifications, inspection certificates, third party inspection registers, and any document covering the technical and performance certifications required for all personnel and equipment (including power generation, electrical, pneumatic and mechanical tools) necessary to perform the activity in the safest possible way.

For references and additional information please see Procedure 035_Review and Approval of Method Statements.

7.5.2. Interface management

Given the fact that two or more jobs being performed within the same area at the same time will affect each other in different ways and could generate hazardous situations, interfaces are a major concern. Hence, an Interface Management Process (IMP) will be set in place to ensure that every identified interface is properly assessed and managed. The main goal of this is to prevent the accumulation of hazards within the same area or system via the analysis of each work (scheduled or unscheduled) against the other activities going on in order to assign priority and relevance to each one, then taking proper decisions about coordination and planning.

Interface management is based on the following elements:

- Previous available information (method statements)
- Interface identification, assessment and classification resulting from the established planning
- Permit To Work management (including LMRA)
- Planning, assignment of adequate resources and preparation of each activity
- Specific controls, as required

According to these, each interface will be classified according to its level of relevance and the required actions. As a general rule, two types of interfaces have been set in order to grant an effective planning and a safe execution.

- **Type A:** There is no possibility to perform simultaneous activities (SIMOPS), so decisions shall be taken to suspend or cancel one or more activities according to specific requirements.
- **Type B:** It is possible to perform SIMOPS, as long as it is possible to set arrangements to avoid affectation between activities, even if they belong to different disciplines (packages).

For references and additional information please see Procedure 009_Interface Management

7.5.3. Energy management

Energy is a primary resource in every project. Due to this, and regarding the regular hazards associated with energy in every stage of the project, an energy management procedure will be set in order to ensure proper decisions are taken for all activities in which energy is or could be present –even when working close to a source of energy- must be conveniently assessed in order to set any control measures considered relevant to grant the job is performed under the safest possible conditions.

Energy management is (and shall be) applicable under the following circumstances

Stage	Conditions
Construction / installation	▪ When working on any equipment set to provide temporary power services before systems are operational (service/maintenance on generators, electrical panels, hydraulic/water pumps, and other temporary equipment) ▪ When testing or pre-commissioning activities are to be performed, regardless of the power source (temporary/permanent)
Commissioning	▪ When activities are to be performed on a system or equipment that has been already transferred to commissioning group (hence considered "live equipment" regardless of its status) ▪ When any equipment must be tested, repaired or otherwise manipulated when it remains under control of the commissioning group. ▪ Any equipment is energized on permanent basis as part of its normal function before being transferred to O&M.
Operations and maintenance	▪ When work is required on any equipment under responsibility of O&M group for repairs or regular maintenance / services operations.

The energy management sequence is based on 5 steps:

- **Assess the job:** The competent personnel must identify the circuit or system to be worked on (or near), and the work to be done.
- **Decide the system status:** MS must be reviewed before any work is started in order to have sufficient information to the competent personnel, so she/he is able to decide if the work will be performed in "dead" or "live" mode.
- **Plan and prepare the job:** Once a decision has been taken about the mode to work on, a Last Minute Risk Assessment (LMRA) is mandatory in order to identify the current conditions and any external factors that affect or could affect the work, so control measures can be identified and set in anticipation.
- **Start the job:**
  - Working on dead systems: Standard procedures will be implemented in order to ensure the circuit/system to be worked on is safe including procedures for secure isolation of the circuit/system, isolation testing and earthing when necessary.
  - Working on live systems: Standard procedures and great efforts must be implemented to ensure:
    - That every suitable measure and precaution is taken, including the use of PPE and collective protective equipment,

- That the working area and the working conditions are as good as reasonably possible (space, lighting, access/egress, etc.), and that access is restricted to anyone not directly related to the work and
- When deemed necessary, ensure that accompaniment is provided (accompaniment should be considered as a "regular" measure when working on live circuits/systems)

- **End of job**: Provisions and procedures must be implemented in order to ensure that the circuit/system is left in safe condition after the work is finished

For references and additional information please see Procedure 034_Control Of Hazardous Energy

7.6. Competence, training and awareness

Trainning is essential within the HSE programme, not only to satisfy legal requirements but also to communicate the requirements of the programme to all levels employees. Total success can only be achieved by participations of all parties, to develop this participation by individuals they must be made aware of the groups and their own responsibilities and accountabilities.

The induction training is focused on making every person aware of the relevance of following all HSE rules within the site, and must enhance the fact that safety is everyone`s responsibility, thus everyone is responsible for her/his own and others´safety while being in the site -including the office area and any other facility not related to the construction site.

Every person entering the project will go through induction training as a primary requisite to gain access. Every contractor shall implement and follow the local induction procedure as it is implemented. HSE induction is mandatory for every person before access is authorized for each individual, according to her/his job assignment, or the activities to be performed at site including visitors and other personnel not authorized to work within the site (a specific "short induction training" is available for visitors and other "non authorized to work" personnel).

Induction –including the access authorization process- would last up to 3 days, and never less than one, according to the project requirements, and shall be delivered in all the appropriate languages to ensure the workforce is properly aware of all applicable HSE requirements, rules and procedures.

A test will be conducted individually to ensure every person has understood every aspect of the induction training, according to her/his specific activities –including visitors- before issuing an access card. Failure to pass the test will imply the denial of the access pass, thus the person will not be allowed to enter the project until induction training is attended a second time, and the test is successfully passed. No person will be allowed to go through the safety induction more than twice within the same month.

The induction training must emphasize the commitment of the Owner and the Contractor to health and safety. Its contents are normally the following:

- How the site health and safety policy works and the roles people play.
- Site security & fire surveillance
- Access controls (including visitors management)
- Internal safety rules
- Any legal duties on individuals to ensure a safe workplace.

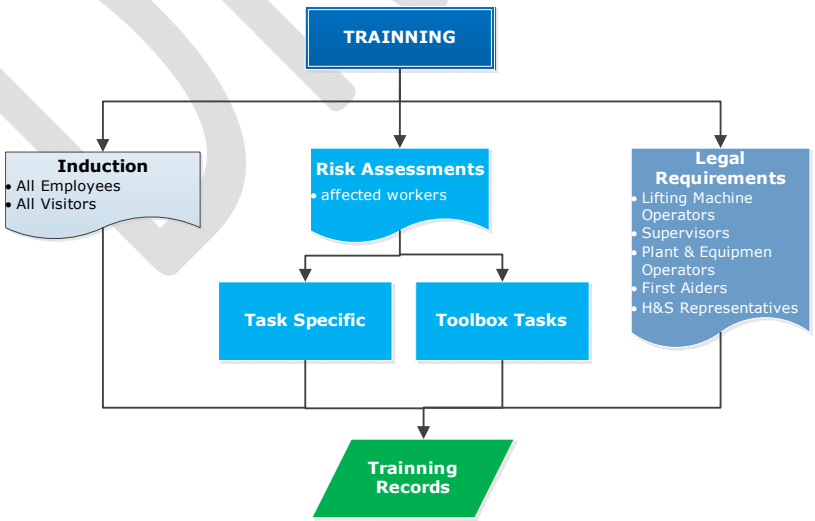
- An explanation of the importance of site induction training, as all sites are different and have a wide range of hazards, which will change as the site develops.
- Transportation, traffic management and control of site vehicles
- Safety signposting and area management
- Housekeeping an site planning
- Site specific information is included as follows:
    - Specific hazardous works
    - Emergency situations and actions -including site evacuation- first aid / firefighting teams and the means to contact them.
    - Medical services, occupational health and medical emergency response organization including first aid previsions.
    - Temporary firefighting equipment/systems, their location and operation procedure
    - Accident and/or incident reporting procedures.
    - Health and safety awards.
    - Welfare facilities, as required.
    - General descriptions of method statements, interface management, PTW procedures, LMRA (Last Minute Risk Assessment), HAZMAT/COSHH management, energy management –including LO/TO application and commissioning controls.

- The induction training should also cover all subjects from the Contractor Health and Safety Plan that are relevant to the person/group being trained.

Induction training must be performed on all new employees at the start of a project and re-induction of all existing employees every 12 months.

All visitors must attend induction training the first time they visit the project whereupon they will be issued with proof induction, which will be valid for a year. The visitors must produce proof of induction before entering onto the project.

From the findings of the risk assessments, further training must be identified and a plan of action devised to complete this training.



All personnel working on the site shall be competent to carry out the works and activities that they have been employed to perform. Since training is considered to be the basis of all the HSE strategy. For this reason, all contractors shall prepare, implement and monitor a project-specific training programme in addition to the induction training.

Managers, technical staff, supervisors and foremen must ensure that all personnel selected for a job are suitably competent to carry on the work before it starts. Competence means that people has the knowledge, training and experience to "be able to do the job", so it includes knowing the limits of competence, so any work requested outside of the worker's competence shall be refused by her/him.

Specific operations, identified and set by each contractor in the training plan will be carried out only by properly trained/qualified personnel, as required. Such programme must cover all aspects of the works to be performed by the contractor, ensuring the following:

- The level must be adequate to the nature, scope and complexity of the activities / works to be performed.
- The contents of the training sessions must include not only theory, but a relevant percentage of practical training.
- All training must be properly documented in terms of didactic materials, records and qualifications.
- External training must be certified or acknowledged by a relevant organization (government or other local authorities, certification/verification body, chartered consultant, etc.).
- The contractor shall establish processes for proper record management, including checking that all personnel is competent enough to carry on with their assigned activities/duties including tools, plant, equipment. Consideration must be given to operation of tools, plant and other equipment to be used. All records and registers – including certificates, attendance lists and any other form of evidence) must be kept properly updated and readily available for inspection/revision by ACCIONA and/or the client.

The following activities require specifically trained/qualified/certified personnel (contractors must set a register of authorized personnel, and keep it properly updated as needed):

- Interface management
- PTW management process (including LO/TO and energy management procedures)
- Lifting operations, rigging and load management
- Scaffolding management, including erection, modification and dismantling
- Performing works on electrical circuits.
- Confined spaces management, including monitor and management of atmospheric hazards
- Performing inspections, such as (this list is not limitative):
    - Vehicles, plant and equipment
    - Cranes and other lifting equipment
    - Ladders and similar auxiliary elements
    - Excavation and trenches
    - Warehouses and laydown areas
    - Life lines, static life lines and other collective protection (fall protection) systems
    - Harnesses, lanyards and fall arrestors
    - Scaffolding

Additionally, the following aspects shall be considered:

- Every contractor shall be responsible for ensuring that all its personnel and the sub-contractors' receive a high standard of health and safety training throughout each phase of the contract, and must keep records of such training.
- Awareness training shall be provided to all personnel during mobilization and immediately before the start of each significant construction and commissioning activity.
- Specific training will be carried out as may be necessary to compliment the work activities.
- High risk works shall not be carried out by lone workers. Lone workers shall be competent to undertake the work and circumstances where this considered necessary.

ACCIONA shall set up a suitable Training Programme for the Project that will cover all activities and subcontractors.

For references and additional information please see Procedures 002_Induction, 003_Trainning

7.6.1. Competence Assessment

ACCIONA ensure that staff and labour workers under their control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any works commences.

The subcontractors must submit the applicable associated records in advance, so ACCIONA shall be able to perform a competence assessment of the personnel. Sub-contractor maybe required to attend an interview process if there is doubt or question of sub-contractor competencies/ qualifications.

7.6.2. HSE Induction Program

All staff and labour working onsite will be required to attend a HSE awareness and training program prior to commencing work, (obligatory training) This induction will include an assessment upon its completion. Registers will be kept. Request for induction to be submitted 24 hours prior to date that induction is required.

All required documentation must be submitted with the application for an access badge. See *Procedure 003_Access Control*

Each person, before starting their activities on site, has to attend a HSE Induction, which shall be repeated every 6 months or when required. Personnel away from site more than 3 weeks to undergo a refresher induction before returning to duties on site.

After attending this briefing, it is recommended that the worker pass a test, to be able to carry out any work.

After passing the test, a sticker will be affixed to the safety helmet of the worker, showing the training day. Registers will be kept of these inductions.

Briefing Contents:

- HSE Policy.
- Site Operation.

- Requirements.
- HSE Plan.
- Heat Stress
- Poisons insects and animals
- Working methods on site.
- Incident notification, investigation and reporting.
- Emergency procedure.
- Permit to work system.
- Confined spaces.
- Scaffolding tag system.
- Electricity.
- LOTO – Lock-Out-Tag-Out System.
- Basting.
- Disciplinary procedures.
- Dealing with and handling hazardous and non-hazardous wastes.

For references and additional information please see Procedure 002_Induction

7.6.3. HSE On-Going Training

ACCIONA and its subcontractor shall provide continue HSE training for the workers under its control, so they know how to carry out new tasks, meeting the necessary control measures, and/or to improve their competence and awareness in HSE matters. Registers will be kept.

When

- A Job Safety Analysis will be developed prior to the beginning of any new task using 001_JOB SAFETY ANALYSIS WORKSHEET and a copy of this will also be inserted in the Permit to work (If one is required).
- Pre Task Briefings: Daily toolbox talks by supervisors.
  - At the start of each works, team supervisors shall lead a pre-task briefing (5-10 min.) with their team.
  - The topic of this talk will be based on the activity about to take place (description, risks and control measures), as per the Job Safety Analysis.
  - Such training will be recorded by filling out the record sheet of the Tool Box Talk Attendance Register.
- Site specific formal or informal HSE Training will be given on a weekly basis.
  - To be carried out by the subcontractors HSE and Supervision team.
  - The toolbox meeting will also include the analysis of any serious incident or accident happened on site.
- When necessary, before any changing process, personnel involved shall attend a HSE briefing.

Also, new tasks and working places must be included.

Contents

- Risk assessment and control measures to be implemented regarding equipment, facilities, process, operations, maintenance, inspection procedures, etc.
- Discussion of health, safety and environment tour or statistical data.
- Comments in relation to the application of HSE regulations.
- Risk and control measures due to:
  - Handling & use of flammable gasses, liquids or toxic materials.

- Confined Spaces.
- Working at height.
- Hot work.
- Fire-fighting.
- Lifting operations, etc.
- Blasting

For references and additional information please see Procedure 003_Trainning

7.6.4. Visitors

All visitors, vendors, service providers, etc. must receive at least a short HSE Induction Course by ACCIONA.

Visits must be accompanied by a suitable representative at all times and are not allowed to perform any work whatsoever.

Contents of these courses shall include:

- Basic rules and regulations.
- Emergency plans.
- Special risks and control measures.
- PPE, etc.

Register will be kept.

For references and additional information please see Procedures 002_Induction and P003_Access Control

7.6.5. Safety Functions

A certificate of competence is required to perform a safety function as regards:

- Drivers – PrDP.
- User of an aerial work platform.
- Crane operator.
- Rigger – banksman.
- Fire Fighter/ Officer.
- Person carrying out NDTs (Non-Destructive Tests).
- Person carrying out high-pressure testing of pipes/ vessels.
- Confined Space Safety Watcher.
- Any other required by Law.

These personnel should have been possess the necessary theoretical and practical knowledge and experience.

7.7. Bulletin Boards, Health, Safety and Environmental Notices and Signs

ACCIONA and the subcontractors shall set up around the Site a suitable and sufficient number of bulletin boards exclusively dedicated to HSE matters. These notice boards will be erected in key areas (offices, mess areas, etc.).

ACCIONA will be responsible for the display in appropriate locations notices applicable to their specific construction operations and processes.

ACCIONA and the subcontractors are responsible for the provision and display of sufficient safety signs applicable to the construction operations / processes being undertaken and appropriate to the anticipated hazard.

ACCIONA and the subcontractors shall ensure that a copy of the Occupational Health and Safety Act 85 of 1993 and the Basic Conditions of Employment Act is displayed in appropriate locations.

7.8. Subcontractors

ACCIONA shall demand the same level of health, safety and environmental performance from its subcontractors as it does from its own employees.

In order to do so, the document "Health, Safety and Environmental Subcontractor Requirements" must be prepared in a way that includes all guidelines for the coordination of activities and risk control among all of the companies taking part in the works.

Before the commencement of the works, a copy of the H&S Plan and Procedures will be submitted to all hired companies and service providers.

All those documents which are handed over must be included in form 002 INFORMATION such document will be signed and sealed by the relevant participating company upon reception of the relevant documents.

Prior to contracting, subcontractors shall be evaluated. This evaluation of subcontractors shall include health, safety and environmental aspects including whenever possible the adequacy of each Subcontractor's HSE Management programs, the maturity of their safety management culture, recent experience between ACCIONA and subcontractor, similar work experience by subcontractor, historical safety performance, willingness to make suggested improvements, ability to execute the work in a safe manner, compliance with relevant legal requirements, etc.

If a subcontractor with inadequate HSE performance must be utilized, ACCIONA shall:

- Provide a written resolution plan to improve subcontractor's HSE performance.
- Provide additional resources and assistance to assure compliance with minimum expectations.
- Costs of these additional requirements will be borne by the sub-contractor.

For references and additional information please see Procedure 001_Subcontractor´s Requirements

7.9. HSE Meetings and Communication

Communication, both internally and externally, is an important aspect of successful project delivery.

To be able to give correct instructions to the working teams, at least one member of each team should be addressable in English.

Internal communication includes arranging regular meetings for the Project team to review and coordinate project progress with regards to health, safety and environmental.

The main agenda for these meetings is the analysis of HSE performance, discussing HSE related information, and establishing coordination guidelines for the execution of the work,

ensuring that overall principles, guidelines, objectives and expectations are clear to all involved.

7.9.1. Programme of Meetings

MEETING	LED BY	PERIODICITY (indicative)	ATTENDEES
New Subcontractor Kick-off Meeting	EPC Management Team	Before start of work.	▪ EPC Management Team. ▪ Subcontractor Manager. ▪ HSE EPC representative. ▪ Subcontractor HSE Manager.
Technical Committee of HSE	EPC HSE Project Manager.	First, third and last Wednesday of the month.	▪ EPC HSE Project Manager or representative. ▪ Subcontractor HSE Project Managers. ▪ Subcontractors Site Management may be invited to attend. ▪ Optional attendees: ○ ACCIONA´s Site Manager. ○ Construction Manager. ○ Commissioning Manager. ○ Superintendents and supervisors.
Committee of HSE required by Law	EPC Project Manager or representative	Second Wednesday of the month, when legally required.	▪ EPC Project Manager. ▪ EPC HSE Project Manager. ▪ Subcontractor HSE Project Managers. ▪ Those others required by Law.
Client HSE Meeting	ACQWA Project Director.	Last Wednesday of the month.	▪ ACQWA Project Director. ▪ ACQWA HSE representative. ▪ EPC Project Manager. ▪ EPC HSE Project Manager. ▪ Subcontractors HSE Project Manager.
Nonspecific HSE Meetings	N/A	N/A	▪ The first topic of discussion will be HSE. ▪ ACCIONA's HSE Manager will attend this first topic.

7.9.2. HSE Kick-off Meetings

Before a new company starts its activities on the Site, a kick-off meeting must be held including in the agenda specific HSE topics.

If the works entail a high risk, a kick-off meeting should be held with the parties concerned, preferably five days before the commencement of the works.

Purpose of the Meeting

- To meet the subcontractor's key personnel, such as the Site Manager and HSE Manager.

- To strengthen Project HSE policy:
  - To review the HSE key points.
  - Owner and legal requirements.
  - To review sub-contractors site HSE File.
- HSE Plans.
- To review the subcontractor's HSE program, which must be specific to the Project.
- To review the performance plan of the subcontractor, the risk analyses and the control measures, together with the additional requirements of the other parties.

7.9.3. Technical Committee of HSE

The HSE Technical Committee is made up of all HSE Professionals working for the Project, and if necessary workers' representatives.

Subcontractors Site Management may be invited to attend.

Purpose of the Meeting

- To ensure compliance with HSE requirements.
- To monitor the health, safety and environmental issues.
- To coordinate construction activities, having into account the hazards, the risks assessment and the required controls.
- To define preventive and corrective actions.
- To analyse HSE training needs

Typical Agenda

- Review of previous minutes.
- HSE inspections.
  - Job or work look-ahead issues
- Exchange of information [HSE Plans, etc.].
- Weekly report by Sub/Contractors:
  - Incidents.
  - Hazardous conditions
  - Protective Clothing
  - Housekeeping
  - Corrective and preventive actions.
  - Forecast work
- Interference analysis and subsequent coordination measures.
  - Work Procedures
  - SIMOPS
- Safety Statistics
- Significant Safety Occurrences
- Improvement proposals, requests and questions.

7.9.4. Committee of HSE Required by Law

The Committee shall meet South Africa legislation.

Agenda

As well as those issues discussed in technical committees of HSE, the agenda of the meeting may include the following items:

- Situation on the site in relation to health-safety-environment: reports of the safety tour, accidents/incidents, measures taken, compliance with the HSE Plans, reciprocal communication and consultation between the parties.
- Discussion of scheduling and activities for the coming weeks, with advice being formulated in relation to health, safety and the environment.
- Clarification and settlement of all uncertainties and disputes between the various parties.

7.9.5. Client HSE Meeting

This meeting is managed by the Client, which decides the agenda and attendees.

In the moment, the attendees are the HSE representatives, ACQWA Project Director and ACCIONA Project Manager.

The meeting is held in a monthly basis.

Minutes of Meeting

ACCIONA shall be responsible for preparing the minutes of meeting.

7.10. HSE Monitoring Program

7.10.1. ACCIONA's HSE Department

The HSE Department of the ACCIONA shall continuously monitor compliance with HSE procedures and practices by its own personnel and subcontractors.

In addition, the ACCIONA's HSE supervisors and representatives of the subcontractors shall carry out periodic inspections.

The HSE inspections program shall verify that the work is being undertaken in compliance with the requirements.

The HSE inspection reports include a list of the identified risks and the measures taken to control them.

ACCIONA's Personnel shall monitor measures taken and their effectiveness.

The monthly report submitted to the client must include all inspections conducted, those corrective measures proposed and the state of such proposals.

A copy of these reports shall be kept by the Project HSE Department.

For references and additional information please see Procedure 005_Inspections

7.10.2. Safety Observation Reports

In order to detect uncontrolled risks, at risk behaviour and at risk conditions, and to improve HSE performance, ACCIONA's Supervisors shall monitor daily their work areas.

Any uncontrolled risk shall be mitigated immediately when possible. Those works deemed to entail extremely serious risks must be immediately suspended. Such works must not be resumed until the relevant risk is under control.

For references and additional information please see Procedure 005_Inspections

7.11. Equipment Inspection Procedures

ACCIONA shall establish an Equipment Inspection Programme which shall cover all tools, equipment and machinery working on site.

Every company shall need to designate qualified and competent inspectors whom shall carry out periodic inspections of all tools, equipment and machinery before entry onto site and then periodically.

Tools, equipment or machinery whose certificates have expired or which cannot be used safely shall be removed from site and/or placed in quarantine areas/containers.

Tools, equipment and machinery which have successfully passed these inspections shall be marked accordingly (i.e. coloured adhesives showing name of inspector, date of inspection and next inspection due).

For references and additional information please see Procedures 005_Inspections and P026_control of machinery, work equipment and tools

In addition, ACCIONA and each subcontractor must hold the legally required inspection certificates for its work equipment. Copies of these certificates must be present on the construction site, under the supervision of the HS Manager.

7.12. Incident Reporting & Investigation

ACCIONA shall investigate, analyze and report accidents and incidents (including high potential near misses), then follow up and close out with remedial actions when and where applicable.

Investigations shall be carried out by competent personnel from ACCIONA (HSE or HSE Officers) and its subcontractors.

Accident and incident reports shall provide useful information to management in order to prevent accidents recurring and as a basis for information to be shared during tool-box talks and other training activities.

The person that must report the event to his/her direct and most immediate manager is the person directly involved in the incident or, if this is not possible, any witnesses of the incident.

Identifying and reporting near misses is an important component in preventing actual incidents. The difference in circumstances between a near miss and an incident may be very slight but differ greatly in the eventual outcome of the incident. By informing others of near misses and taking actions to prevent their recurrence, potential causes for future incidents can be eliminated.

Significant near misses, those with the high potential to result in serious consequences, are to be reported and investigated.

An environment must be created to facilitate near miss reporting that is non-threatening or will result in punitive action against an employee. Employees that report a near miss should be encouraged to provide their name in case additional follow up is needed, but it is understood there may be instances where a near miss report will be submitted anonymously.

Notification Procedure To ACCIONA

The notification procedure for a near miss or incident shall be the following:

- Immediate verbal notification.
- A detailed incident report within 2 working days of the incident.

Form *003_INCIDENT REPORT* must be filled out.

7.13. Emergency Response Plan [ERP]

A response plan for emergencies will be prepared. This plan must include the analysis of all potential emergency situations that may arise on site and it must define, in accordance with those means proposed, the measures and procedures to be applied for each case.

The Emergency Plan must be adapted to different hypothesis and construction stages of the works while taking into consideration the alarm and evacuation protocols for each case; to that end, the Emergency Plan must be a dynamic document, since facilities are not permanent but changeable due to the very nature of the construction process, and therefore said Plan needs to be able to adapt to such circumstance.

This plan may also serve as a guide so that workers on site can respond to emergencies in an orderly and effective manner. It includes information regarding roll call procedures, roles, responsibilities, training, exercises, muster points, etc.

The contractor must communicate the Emergency Plan to all companies and workers taking part in the works as well as to those visitors before they access the site.

All personnel must be informed about the basic arrangements as part of their induction training.

The person who discovers an incident must raise the alarm.

Site HSE Manager will then determine the nature of the situation and any possible casualties, and telephone the emergency services as required.

In the event of an evacuation warning signal is given, all personnel will meet in their designated meeting point.

Each company will check the total number of employees, and if there are unaccounted persons must inform to the Site HSE Manager.

If safe, an emergency rescue team shall mobilize to look for them.

All relevant staff, as detailed in the procedure, must be informed.

At site, it will be always ensured the accessibility for emergency vehicles to access and egress.

After an incident, it will carry out a full investigation.

For references and additional information please see Emergency Response Plan

7.13.1. Emergency Medical Services (EMS)

The goal of most emergency medical services is to either provide treatment to those in need of urgent medical care, with the goal of satisfactorily treating the presenting conditions, or arranging for timely removal of the patient to the next point of definitive care. This is most likely an emergency department at a hospital.

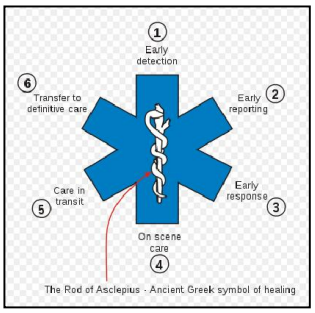
ACCIONA will provide an equipped medical facility to ensure provision of basic medical and emergency services to all personnel present on site during working hours.

In addition to this, every contractor with more than 150 employees must adhere to the following:

- Set arrangements in order to ensure that at least one nurse or paramedic (intermediate level) is available during the working hours with equipment enough to provide medical and emergency medical care should it be required. Medical personnel shall be competent in regards to illnesses, diseases and emergency medical care, and must provide support to the site medical care service in case it is required (e.g.: emergency situations, health monitoring/vaccination campaigns, and any other effort requiring assistance)
- Ensure the existence and proper supply of appropriate medical care equipment, according to applicable regulation, and adequate to the activities to be performed.

If projects are to be developed in remote locations requiring the contractors to provide accommodation and services for their workforce within a compound, equipped medical facilities –including an ambulance- must be installed, managed and operated 24/7 to provide medical and health services. This requirement could be negotiated according to the number of personnel, specific contractual agreements or any other solution that results convenient for both ACCIONA and the contractor.

Emergency medical service exists to fulfil the basic principles of first aid, which are to Preserve Life, Prevent Further Injury, and Promote Recovery.



Star of Life: These 6 points are used to represent the six stages of high quality pre-hospital care, which are:

- Early detection: Members of the job force find the incident and understand the problem.
- Early reporting: The first persons on scene make a call to the emergency medical services and provide details to enable a response to be mounted.
- Early response: The first professional (EMS) rescuers arrive on scene as quickly as possible, enabling care to begin.
- Good on-scene care: The emergency medical service provides appropriate and timely interventions to treat the patient at the scene of the incident.
- Care in transit: The emergency medical service load the patient in to suitable transport and continue to provide appropriate medical care throughout the journey.
- Transfer to definitive care: The patient is handed over to an appropriate care setting, such as the emergency department at a hospital, in to the care of physicians.

First Aids

ACCIONA shall ensure that qualified staff are present at all times to provide first aid.

The requirements for the ACCIONA site, because of the possibility of multiple patient management is First Aid Level III.

There shall be a Health Care Facility. One or more rooms shall be available for the provision of first aid. Rooms intended for the provision of first aid shall have the equipment and materials that are absolutely necessary for this aid and shall be easily accessible with stretchers.

The health Care Facility shall be marked in accordance with the provisions relating to health and safety signs at work.

The address and telephone number of the local first aid post must be clearly indicated.

First Aid Kits

First aid material shall also be present at all points where the working conditions so demand.

This material shall be marked appropriately and be easily accessible.

The subcontractors shall ensure that every work place, including workshops, maintenance and repair facilities, etc., is fitted with an adequate number of first aid kits, and that they are protected against dust, moisture and any other contaminant present in the workplace.

There shall also be in place a programme for checking periodically these first aid kits (cleanliness, stocks, instructions, drugs past their expiry dates, etc.).

First aid kits must be available as per the following:

- One first aid box for each 50 workers (contents must be in accordance with applicable local regulation)
- Each vehicle shall have a basic personal first aid kit in addition to the standard safety/emergency equipment (high visibility triangles, hi-vis jackets, spare tire, etc.)

The minimum contents for these kits shall be those specified in applicable as per Occupational Health and Safety Act 85 of 1993, General Safety Regulations – Section 3 (Annexure Regulation 3). Each Employer shall name a person responsible for ensuring these first aid kits are in a suitable condition permanently.

7.13.2. Fire Prevention & Portable Fire Extinguishers

On observing a fire, an employee should immediately contact Supervision &/or Site Management. All key personnel (foremen, etc.) shall be given basic instructions in fire prevention and hands on training in the use of fire-fighting equipment provided on the Project.

Daily pre-work inspections shall check for fire hazards and for adequacy of fire detection, prevention and control measures. Deficiencies shall be eliminated or reported immediately to ACCIONA.

A key point is housekeeping, which has to be excellent at any times.

The following general requirements are applicable to the selection, placement, maintenance, inspection and use of portable fire extinguishers on the project:

- Appropriate types, sizes and numbers of approved portable fire extinguishers shall be provided as temporary fire-fighting equipment in all areas, on, with or near certain specified construction equipment and at or near certain specified high fire-risk construction operations, as specified by applicable regulatory standards and this program.
- Then practical, welding and flame cutting operations shall be performed in fire-safe areas such as separately established fabrication yards located away from principal areas of combustible and flammable materials. Where this is not possible, all flammable and combustible material must be removed at least 10 meter from the area where welding or flame cutting is to be performed. It shall be covered with fire resistant blankets or non-combustible covers such as sheet metal and sources of flammable liquids or vapours shall be turned off, contained or led a safe distance away from the area.
- Portable fire extinguishers shall be according national codes and regulations.
- All portable fire extinguishers shall be immediately operable when issued for use.
- When issued for use, all previously issued or used portable fire extinguishers shall have been properly inspected and, if necessary, properly serviced.
- Each portable fire extinguisher shall be inspected at least monthly by a designated employee who shall attach a tag to each extinguisher inspected showing the date of the inspection and the inspector's initials. This inspection shall cover at least the following:
    - The extinguisher is in its designated or required place;
    - The extinguisher is clearly visible from all parts of the area or operation it services and is readily accessible;
    - The operating instructions of the extinguisher are legible and face outward;
    - Extinguishers with pressure gauges shall be checked to determine that the pressure is within the operable range;
    - Water-type extinguishers without pressure gauges shall be "hefted" to determine that they are full;
    - All seals or tamper indicators shall be checked to determine that they are present and intact;
    - Extinguishers that are under-pressured, not full, or that have broken or missing seals or tampered with shall be replaced immediately with a newly inspected or serviced extinguisher of the same type and size.
- Each portable fire extinguisher shall be inspected and serviced annually by a trained, licensed professional having available the proper types of tools, recharge materials, lubricants and the manufacturer's recommended replacement parts. All such inspections shall be performed in accordance with National codes and regulations. All reissued portable fire extinguishers on the project shall have an attached tag or label that shows the date of the last inspection, the name of the inspection firm and the name or initial of the inspector.
- A register will be kept documenting all the fire extinguishers on site.
- All inspection documents will be filed in the Site HSE File.

All contractors shall take previsions to reduce the fire hazards and eliminate risk from fire through development and implementation of fire hazard identification and risk assessment. This shall consider in its widest sense the generic and site specific controls of the four elements necessary for fire:

- Fuel
- Heat (ignition source)
- Oxygen (oxygen suspended in air is enough)

- Continual chemical (chain) reaction

All contractors must be proactive and support any emergency procedure from preparedness (drills, equipment selection/maintenance, etc.) to response to real situations as required.

Each subcontractor shall appoint a qualified technician so that he or she may check all fire-extinguishing equipment with the frequency set out in the Emergency Plan.

For references and additional information please see Emergency Response Plan

7.13.3. Prevention and Response to Spills and Accidental Discharges

The most common environmental emergency in construction site is the oil and chemical spill, which is a potential cause for soil contamination, groundwater and water pollution.

Spills of hazardous materials may include:

- Gasoline.
- Diesel.
- Adhesives.
- Hydraulic oil.
- Lubricating oil and grease.
- Cleaning solvents.
- Paint and paint thinners.
- Concrete formwork release agents.

The ERP[1] must be prepared to cover any potential risks of accidents or spills and will be made known and available to all workers within the construction site.

Key personnel will know and understand their responsibilities as well as coordinate their response actions with their subordinates.

This plan serve as a guideline to organize a prompt and effective response to oil spills affecting or likely to affect the area of the site and to ensure preparedness, response and reporting following an oil and chemical pollution incident.

For this purpose the following specific actions are listed:

- Preparedness;
- Response; and
- Reporting.

Preparedness

HSE induction course must include spill prevention and response. Spill kits to be kept on site by ACCIONA and all sub-contractors. MSDS's of all listed hazardous chemicals to be kept on site and a copy submitted to the Site Clinic as well as the ACCIONA EPC HSE Department.

A variety of equipment and personal protective equipment may be needed to support a chemical or oil spill incident response. A list of equipment is detailed below:

[1] Emergency Response Plan.

- Sand.
- Sand bags.
- Buckets and shovels.
- Emergency floating barriers.
- Barriers are found on quaysides, on rollers to allow rapid unrolling into the water in the event of leakages of oily substances or other pollutants.
- Storage containers.
- Spill kit.

Sand stocks will be dry and buckets and shovels readily available. Mechanical loading shovels, excavators and dump trucks may also available for sand distribution and clean up. Storage containers for contaminated materials and earth will be bunded, located in the waste storage area, and labelled and treated as hazardous waste. The bunded area must have a capacity of 110% of the total capacity of the potential pollutant. All equipment will be stored in a safe location on site in close proximity to the storage and waste areas. This material is to be used to contain and clean up pollution/spills, care will be taken to dispose of any absorbent materials properly. The companies will keep stocks well maintained and replenished.

Emergency Spill Response

In the event of a chemical or oil spill the following measures will be employed:

- Notify Supervisor and HSE Officer.
- Only attempt containment and clean-up operations of spilt substances when it can be performed safely.
- If spilled material is flammable, eliminate sources of ignition near spill area.
- Evacuate personnel and neighbours if they are at risk and
- Secure the area and establish perimeter control at a safe distance from the spill.

Oil Spill Response Options

Remedial action to collect and remove all materials contaminated by the oil spillage or leakage event is to be taken immediately. The following actions are required:

- Any oil remaining on the ground is to be collected using oil spill kit. The spill is to be surrounded by the kit and then the area of the spill is to be slowly reduced by enclosing the absorbent. The absorbent pads will be used to absorb the oil. Once all of the oil on the ground surface has been collected, the absorbent agents themselves are to be appropriately stored and disposed;
- All contaminated materials are to be handled as hazardous waste. The contaminated material shall be collected and appropriately stored. A hazardous waste vendor will collect this;
- Contaminated materials will be stored in plastic barrels with tightly closing lids. These barrels are to be stored in a concrete lined bund if available. In absence of such a bund at the site as a short-term storage alternative, a double plastic lined bund will be used. Barrels will be placed on plastic or wooden pallets in the temporary double plastic lined bund and not directly on the plastic; and
- Conventional metal barrels will not be used, however if there are no alternatives the materials may be stored in them providing they are covered with plastic sheet tightly fastened to prevent Aeolian distribution and again are stored in an appropriately bunded location to prevent leakage will the barrels suffer corrosion.

- All contaminated materials that cannot be collected and disposed are to be cleaned in-situ. This cleaning is to be undertaken by an approved service providers.

Chemical Spill Response Options

The following actions are to be taken in case of a chemical spill;

- Only attempt containment and clean-up operations of spilt substances when it can be performed safely;
- If spilled material is flammable, eliminate sources of ignition near spill area;
- Liquid spills - If the spill is liquid its path will be blocked or diverted and then soaked up using an absorbent material such as sand;
- Gaseous spills/leaks - A gaseous leak must be stopped at the source as soon as possible and will then disperse in the air. All hot work or spark generation work to be immediately stopped.
- No spills will be rinsed away;
- Contaminated soils and clean-up materials from spills will be handled properly using personal protective equipment, stored in a suitable container that is then labelled and stored in the appropriate location for subsequent disposal;
- Any stockpiles of remnant contaminated materials will be covered;
- Contaminated materials will be stored in plastic barrels with tightly closing lids. These barrels are to be stored in a concrete lined bund if available. In absence of such a bund at the site as a short-term storage alternative, a double plastic lined bund will be used;
- Barrels will be placed on plastic or wooden pallets in the temporary double plastic lined bund and not directly on the plastic; and
- Conventional metal barrels will not be used, however if there are no alternatives the materials may be stored in them providing they are covered with plastic sheet tightly fastened to prevent Aeolian distribution and again are stored in an appropriately bunded location to prevent leakage will the barrels suffer corrosion.
- All contaminated materials that cannot be collected and disposed are to be cleaned in-situ. This cleaning is to be undertaken by an approved service providers.

Reporting

Any person involved in construction works that witnesses an incident must be able to report the incident to the responsible supervisor. The HSE Team shall be responsible for ensuring a report is filed describing the cause of the incident, action taken, the incident and recommended actions for ensuring the incident will not reoccur.

For references and additional information please see Procedure 033_Dangerous Substances Management

7.13.4. Evacuation Exercise

An evacuation exercise may be organised twice a year, in which everyone must evacuate, including work zones. If necessary, this will take place more regularly depending on how often the staff on the construction site changes.

ACCIONA must also carry out a joint coordinated evacuation exercise every 6 months.

For references and additional information please see Emergency Response Plan

7.14. HSE Audits

For references and additional information please see Procedure 006_Audits

7.14.1. Internal Audits

Internal HSE audits to be carried out to verify the implementation of this Plan and therefore compliance with the health, safety and environmental requirements.

The audit will be performed by an internal HSE auditor.

The audited staff will be ACCIONA staff and subcontractors on Site.

The audit results will be documented in its report.

If deviations are detected, it will require the taking of corrective measures, it will monitor the measures taken and their effectiveness.

A procedure will be prepared in order to establish those guidelines to be followed for the conduction of internal audits aimed at verifying compliance with and effectiveness of those requirements established by the occupational risk management system in place.

7.14.2. External Audits

External audits will also need to be undertaken quarterly by an external, independent auditor in order to satisfy the Clients requirements.

This audit will take place in order to ensure the following:

- Compliance with all standards and regulatory requirements
- Auditing the contractor and subcontractor activities for non-conformances;
- Checking monitoring records, inspection checklists, and other relevant documentation; and
- Identifying the requirements for corrective actions.

7.14.3. Control of Non-Conformance

Any non-conformance with respect to the implementation of this HSE Management Plan shall be handled according to the guidelines of the Internal Audit Procedure.

All works are stopped on the operation/activity concerned, and immediately investigates the cause of the nonconformity where audits/inspections reveal deficiencies of a major nature, and initiate corrective actions to rectify such deficiencies and non-conformities to prevent recurrence.

These corrective action plans are submitted to the Project Manager for review and comment within 24 hours of the audit finding.

7.15. Site security and access controls (specific rules/procedures are available on the site security plan)

According to security assessments, arrangements will be set in order to grant an adequate level for protection of persons, goods, sensitive items and access controls. All involved personnel shall follow all procedures and standards set for this purpose. Basic elements of site security and access controls are:

- Control and record access/egress of all personnel and vehicles to/from site

- Control and record access/egress of all visitors to/from site
- Ensure all access/egress and designated walkways are clear and accessible
- Enforcement of parking restrictions, where applicable
- Controlling the speed of incoming and outgoing vehicles
- Enhance site safety provisions through defined health and safety checks
- Provide safe, controlled and monitored site evacuation
- Restrict access of all unauthorized persons and vehicle to the site
- Surveillance of persons and vehicles on site
- Physical protection of the site assets
- Ensure no unauthorized items are bought onto site
- Ensure no unauthorized items are entered/withdrawn from site
- Perform searches of vehicles and individuals as required
- Ensure all persons accessing the site comply with minimum PPE requirements, including the drivers and delivery vehicles
- Security patrols on site and on external site areas to check for any fire, flooding, environmental spills, breaches to perimeter fence security and for the security of site offices, buildings, and storage compounds
- Monitor for irregularities and suspicious behavior
- Manning of telephones outside normal working hours, including calling alarms in response to fires or other emergency situations
- Directing of emergency vehicles, for example fire engines and/or ambulances responding to emergency calls
- Assisting to secure any restricted area on site (e.g.: an accident scene)
- Fire surveillance outside normal working hours will verify that safety equipment (telephone, fire hydrants and fire extinguishers) are operational and accessible
- Liaise with stakeholders, police and local authorities as required

Special security previsions to be considered are:

- All personnel must go through an alcohol test every time they enter the site.
- All personnel will be given an access ID card. The card must be carried at all times by the holder, and must be always available for inspection. Visitors must follow the same rule.
- Visitors cannot be alone inside the constructions site. They must be accompanied at all times by a responsible person.
- A rolling inspection system (commonly 1 in 6) will be set for all transport vehicles carrying materials, equipment, goods and sensitive items entering the project when entering/leaving the site. This rule could be changed as necessary when working in places/countries where security is a special concern in terms of risk.
- Contractors must keep an up to date register with identification information for the workforce on site. If sub-contractors are used the register must also include details of the sub-contract workforce. The register should include the worker name, site pass number, start date on site and the company they work for
- Without prejudice to other contractual provisions, workers from a country outside the country where the construction work is taking place shall hold a 'work permit' or 'work card' as required by that country, before starting works and throughout the duration of their work on site. ACCIONA will reject any personnel who has not completed the required processes to obtain such documentation until the relevant formalities have been duly completed
- No person younger than 14 years old is authorized to enter the site, even for a simple visit, unless company policy and agreements with local authorities or corporate social responsibility foster restricted visits to students or similar visiting groups.

For references and additional information please see Procedure 004_Access Control

7.16. Visitors management

Visitors are considered to possess a specific level of hazard due to their lack of knowledge of the most relevant information in terms of risks and risk control measures. Basic previsions in terms of visitors are:

- Every visit shall be reported to the security department at least 48 hours before arrival to site.
- Every visitor shall attend induction training and pass the test before being allowed to enter the site. If the visitor will remain in the site for more than 3 days, she/he must attend the full safety induction course
- No visitor is allowed to enter the site alone. She/he must be escorted by a specifically assigned person
- All visitors must wear the required PPE according to the activities they will do onsite

7.17. Reports

Weekly Reports

Each week an overview will be drawn up of the number of work accidents leading to unavailability for working, accidents with medical assistance, first aid, near-misses, and environmental and material losses. (Use form 004 HSE WEEKLY STATS)

This overview is discussed at the weekly meetings.

Monthly Reports

Monthly report´s content:

- H&S executive summary
- Accidents/incidents
  - Accidents/incidents data
  - First aid cases details
  - Sinistrality rates
  - H&S training, meeting
- Main site H&S activities
  - Safety drill
  - Accidents
  - Audit
  - H&S organization
  - H&S procedures
  - Housekeeping activities
- Companies working on site
- EPC/ contractors/ sub-contractors manpower

7.18. Disciplinary, Incentive & Recognition Programme

The creation of a positive culture towards HSE matters shall be promoted through a reward scheme.

ACCIONA considers HSE Incentive Schemes as key element to improve and to promote a safety culture in all the workers participating in any Project.

These prizes are generally wallets, t-shirts, caps, etc. engraved with company logos and a safety slogan. These prizes are presented to whole workshops, disciplines or subcontractors. The basis for awarding the prizes is the HSE performance of these groups.

The discipline, workshop or subcontractor which receives the HSE Monthly Award is made public by informing the workforce during toolbox talks, putting up the name of the group awarded the HSE prize on the bulletin boards in workshops and assembly areas.

The other side of this programme would be the development of a clear Disciplinary Programme applicable to both workers and subcontractors working on Site.

Typical infractions of applicable safety rules would be described along with fines &/or disciplinary actions associated to them. Fines would only be applied to subcontractors, never to workers.

Any serious breach of these HSE requirements will result in disciplinary actions. Specific actions have been set for certain aspects. When disciplinary actions are not specified, three general "levels" are applicable:

- First written warning outlining the offence and required improvement and that further violation will result in suspension
- Second written warning which results in suspension violation will result in permanent dismissal
- Final written warning and dismissal

These "levels" should be applied as a sequence, although it is possible to skip any of them depending on the severity of the issue (e.g.: if a person has done something that exposed her/him and others to a non-controlled hazard with potential of causing severe wounds or death, the disciplinary action will go straight to the third level, thus the responsible will be permanently dismissed from the site.

Other examples of serious breaches are:

- Carrying weapons
- The use of physical violence, intimidation, bullying or harassment
- Smoking in forbidden areas
- The abuse of alcohol and illegal drugs such that an individual's performance and judgement has been found to be affected by alcohol or illegal drugs or individuals have been found in possession of or involved in the supply of these substances
- Entering a designated confined space without following the applicable PTW – LO/TO procedure
- Entering an excavation without following the applicable PTW – LO/TO procedure
- Entering an unsupported excavation, or an excavation that has not been properly shored
- Performing hot work without a permit to work
- Working at height of more than 2 metres where there is a reasonably foreseeable risk of injury without following the applicable PTW a secured and/or without using an approved safety harnesses.
- Any reckless behaviour or horseplay likely to cause or lead to injury
- Walking or standing under a suspended load

- Working unsafely with electricity or any form of energy that has not been properly assessed and controlled
- Working on a chemical system without the correct PPE being worn
- Defeating trips and interlocks, except where such incidences are a part of a formal test / commissioning procedure carried out in accordance with a written test procedure / method statement.
- Driving within the site without wearing a seatbelt, regardless of the vehicle
- Driving whilst using a mobile communication device
- Working whilst using a mobile communication device unless authorized to do so
- Use of plant and machinery without proper certification / authorization

7.19. Management of Change

ACCIONA shall implement a Management of Change procedure that will ensure that temporary and permanent changes to systems, processes, procedures, equipment, organization, personnel, products, materials and work arising from changes in laws and regulations cannot proceed unless a Management of Change process has been completed, where applicable, including:

- A risk assessment that covers all impacted by the change.
- A work plan that clearly specifies the timescale for the change and any control measures to be implemented regarding:
  - Equipment, facilities and processes.
  - Operations, maintenance, inspection procedures.
  - Training, personnel and communication.
  - Documentation.
  - Authorization of the complete work plan by the responsible person(s).

8. HEALTH AND SAFETY STANDARDS

8.1. Safe Workplace management

This section shows the general aspects of described activities.ACCIONA has specific documentation for each topic, which will be delivered to all contractors after they are awarded with a contract, in order to facilitate a standard implementation of all these safety requirements.

When a contractor performs an activity so specialized that ACCIONA has no documentation, they shall deliver it to H&S Departament in order to review and approve it. Since part of this information could be confidential, H&S Departament commits to respect any confidentiality request coming from subcontractors in terms of technology, knowledge and information management.

8.1.1. Interface management, Method statements and Risk assessments

Interface management is the methodology used to analyse every interference from all aspects (enginnering, quality, safety, environment, etc.) in order to decide the sequence of execution for activities belonging to different disciplines/packages. Interface management is supported by the following processes:

- Method statements: Every contractor shall deliver method statements for all their activities for review/acceptance by ACCIONA 30 days before the commencement of their works. ACCIONA will run a process for review, analysis and acceptance to ensure

that all activities are controlled in every aspect (production, quality, technical and health&safety)
- Risk assessments must be conducted by each subcontractor for every activity included within a method statement. In addition, each work will be "risk assessed" as part of the interface management/PTW programme.

Contractors shall take proper previsions to ensure these two elements are conveniently covered with anticipation enough to grant proper management and coordination of their activities.

For references and additional information please see Procedures 009_Interface Management and P035_Review and approval of method statements

8.1.2. Mobile communications:

Each contractor shall provide resources enough to ensure that every person with relevant positions has effective communication means in order to grant proper management of activities and other relevant communications, such as incident reporting and support to emergency response. Examples of communication means are:
- Mobile/satellital telephones
- TETRA type or other radiocomm similar system
- Multi-channel handheld radio sets

Every contractor must have a stock of communication equipment assigned for special operations on which it is necessary to use more equipment. In any case, common channels will be set in the project in order to ensure that general and emergency response communications are standardized.

Specific previsions shall be taken when these equipment are to be used inside areas at which the potential of atmospheric hazards (ATEX rated areas) is identified. Specific rules for use of communication devices are:
- Handheld communication devices must never be used where full concentration and/or undivided attention of the operative(s) performing the task is critical to the safe execution of the task.
- Never use a mobile communication device whilst driving.
- Unless it is crucial for the activity, and only when the device is certified for the type of ATEX class, never use a mobile communication device in a designated area where intrinsically safe equipment required
- Avoid using a mobile communication device whilst using stairs or ladders, or climbing to a location using any form of work at height.
- Never use a mobile communication device whilst re-fuelling vehicles.
- When walking around the site hand held communication devices should only be used whilst stationary.
-

For references and additional information please see Procedure 008_Communications and Warning

8.1.3. Site illumination

All contractors shall ensure that all areas under their responsibility are lit enough to allow safe transit and work whenever it is required. Standard values are:
- Traffic routes and storage areas, 50m lux

- Office work 100 lux.
- Limited detail work (kitchens, general construction, etc.) 100 lux
- Detailed work (workshops, offices, etc.) 200 lux
- Fine detail work (electrical component work) 500 lux.
- Lights shall be arranged to avoid dazzling or temporary blindness because of the glare.
- Proper distribution of light arrays must be performed in order to achieve a uniform light distribution and the avoidance of high intensity hot spots.

NOTE: Since these are temporary electrical installations, proper arrangements shall be made to ensure that electrical hazards are conveniently identified, assessed and communicated to all personnel according with their qualifications and responsibilities. In any case, it is expected that contractors will follow local regulation, good industrial practice and technical specifications in order to ensure a proper management of electrical hazards and temporary electrical installations.

8.2. Qualitative Risk Ranking

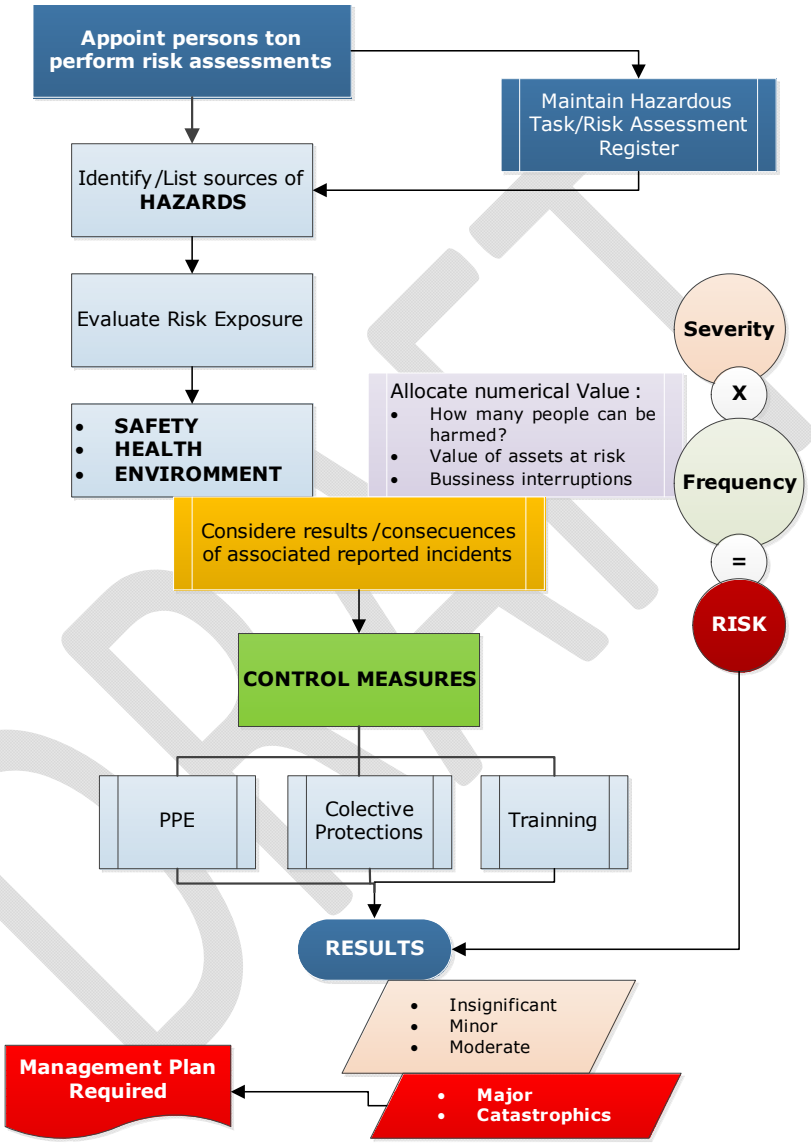
The application of prevention and control measures to occupational hazards should be based on comprehensive job safety or job hazard analyses. The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards. An example of a qualitative risk ranking or analysis matrix to help identify priorities is described in the following table.

Likelihood / Hazards Effects		Risk Rating				
		1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Almost Certain	The unwanted event has occurred frequently; has a 90% and higher probability of reoccurring	**11 Medium**	**16 Significant**	**20 Significant**	**23 High**	**25 High**
4 Likely	The unwanted event has a probability of between 60% and less than 90% of occurring	**7 Medium**	**12 Medium**	**17 Significant**	**21 High**	**24 High**
3 Possible	The unwanted event has a probability of between 30% and less than 60% of occurring	**4 Low**	**8 Medium**	**13 Significant**	**18 Significant**	**22 High**
2 Unlikely	The unwanted event has a probability of between 1% and less than 30% of occurring	**2 Low**	**5 Low**	**9 Medium**	**14 Significant**	**19 Significant**
1 Rare	The unwanted event has never occurred, has a probability of less than 1% of occurring	**1 Low**	**3 Low**	**6 Medium**	**10 Medium**	**15 Significant**

Risk Ranking Criteria

RISK MATRIX	Hazard Effect / Consequence				
Loss Type	**1** **Insignificant**	**2** **Minor**	**3** **Moderate**	**4** **Major**	**5** **Catastrophic**
Timeline	No impact on overall project timeline	May result in overall project timeline overrun of less than 5%	May result in overall project timeline overrun of between 5% and less than 20%	May result in overall project timeline overrun of between 20% and less than 50%	May result in overall project timeline overrun of 50% or more
Budget	No impact on the budget of the project	May result in overall project budget overrun of less than 5%	May result in overall project budget overrun of between 5% and less than 20%	May result in overall project budget overrun of between 20% and less than 50%	May result in overall project budget overrun of 50% or more
Investment Return – NPV loss	Less than R5m	R5m to less than R50m	R50M to less than R500m	R500m to R5b	R5b or more
Quality	No impact on quality	Minimal quality issues that can be addressed in a short timeframe with minimal interactions	Some quality issues that requires immediate management action	Significant quality issues that requires senior project management interaction	Significant quality issues that requires sponsorship intervention with significant resource and cost implications for rework
Safety / Health	First aid case / Exposure to minor health risk	Medical treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Single fatality or loss of quality of life / Irreversible impact on health	Multiple fatalities / Impact on health ultimately fatal
Environment	Minimal environmental harm – L1 incident	Material environmental harm – L2 incident remediable short term	Serious environmental harm – L2 incident remediable within LOM	Major environmental harm – L2 incident remediable post LOM	Extreme environmental harm – L3 incident irreversible
Legal & Regulatory	No legal impact	Minor legal concerns with minor impact	Some legal concerns with manageable level of impact	Serious legal concerns and significant impact on operations	Legal non compliance with risk of shutdown of operations with significant cost impacts
Reputation / Social / Community	Slight impact - public awareness may exist but no public concern	Limited impact - local public concern	Considerable impact - regional public concern	National impact - national public concern	International impact - international public attention

The entire process flow must be considered for, routine and non-routine activities. Beginning with the raw materials and parts etc.to the processes used to manufacture assemble or construct the final products, all supporting funtioncs like maintenande, cleaning, subcontractors must be included. Follow with final outputs, packing, storing, dispatch and construction finishing, finally considering the hazards which the final product may have for the end user.



8.3. General Risk Assessment and Risk Control

8.3.1. General Risk Assessment

Hazard	Likelihood	Consequences	Risk
Traffic accidents.	2	Major	Significant
Falls of people at different levels by working at height.	2	Catastrophic	Significant
Falls of persons at the same level by lack of housekeeping.	5	Minor	Significant
Falling objects.	3	Major	High
Hit with fixed or moving objects.	3	Minor	Medium
Injuries in the use of tools.	3	Minor	Medium
Projection of fragments or particles.	3	Moderate	Significant
Entrapment between objects.	3	Moderate	Significant
Over stressing.	3	Minor	Medium
Thermal contact with hot or molten metals.	3	Moderate	Significant
Electric shock.	3	Major	Significant
Exposure to harmful substances.	2	Moderate	Significant
Arc eye, welder's flash, flash burns, etc.	2	Moderate	Significant
Explosions and fires: gas to preheat and cutting. Fall projections of welding and cutting.	3	Catastrophic	High
Noise and vibration. Use of grinding machine.	3	Minor	Medium
Lack of LOTO; working on energized equipment, or in its proximity; pressurized facilities; high temperatures; moving parts of equipment; classified areas (flammable gases, chemical contaminants, deficiency of oxygen...).	2	Catastrophic	Significant
Falling objects in lifting operations; lashes for breakage of cables or slings; use of a non-locking snap hook; lifting lugs, shackles, etc. in poor conditions...	3	Major	Significant
Severe impact after cutting an stressed element.	3	Moderate	Significant
Cuts, pinches and pricks when handling cables, slings and accessories.	3	Minor	Medium
Entrapment in lifting operations.	3	Major	Significant

Hazard	Likelihood	Consequences	Risk
Crane overturns.	1	Catastrophic	Significant

8.3.2. General Risk Control

- The system of established permits to work will be fulfilled.
- Use of calibrated equipment as necessary: gas detectors, electrical testers, pressure gauges, torque wrenches, etc.
- Full review before start up, preferably using checklists.
- Before starting any work must be in place all necessary measures. For example:
  - Location of any underground and aerial services.
  - Collective Protections, temporary edge protection systems, safety nets, etc. If it was not possible, must be used harnesses, fall arresters, lifelines, anchor points, etc.
  - In excavations from 1.20 metres of depth, leave the stable slope determined in the Geotechnical study of the Project. The natural slope corresponding to the type of terrain shall be used. If using shoring should be considered patented shoring systems. Excavations deeper than 1.8 metres require solid barricading.
  - Safety walkways.
- To remove any protection, it must ask authorization on the Safety department. Meanwhile, an alternative safety measure shall be used, per example harnesses, fall arresters, lifelines, anchor points, etc. Barriers and safety signs must be placed to avoid any entrance. Completed the work, the removed safety measures must be reinstalled.

Safety measures in potential falling objects areas:

- Horizontal safety nets.
- Roofs.
- Barriers and safety signs preventing entry.
- All small tools in use while working at heights, need to have a lanyard attaching them to the hand of the user.
- Pipes, equipment, structures, etc. located at a height lower than 2 meters should be properly marked/ labelled with signs avoid hit them.

Work equipment must:

- Comply with the provisions of any relevant rule which is applicable.
- Be subjected to programmed inspections as required to ensure that health and safety conditions are maintained.
- Be accompanied by physical evidence that the last inspection has been carried out.
- The use of work equipment is restricted to those persons given the task of using it.
- In the case of repairs, maintenance or servicing, the workers concerned are specifically designated to carry out such work.
- Have written instructions containing at least adequate safety and health information concerning the conditions of use. Workers shall have at their disposal written instructions on the work equipment used at work. Workers given the task of using work equipment must have received adequate training.
- Driving license or equivalent if applicable.

Grinding machines:

- Using disks according to the grinding machine velocity.
- Using the protection cover.
- Pipes and spools must be properly supported.

Scaffoldings, ladders and any other equipment

Shall be standardized, in good conditions and properly installed and used.

The use of ladders, stepladders and platform ladders as workstations at height is limited to situations in which, the use of other safer work equipment is not justified, given the minimal risk and in view either of the brief period of use, or the existing characteristics of the workplace and workstations, which the employer cannot change. However, no work with hand tools is to be carried out at height from ladders.

Temporary electrical facilities:

- The temporary electrical installation must be submitted to periodic checks, especially the elements exposed to the harshness of the works. There must be earth, electrical protection as less as IP-45 or IP-67 with water around, 30mA protection, circuit breakers, electrical hazard signals...
- Electrical tools must have double insulation or earth.
- Avoid the presence of electrical cables in transited zones: use air cables or buried ones through pipeline; protect them if they are on the surface. Electrical wires and hoses with flammable gases won't be together to prevent the risk of fire or explosion if there's a leak. The use of improvised connections is forbidden.
- Check the power cables condition periodically.

Chemical hazards:

- Storing and handling according to the Materials Safety Data Sheets (MSDS).
- Providing specific worker training.
- Communicating chemical hazards to workers through labelling and marking according to national and internationally recognized requirements and standards.
- Adequate containers.
- MSDS shall be available on site.
- Chemicals to be stored in dedicated chemical stores that are well ventilated and have the appropriate signage.

- Gas bottles need to be stored in appropriate cages that are well ventilated and clearly marked with appropriate signage.
- Empty gas containers are to be stored apart from full containers.

Housekeeping:

- All sub-contractors are to appoint a competent Stacking and Storage Supervisor to supervise the stacking and storage activities.
- Work areas shall keep clean and free of trash, rubbish and debris at all times.
- Materials and supplies shall be stored in locations that will not block access ways and arranged to permit easy cleaning of the area.
- All hoses, cables, extension cords and similar materials shall be located, arranged and grouped so that they will not block any access way and will permit easy cleaning and maintenance.
- Walkways, stairs and the bottom of ladders shall be kept clean and clear of tripping hazards.
- Tools, hoses, extension cords, chokers, welding leads, etc. are to be properly rolled up and stored when not in use. All such equipment shall be routed out of walkways and traffic.
- Cords and leads should be suspended at least 2 m overhead.
- Stockpiles shall be stable and organized. Pipes shall be well wedged.
- Safety containers shall be provided for flammable or harmful substances with contents plainly marked. Separate containers shall be provided for different types of refuse, i.e. oily rags, steel, waste paper, lumber, etc. Eating and drinking will only take place in designated areas. Trash containers shall be placed adjacent to all drinking water locations and areas used for employees for lunch and/or break areas.
- Welders shall have waste tins for electrodes, disks, etc.
- Housekeeping activities shall be undertaken every day, at the end of work, leaving work areas clean and tidy. Besides, if necessary, every Friday the contractor and subcontractors will perform thoroughly housekeeping.
- Take care while moving through the works. Don't transit below suspended loads or through areas with risk of falling objects; don't stay close to the machinery or vehicles range of action, nor remain behind them or rest in its shade.

Hot works, welding, cutting…

- Correct use of compressed gas is a must (gas cylinders in carts, ventilated spots, dry powder fire extinguishers around, anti-recoil valves in torches, hoses in good condition...).
- To avoid the accumulation of gases in case of leakage, do not store torches in confined spaces.
- While doing hot work, precautions shall be taken to eliminate the risk of fire or explosion, such as removing materials and flammable products from the working area, or protect them properly with fire-retardant blankets.
- Welding work spots need to be protected with fireproof blankets.
- Mobile screens must be used to avoid projections which could hurt other workers. The material must be also flame- retardant.
- Helpers and other personnel will not look at the welding arc.

- Welding cocoons need to be constructed in a way that does not create a confined space.

Flame Cutting Equipment

- The compressed gas cylinders must be in upright position; in a cart, preferably. They should stay away from any electrical contacts, heat sources and protected from the sun.
- Spark igniters will be used to light the torch.
- Anti-recoil valves for both manometer and torch are compulsory.
- The oxygen reacts violently with fats, oils or fuels. Clothing and equipment must not be cleaned with oxygen.
- Do not use oxygen to clean or blow parts, or to fan a place.
- To keep hoses in good condition, the contact with chemicals, hot surfaces, sharp or pointed items must be avoided. Likewise, we must prevent the formation of loops or knots. Hoses must not leak: joints, fittings and faucets need to be checked periodically. Proceed to replace hoses if any damage is detected.
- Sparks produced by the torch must be kept away from gas cylinders and hoses.
- The spot must be well ventilated.
- There must be fire extinguishers in all the working areas. No hot work will be done without having a dry powder fire extinguisher around.
- Take care while carrying loads (Flex the legs, the back must be straight, don't turn the waist, and wear a tight belt and gloves, preferably for specialized workers...).
- Respect the signals while driving or those related to the safety at work on the construction site.
- It is forbidden to consume alcohol or drugs during the workday. The same with any work activity to do under their effects.

8.4. Personal Protective Equipment (PPE)

Whenever risks cannot be reduced to acceptable levels by any other means (collective protection, work organization, etc.), ACCIONA and its subcontractors will provide and maintain, at no cost to their workforce, fully certified protective clothing and equipment appropriate to the nature of the activity and also monitor their correct use.

The selection of PPE will be performed by competent personnel authorized to do so by each Employer. Employers will also guarantee adequate storage, maintenance and replacement of PPE.

All contractors shall indicate the required PPE to be used during work within their method statements. All personnel must receive training about selection, use, cleaning, maintenance and disposal of PPE. In addition, a PPE matrix must be available for review. This matrix should contain the following information:

- Type, class or standard (e.g.: HEPA, ANSI, etc.)
- Operations requiring such PPE
- Main usage
- Substitution periods (validity dates)
- Limitations or prohibitions of use, where applicable

Workers are required to use and properly care for clothing and personal protective equipment supplied. Any employee who wilfully refuses to use the prescribed protective equipment designed to protect him or wilfully damages such equipment shall be subject to disciplinary action.

Obligatory PPE:

- Helmet.
  - Management Personnel to wear WHITE Hard Hats.
  - Skilled artisans and general workers to wear Blue Hard Hats.
  - Visitors shall wear white helmets with Visitor stickers on them where possible.
- Safety glasses. (Smoked for day and yellow for night if needed)
- Reflective Hi-Viz safety Vest/ Jacket)
- Safety shoes with steel toe-caps and steel sole pad.

Note: Shorts are not permitted at the workplace and sleeveless work clothes are not allowed on the construction site for people performing manual work.

PPE when necessary:

- Clothes for ATEX areas.
- Electrical PPE.
- Harnesses and fall arrestors.
- Welders PPE (Welding Helmet, Leather aprons, gauntlet gloves, spats, etc.)
- Safety gloves.
- Safety dust proof goggles.
- Face Shield.
- Respiratory protection, safety masks, respirators etc.
- Ear plugs and ear muffs for high noise activities.

For references and additional information please see Procedure 014_PPE

All PPE provided will comply with SABS standards and regulations.

Foot Protection

All persons working on site shall wear approved steel toed and bottom steel plate foot protection (boots or shoes). Soles will be flexible and anti-slippage and the lining will be comfortable and prevent excessive moisture from accumulating. Sizes will take into account movement, working conditions, etc. Working in wet environments or in the presence of hazardous, corrosive chemicals, etc. will require the use of rubber boots.

Hearing Protection

If noise levels cannot be further reduced by collective, technical &/or organization measures (i.e. on the source, reducing time of exposure, etc.) appropriate hearing protection shall be worn in work areas where noise levels exceed 85 dB(a) time weighted average (8 h).

Hearing protection devices will be certified, able to cover ears without coming into contact with its inner walls, not impede verbal communication, be easily adjustable to the worker's features and comfortable, durable, easy to clean, hypoallergenic and allow for the use of other personal protection equipment.

Eye & Face Protection

All tasks, as per risk assessments, that present a risk of injury to the eyes or face will require the use of suitable PPE eye and face protection. Eye and face PPE will be certified, suitable in design, light weight, guarantee adequate visibility, etc.

All persons entering the Site will wear eye protection.

Minimum eye protection includes approved safety glasses. Additional eye and face protection shall be worn by employees when necessary (welding, burning, cutting with torches, using abrasive wheels, portable grinders, working under dusty conditions, sand or water blasting, working on energized switchboards, working with compressed air or other gasses, chemical goggles for handling hazardous materials, etc.).

It will be mandatory the use of safety dust proof glasses under the face protection for double eye protection for grinding and welding activities.

Dark protective eye glasses shall not be worn inside buildings.

Head Protection

All employees shall wear approved, light, fire retardant, hypoallergenic, non-metallic hats, with chin strap if working at height or wearing a "Beanie".

Hard hats shall be void of any type of defects and should not be altered in any way.

Hard hats shall display Employer logo and will have proof of induction stuck on the side.

Helmets will be issued personally, replaced every 2 years if used regularly (unless subject to shock which will require an instant replacement).

Arm & Hand Protection

All tasks, as per risk assessments, that present a risk of injury (electric shock, cuts, punctures, vibration, hazardous substances, etc.) to hands &/or arms, will require the use of suitable arm & hand protection.

Arm & hand PPE will be certified, the right size, allow for adequate movement and sensibility and be hypoallergenic.

Breathing Protection

All tasks, as per risk assessments, that present a risk of injury to any workers' respiratory system and where concentrations of hazardous substances or materials reach undesirable levels will require the use of suitable breathing protection. If working with solvents etc. that general noxious fumes, suitable breathing respirators rated for that specific fume/ gas rating, shall be worn.

These activities include work with hazardous substances (additives used with concrete, solvents and paints in enclosed areas, etc.), cutting, grinding and polishing, welding, etc.

Respiratory protection equipment will be certified, easily adjusted, light and non-obstructive, adequately designed (filters and valves will allow a sufficient air supply for the most strenuous task planned), hypoallergenic, allow for the use of additional PPE (ear muffs, helmets, etc.), fitted with appropriate filters (including compressors and air purifiers) and be subject to an inspection regime before, during and after its deployment.

High Visibility Clothing

Work in low visibility or where there is a significant risk of collisions or impact with vehicles, etc. in motion will require the use of high visibility clothing (i.e. vests).

8.5. Stacking

Supply materials must be placed or stored in such a way that any possible collapse, fall or roll-over is prevented.

Their stability and balance must be duly verified, particularly after modifying the height of the stockpile.

Access to those surfaces comprised of materials lacking the necessary resistance will only be authorised when the appropriate equipment or means so that works are carried out in a safely manner have been provided.

The elevation of the loads, their weight and the angle formed by the straps of the slings used -which may never exceed 90 degrees- must be taken into account.

Suspended parts must be transported by means of a movable crane, which must comply with all requirements set out in the machinery section. The guiding of suspended pieces must be carried out by means of secured straps; it must never be carried out manually.

Under no circumstance are workers allow to stand or walk under suspended loads and therefore guiding ropes must be long enough to allow the handling of loads from outside such area.

Overloads must not be applied on structures.

Surfaces meant for stockpiling must be levelled and have the appropriate resistance.

The height of the pile must not exceed the one established by the manufacturer of the relevant material.

The same pile must not include materials featuring different shapes or vessels with different contents.

<u>Stockpiling of soil and aggregates</u>

The stockpiling of soil and aggregates must be carried out in accordance with the following rules.

- If the pile exceeds a height of 1,8 m, the whole stockpile area must be fenced or marked out.
- Stockpiling must be only performed for those works that so require.
- Piles must never be placed over roads or access ways; however, if that is necessary, piles must be duly marked out.
- Soils or aggregates must never be placed by excavations or slopes that may cause slides and/or spills of those materials piled up.
- Piles of soil or aggregates must never be placed by drainage devices that may get blocked as a consequence of the dragging of those materials piled up or that otherwise may get blocked simply because of the discharge of the device.
- Loose aggregates must be stacked in the form of mounds limited by boards preventing them from accidentally mixing and spreading.

<u>Stacking of pipes, frames, prefabricated elements and scrap items</u>

For the stacking of pipes, frames, prefabricated elements and scrap items the following safety rules must be followed:

- The stacking of pipes must be carried out in a way that ensures their stability by using the appropriate shoes to such effect. Transportation of pipes must be carried out using the appropriate tools in order to prevent the sliding or fall of those elements being transported. Such tools must be regularly inspected to as to guarantee the appropriate use conditions.
- Scrap items must be stacked by the corresponding site, avoiding contact with wet surfaces so as to prevent them from rusting and therefore preventing them from losing their resistance qualities.

Stacking of paints, release agents and fuels

- A covered and independent warehouse must be used for the storage of fuels or toxic products that may be required for the works. Smoking is not allowed within such warehouses and works generating heat, such as welding, are prohibited. If there are materials giving off toxic vapours, vents within the facilities must be regularly inspected. Besides, those workers accessing such facilities must be provided with respirator filters.
- If products feature high environmental toxicity, the storage facilities must not be placed at stream beds or extremely permeable surfaces so as to minimize the effects of a possible accidental spillage.
- Warehouses must be equipped with a sufficient number of fire extinguishers appropriate for the relevant flammable product; such fire extinguishers must be duly maintained. In any case, regulations regarding toxic and hazardous substances must be complied with, in particular, those regarding the requirement of hiring a safety advisor specialized in such field.
- Fuel transfer operations must be carried out in places with the appropriate ventilation, away from sparks and ignition sources. Likewise, consequences of any possible spills during the operations must be foreseen; therefore soil or sand must be ready in case they need to be spread over the ground.
- During the execution of these works smoking or lighting any kind of flame must be strictly forbidden.
- When transferring liquid fuels or deposits are being filled, engines being activated by the fuel being transferred must be switched off.

Storage of LPG and other gases

All LPG cylinders, pressurised gas cylinders and flammable gases shall be stored and handled in accordance with the manufacturer recommendations. General rules are:

- All LPG, pressurised gas cylinders and flammable gases storage areas shall be secured and positioned at least 6m away from any site accommodation. They shall be appropriately signed with warning/advising information and shall have adequate upper and lower ventilation afforded to these storage facilities to enable any escaped gases to dissipate into the atmosphere.
- Quantities of stored LPG, pressurised gases and flammable gases shall be kept in minimum requirements, where this is reasonably practicable
- All gas cylinders shall be clearly labelled or colour coded to show their contents
- Full and empty gas cylinders shall be labelled and physically segregated
- All empty gas cylinders shall be treated and Handled as if full
- All empty gas cylinders shall be removed from site promptly to the appropriate storage area to wait for immediate backload to the suppliers.
- All gas cylinder end caps shall be put back onto the cylinders when they are not in use
- All gas cylinders shall be secured in the upright position
- Grease, oil and oxidizing substances shall be kept away from gas cylinders

- Gas cylinders shall be transported around site in an appropriate cylinder bank, bottle trolleys or a purpose built transit cage, secured and upright
- Gas cylinders shall not be stored inside containers or the welfare facilities, unless designed for the specific purpose
- Quantities and storage/use locations of LPG, pressurised gases and flammable materials shall be clearly marked up on the site plan located within the emergency response plan with their associated materials data to aid the emergency services in an event of a fire
- All naked flames, sources of ignition and smoking shall be forbidden within the vicinity of all LPG, pressurised gas and flammable materials.

Stacking of gas bottles

- Gas bottles must not be stored in underground facilities or in those places directly connecting with basements, stairwells, corridors, etc.
- Grounds must be flat, made of a materials which are not easily flammable and with characteristics guaranteeing the appropriate stability of the container.
- In closed storage areas, ventilation must be constant and sufficient and therefore such areas must include holes and openings which communicate directly with outside areas; such holes and openings must be duly distributed in high and low areas. The total surface of such openings must be equal to, at least, 1/18 if the total area of the storage facility.
- The electrical installation must comply with current Electro-technical Regulations.
- The fact that smoking is forbidden must be duly signposted.
- Bottles must be kept away from naked flames, electric arcs, sparks, radiators or other heat sources.
- Bottles must be protected against any type of incandescent projections.
- In case of fire, bottles must be removed from the area where the fire is taking place; if bottles are overheated, they must be cooled down with lots of water.
- Standardized colour codes must be used in order to identify and differentiate the contents of the bottles.
- Bottles must be protected against extreme temperatures, ice, snow and sun rays.
- Bottles must be protected against any kind of mechanical damage such as blows with one another or against hard surfaces.
- Bottles with removable caps must not be hold by such cap. While being moved from one place to another, bottles must be closed with their caps duly fixed.
- Bottles must not be dragged, slid or rotated while in horizontal position. The safest procedure is to transport them using a lift truck specifically designed for such purpose; bottles must be duly secured to its structure. If lift trucks are not available, they must be moved by rolling them in vertical position over their own base or pedestal.
- Bottles must not be handled with greasy hands or gloves.
- Valves of full or empty bottles must be closed by securing the appropriate safety caps.
- Bottles must always be stored in vertical position.
- Bottles presenting any kind of leak must not be stored. In order to detect leaks, flames must not be used; to that end, the appropriate product for each gas must be used.
- In order to load/unload bottles, the use of any magnetic device is forbidden; the use of chains, ropes or slings which are not duly equipped with elements specifically designed for their lifting is also forbidden.
- Full and empty bottles must be stored in separate areas.

- Storing bottles under direct sunlight for a long time is not advisable since pressure inside them may dangerously increase if such bottles are not specifically designed for temperatures over 54ºC.
- Bottles must be stored in places where they cannot get oil or grease stains.
- If a bottle containing acetylene is accidentally stored in horizontal position, it must remain in vertical position at least twelve hours before its use. If ice is formed over them, hot water must be used to remove it before using those bottles.
- All bottles must be handled as if they were full.
- If mechanical equipment is used for their transportation, bottles must be placed on the appropriate basket, platform or trolley; valves of the bottles must be closed and the safety cap must cover them.
- Metallic chains or cables, or even cables covered with rubber, must not be used to lift or transport bottles, since they may slip.
- If there are flammable materials such as paint, oil or solvents, even though they may be inside special cabinets, a minimum distance of 6 m must be kept.
- Oxygen and acetylene bottles must be stored separately, keeping a 6 m distance between them if there is no separation wall.

If there is a separation wall, two different options may apply:

- Separate wall: the wall must be at least 2 m high and it must exceed 0.5 m the upper part of the bottles. Besides, the horizontal distance from the end of the storage area and the fire resistance quality of the wall depend on the type of warehouse.
- Wall attached to another wall: it must comply with the same requirements as the separate wall, except bottles may be stored by the wall and the minimum horizontal distance only needs to be kept between the end of the storage area for bottles and the separation wall.
- According to South African Legislation/ Best practice, Gas bottles are to be in a shaded area that is well ventilated (a cage with a shade).
- Separation signs to be posted for empty and full bottles.

Storage and handling of flammable materials

All contractors must submit a list of flammable materials including quantities, hazards (using MSA904 or any similar method) and the MSDS of every material to be used. If any material must be changed, the list must be updated and re-submitted as well as the MSDS.

General rules are:

- All flammable materials and substances must be stored and handled in accordance with the manufacturer recommendations.
- All flammable substances, fuels and thinners must be stored in appropriate containers out of direct sunlight and away from sources of ignition
- Quantities and storage/use locations of flammable materials and substances must be clearly marked up on the site plan located within the emergency response plan with their associated MSDS to aid the emergency services in an event of a fire
- All flammable materials and substances will be returned back to their secured storage areas when work is complete or at the end of the working day
- All oily rags and similar not required, the bin contents shall be disposed of as contaminated waste.
- The quantities of stored flammable materials and substances shall be kept to a minimum

- All paints shall be stored within an appropriate paint store, which shall have upper and lower ventilation which shall allow the build of fumes to dissipate into the atmosphere.
- All flammable materials and substances storage areas shall be clearly signed with appropriate warning and advising signs
- All naked flames, sources of ignition and smoking shall be forbidden within the vicinity of all flammable materials and substances
- All waste materials shall be disposed of in accordance with the manufacturer recommendations
- All flammable fluids shall be stored within a protective containment area away from drains, pits, sewers, excavations well fumes can build up.
- Bulk refuelling for vehicles and plant shall be undertaken via an appropriate delivery tanker
- As a matter of special concern, high standards of personal hygiene shall be implemented by all operatives handling these substances since most of them contain or could contain certain components classified as carcinogenic and/or de-fatting agents.

ACCIONA will appoint a competent person with the duty of supervising all stacking and storage on a construction site.

For references and additional information please see Procedure 039_Warehouse and temporary storage area management

8.6. Housekeeping

Site shall be maintained by the ACCIONA and its subcontractors in a clean and tidy state, whereby scrap and debris is to be collected and segregated in compliance with environmental regulations in containers and cleared from the Site on a regular or weekly basis this as such required.

ACCIONA and its subcontractors shall be responsible to keep all the roads that are used for the construction activities clean and repair all eventual damages caused by Contractor.

Housekeeping standards will be monitored as part of the HSE Inspections Programme.

ACCIONA will establish as part of this programme a suitable number of housekeeping teams made up of personnel from its subcontractors who will keep the work areas clean and free of trash, rubbish and debris at all times.

If ACCIONA agrees that housekeeping is not up to reasonable standards, has the right to arrange housekeeping services. In case of deviations, ACCIONA will endeavour to bring the area back to standard as soon as is practicably possible. All non-hazardous waste material, rubbish and debris shall be removed from the work areas (as soon as possible) and placed in closed top containers, provided by ACCIONA and its subcontractors. Such containers shall be removed from site when full and shall be disposed of as per local legislation at an offsite location. Flammable and other hazardous materials (oily rags, etc.) shall be stored in metal containers provided for that purpose.

ACCIONA and its subcontractor have the direct responsibility of storing these wastes adequately while on Site and will maintain registers showing disposal as per local regulations.

Housekeeping activities shall be undertaken every day, minimum at the end of work and if necessary in between the activities, leaving work areas clean and tidy.

Besides, if necessary, every Friday the contractor and subcontractors will perform thoroughly housekeeping.

Good practices include:

- Work areas shall be kept clean and free of trash, rubbish and debris at all times
- Materials and supplies shall be stored in locations that will not block access ways and arranged to permit easy cleaning of the area. If areas where equipment might drip oil or cause other damage to the floor surface, a protective cover of heavy gauge, flame resistant, oil proof sheeting shall be provided between the equipment and the floor surface sheeting so that no oil or grease contacts the concrete. This requirement is applicable to both finished and unfinished floors.
- All hoses, cables, extension cords and similar materials shall be located, arranged and grouped so that they will not block any access way and will permit easy cleaning and maintenance. Materials and equipment shall be stored neatly in controlled stacks in accessible locations. Materials are not to be scattered over the Site. Neatly stack those materials that are to be used that day.
- Field offices shall be maintained in good internal and external conditions, i.e. no broken windows, rickety stairs, broken doors, splintered desks, etc.
- Wrecked forms and lumber are to have nails pulled or bent over immediately after wrecking and be neatly stacked or removed from the work area(s).
- Excavations are to be left open for a minimum time and while open shall be barricaded. Barricades shall be at least 1 m. away from the excavation opening.
- Walkways, stairs and the bottom of ladders shall be kept clean and clear of tripping hazards: tools, hoses, extension cords, chokers, welding leads, etc. are to be properly rolled up and stored when not in use. All such equipment shall be routed out of walkways and traffic. Cords and leads should be suspended at least 2 m overhead, and never suspend cords and/or leads with wire.
- Stockpiles shall be stable and organized.
- Pipes shall be well wedged.
- Safety containers shall be provided for flammable or harmful substances with contents plainly marked. Separate containers shall be provided for different types of refuse, i.e. oily rags, steel, waste paper, lumber, etc.
- Eating and drinking will only take place in designated areas. Trash containers shall be placed adjacent to all drinking water locations and areas used for employees for lunch and/or break areas.

For references and additional information please see Procedure 013_Housekeeping

8.7. Barricades, Safety Signs and Labelling of Equipment

ACCIONA & subcontractor shall use barricades and safety signs to prevent exposure to personnel from potentially hazardous situations by limiting access to an area and by issuing warnings of potential danger and information regarding risks &/or safety norms that need to be complied with. Yellow/black, red/white barricades tapes, scaffolding, traffic cones, signs and barricade tags will be used to accomplish barricading and communication responsibilities.

All vessels that may contain substances that are hazardous as a result of chemical or toxicological properties, or temperature or pressure, should be labelled as to the contents and hazard, or appropriately colour coded.

Similarly, piping systems that contain hazardous substances should be labelled with the direction of flow and contents of the pipe, or colour coded whenever the pipe passing through a wall or floor is interrupted by a valve or junction device.

Safety signs will follow the colour codes specified in local rules and regulations.

8.8. Noise

Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible.

The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85dB(A), the peak sound levels reach 140dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85dB(A).

Although hearing protection is preferred for any period of noise exposure in excess of 85dB(A), an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3dB(A) increase in sound levels, the 'allowed' exposure period or duration should be reduced by 50 percent.

Periodic medical hearing checks should be performed on workers exposed to high noise levels.

For references and additional information please see Procedure 041_Hygienics Risk Control

8.9. Vibration

Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, should be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure.

For references and additional information please see Procedure 041_Hygienics Risk Control

8.10. Electrical

All working will be done on dead systems. Live working shall only be allowed for a limited number of activities and only after it has been deemed necessary on a risk based approach and approved by appropriate management. Once approved the dangers associated with any live working must be reduced as low as possible.

Only competent persons will be authorized to perform work on any electrical system, they will be competent through adequate knowledge, ability, training and experience. They must be competent in the specific tasks they are to undertake and must be given specific training as required before any work can be authorized.

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers.

Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact.

Temporary electrical facilities must be inspected by a competent person prior to be taken in service and are subject to periodic checks.

The use of improvised connections is forbidden

Recommended actions include:

- Establishing "No Approach" zones around or under high voltage power lines in conformance with the following table.

No Approach Zones for High Voltage Power Lines	
Nominal phase-to-phase voltage rating	Minimum distance
750 or more volts, but no more than 150,000 volts	3 meters
More than 150,000 volts, but no more than 250,000 volts	4.5 meters
More than 250,000 volts	6 meters

- Marking all energized electrical devices and lines with warning signs.
- All works will be carried out on dead systems. When strictly necessary, live works shall always require a permit to work
- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance.
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools.
- All electrical equipment must have double insulating or grounding; using equipment with ground fault interrupter (GFI) protected circuits.
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas.
- Appropriate labelling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited.
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work.

For references and additional information please see Procedure 022_Temporary electrical installations

8.11. Welding/ Hot WorkS

For work involving a risk of fire a fire officer must be present at all times with the necessary fire-fighting equipment stand-by.

Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases.

Hot works require a PTW to be submitted to ACCIONA for approval. When this activity is part of a more complex operation, hot works must be considered and assessed as a single activity within the risk analysis of the method statement.

All contractors shall ensure that all activities which present a risk to the workforce in respect to hot work are eliminated or reduced to as low as reasonably practicable. Hot work is defined as "operations requiring the use of open flames or the local application of heat or friction". Examples are:

- Welding.
- Flame cutting.
- Soldering.
- Brazing.
- Grinding.
- The use of other equipment incorporating a flame, e.g. tar boilers, etc.

Recommended measures include:

- Co-ordination of the work activities with other persons or other work processes, according to the procedure for interference management
- Set time limits when it is safe to work.
- Ensure that the works are properly supervised.
- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required.
- Special hot work and fire prevention precautions and Standard Operating Procedures should be implemented if welding or hot cutting is undertaken outside established welding work stations, including 'Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated. Special procedures are required for hot work on tanks or vessels that have contained flammable materials.
- While doing hot work, precautions shall be taken to eliminate the risk of fire or explosion, such as removing materials and flammable products from the working area, or protect them properly with fire-retardant blankets prior to start the work.

For references and additional information please see Procedure 032_Hot Works

8.12. Piling and drilling

8.12.1. Piling

The Contractors shall ensure that all piling activities are subject to risk assessment and a management plan, taking into account:

- Operatives require clean and dirty clothing management facilities.
- Provision of transport and suitable lay down areas.
- Rigs are heavy, large and difficult to manoeuvre and require access and movement round site.
- Stability of ground conditions to suit the location and nature of the operation.
- The need for many daily deliveries and handling associated with the operations including receipt and placement of concrete

Basic HSE arrangements must include the following:

- All pile driving equipment is to be inspected weekly by a trained and competent person.
- Before commencing the piling operation, the ground shall be checked by a trained and competent person to confirm its suitability to provide a stable platform.

- Movement of piling equipment or the piling operation itself may cause sinkholes to appear. A visual check of the surrounding strata is to be undertaken to confirm a firm foundation.

8.12.2. Drilling

Drilling operations typically consist of trial pitting, window sampling, dynamic probing, boring, piling, rotary coring, shell and auger or open hole drilling. A method statement and a PTW are required to be submitted to ACCIONA for review and acceptance of any drilling works.

A detailed desktop study of the surrounding ground conditions must be carried out to investigate any underlying hazards, such as warm/steaming ground, shafts/cavernous ground and contaminated ground.

8.13. Explosives and blasting

Work with explosives require a Method statement and a PTW to be submitted to EPC Consosrtium for approval. When this activity is a specific part of a construction method, it must be included in the method statement as a specific hazard/risk. Work with explosives is a highly regulated activity, so any contactor requiring the use of explosives must ensure that all permits, procedures and controls are set before starting any activity related to blasting.

The default position shall be that explosives are not permitted or to be used on site. Only in specific cases, where there is no alternative to the use of explosives, shall explosives be used. When used, the contractor shall provide written justification, and develop and implement a plan which takes into account local statutory legislation requirements. ACCIONA and the client must be informed before explosives are brought on site.

8.14. Explosive atmospheres

Work within areas with atmospheric hazards requires a Method statement and a PTW to be submitted to ACCIONA for approval. When this activity is a specific part of a construction method, it must be included in the method statement as a specific hazard/risk.
Where an explosive atmosphere could occur the Contractor shall ensure that an "Explosion Protection Document" (EPD) is drawn up and kept up to date. The EPD shall demonstrate in particular:

- That the explosion risks have been determined and assessed.
- The measures taken to protect against explosion risks.
- Those places which have been classified with a risk of explosion.
- Those places where the minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres will apply.
- That the workplace and work equipment, including warning devices, are designed, operated and maintained with due regard for safety.

Although some local legislation does not explicitly require the preparation of an EPD, it is considered good practice to record the significant findings of the risk assessment and measures taken to comply with the risks of explosions.

For references and additional information please see Procedure 033_Explosive Atmospheres Management

8.15. Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses.

Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly.
- Adjustment of work and rest periods according to temperature stress management procedures, depending on the temperature and workloads.
- Providing temporary shelters to protect against the elements during working activities or for use as rest areas.
- Use of protective clothing.
- Providing easy access to adequate hydration such as drinking water or electrolyte drinks, and avoiding consumption of alcoholic beverages.

8.16. Manual Handling

Manual Handling is the transporting or supporting of a load by hand or by bodily force including:

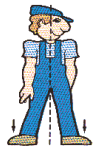
- Lifting, putting down, pushing, pulling, carrying or moving.
- Use of mechanical aids, e.g. wheel barrows, bucket loaders, trolleys

The most common injuries from manual handling are sprains or strains, often to the back. prains and strains arise from incorrect application of bodily force; poor posture and excessive repetition of movement can be important factors in their onset. Every contractor must provide training and PPE to the workforce regarding back protection and prevention measures. Whenever reasonable, processes and procedures must be modified/replaced to eliminate or diminish the need of manual handling.

Injuries due to manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. This problem should be minimized or eliminated to maintain a productive workplace.

Controls may include:

- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds.
- Selecting and designing tools that reduce force requirements and holding times, and improve postures.
- Incorporating rest and stretch breaks into work processes, and conducting job rotation.
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
- Training of workers in lifting and materials handling techniques.

POSTURES AND MOVEMENT					
LOAD					
	▪ Get close to the load ▪ Stand firmly on both feet			▪ Place your feet apart, on the direction of the load movement	
	▪ Flex your legs ▪ Get a good grip on the load (palms)			▪ Keep your arms straight and close to your body ▪ Stretch your legs, keeping your back straight.	
LIFTING					
	▪ DO NOT Bend your back		▪ DO NOT... Twist your waist		▪ DO NOT... Lift a heavy load above the waist level on a single movement
DISPLACEMENT					
	▪ If the load is too heavy or too large... **ask for help**				

For references and additional information please see Procedure 007_Manual Handling

8.17. Working at Heights

Any work above 1.8 m will be considered to be working at height. Consideration should be given to the risk of the work taking account of frequency, duration, height, task involved, weather, etc.

Works at height require a permit to work to be submitted to ACCIONA for approval. When work at height is a specific part of a construction method, it must be included in the method statement as a specific hazard/risk

Before the commencement of the works at heights the company in charge of those works must appoint the person responsible for the preparation of a Fall Protection Plan.

The fall protection plan shall include:

- a risk assessment of all work carried out from an elevated position which shall include the procedures and methods used to address all the risks identified per location;

- the processes for evaluation of the employees physical and psychological fitness necessary to work at elevated positions and the records thereof;
- the programme for the training of employees working from elevated positions and records thereof; and
- the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than 1.8 meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights.

Fall prevention may include:

- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area.
- Proper use of ladders and scaffolds by trained employees.
- Use of fall prevention devices, including safety harness and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines. Fall arrest systems must be appropriate for the specific situation and approved by a competent person. Its selection must be in accordance with a documented risk assessment carried out by someone trained and competent to make such a selection.
- Appropriate training in use, serviceability, and integrity of the necessary PPE. Damaged harnesses must not be used, some types of harnesses can only be activated once, particularly those which have an energy absorber.
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall. People left suspended in harness type systems even for very short periods (15 min) can suffer serious injury or fatality if not rescued in a short period after the fall (suspension trauma).

The hierarchy of preference for controls for working at height will be:

- Avoid working at height.
- If unavoidable, prevent falls when working at height by using collective protection systems (i.e. fixed platform with guard or hand rails, verified and approved by a competent person). They can be permanently installed as those attached to loading racks or similar facilities, or may be part of a temporary structure such as a scaffold.
- If fixed platforms are not a practical option other systems which prevent falls, such as a restraint system which prevents a person approaching a position where they can fall can be considered.
- Finally, if fixed platforms and restraint systems which prevent falls are not practical, systems which minimize the consequences of a fall such as a harness, an air bag system or a safety net must be used.
- During works at a height, the surrounding area must be barricaded.
- Everybody working at a height above 1.8metres, shall where fall protection, e.g. safety harness with a double lanyard, with both tied off.
- Everybody working at a height above 1.8metres, shall be properly trained and be in possession of a valid Working At Heights Certificate as per the SAQA requirements.

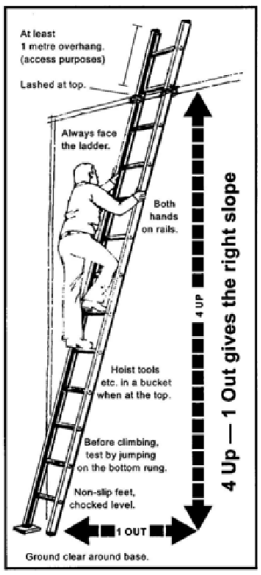
All contractors must deliver a list of all work at height equipment (harnesses, fall arrestors, portable life lines, locking devices, ascending and descending devices, etc.) This list must contain the following information:

- Equipment (class or type)
- Works on which the PPE is used
- Owner (PPE for works at height is personal, so the same equipment cannot be used by two workers)
- Date of manufacture
- Date of inspection (internal) or inspection history, when applicable (a monthly internal inspection of 100% of PPE is mandatory).
- Date of last inspection or inspection history, when applicable (external) and date of next inspection (manufacturer certificates and test approval certificates from authorized third parties must be available for review)
- All PPE rejected during certification/testing and/or inspection processes must be destroyed.

All personnel performing works at height must have a relevant certification from an authorized third party (unless the contractor itself has a valid homologation as "specialist" or "trainer", on which case it is allowed to extend certifications). A list of authorized personnel must be delivered to ACCIONA, updated as necessary to ensure the last version is available, and re-submitted to ACCIONA each time it is updated.

Working On Ladders:

- All ladders will be inspected before and after use and records of these are to be placed in the site HSE File.
- Three point contact will be maintained at all times when climbing a ladder.
- Ladders must use the 1 out 4 up formula when setting it up against a structure or building.
- Ladders must protrude at least 900mm above the structure that it is leaning against.
- Ladders must be tethered at the top of structure.
- A ladder register must be kept and these records are to be placed in the site HSE File.



For references and additional information please see Procedure 027_Working at Heights

8.18. Chemical Hazards

Chemical hazards represent potential for illness or injury due to single acute exposure or chronic repetitive exposure to toxic, corrosive, sensitizing or oxidative substances. They also represent a risk of uncontrolled reaction, including the risk of fire and explosion, if incompatible chemicals are inadvertently mixed.

Chemical hazards can most effectively be prevented through a hierarchical approach that includes:

- Replacement of the hazardous substance with a less hazardous substitute.
- Implementation of engineering and administrative control measures to avoid or minimize the release of hazardous substances into the work environment keeping the level of exposure below internationally established or recognized limits.
- Keeping the number of employees exposed, or likely to become exposed, to a minimum.
- Communicating chemical hazards to workers through labelling and marking according to national and internationally recognized requirements and standards, including the Materials Safety Data Sheets (MSDS), or equivalent. Any means of written communication should be in an easily understood language and be readily available to exposed workers and first-aid personnel.
- Products must never be transferred to bottles or canisters originally used for foodstuffs.
- Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE.

Working with hazardous materials requires a PTW to be submitted to ACCIONA for approval. When this activity is part of a more complex operation, hazardous materials must be considered and assessed as a single activity within the risk analysis of the method statement.

All contractors shall ensure, so far as is reasonably practicable, that the risks to health from the use of hazardous, carcinogenic, mutagenic or repro-toxic substances, chemicals, preparations and biological agents on site are managed.

All contractors must:

- Ensure compliance with all relevant legislation.
- Ensure effective purchasing arrangements for substances hazardous to health.
- Undertake suitable and sufficient risk assessments.
- Identify and implement control measures to reduce risks from substances hazardous to health.
- Conduct regular maintenance and testing of equipment.
- Provide suitable and sufficient information, instruction, training and supervision to staff and all visitors.
- Provide adequate health surveillance, as and when required.

For references and additional information please see Procedure 040_Hazardous Substances Management

8.19. Fire and Explosions

Fires and/or explosions resulting from ignition of flammable materials or gases can lead to loss of property as well as possible injury or fatalities to project workers.

Prevention and control strategies include:

- Storing flammables away from ignition sources and oxidizing materials. Further, flammables storage area should be:
  - Remote from entry and exit points into buildings.
  - Away from facility ventilation intakes or vents.
  - Have floor and ceiling level ventilation and explosion venting.
  - Use spark-proof fixtures.
  - Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to withstand flame impingement for a moderate period of time.
- Providing bonding and grounding of, and between, containers and additional mechanical floor level ventilation if materials are being, or could be, dispensed in the storage area.
- Where the flammable material is mainly comprised of dust, providing electrical grounding, spark detection, and, if needed, quenching systems.
- Defining and labelling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment).
- Providing specific worker training in handling of flammable materials, and in fire prevention or suppression.

For references and additional information please see Procedure 033_Explosive Atmospheres Management

8.20. Corrosive, Oxidizing, and Reactive Chemicals

Corrosive, oxidizing, and reactive chemicals present similar hazards and require similar control measures as flammable materials. However, the added hazard of these chemicals is that inadvertent mixing or intermixing may cause serious adverse reactions. This can lead to the release of flammable or toxic materials and gases, and may lead directly to fires and explosions. These types of substances have the additional hazard of causing significant personal injury upon direct contact, regardless of any intermixing issues.

The following controls should be observed in the work environment when handling such chemicals:

- Corrosive, oxidizing and reactive chemicals should be segregated from flammable materials and from other chemicals of incompatible class (acids vs. bases, oxidizers vs. reducers, water sensitive vs. water based, etc.), stored in ventilated areas and in containers with appropriate secondary containment to minimize intermixing during spills.
- Workers who are required to handle corrosive, oxidizing, or reactive chemicals should be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc).
- Where corrosive, oxidizing, or reactive chemicals are used, handled, or stored, qualified first-aid should be ensured at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work, and eye-wash stations and/or emergency showers should be provided close to all workstations where the recommended first-aid response is immediate flushing with water.

For references and additional information please see Procedure 040_Hazardous Substances Management

8.21. Radiological Hazards

Radiation exposure can lead to potential injury or serious illness to workers.

Places of work involving occupational and/or natural exposure to ionizing radiation should be established and operated in accordance with recognized international safety standards and guidelines.

8.22. Confined Space

A confined space is defined as a wholly or partially enclosed space not designed or intended for human occupancy and in which a hazardous atmosphere could develop as a result of the contents, location or construction of the confined space or due to work done in or around the confined space.

A "permit-required" confined space is one that also contains physical or atmospheric hazards that could trap or engulf the person.

All works in a confined space require a method statement and a permit to work to be submitted to ACCIONA for approval.

Confined spaces must be managed according to ACCIONA procedure, including the PTW system implemented in the project. In this case, there is no possibility for contractors using different methods in order to ensure a high level of control.

Confined spaces can occur in enclosed or open structures or locations. Serious injury or fatality can result from inadequate preparation to enter a confined space or in attempting a rescue from a confined space.

Recommended management approaches include:

- Engineering measures should be implemented to eliminate, to the degree feasible, the existence and adverse character of confined spaces.
- Permit-required confined spaces should be provided with permanent safety measures for venting, monitoring, and rescue operations, to the extent possible. The area adjoining an access to a confined space should provide ample room for emergency and rescue operations.
- Prior to entry into a permit-required confined space:
    - Process or feed lines into the space should be disconnected or drained, and blanked and locked-out.
    - Mechanical equipment in the space should be disconnected, de-energized, locked-out, and braced, as appropriate.
    - The atmosphere within the confined space should be tested to assure the oxygen content is between 19.5 percent and 23 percent, and that the presence of any flammable gas or vapour does not exceed 10 percent of its respective Lower Explosive Limit (LEL).
    - If the atmospheric conditions are not met, the confined space should be ventilated until the target safe atmosphere is achieved, or entry is only to be undertaken with appropriate and additional PPE.

- Safety precautions should include Self Contained Breathing Apparatus (SCBA), life lines, and safety watch workers stationed outside the confined space, with rescue and first aid equipment readily available.
- Before workers are required to enter a permit-required confined space, adequate and appropriate training in confined space hazard control, atmospheric testing, use of the necessary PPE, as well as the serviceability and integrity of the PPE should be verified. Further, adequate and appropriate rescue and / or recovery plans and equipment should be in place before the worker enters the confined space and the workers has been properly trained in this job.
- For description of Working in Confined Spaces, refer to General Safety Regulations GSR5. (Excavations - Construction Regulations 11(3)(j).)

For references and additional information please see Procedure 031_Confined Spaces

8.23. Permit To Work

The Permit to Work or Authorization for special works is the instrument used for the identification of risks, establishment of preventive and protective measures, organization and coordination of the execution of particularly dangerous works or activities or those activities other than the regular ones which will be implemented and documented when so required.

No work shall start unless a Permit To Work when necessary is completed and signed off by all those required.

Each Permit To Work shall be accompanied by a Risk Assessment. Some of these permits will be issued daily while others may be issued for periods significantly longer than 1 day (1 week, 2 weeks, monthly, etc.).

The Risk Assessment shall be read by those to whom it applies and each employee shall sign off on the Risk Assessment to show it has been read and understood.

The Permit to Work and Risk Assessment shall be on the job at the work location for all to review if necessary during the course of work.

Permits to Work and Risk Assessments will be produced at least 1 day before work is required, a suitable time in advance to allow for a proper review and possible modifications.

All operations must be reviewed, assessed and authorized according to the established project planning. The PTW system is the tool to be used in order to ensure the following:

- Consistent approach to work planning and work coordination.
- Better information about each activity is available to make work coordination and interface management easier for project management and technical staff.
- Solid process for work management/authorization is set in place.
- Proper resources, responsibility and supervision assignment for each activity.
- Adequate control of contractors' activities.
- Better control of site conditions before, during and after a work has been carried out.

For references and additional information please see Procedure 010_Permit to Works

8.24. Blasting & Demolition

Blasting or use of explosives is not permitted on Site unless written authorization is obtained from ACCIONA.

Only qualified and competent subcontractors, authorised by local legislation, may perform this type of activities. Blasting activities will be subject to the issue and authorization of a Permit to Work.

Special consideration will be given to demolition work of structures that may contain hazardous substances (asbestos, etc.). In the event of any further suspect asbestos being encountered during the demolition work, all work will cease. Once the nature of the asbestos contaminated materials has been verified an additional or replacement Plan of Work will be issued by an Asbestos Removal Company covering all aspects of the asbestos removal work to conform to the necessary Asbestos Regulations and current Codes of Practice. All materials containing asbestos found in buildings, plant, pipe work or equipment will be handled according to the relevant safety legislation. All asbestos waste will be transported to a nominated licensed waste disposal site.

All demolition works must be monitored by a qualified technician appointed by the company in charge of such works.

8.25. Civil Works

All Civil Work (excavation, concrete pouring, form/false work, rebars pilots, sheet piles, etc.) shall be carried out by competent personnel under suitable supervision as per applicable HSE Plan / regulations / procedures.

8.25.1. Excavations and shuttering

Excavation works require a method statement and a permit to work to be submitted to ACCIONA for approval. Proper identification of hazards (underground services like water, sewage, electricity, etc.) must be done for each process when there is a suspect about the presence of these.

Each week, all contractors must provide an excavation plan including the location and duration of each work. This will facilitate the analysis of conditions to set proper traffic controls.

Regarding excavations (man-made cut, cavity, trench or depression in the soil), the work will not be allowed to proceed unless:

- Valid authorization is obtained.
- All underground hazards, i.e. pipelines, electrical cables, etc., have been identified, located and if necessary, isolated.

When required for the completion of Contractor's Works, Owner's documents and drawings of the existing underground facilities can be made available for Contractor's use. Owner cannot confirm either their accuracy or completeness, or that these documents reflect the as-built condition. In case of any doubt, Contractor shall survey the existing facilities at its own costs.

- Any excavation deeper than 1,00 metre must be properly protected to prevent unadverted / unauthorized access, and clearly signposted to make it visible.
- Piling and drilling holes must be covered until they are filled.
- Adequate barriers and fencing must be set
- Excavation work shall be carried out carefully and follow recognized safe digging and excavation shuttering/protection practices.

- Once a locating device has been used to determine cable positions and routes, excavation may take place, with trial holes dug using suitable hand tools as necessary to confirm this.
- Excavation shall be alongside the service rather than directly above it.
- Final exposure of the service by horizontal digging is recommended; as the force applied to hand tools can be controlled more effectively.
- Insulated tools shall be used when hand digging near electric cables.
- Previsions must be taken to pump water out of any excavation when necessary.
- Illumination is mandatory when the excavation is so deep that light is not enough at the bottom
- During excavation works in the vicinity of existing facilities, mechanical excavations or earthworks may be permitted up to a distance of at least one meter from these facilities provided the exact position of said existing facilities has been established by means of trial trenches. Any excavation work that needs to be carried out closer than one meter from said facilities must be carried out entirely by hand.
- Where persons are to enter an excavation:
  - A confined space entry permit must be issued where applicable.
  - Ground movement must be controlled and collapse prevented by systematically shoring, sloping, benching, excavation dewatering, etc., as appropriate.
- Any excavation of a pit or trench to a depth of greater than 1.2 meters and in which works are to be carried out, shall be provided with a sufficient number of ladders or means of escape to give personnel working in the excavation a way of escaping quickly.
- Working pits of more than four meters deep with restricted dimensions and narrow trenches of more than four meters deep and less than two meters wide are deemed to be - and classified as - confined spaces to which specific safety provisions shall apply (permanent supervision from outside the working pit, continuous oxygen monitoring, monitoring harmful substances, safety harnesses with lanyards for evacuation, etc.).
- Ground and environmental conditions must be continuously monitored for change.

All excavation works must be monitored by a qualified technician appointed by the company in charge of such works.

For references and additional information please see Procedure 017_Excavations and Earthworks

8.25.2. Demolition

Demolition can be an early operation carried out in association with site clearance and is often undertaken prior to the setup of full site facilities. A systematic approach shall be employed by each contractor to identify and control all hazards (including environmental aspects) are identified and properly assessed, and a Method Statement (MS) shall be produced containing all relevant information including (this list is not limitative):

- Original drawings
- Adjacent structures and public areas
- Exclusion zones, barricades collective protections and warning signs
- Pipe work condition
- All structural hazards
- Previsions against uncontrolled collapse
- Vessel condition analysis
- Underground services/utilities
- Overhead power lines and protection measures.
- Demolition methods and techniques

- Isolation and decontamination
- Process residues and waste including
- Biological hazards
- Management of asbestos and refractory fibres (when required)
- Polychlorinated Biphenyls (PCBs).

This MS shall be reviewed and updated when required to reflect changes on the identified hazard, risks and environmental aspects throughout all stages of the demolition process. Any demolition work requires a method statement and a permit to work to be submitted to ACCIONA for approval.

8.25.3. Formwork and support work

These are the elements aimed at containing and give shape "on site" to the different parts of a concrete structure. The forming and striking of concrete is an operation carried out manually by specialized personnel. The formwork unit is in charge of the construction of the panels, the assembly of the formwork and subsequent striking, if appropriate.

Formworks may fall into two categories: "traditional" (usually wooden) and "prefabricated" (metallic or wooden).

The most important components are:

- Traditional (plank, board, sheet and posts).
- Prefabricated (screen, cramps, stabilisers, cantilever beams and lifting clamps).

Formwork assembly is the joining of different single panels which are modulated until the desired form is achieved, both regarding height and length, including working platforms, accesses, etc. Units included in formworks are: assembly, transportation and placement.

As many operations as possible must be performed on ground level, including the assembly of the working platforms, before the on-site placement of the formwork.

Elements used:

- Tubular scaffolds.
- Chains, straps and slings.
- Ladders.
- Tubular ladders.
- Hooks and clamps.
- Struts.
- Crane on truck.
- Self-propelled crane.
- Tower crane.
- Power generating set.
- Lifting platforms.
- Circular saw.

General rules

- All works must be carried out from the working platforms and, whenever assembly conditions do not allow to work from the aforementioned elements, fall-arrest safety harnesses must be used; therefore, anchorage points must be set in place in advance.

- If the formwork is not placed horizontally on the natural ground but inclined, the mooring and unmooring by means of cramps must be carried out using ladders.
- The access tubular ladder must meet the appropriate safety requirements and it must be braced.
- It is forbidden to climb the formworks or stand on them while maintaining the balance.
- Formwork panels must not be unhooked until they are properly stabilized.
- Stabilization of panels must be carried out in accordance with their size and following the instructions of the manufacturer.
- The use of struts and winches must be restricted to those cases in which, due to space or other reasons, it may not be possible to use stabilizers.
- The assembly of panels may require the use of personal protective equipment to avoid the risk of falls from a height; therefore, the use of certified harness hooks for those hitches available must be foreseen; such hitches are in many cases just the holes drilled on the ribs of the formworks which are already secured.
- Assembly, disassembly and maintenance instructions established by the manufacturer must be followed.
- The kind of formwork used must be defined based on the type of structure. Likewise, the formwork must be solid enough to support, without substantial deformations, the concrete load it contains.
- Formwork elements must be stacked in an orderly manner, always in the horizontal position in the appropriate places, away from transit areas.
- In case of strong winds or very strong winds, works must be stopped.
- Keep all worksites clean and tidy.

Rules for use and maintenance

- The conditions of the formwork panels, associated collective protections and all auxiliary elements for the assembly must be verified.
- It must be verified that all formworks are free from concrete and that all spikes have been removed.
- The crane driver must have an appropriate view during the whole operation. If that is not possible, he or she must be assisted by a banksperson.
- During the placement of the formwork only those persons in charge of executing such operation must be at the work area.
- The proper strutting must be guaranteed.
- A safe access to the work area must be defined.
- Premature striking must be avoided.
- Even distribution of the piles of materials over the surfaces of the formwork is required.
- Even distribution of the concrete is required.
- The struts and the support systems must be inspected frequently.
- Tools must not lay untidily over the formwork area.
- Chemical products for formworks must be used in accordance with the technical specifications of the manufacturer as included in the technical data sheet.
- Whenever possible, use the machines available for the transportation of the heaviest elements of the formwork; if that is not possible ask for help to other workers.
- During the striking process, if any panel of the formwork remains attached to the structure, it must be removed using a metallic lever from a surface the formwork of which has been previously removed.
- Use provisional defined accesses to access the upper section of the formwork and do not do that by drilling through the formwork.

Collective protections

- Formworks must be provided at all times with working platforms including banisters and, in those cases in which it may be necessary to prevent the transit or fall of workers and objects they will be provided with banisters at an intermediate height and a skirting board respectively.
- During formwork operations and, in particular, during striking operations, the access to the area must be restricted to certain workers.
- During striking operations, those areas which may potentially get impacts from detached materials must be marked out.

All formwork operations must be monitored by a qualified technician appointed by the company in charge of such works.

8.25.4. Self-Climbing formwork

Hydraulic self-climbing formwork can climb as a whole characterized with stable motion, high safety-performance and fast speed, and so can decrease the labour intensity effectively. Hydraulic self-climbing formwork adopts the standardized wood system with the advantages of high stiffness and light weight, and can be easy to install, calibrate and dismantle.

Characteristics and advantages

The main advantages are highlighted in the following aspects:

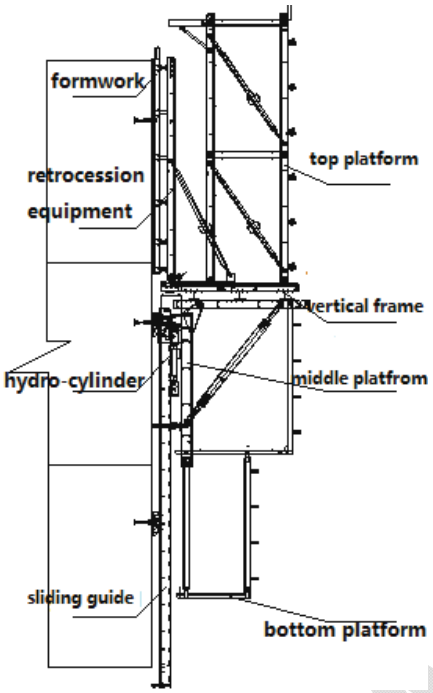
- The concrete poured by Hydraulic self-climbing formwork, has a high quality of smooth surface and corner seams
- Hydraulic self-climbing formwork with the operation platform and climbing system into one system has traits of whole compact mechanism and easy operation
- The overall equipment can climb freely, conveniently driven by the hydraulic climbing device.

Formwork structures

The new Hydraulic self-climbing formwork consists of large scale formwork system, climbing system and steel structure work platform. The large scale formwork system is linked with the whole system by using the steel structure; the formwork set 6 operation platforms; each platform is connected by a fixed staircase. The platform set some fire prevention board devices and the hydraulic oil cylinder assembles the safe equipment which can prevent oil pipeline rupture.

Process flow

The process flow of hydraulic self-climbing formwork is as shown in next Fig.



Hazardous factors identification

Hydraulic self-climbing formwork has the operating platform and climbing system as a whole, and the overall pressuredriven device can achieve even climbing. As a result hydraulic self-climbing formwork has markedly improved its safety performance. However, hydraulic self-climbing formwork with a complex and bulky structure is still the focus of construction safety control. There is still a great safety risk in the process of operation and use, such as its installation and dismantling, adjustment of position, which is prone to lead to template collapse, fall from height, and strike by objects, etc, especially in the construction of tower with the elevation of +200 m.

Template collapse

As typical large-scale construction equipment, the collapse accidents of Hydraulic climb formwork occasionally happened due to improper use and operation, such as working procedure of installing, climbing, and removing of the formwork.

Falling from height

The construction of tower belongs to height operations. And the narrowly height operation space will cause the danger of falling if workers don't wear the seat belt or use it incorrectly. The falling accident's consequences would be catastrophic.

Strike by objects

Tools and some small working machines will easily fall when the operating personnel working in a limited operation space, especially during the process of vertical crossing operation, cranes lifting, and ground prefabrication. And these will cause a severe consequence if those tools and machines hit on workers who walk on ground.

Safety control of hydraulic self-climbing formwork

Safety control during the process of preparation

The safety control during the preparation of the hydraulic self-climbing formwork would be focused on the followings.

Safety schemes programming and technological explanations.

A targeted, operable safety special scheme should be programmed before construction. In the safety special scheme, the hazardous factors have to be identified, and corresponding safety protection design and management measures should be put forward.

Before construction, all the relevant managers and workers should participate in the safety training in order to improve their safety awareness and skills, and technological explanations should also be organized to make managers and workers be familiar with the hazardous factors and emergency response measures.

Safety acceptance before operation.

It is important to accomplish the safety acceptance of hydraulic climb formwork before using it. Equipment manufacturers, supervision engineers, owner's representative, and some related experts when necessary, should be invited to inspect the safety function of the formwork system. The inspection should be done according to the original design documents, and the key check points include: component connection point, hydraulic self-climbing devices, and so on. And the welded parts of important components should be conducted by weld flaw detection.

Safety control during the process of self-climbing

Self-climbing process should strictly comply with the operation procedures. Before self-climbing, it is necessary to clear the all scattered objects and only the workers could stay on the work-platform. During self-climbing, it is necessary to pay special attention to monitor the sliding guide, climbing speed and dynamical system. After reaching a new pendant point, hydraulic climb formwork could come into use only by safety acceptance.

Self-climbing of sliding guide.

Before self-climbing of sliding guide, the operation personnel, construction person in charge, and safety officer and other relevant personnel administrator need to be at present. In addition, it is necessary to ensure the concrete strength are over 20MP and all the components and control systems are in good condition.

Self-climbing of climbing-frame.

Before self-climbing of climbing-frame, it is important to remove the unnecessary loads, such as reinforced head, oxygen and acetylene empty bottles, and so on. The safety inspection emphasis includes: the connection between the long side and short of climbing-frame has been removed; the length of main cable suspension is adequate from tower cranes to climbing-frame; all hydraulic components and control systems are in good condition.

Safety check at the end of self-climbing.

At the end of self-climbing, the safety inspection emphasis includes: The load-bearing pins and safety pins are inserted in place; all platform wheels and feet touch the concrete surface

tightly; the anchor bolts are tighten, and the corners of the connection parts are solid; the protection facilities for each platform are put in place.

Safety control during the process of operation

The safety control during the operation of the hydraulic self-climbing formwork is focused on the followings.

Operating platform protection.

The operating platform must ensure passage unobstructed, and protective rails and safety nets in place. Operating platform protective railing which consisted by two horizontal rails and vertical rails should be installed strictly according to pecifications: the height of bottom horizontal rail is 0.5 ~0.6m, the height of top horizontal rail is 1.0 ~1.2m meters high, and the distance between the vertical rails is no more than 2m. In addition, bridging and bracing has also been set in the construction of Tower.

It is also very important to select the type of the safety net. If using the ordinary dense-mesh net, high-altitude wind will affect the stability of hydraulic self-climbing formwork; if using larger-mesh safety vertical net, it will increase the risk of altitude litter; In addition, the construction has a large number of welding slags, welding flowers which can easily ignite the ordinary safety net. Based on the comprehensive consideration of the above factors, a new kind of new fire-retardant and dense-mesh safety net is adopted in the construction of Tower.

Operating load control.

All the construction loads of hydraulic self-climbing are supported by ten anchor points in four directions.

So it is necessary to reduce additional loads as far as possible, and all the loads are forbidden to pile together.

High altitude operation management.

The Tower has the height of more 200m and so its construction faces great risk of high altitude operation.

Workers in high altitude operation must wear labour protective equipment properly, and begin to work after manager's consent. The number of workers must be in strict control.

For references and additional information please see Procedure 028_Scaffolding, platforms and temporary structures

8.25.5. Steel erection

Steel erection requires a Method statement and a PTW to be submitted to ACCIONA for approval. When this activity is a specific part of a construction method, it must be included in the method statement as a specific hazard/risk.

The Contractor shall plan all steel erection activities and take into account the nature of work on incomplete and unstable structures during erection. All steel shall be erected in a safe, logical, sequential manner and in accordance with the issued design drawings. The Contractor shall ensure that operations include:

- All the requirements set for Working at Heights / Roof Work.
- Crane lifting operations and hot works shall be carried out under a permit to work.
- All drilling, cutting and grinding adjustment shall be done at ground level as far as possible.
- Appropriate access to and egress shall be in place for all working at heights.
- Where applicable appropriate safety nets will be secured to the inside of the structure being erected or fall arresters shall be deployed.
- Erectors will not be permitted to walk the beam. Where practicable, appropriate and tested life lines must be strung out around the work at height to allow erectors to clip on
- Appropriate, free from defect, mobile elevating work platforms, MEWP, scissor lift, cherry picker and similar shall be used, where an appropriate access platform cannot be provided.
- All suspended loads shall have tag lines fitted
- All loose tools and fittings shall be secured to prevent them from falling from height
- All key pieces shall be positioned and secured; all mounting bolts shall be packed and tightened to the specified design torque
- The working area shall be cordoned off to prevent unauthorised access. Warning/advising signs shall be erected
- The works shall be tightly coordinated and closely supervised
- All workers shall wear gloves when handling steel work
- A rescue procedure must be included in the method statement, and tested in order to verify it effectiveness

For references and additional information please see Procedure 029_Steel Erections

8.25.6. Assembly Of Structures

- If applicable, the elements will have the definitive handrails installed (or in their absence provisional ones) before lifting and installing them in their permanent position.
- In areas without protection must be used harnesses, fall arresters, lifelines, anchor points, etc.
- Lift platform platforms are preferential. Personnel must be tied with a harness, particularly when working out of the basket. Personnel handling the platforms must be authorized and trained to do it.
- Regarding the fall of objects when assembling and welding or cutting projections:
  - Dry powder fire extinguishers, of at least 6 kg., above and under the structure.
  - Whenever necessary, fireproof canvas covering welding posts.
  - To prevent personnel from accessing areas at risk of falling objects or projections of welding or cutting, must be placed barriers.
  - Under the same vertical area, works at different levels shall not be performed to prevent objects from falling over persons working on lower levels.

Category A: Total encapsulation of the spark generating process. Typically applied within a Process unit only.	
Category B. Partial Containment. Protection to be focused on the area where general spark pattern is generated. On Process units, use only if sparks are localized and can be contained effectively.	
Category C (RAM Score 0 to 6). Protection of falling sparks only. Open areas away from surrounding equipment/piping and where sparks are localized	

For references and additional information please see Procedure 029_Steel Erections

8.25.7. Mechanical Lifting Operations, Dismantling or Assembly and Erection of Prefabricated Structures

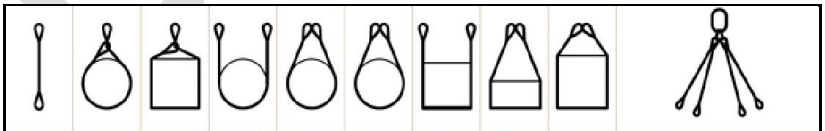
It includes lifting operations, dismantling or assembly, works with cranes, truck cranes, cables, slings and lifting accessories.

- Cranes must have the following;
  - Cranes must have load and torque limiters to prevent overload and overturning.
  - Material must have SABS or CE labelling or equivalent suitable for lifting loads.
  - Equipment must be clearly labelled with working load.
  - Must have valid Load Test Certificates for the crane and all other lifting tackle, tested by a registered licensed LMI.
  - All elements must be inspected periodically discarding those in bad condition. These are to be sent back to the original supplier to have them removed from the records.
  - Non-locking snap hook cannot be used.
  - Broken wires must be cut from cables and steel slings.
  - It must be properly barricaded and have adequate signs forbidding entry in the lifting area. Personnel must be kept away from the field of action of suspended loads.
  - Weather conditions must be considered. Crane operations are not allowed to continue during inclement weather and high winds. Crane operations wind limit will be set at 32km/h.
  - Cranes and trucks cranes must be settled on a steady base, levelled and supported on manufactured load distribution elements. The thickness of planks used to support stabilizers will agree to the manufacturer's instructions. Their use is mandatory even on apparently steady land.
  - Elements being lifted will not have loose parts.

- The person planning the operation should have adequate practical and theoretical knowledge and experience of planning lifting operations. They shall be in possession of a South African Government Red Seal Certificate for Rigging. (Verifiable).

- Factors you should consider when selecting lifting equipment so that it is suitable for the proposed task include:
  - The load to be lifted;
  - Its weight, shape, centre of gravity, availability of lifting points;
  - Where the load is presently positioned and where it will be positioned after the lifting operation;
  - How often the lifting equipment will be used to carry out the task;
  - The environment in which the lifting equipment will be used; and
  - The personnel available and their knowledge, training and experience.

- If necessary one or more tag lines [2] will be used when handling loads. (Items longer than 6 metres.)
- All persons involved (slinger, crane operator…) must be experienced and suitable qualified.
- The lifting equipment operator, responsible person and, where applicable, any assistants to the responsible person need to use the same reliable means of effective communication. This could be by using hand signals, radios or telephones, etc.
- Signalling to be used as per international rigging signalling.
- Loads must be lifted vertically, not obliquely, otherwise the load would move uncontrollably.
- Loads must not be lifted too fast.
- Nobody must stand between suspended loads and another structure.
- Personnel must keep away from the field of movement of machines.
- To prevent being trapped when unloading or placing transported material, hands must not be placed in spaces between objects. The same measures must be kept in case of toes.
- Correct PPE to be worn at all times.
- Personnel must keep sufficiently away from stressed lifting accessories, slings… in case of brake (e.g. when pulling from a machine).
- Use of protectors in cutting elements, as well as planks to unload and not crush the slings when necessary.
- Slings, lifting accessories, lifting points, etc. shall be used according to the loads being supported. If necessary a spreader beam will be used.



REEVE LOAD			Round Basket Load			Oblong Basket Load			2,3 or 4 Leg Sling		
Straight	Round	Oblong	0°	60°	90°	0°	60°	90°	0°– 60°	90°	120°
1,00	0,75	0,50	2,00	1,70	1,40	1,00	0,85	0,70	1,70	1,40	1,00

[2] Crane tag lines: When operating a crane, guy wires, known as tag lines, may be connected to unwieldy payloads, allowing ground crew to control rotation and swaying while maintaining a safe distance.

- A load handler or slinger has the responsibility for attaching/ detaching and securing the loads to the lifting equipment. The load handler should have the necessary competence to select suitable lifting accessories. You need to ensure that they receive adequate information, instruction and practical experience on the principles of selection, use, care and maintenance of lifting accessories including any limitations on use.
- It shall be used ladders, lifting platforms and safety harnesses for attaching/detaching when necessary.
- Personnel handling lift platforms must be authorized and trained to do it.
- Presence of a safety officer when lifting loads beyond a certain size.

See diagram below for rigging signal detail.

	**1.-Hoist** With forearm vertical, finger pointing up, move hand in small horizontal circles.			**7.- Move slowly** Use one hand to give a movement signal and place the other hand motionless in front of the hand giving the signal.
	**2.-Lower** With arm extended down and index finger pointing down, move hand in small horizontal circles			**8.Travel** Arm extended forward, hand open and slightly raised, pushing in the direction of the travel
	**3.- Raise boom** Arm extended with fingers closed, point thumb upwards			**9.-Stop** Arm extended, palm facing down, move arm backwards and forwards horizontally
	**4.- Lower boom** Arm extended with fingers closed, point thumb downwards.			**10.- Raise boom and lower load.** Arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.
	**5.- Extend boom** Both fists in front of body, with thumbs pointing outward			**11.- Lower the boom and raise the load** With arm extended, thumb down, flex fingers in and out as long as load movement is desired.

	**6.- Swing** Arm extended, point in direction of swing of boom with the finger.			**12. Emergency stop** Both arms extended, palms facing down, move arms back and forwards in horizontal position.

For references and additional information please see Procedure 020_Hoisting Operations

8.26. Scaffolding

Unless a scaffold is a basic configuration described in recognised guidance for tube and fitting scaffolds or manufacturers' guidance for system scaffolds, the scaffold should be designed by calculation, by a competent person, to ensure it will have adequate strength and stability.

ACCIONA shall appoint a single certified scaffolder to construct all the scaffolding required.

At no time shall any scaffold be overloaded. The design of the scaffold will take into account and include: the load imposed by the workers, construction materials and the weight of the scaffold itself, safe means of access and egress (stairs and ramps), adequate work platforms (lean-to scaffolds and makeshift platforms are prohibited), anchor points, adequate bases (footings of anchorage for any scaffold shall be sound, rigid and capable of carrying the maximum intended load without settling or displacement), etc. Scaffolds shall not be used for the storage of material except material being currently used. Maximum load labels have to be mounted and visible at all the time.

The company supplying the scaffolds shall also appoint a scaffolding coordinator who is responsible for the timely setting up, modification and dismantling of scaffolding and the internal organisation of scaffolding between (sub)contractors.

All scaffolding structures will be inspected before their use is authorized (i.e. stability check, condition of toe boards and guard rails, bracing, consistency between design and final structure, etc.), then periodically and after modifications or periods of inclement weather. All scaffolds shall be maintained in safe condition and scaffolds damaged or weakened, from any cause, shall be immediately repaired or dismantled.

Legal Requirements; CR14

Structures and platforms must be inspected by a competent person who has adequate experience in the erection and maintenance of scaffolds:

- Once per week
- Every time after inclement weather or displacement or major change to the sacffold

After being set up, all scaffolding constructed by a scaffolder is inspected both by a senior representative of the scaffolder and by a senior representative of the party that requested the scaffolding.

Scaffolds shall be tagged denoting their status, whether complete or incomplete (i.e. green tag and red tag respectively).

All employees, when erecting or dismantling scaffolding above 2 meters in height, shall wear safety harness with double safety lanyard.

It is strictly forbidden to change or modify scaffolds from any other ACCIONA or subcontractor.

Distance between scaffolding and aerial cables or electrical installations must be > 5.00 m unless these cables have been previously disconnected or diverted.

Scaffolds shall be provided with an access ladder or equivalent safe access. Employees shall not climb or work form scaffold handrails, mid-rails or brace members. Stairway towers preferable to be used, if height of scaffolding is over 15 m for easy access and exit from scaffolding in case of emergencies.

Work platforms will be of adequate resistance, appropriate size, sufficient in number and secured against displacement. They must be free from tripping hazards, secured to the main scaffolding structure, and measure 0.60 m wide minimum, and extend over their vertical supports the distances established in relevant legislation. These platforms will be inspected by competent personnel periodically as part of the scaffolding inspection and tagging programme. Scaffolds shall be braced and tied off both horizontally and vertically as specified by relevant instructions or regulations.

Scaffolding or staging more than 2 m above the ground or floor, suspended from an overhead support or erected with stationary supports, shall have standard guardrails and toe boards properly attached. Whenever a scaffold cannot be erected with handrails, personnel working on said scaffold shall be provided with safety harness and double safety lanyard. Guardrails shall be 1 m high with midriff.

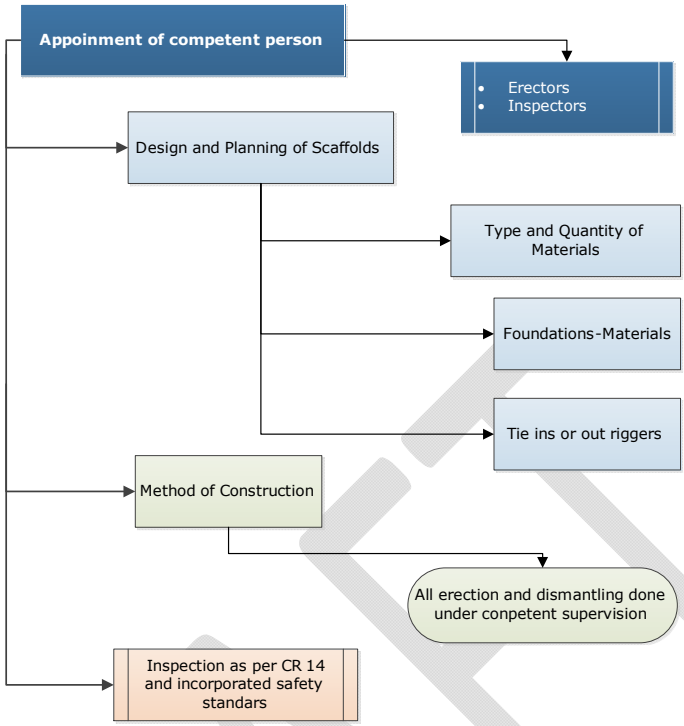
Toe boards shall be a minimum of 15 cm in height. Scaffold towers (i.e. on wheels) will have braking systems in every wheel. The wheels will be locked or blocked before someone goes up. No personnel will be allowed on the scaffold while it is being moved. Before moving the tower, all materials on the platforms susceptible of falling will be removed. These scaffolds will only be used on flat even ground. When free-standing manually propelled mobile scaffolds are used, the height shall never exceed four times the minimum base dimension.

Suspended scaffolds will comply with all legal requirements and with the instructions provided by their manufacturer. All materials used for their installation (hooks, shackles, cables, winches, ratchets, platforms, etc.) will be fully certified and will be assembled by competent personnel.

They will be provided with all necessary safety measures (automatic braking systems, dead man control devices, etc.).

They will be inspected by competent personnel before each shift. This inspection will include all key components. All suspended scaffolds will be tested before use. Personnel working on suspended scaffolds must use safety harnesses and attach themselves to a point above their working height and independent from the scaffold's suspension system.

Before scaffolding work takes place, suitable and sufficient rescue arrangements must be in place in order to allow for a quick recovery of personnel which may be left hanging, before the effects of suspension trauma set in. (Scaffold Compliance with SANS 10085-1)



The following scaffolds must be specifically designed by a competent scaffolding engineer and erected in line with the design drawings:

- All scaffolds in excess of 50 metres high.
- Sheeted scaffolds over 25 metres high or exposed to very strong winds.
- All cantilevered scaffolds.
- All truss out scaffolds.
- All scaffolds with lifting facilities attached All scaffolds required for significant load bearing capability.

For references and additional information please see Procedure 028_Scaffolding, platforms and temporary structures

8.27. Lifting Operations and Lifting Equipment

Lifting operation: An operation concerned with the lifting or lowering of a load.

Lifting equipment: Means work equipment for lifting and lowering loads. This includes lifting accessories and attachments used for anchoring, fixing or supporting the equipment.

Lifting equipment considers the following (this list is not limitative):

- Cranes
- Fork-lift trucks
- Lifts
- Hoists
- Mobile elevating work platforms (MEWP)
- Lifting accessories such as chains, slings, eyebolts, etc.

Lifting operations can often put people at great risk of injury, as well as incurring great costs when they go wrong. It is therefore important to properly resource, plan and organise lifting operations so they are carried out in a safe manner. Each of these elements requires a person or people with sufficient competence to be involved at each step. These people should have sufficient theoretical and practical knowledge of the work and equipment in question, to be able to do this properly. For complex and high-risk operations, the planning and organisation should be extensive and meticulous.

Selecting The Right Equipment

Lifting equipment should be positioned or installed in such a way as to reduce the risk, as far as reasonably practicable, of the equipment or load striking a person, or of the load drifting, falling freely or being unintentionally released.

All lifting equipment must certified by a recognised third party before it arrives to site. A project specific inspection will be run at arrival, including documentation review and checking of all qualifications and certifications of operators and riggers. This process will result in the approval/rejection of equipment, and the subsequent register, if approved.

Marking Of Lifting Equipment

All lifting equipment, including accessories, must be clearly marked to indicate their SWL (safe working loads), the maximum load the equipment can safely lift.

Where the SWL of any equipment or accessory depends on its configuration, the information provided on the SWL must reflect all potential configurations.

Accessories must also be marked to show any characteristics that might affect their safe use. This may include the weight of the parts, where their weight is significant.

Thorough Examination

It is forbidden to perform maintenance operations to lifting equipment (or any other vehicle, equipment, plant or machinery) within the construction site. Depending on the maintenance, renewed/additional certifications could be requested to the contractor to allow the equipment to return to site. Any lifting equipment shall go through the project inspection process as determined, or every time it abandons the site.

Lifting equipment must be thoroughly examined in a number of situations, including:

- Before first use.
- Where it depends on installation, or re-installation / assembly at another site.
- Where it is exposed to conditions causing deterioration, liable to result in danger.

Records of thorough examinations should be made.

Planning, Organising And Carrying Out Lifting Operations

All lifting operations involving lifting equipment must be:

- Properly planned by a competent person.
- Appropriately supervised.
- Carried out in a safe manner.

The planning of individual routine lifting operations may be the responsibility of those who carry them out (e.g. a slinger or crane operator). But for much more complex lifting operations, a written plan should be developed by a person with significant and specific competencies - adequate training, knowledge, skills and expertise - suitable for the level of the task.

Lifting operations require a method statement and a permit to work to be submitted to ACCIONA for approval. Minor or non-critical lifting operations do not require a method statement, but a lifting plan to be filled as instructed by ACCIONA.

The MS for any lifting operation must address the foreseeable risks involved in the work and identify the appropriate resources (including people) necessary for safe completion of the job.

The MS should set out clearly the actions involved at each step of the operation and identify the responsibilities of those involved. The degree of planning and complexity of the plan will vary and should be proportionate to the foreseeable risks involved in the work.

Strength and stability

Lifting equipment must be of adequate strength for the proposed use. The assessment of this should recognise that there may be a combination of forces to which the lifting equipment, including the accessories, will be subjected. The lifting equipment used should provide an appropriate 'factor of safety' against all foreseeable types of failure.

Positioning and installation

The position of mobile lifting equipment or the location of fixed installations can have a dramatic effect on the risks involved in a lifting operation. It is vital to take all practical steps to avoid people being struck by loads or the equipment itself during use. The equipment should also be positioned to minimise the need to lift over people. Measures should be taken to reduce the risk of load drift (e.g. spinning, swinging, etc); and of the load falling freely or being released unintentionally.

When positioning lifting equipment, care must be exercised to avoid hazards arising from proximity, for example: coming into contact with overhead power lines, buildings or structures; coming too close to trenches, excavations or other operations; and coming into contact with buried underground services, such as drains and sewers.

Working under suspended loads

Where it can be avoided, loads should not be suspended over occupied areas. Where it cannot be avoided, the risks to people must be minimised by safe systems of work and appropriate precautions. Where loads are suspended for significant periods, the area below them should be classed as a danger zone, where access is restricted.

Supervision of lifting operations

Supervision should be proportionate to the risk, taking account of the competencies and experience of those undertaking the lift. From time to time, employers may need to monitor the competence of workers undertaking lifting operations to ensure they continue to be carried out safely.

Restrictions

Contractors shall follow any indication regarding restrictions set for lifting operations. These restrictions could include weather, winds, equipment condition, ground instability, rigging equipment, etc. Main restrictions are:

- Lifting, rigging and/or moving of loads can only be performed by competent, experienced and qualified personnel.
- Under conditions of unstable weather, e.g. imminent thunderstorms or wind velocity above 40km/h the lift must not be executed. In all cases where the lift is in progress and the wind speed velocities exceed safe velocities the lift must be stopped immediately.
- Wind velocities shall be checked by the lifting supervisor prior to lifts. An anemometer shall be available. In addition, prior to all lifts the Contractor must take account of the crane manufacturers' safety recommendations for wind velocities. The recommended operational wind velocities may vary depending on the set-up and configuration of the crane.
- Lifting, rigging, moving of loads and transports shall only be performed by experienced, qualified and competent personnel.

Critical lifting operations.

Critical lifting operations are the following:

- Lifting any load superior to 10 tons,
- Using up to 88% of the crane capacity
- Using two cranes
- Lifting very large loads
- Lifting when the operator cannot see the final position
- Lifting of main equipment (turbines, generators, transformers, etc.) regardless of the weight/size

The contractor shall ensure that every lifting machine is operated by an operator specifically trained for a particular type of lifting machine: Provided that in the case of a lift truck with a lifting capacity of 750 kg or more and jib-cranes with a lifting capacity of 5000 kg or more at minimum jib radius, the user shall not require or permit any person to operate such a lifting machine unless the operator is in possession of a certificate of training, issued by a person or organization approved for the purpose by the Chief Inspector. [Date effective 10 October 1993 - G.N.R.2483 of 4 September 1992]

For references and additional information please see Procedure 020_Hoisting Operations

8.28. Hand tools and portable power tools.

The Contractor shall ensure that all tools used on site are of the best quality with proper safeguards and are suitable for the use intended. All tools shall be free from defects and maintained in good condition.

Work tool selection shall take into account the particular conditions and risks associated with the environment in which the work is carried out (such as exposure to water, physical shocks, heat, cold, dust, explosive atmosphere, etc.). Work equipment must be suited to the users, correctly maintained and in good operating condition. A list of tools and portable powered tools must be available for inspection.

For references and additional information please see Procedure 026_Control of machinery, work equipment and tools.

8.29. Lock Out / Tag Out

ACCIONA will develop and implement a Lock Out & Tag Out procedure, applicable whenever isolation of energy systems; mechanical, electrical, process, hydraulic and others, is necessary for work to proceed safely.

It will cover the following items:

- Method of cut-off and discharge of stored energy are agreed and executed by (a) competent person(s).
- Discharges of stored energy.
- System of locks and tags used as isolation points.
- Tests conducted to ensure the isolation is effective.
- Monitoring of isolation effectiveness.

For references and additional information please see Procedure 037_Comissioning Control and testing.

8.30. Commissioning

Once the construction contractor has completed the installation of an item of equipment or system, the Commissioning Manager is notified that the equipment is available for pre-commissioning.

Entry into a Pre-Commissioning or Commissioning Module requires formal permission from the Commissioning Manager or designated Superintendent. These equipments, systems or modules should be tagged.

Live lines (containing products) should also be marked with stickers on which "LIVE LINE" is written.

Safe work procedures must be implemented in an effort to prevent injuries, loss of life, and damage to equipment or environmental contamination during "start-up" and commissioning activities. It is imperative that all companies strictly adhere to these procedures at all times for protection of its employees and those around.

To undertake any work in a Pre-Commissioning or Commissioning area requires a specific Permit to Work.

Permits should be approved by the Commissioning Area Supervisor and Commissioning Manager or designated Superintendent.

The Commissioning Manager is responsible for advising each person acting in a supervisory role within the project of their responsibilities.

8.30.1. Hazards

Activities		Hazards
Hydro testing of tanks, lines and vessels.		The equipment may fail which can cause injuries.
Chemical cleaning of lines and equipment.		The chemicals may leak due to equipment failure or could be spilled due to failure of fittings and causes burns to the skin on contact or injure the eyes, or contaminate the environment. If the chemically dosed water is drunk, it may result in illness or death.
Pneumatic testing of lines and equipment. Air blowing of lines.		Equipment or fittings may fail and cause injuries. Water can cause "water hammers" if not properly drained after hydro testing and result in lines jumping off racks or burst open and cause injuries. Flying particles at open ends may result in eye injuries. High noise levels are often.
Steam blowing of line.		Steam will heat up the lines and equipment, which can cause burns. Steam blowing is also associated with high levels of noise which may harm the ears. If the line is under pressure with a product or substance it will escape and cause burns, eye injuries, or other types of serious injuries, fires, gas leaks/clouds etc.
"Breaking" of pipes/flanges to replace studs/bolts/ gaskets/"swing" blinds/insert or remove spades etc.		There is always a danger of electrical shock and/or unguarded moving parts that may cause injuries. Apart from this there is also the possibility that the equipment may fail.
Rotating equipment and other electrical testing.		Failure of equipment or fittings/tubes which could lead to eye injuries and environmental contamination.
Hydraulic testing of instrument system.		
Live lines: After the lines have been cleaned and pressure tested they are commissioned. This is when they are charged /loaded /filled with the products they were designed to carry during the facility's operation.		A. Some gases are poisonous and others can kill because they displace the air which people need to breathe to stay alive. B. Some chemicals are poisonous and others can literally eat or burn away skin or muscles. C. Some gases are explosive when mixed with air and many of the liquids are flammable. D. High pressures. E. High temperatures.

When the pressure and temperature of a dangerous chemical or gas is increased, then the product's hazardous properties are further magnified by the pressure or temperature increase. Some products, which may normally be only flammable, may be so hot in the process that they will also ignite automatically when exposed to the air.

Other aspects which, if not given adequate attention, may contribute to existing hazards/dangers and requiring continuous consideration are as follows:

- Many persons doing different jobs in the same small area simultaneously.
- Persons who have conflicting interests working on the same equipment /activity.
- Too much pressure applied to finish work quickly resulting in "short cuts" being taken.
- Ignoring/by-passing safety aspects because "they cause delays"/retard progress.
- Using incorrect sub-standard tools/equipment or faulty tools/equipment.
- People not being trained and familiarized with dangers associated with hazardous products/substances/gases.
- Ignoring permit conditions or working without an authorized work permit.
- No banners and warning signs or restricted area access control.
- No barricades erected to create a restricted access area.

For references and additional information please see Procedure 037_Comissioning Control And testing.

8.30.2. Permit to work

All work in the commissioning area should only be carried out on an authorised permit. Also, it is essential to issue of a "Permit to Work" in relation to all other work procedures being undertaken in the immediate work area, as well as those remote areas likely to be affected.

The issue of a specific "Permit to Work" requires the added submission of a Hazard Analysis and a documented safe work procedure.

All items of equipment in a commissioning area should be treated as live unless specifically isolated and locked out.

The system and procedures constitutes the most methodical means of ensuring that safe work practices are followed and that the work environmental is safe.

The objective is for an experienced and trained authorized person, (who will ultimately sign the permit to work), to pre-assess (with all the necessary technical assistance) the hazardous circumstances involved and prescribe all precautions required.

The permit is designed to ensure that all parties involved are aware of:

- A. The nature of the work to be performed, the place the work has to be carried out and the equipment or plant involved.
- B. The period of time in which the work may be carried out.
- C. The hazards which are, or might be, present.
- D. The tests and checks which have to be made and the precautions to be taken before starting the work.
- E. The equipment to be used or to be made available on a standby basis.
- F. The personal protective equipment to be used by those involved in the work.
- G. The requirement, if any, for further periodic tests and checks.
- H. Personnel permitted to do the work.

- I. The emergency/rescue procedure and other arrangements for the evacuation of personnel.

The supervisor in charge of the work to be performed must make sure that he fully understands all the permit conditions and that he and his crew will be able to comply.

Therefore be must personally check all the tools and equipment to be used, the work environment, PPE and explain the work and the permit conditions to his crew before the work commences.

Some safety requirements could be:

- A. Sparks must be contained with fire resistant material (i.e. fire blanket, etc.).
- B. All sewers/drains within 15 meters must be covered.
- C. A fire extinguisher(s) and hose with running water (fire hydrant) must be available at the work point.
- D. A metal container to deposit welding rod stubs, never deposit welding stubs anywhere else than in such metal container.
- E. Barricades and fences are there to prevent people from going into hazardous/dangerous areas. This should not be taken lightly and everyone should comply.
- F. All areas where hazardous pre-commissioning and or start-up work is being performed shall be properly barricaded and access into the area controlled.
- G. Contractor and subcontractor shall display banners and signs to warn people against the possible hazards and dangers. The following are possible but not limited:
  - Prohibited smoking zones.
  - In noise zones to wear ear protection.
  - Touching hot pipes, valves, equipment.
  - Chemical cleaning of pipes, valves and equipment.
  - Chemical, oil spillage.
  - Possible particle missiles during air blowing activities.
  - Electrical hazards.
  - Hazardous work overhead.
  - Permit areas, etc.
  - Various pressure tests and associated hazards/dangers.

For references and additional information please see Procedure 010_Permit To Works

8.30.3. Training

Contractor and subcontractor shall ensure all employees involved in pre-commissioning and start-up work are trained in their task and associated hazards and dangers of their work.

All employees shall attend specific safety orientation training during this phase.

Only people who have received this orientation training should be allowed to perform work inside restricted areas.

9. TRAFFIC MANAGEMENT PLAN

The Traffic Plan includes:

- Access requirements (i.e. proof that the vehicle is appropriate for its intended purpose, inspection and confirmation that is in safe working order, fully certified, insured, etc.)
- Routes and restrictions.
- Qualifications of operators.

All categories of onsite motorized vehicles must not be operated unless:

The Contractor shall ensure that plant and equipment used takes account of the following:

- Suitable for the intended use (no plant, machinery or equipment older than 6 years will be allowed into the site)
- Maintained in a safe condition for use
- Used by operators holding certificates of competency
- Inspected pre-use to ensure that it is, and continues to be, safe for use
- Inspections shall be carried out by a competent person
- These inspections shall include a check of:
  - Brakes
  - Lights
  - Safety devices
  - Audible warning alarms
  - Tyres / tracks
  - Steering
  - Leaks
  - Seat
  - Fuel and water levels

- Inspection records must be kept in addition of the inspections performed by ACCIONA when the equipment arrives to site, and afterwards according to the project specific inspection programme.
- The vehicle is appropriate for the purpose, inspected and confirmed to be in safe working order.
- Seat belts are installed and worn by all occupants and other relevant safety devices are used as intended.
- Loads are secured and do not exceed design specifications.
- The local road safety regulations are fully complied with.

Drivers must not be allowed to operate the vehicle unless they are fully trained, qualified and medically fit to drive and operate the vehicle. And:

- Fire and emergency access routes will be kept free from obstruction at all times.
- Agreed access and egress routes on the site will be observed at all times.
- Footpaths and roads will always be kept clear of obstructions, including parked cars.
- Footpaths and roads will be protected and maintained in a condition suitable for vehicular and pedestrian traffic.
- Materials will not be stored on or near roadways, paths or other areas where they may constitute a hazard.
- Traffic control and warning lights will be made available for use where thoroughfares are obstructed.

- Banksmen will be employed to assist in traffic movements on and off site with consideration for other road users and pedestrians.
- In the event of an emergency a nominated person will meet the emergency services at the entrance to the site and guide them to the emergency.
- Safe routes to separate pedestrians from plant and vehicles will be established on site asap (as soon as possible).
- Wherever possible, traffic will enter the site in forward gear and, after unloading/loading, drive round and leave the site without the need to reverse.
- Where necessary a separate reversing area will be set up excluding all pedestrians.
- Vehicles not fitted with an audible reversing alarm/flashing beacon will have a banksman present when reversing or carrying out difficult manoeuvres on site.
- Banksmen will always wear high visibility clothing.
- Delivery vehicle movement will be controlled on site and will follow the site rules.
- Safety signs will be clearly posted to make personnel on site aware of traffic hazards.
- Operatives must not drive or interfere with any vehicle unless authorised and trained to do so.
- The use of mobile phones whilst driving or operating plant is forbidden.
- Acts of threat or violence will not be tolerated and any offender will be removed and permanently excluded from the site.
- Drivers must obey the site traffic management system including speed restrictions.
- The above measures will be monitored during safety audits and personnel will be made aware of the control measures at the induction and tool box talks.
- Designated traffic routes will be suitable for the persons or vehicles using them, sufficient in number, suitably positioned and of sufficient size.
- Suitable steps will be taken to ensure that vehicles can use traffic routes without causing danger to the health or safety of persons nearby.
- Pedestrian accesses which lead onto a traffic route will be sufficiently separated to enable them to see approaching plant and vehicles, from a place of safety.
- Adequate separation between vehicles and pedestrians will be established to ensure safety or, where not reasonably practicable, other means of protecting pedestrians and effective arrangements for warning, person/s liable to be crushed or trapped by a vehicle, of its approach.
- Every traffic route, where necessary for reasons of health or safety, will be clearly indicated by suitable signs regularly checked and properly maintained.

Traffic routes will be kept free from obstruction and have sufficient clearance for its use, so far as is reasonably practicable.

Where sand and other dusty material is transported to the site, trucks will not be overloaded and will be appropriately covered /sheeted to eliminate the contamination to the air.

A safe parking area will be established and personnel will be made aware.

Designated roads will be made clear to the drivers and signs for the directions and speed limit will be placed all along the roads 20 Km/h.

Access roads from the entrance to the site will be compacted and sprayed with water to minimise the dust generated from the vehicles and trucks.

The construction vehicles leaving the site will be appropriately cleaned (provisions of wheel-washing facilities or high-pressure hose to ensure all vehicles leaving the site are in a satisfactory state of cleanliness).

All the vehicles used in the site shall be appropriately maintained.

All contractors shall follow any instruction related to traffic management in order to gran proper accessibility and an efficient coordination of the site, including response to emergency situations where access is crucial.

Each contractor shall deliver a list of all vehicles, machinery and plant to be brought to the site. All these will go through an full initial inspection process that includes a documentary review, and checking the qualifications and certifications to ensure that all personnel with operation tasks is competent enough for the work.

Access to site is forbidden to any person who shows obvious signs and symptoms of being under the effects of alcohol of drugs. This condition will result in immediate exclusion from the site and reporting the issue to the local authorities as required in the applicable regulation.

Where the regulation, the contract, or both allow, all personnel including visitors shall go through an alcohol test every time they enter the site. There is zero tolerance to alcohol, so any value bigger than 0,01 on an alcohol breath tester/detector will mean that the person cannot enter the site.

ACCIONA has the right to perform drug tests as considered necessary. A drug test will be considered as part of the initial medical examination. A drug random test (without notice) will be established once in a month within the site. Selected personnel cannot refuse to participate when required to do so.

For references and additional information please see Instruction_IT002 On-Site Traffic Rules

10.ENVIRONMENTAL MITIGATION MEASURES

All information contained in this section is considered within the project specific environmental management plan (EMP). This section describes the main aspects and requirements of environmental management.

The objectives of the EMP are to:

- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels.
- To identify measures that could optimize beneficial impacts.
- To create management structures that addresses the concerns and complaints of I&APs with regards to the development.
- To establish a method of monitoring and auditing environmental management practices during all phases of development.
- Ensure that the construction and operational phases of the project continue within the principles of Integrated Environmental Management.
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project.
- Ensure that the safety recommendations are complied with.
- Propose mechanisms for monitoring compliance with the EMP and reporting thereon.
- Specify time periods within which the measures contemplated in the draft environmental management plan must be implemented, where appropriate.

10.1. Air quality

The Contractors will put in place appropriate provisions to manage dust arising from construction operations in order to prevent nuisance and hazards to health. This will include consideration of dust arising from soil movements, general aggregate handling, engine exhaust fumes and construction traffic

10.2. Noise

The Contractors will put in place appropriate provisions to manage noise arising from construction operations to ensure plant machinery does not impact significantly on local background noise levels, to control traffic related noise and vibration, and to minimise disturbance or nuisance to local Residents.

10.3. Waste management

The Contractors will put in place appropriate provisions for materials handling, storage, and waste management to prevent land contamination, which typically arises from the spillage of fuel, oils and greases and other chemicals, and/or the storage and handling of waste.

10.4. Transport

The Contractors will put in place appropriate provisions for transport management to ensure minimal impact of construction operations to air quality, and noise. This should include the following as minimum provisions:

- Develop detailed procedures (as part of a Site Vehicles, Transportation and Traffic Plan) to ensure that routing of vehicles causes minimal disruption. This should include designating routes for any unusual loads and providing any necessary advance warning
- Sheet all vehicles carrying bulk materials into and out of the site to prevent dust dispersal during transit
- Monitor by regular visual inspection of the site roads and immediate external roads

10.5. Ecology

Every contractor must adhere to all environmental previsions set by ACCIONA on behalf of ecology protection. The Contractor will put in place appropriate provisions for the preservation of terrestrial and marine habitats which may be affected by factors such as the clearing of vegetation, noise, dust, vehicle movements, blasting, dredging, waste water discharges and turbidity. The following mitigation measures should be considered and their effects monitored:

- Development of a habitat management plan to include identification of potential impacts, and provision of detailed mitigation and management measures to minimize these impacts.
- Ensure provisions are in place for reacting to adverse impacts on ecology as part of the Pollution Incident Control Procedure.
- Minimise and clearly demarcate the land area required for the construction activity, so that vegetation is only cleared from designated areas
- Prevent uncontrolled waste storage and dumping on or outside, the construction site
- Ensure that good housekeeping practices are adopted at the site
- Ensure vehicle movements are restricted to authorized routes, with no off road driving where reasonable practicable

- Take due consideration of the locations of any significant local ecology/habitats such as bird breeding sites, mangroves etc., and ensure staff are made aware of their importance
- Ensure construction workers are aware of the potential presence of poisonous snakes, insects that bite or sting and/or other dangerous animals or plants on site, and receive first aid training appropriate to these risks in the event of an incident.
- Take measures to prevent the unauthorised hunting/killing of animals
- Monitor ecology by a nominated person to ensure that good practice is being employed to visually identify any problem areas. Inspections to include visual checks, sampling and monitoring of key parameters as appropriate:
  - Use of water resources
  - Soils and ground water
  - Landscape and visual impact
  - Lighting (in terms of avoiding nuisance from site lighting
  - Archeology and cultural heritage
  - House keeping

11.HOUSEKEEPING

It must be established good housekeeping practices to ensure that both hazardous and non hazardous waste fractions are separated, properly handled, stored and subsequently transported, recycled or disposed by an approved waste management contractor to a licensed landfill or alternative disposal location.

Good housekeeping practices shall include the following:

- Separation of waste streams to facilitate recycling;
- Adequate storage facilities for non-hazardous waste storage in designated areas to prevent waste from dispersing throughout the site;
- Adequate hazardous waste storage in bunded containers stored in dedicated, covered storage areas with impermeable bases, sufficient containment capacity and equipped with spill kits;
- Immediate spill response protocol and contingency plans to detail the cleanup of any spillages;
- Procedures and rules for hazardous waste handling;
- Training program for employees to increase their awareness of waste management protocols including proper handling and storage of waste, chemicals handling and emergency response and contingency plans.

For references and additional information please see Procedure_013 Housekeeping

11.1. Refuelling, Maintenance And Washing Of Vehicle And Machinery

During the transfer of fuels, any work that might cause sparks or flames must be stopped within an immediate radius of ten meters. Generator or internal combustion engine fuel tanks are to be filled with the engine always switched off. Each jerry can must be sealed again immediately after such a transfer.

If possible, the maintenance and washing of vehicles and machinery shall not be carried out on site; otherwise it would be necessary the construction of a specific area for site machinery maintenance.

As a means of protection after concreting works, ditches shall be dug for washing the concrete mixer trucks, where the slurry is collected in a controlled manner. No area outside the planned areas shall be used for this purpose.

A specialist contractor will remove the recovered oil for recycling.

Chemical handling will be conducted over sealed grounds and/or designated areas.

Contractor and subcontractors will have adequate spill kits.

11.2. Collection and Temporary Storage

As we begin the construction phase will be installed properly equipped and marked areas for the collection and temporary storage of waste.

The waste management area has to be designed so that rainwater is not in contact with the waste. The storage shed must be built on a concrete base and must have a drainage system to contain spills or leaks and facilitate safe removal.

There will be a separate collection of waste by type to facilitate its subsequent management.

The waste has to collect in appropriate containers to prevent corrosion and deterioration, spills and dispersion during handling and storageWaste containers shall be clearly marked with appropriate warning labels to accurately describe their contents and detailed safety precautions.

Hazardous wastes must be stored in an area for such purpose and duly marked, avoid mixing incompatible wastes.

Hazardous waste must be contained in waterproof containers. Storage containers shall be double wall if necessary. Bunded base will have the ability to contain 110% of the total volume of the stored materials. This area should be located away from sources of ignition.

All storage areas must be well organised and waste appropriately managed through segregation of hazardous and non-hazardous waste. Waste within each category will be further segregated by type (paper, plastic, metal) and whether the material is recyclable or non-recyclable. Construction waste will be separated into combustible and non-combustible, and all flammable substances must be kept away from sources of ignition.

It must maintain good practices "housekeeping" in all working areas.

Burning of waste is forbidden.

Fire extinguishers must be placed at strategic points.

When applicable, contractor and subcontractors must be approved hazardous waste producer and enrolled in the appropriate register.

It must maintain an inventory of hazardous waste generated.

12.SITE SANITATION AND TEMPORARY HOUSING

At the peak of construction it is anticipated that as many as 800 workers will be employed on site.

The contractors will therefore be responsible for the onsite provision of workers services, such as canteens and domestic facilities. The canteens will generate putrescible and domestic waste, which will be collected from designated areas for storage and removal to an appropriate municipal waste disposal facility. Additionally, litterbins will be provided around the construction site.

According to current regulations, sanitary facilities should have locker room, showers, dinner room with sinks, toilets and washbasins.

Features:

- Separate for men and women.
- Drinking water.
- A WC for every 30 workers.
- A shower with hot and cold water for every 15 workers.

Chemical toilets will be available on site and septic tanks will be installed at the labour accommodation and administration buildings. The number of septic tanks will be proportional to the increased of workers on site. These will also be regularly emptied by a licensed waste contractor and transported to an approved sanitary waste facility off site.

The facilities will be cleaned daily.

Mess halls and canteens

Where applicable, must comply with local regulation regarding food management and disease control. They must be equipped as follows:

- All tables, serving hatches, etc, should be covered with a clean, disposable material.
- Where 10 or more persons are employed a suitable means of boiling water and heating food should be provided. (This is not applicable where hot meals are provided by site canteen facilities).
- Where conditions require a drying room should be provided, wet clothes shall not be stored in any mess rooms.
- In cold weather, heating should be provided.
- In hot weather, cooling should be provided.
- Tools, equipment and materials should not be stored in any mess rooms.
- Suitable receptacles with lids should be provided for the disposal of waste material and should be emptied regularly.
- Heat resistant material should be placed underneath all gas rings, boilers and ovens, and where any of these are situated near to a wall the heat resistant material should be placed between the appliance and the wall.
- An adequate number of suitable fire extinguishers should be provided and these should be secured to the wall near the doors, and kept in an efficient working order.
- Mess rooms should be suitably lit.
- Mess rooms, including all walls, etc., should be kept clean, tidy and in good condition at all times.

Temporary housing

If migrant labour is required, adequate housing will be provided. Available accommodation locally will be favoured.

If temporary housing was to be provided, it shall be of high quality with appropriate amenities.

The environmental and social impact of any temporary accommodation will be adequately assessed.

Strict controls over the provision of housing shall prevent any unplanned settlements from developing. Unplanned settlements in the site are unlikely, as it will be monitored by security personnel

13.HEALTH AND SAFETY STATISTIC

The Contractor submits monthly Health & Safety Statistics before mid-day on the last day of each month to the Project Manager's nominated representative.

These statistics will be included in the monthly report.

Frequency and severity indexes will be studied.

14.MEDICAL SURVEILLANCE

ACCIONA is required to monitor the health of those workers executing special tasks; likewise, it must undertake to guarantee that all subcontractors also comply with such requirement in relation to the workers they provide for the works while they are taking part in the execution of the relevant works.

To that end, all workers taking part in the works are required to undergo medical examinations once a year.

15.DOCUMENTATION

The following documents and records shall be available on site:

- A valid Letter of Good Standing with a Compensation Insurer.
- Notification to Department of Labour of Construction Work
- Incidents or accidents recorded.
- H&S Plan and Procedures
- Emergency procedures
- Company Policies.
- Appointments
- Risk assessment.
- Manual handling assessments.
- Safe Work Procedures
- Inspection Registers
- Internal Audits
- SDS Safety Data Sheet.
- Record of toolbox talks.
- Record of Site Inductions.
- Protection Fall Plan
- Waste transfer notes.

ACCIONA will collect and collate the requisite information from each subcontractor.

For references and additional information please see Procedure 002_Subcontractors Requirements