

# ENVIRONMENTAL, HEALTH, SAFETY & SECURITY MANUAL

## AL Reem Integrated Healthcare Centre





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## 1. INTRODUCTION

VAMED Group strongly emphasize on high standards of Health & Safety in the work place wither this be in an office or on a project sites in order to protect all employees, subcontractors, members of the public, equipment, property and the environment as well as adhering to local laws and regulation. This Project Construction HSE Plan is reviewed and updated in accordance with the upcoming activities in line with local laws and regulation. This HSE Plan has been developed on the basis of the most effective HSE programmes implemented previously for similar projects by VAMED which is part of the VAMED continuous improvement process to ensure safe working environment for all persons on all VAMED projects.

There are various checklists developed for the HSE inspection of the work site and equipment. The system details the approach to actively managing Health, Safety, and Environmental (HSE) aspects of the Project. The program establishes clear goals and provides mechanisms to regularly monitor and measure performance. Control is verified through inspections, reviews and audits appropriate to the level of risk. Self-regulation is practiced at all levels and assurance is provided by HSE assurance audit. Where inadequacies are identified they are recorded for immediate action and addressed.

It is our intention that this project shall be executed with the highest regard for Environmental Protection, Health, Safety, Welfare and Fire Prevention, hereafter referred to as Health & Safety matters. Arrangements to achieve this are contained in this Health and Safety plan which will be adopted by the Environment Health & Safety Officer (EHS Officer) if necessary, who shall be responsible for project safety co-ordination. Compliance with this plan is of major importance and shall be given priority by all persons involved with the project.

Based on our long gained experience from previous projects, one of the major success factors concerning Health and Safety is the appointment and visibility of the Health & Safety Officer to ensure an accident free working environment. This does not only ensure that regulations are being adhered too but also shows that VAMED is committed to a safe working environment.

All activities carried out under any VAMED projects will be closely monitored to ensure safe working practices are being applied and followed by all contractors and sub- contractors to ensure local laws & regulations and good working practices are being applied and followed. Each and every person will be held responsible for their own health & safety and actions as well as others working in very close contact with them.

The following Health & Safety manual shall give a clear understanding and guidance of VAMED's safety methodology and of what we expect of each and every person that enters any of our projects and how the workplace and site for VAMED activities will be organized concerning Health & Safety. Any person(s) not adhering to the regulations set before them ~~will~~ maybe ~~asked~~ requested to ~~leave~~ vacate the project with immediate effect & if required a non-conformance report may be issued and penities applied to ensure a safe working environment for all parties involved.

**VAMED is counting on your co-operation and we look forward to complete the project with ZERO accidents.**



## 2. SCOPE AND OBJECTIVES OF THE MANUAL

This HSE manual shall apply to all personnel on the project including the general contractor, and sub-contractors, third parties on site and persons under the direction or indirect control of either.

The HSE manual sets out the means by which Health, Safety, Environment and security will be coordinated/ controlled at site level.

The objective of the plan is to enable the work to be executed with diligence, minimal impact on the environment and without accidents.

This document describes the management arrangements and responsibilities for delivering our commitment on HSE.

HSE is a line management responsibility and it is essential that the contents of this document are understood and followed by senior management, Project Managers and supervisors and work force of VAMED. In addition, all employees need to be made aware of and discharge their individual responsibilities.

Project Manager, Construction Manager, HSE Manager/Engineer, HSE Officer and other appointed personnel for the project are required to encourage the employees in project activities to comply with project HSE and Welfare requirements.

DATE	Version	Author	Main changes
May 2017	2	BAN, HUR, AHM	Second Issue

### 3. DEFINITIONS

<b>Accident Prevention</b>	The application of measures designed to reduce
<b>VE</b>	VAMED.
<b>Client</b>	
<b>Employers Representative</b>	
<b>Contractor</b>	A business, firm, partnership, consultant or individual hired to perform a specific task or job
<b>Sub-contractor</b>	Person, firm or corporation contracting with the contractor to perform part of the work.
<b>Visitor</b>	Any person temporarily on the site who is not regularly involved in daily site activities including delivery personnel and guests
<b>Worker/ Employee</b>	Any person engaged in an occupation at the site
<b>Site</b>	The entire area required for the performance of the work including temporary working space
<b>HSE</b>	Health, Safety & Environment
<b>H&amp;S Policy</b>	Statement by the company of its intentions and principles in relation to its overall H&S performance which provides a framework for action and for the setting of H&S objectives and targets.
<b>H&amp;S Targets</b>	Detailed performance requirement, quantified where practicable, applicable to the project's parts thereof, that arises from the H&S objectives and that needs to be set and met in order to achieve those objectives.
<b>H&amp;S Objectives</b>	Overall HEALTH AND SAFETY goal, arising from the H&S Policy, that the project sets itself to achieve a high safety culture, and which is quantified where practicable.
<b>H&amp;S Performance</b>	Measurable results of the H&S Management System
<b>Regulation</b>	A rule, ordinance, law, legal regulation or device by which conduct or performance is controlled.
<b>OSHAD CoP</b>	Oshad Codes of Practice
<b>EHSMS</b>	Environment, Health & Safety Management systems
<b>Environment</b>	The air, land or water within the vicinity of the Project, that may be exposed and vulnerable to adverse impacts potentially arising from non-compliant environmental emissions
<b>EAP</b>	Environmental Action Plan
<b>Hazard</b>	The inherent property or ability of something to cause harm: potential to interrupt or interfere with a process or person, which is or may be casually related to an incident by itself or with other variables

<b>Incident</b>	An unplanned, undesired event that can result in physical harm and/or property damage, usually resulting from contact with a source of energy above the ability of the body or structure to withstand it or be a near miss or error.
<b>Near Miss/ Near Hit</b>	A situation that could or may have caused harm to employees or Property
<b>Consequence</b>	The hazardous scenarios and resultant effects associated with an event or chain of events that result from the release of a hazard.
<b>Risk</b>	The probability that a hazard will result in injury or loss, with definable consequences.
<b>Risk Assessment</b>	A hazard identification tool comprising of a document containing a list of basic job steps, hazards identified with the job steps and the mitigating
<b>Loss Prevention</b>	A before-the-loss program designed to identify and correct potential causes of accidents before they result in actual injuries or financial loss.
<b>LTI</b>	(LTI) An injury resulting in "days away from work" for more than three (3) days after the day or shift on which the injury occurred.
<b>Lost Workdays</b>	The total number of calendar days on which the injured person was temporarily unable to work as a result of a lost time incident.
<b>First Aid Case</b>	Any one-time treatment and any follow-up visit for the purpose of observation of minor scratches, cuts, burns, splinter and so forth, which do not ordinarily require medical care. Such a one-time treatment and the follow-up visit for the purpose of observation are considered first aid although provided by a physician or registered medical professional.
<b>Medical Treatment</b>	A first aid treatment case that requires medical intervention from a Hospital
<b>PTW</b>	Permit to work ( Reference AD EHSMS COP 21.0 )
<b>Hot Work</b>	Use of open flame, other heat sources and/or spark producing devices where there is a potential for explosion or fire. ( Reference AD EHSMS COP 28.0 )
<b>Confined Space</b>	An Enclosed space which: Is at atmospheric pressure during occupancy ; and /or is not intended or designed primarily as a place of work; and /or may have restricted means of entry and exit; and /or may: -have an atmosphere which contains potentially harmful levels of contaminant ; or - not have a safe oxygen level or cause engulfment ( Reference AD EHSMS COP 27.0 )
<b>MSDS</b>	Material Safety Data Sheets
<b>LPG</b>	Liquid Petroleum Gas ( Reference AD EHSMS COP 49.0 )
<b>PPE</b>	Personal Protection Equipment ( Reference AD EHSMS COP 2.0 )
<b>ELCB</b>	Earth Leakage Circuit Breaker
<b>RCD</b>	Residual Current Device
<b>SWP</b>	Safe Working Practices
<b>SWL</b>	Safe Working Load
<b>SLI</b>	Safe Load Indicator
<b>TWL</b>	Thermal Work Limit ( Reference AD EHSMS COP 11.0 )

SI	Safety Instruction
NOC	No objection Certificate
NCR	Non Conformance Report
ELCB	Earth Leakage Circuit Breaker
CDM	Construction Design Management

## 4. DISCLAIMER

VAMED has to fulfil its tasks and meet all its duties in accordance with the main contract, the Project Manual, Quality Assurance Manual and the Environmental Health, Safety & Security Manual and all legal stipulations, irrespective of any approval or acceptance by the client, the Owner or any third party.

## 5. HEALTH AND SAFETY MANAGEMENT ORGANISATION AND RESPONSIBILITIES

Health and safety is a general contractor's management responsibility and its general control will be exercised by the nominated EHSS Officer. However certain additional key personnel shall be appointed by EHS officer like the site security supervisor, and sub- contractor's health & safety Officer.

All employers have a legal and ethical duty to ensure work is carried out safely and without risk to employees, members of the public, property and the environment, therefore all sub-contractors must be able to visibly demonstrate a strong commitment to EHS and to lead by example.

VAMED requires sub-contractors to have a thorough understanding of, and to comply with all provisions of Federal UAE and Local Abu Dhabi Laws and Regulations relating to Health Safety & Environment.

In particular, Sub-Contractors must comply with the following including other regulations that may not be covered in this manual but ensure compliance to local regulations:

- UAE Federal Law 8 of 1980 - On Regulation of Labour Relations
- Ministerial Order 32 1982- Regarding the Determination of the Ways and Means to Protect Employees against Occupational Hazards
- UAE Federal Law 24 of 1999 – for the Protection and Development of the Environment
- Law No 21 of 2005 for Waste Management in the Emirate of Abu Dhabi
- AD EHSMS RF V2 – EHS regulatory instrument – Standards & guideline values, Mechanisms, and Codes of practice.
- Decree No. (42) of 2009 – concerning the environment, health, and safety management system in Abu Dhabi Emirates and the resulting AD EHS Codes of Practice
- Civil Defense Regulation
- Other AADC/ ADDC requirements

The sub-contractor must also comply with any new Federal or Local EHS Laws which may be revised or introduced from time to time. In addition to its obligations under this paragraph 2, the Sub-

contractor must not cause VAMED to be in breach of any applicable Federal UAE and Local Abu Dhabi Laws and Regulations relating to Health, Safety & Environment.

- Sub-contractors must perform their work in a manner through which EHS risks are identified and effectively manage as per AD EHSMS RF V2 – EHS regulatory instrument – Standards & guideline values, Mechanisms, and Codes of practice.

This requirement particularly applies to those Sub-Contractors performing specialized and potentially hazardous tasks, such as confined space entry activities, work at height and non-routine repair activities.

Sub-contractors shall provide VAMED with all EHS documentation including a current Health, Safety and Environmental Management System (EHS MS) that demonstrate compliance to VAMED EHS policy and requirements.

## 6. PROVISIONS OF EHS COORIDINATORS

In accordance with EHS risks and the scale of operations, VAMED requires that the Sub-contractor provides sufficient competent EHS Coordinators (OSHAD practitioner) to administer and oversee all issues relating to Health, Safety and Environment (EHS). As minimum requirements, the following table needs to be fulfilled during the project execution.

Number of Employees (Staff & Workmen)	Number of EHS Staff
1-50 nos.	1 EHS Officer
51-150 nos.	1 EHS Engineer + 1 EHS Officer/ Inspector
151-300 nos.	1 EHS Manager + 1 EHS Engineer + 2 EHS Officer
Above 300 nos. for every 150 workers	1 EHS Manager + 1 EHS Engineer + EHS Officer for every 150 employees

The Sub-contractor shall provide details of the competency of the EHS Coordinator for review and approval by VAMED, prior to commencing any work on site.

EHS Coordinator shall liaise with VAMED EHS staff in all EHS issues relevant to their activities.

## 7. ORIENTATION AND TRAINING

VAMED will ensure that all employees, sub-contractors and visitors to the site are given adequate health, safety and environmental training.

All employees will be informed of the changes in health, safety and environmental legislation. Briefings on any changes to the legislation will be given verbally and/or in writing and it is the responsibility of all employees to familiarise themselves with changes in HSE legislation and procedures etc.

All employees will attend health & safety and environmental courses, refreshers and awareness training corresponding to the level of their responsibilities as and when required to ensure their continued competence. Inductions will be conducted for employees, supervisor's, managers and visitors.

Only trained and competent workers will be allowed to carry out the work for which they received competency training.

All new workers and visitors will receive induction training including a review of main hazards and HSE rules. Similarly those transferring from one job or site to another will be given any necessary safety information. The induction will be conducted in a language of the majority of those attending

The VAMED Project Director will ensure that all employees including sub-contractors under his control have received induction training on the job.

The induction training shall cover, but not be limited to, the following topics:

- The VAMED commitment to safety
- General site rules and regulations
- Security arrangements – Site Security Management plan
- Traffic rules
- Fire
- Electricity
- Responsibilities
- Environment
- Welfare
- Emergency arrangements
- Instructions
- Training
- Permit to Work Systems - Work at height, Hot works, Confine Space, Excavation
- House keeping
- First Aid.
- Accident
- Any task-specific hazards applicable to the inductees.

Once the site induction has been completed a sticker will be issued and placed on the side of the person(s) safety helmet and a sticker showing important contact number inside the helmet as good practice. Records of all induction will be kept on file with VAMED and a copy sent to the relevant contractor.

## 7.1 Safety Recognition

VAMED will present a monthly award to such persons with either a monetary or gift award. These employees will be nominated by their engineer in charge and then assessed by the HSE team on site. Sub-Contractors will be invited to participate in this. The Employers Representative and ERA –E will be invited to these awards.

A program of Safety awareness will be held throughout the duration of the project highlighting key areas of safety. Employee will be encouraged to participate in these campaigns and the project will participate in any HSE campaign run by Abu Dhabi Government, UAE.

## 7.2. Site Rules

The site safety rules are provided below and are for the protection of everyone, they apply to all persons on the site, and including visitors any person found in non-compliance will be excluded from the site.

These rules will be communicated in the site induction. Visitors should be handed a copy of these rules prior to accessing the site and sign that they understand them. Translations of all the Site Rules in the most common language and writing will be provided for the benefit of the operatives and be displayed on the site HSE notice board.

## 7.3. General Site Rules

- All personnel will undergo induction training; the minimum PPE for the project is, safety boots, Coveralls, Hard hat and high visibility vest.
- Every incident and „near miss“ event will be recorded by the VAMED and reported to the ER as per the requirements.
- Any person found to be interfering or misusing fixtures, fittings or equipment provided in the interest of health, safety, Environment, Security or welfare will face disciplinary action.
- Smoking is restricted to designated areas that will be clearly marked on site.
- Visitors who come to the site must first undergo an induction then be escorted around the site. While on site, visitors are to wear the appropriate PPE at all times and follow the site rules.
- Drivers of delivery vehicles will undergo an induction and must be in possession of their PPE and wear it when in or out of the vehicle, Failure to have the correct PPE will result in the vehicle and driver being removed from site.
- Vehicles are not to reverse without banksman.
- Health Safety, Environment, and Security signs and notices must be followed.
- Transistor radios or personal stereos/I-pods are not to be used.
- Permission must be obtained from the Employer prior to any photography or video filming on site.
- Site fire and emergency alarms, equipment and instructions are designed to protect life and must be adhered to at all times.

## 7.4. Personal Safety Site Rules

- The consumption of alcohol and drugs is prohibited
- No person is to operate any mechanical plant or equipment unless they have been trained and have been certificated as competent
- Any mechanical plant or equipment found to be defective is not to be used, recorded and taken out of circulation until repaired
- Ladders must only be used for access. Ladders must always be secured to a structure or securely „footed“ by another person whilst in use
- Ladders are not to be as a work platform
- The use of trestles and bandstands is prohibited, thereafter properly constructed and guarded mobile towers are to be used. Mobile towers without guard-rails must not be used
- Food cannot be brought onto site from the respective camps; Rest areas will be provided for use during breaktimes.
- No person, other than a designated and qualified electrician, is to make connections/disconnections other than at approved plug and socket points, nor make any alteration to the temporary electrical supply;
- No personnel shall indulge in fighting, horseplay or practical jokes within the site perimeter. Offenders will be removed from site.

## 7.5. Safety Refresher - Training

The HSE department shall provide refresher/reinforcement training and toolbox talks at regular intervals. In house training will be conducted focusing on relevant topics for the month, every month a Toolbox talk schedule will be compiled with a list of topics that will be discussed to our Construction team and workers. 3<sup>rd</sup> Party training will be carried out in respect to legal requirements. Records of all training and course material will be kept by the Project HSE Site team.



## 7.6. Health & Safety Communications

### Bi-Weekly management Health, Safety and Environmental meetings

These meetings will be chaired by VAMED and attended by all sub-contractors to review any Incident, Safety Violation, Safety Audits, and other safety specific topics. Minutes from these meetings will be distributed by VAMED to all parties identifying specific action required. Minutes of this meeting will be forwarded to Project Management, Client etc..

## 7.7. Weekly Safety Tour

A weekly safety tour will be conducted by VAMED Safety Team, Attendance by all parties sub-contractors safety representatives, site engineers and construction managers will be mandatory schedule will be circulated as per project requirements.

Any safety violations and or incidents will be reviewed during the safety tour and corrective action shall be initiated.

Potential safety and environmental hazards will also be analyzed and preventive measures shall be initiated.

## 7.8. Weekly Tool Box Meetings

The weekly Tool Box meetings will be conducted by VAMED and under the direction of the Site Engineer/Foremen. It will be attended by the Safety Manager or Representative and the Labor engaged on the site. The meetings will address safety topics relevant to on-going operations and concerns raised in the bi-weekly HSE meeting. Positive comments and suggestions related to HSE will be solicited. The meetings will be conducted by the supervisors and, records of these meetings along with contents will be kept by the Project HSE team using. Monthly HSE Toolbox schedules will be provided with construction works topics and environmental

## 7.9. Daily Pre-work Meetings (STAART CARD)

Prior to the start of the work shift, each area supervisor will address the workers on the HSE measures to be followed for the day, particularly on any new trade or equipment being introduced. The meetings will be conducted on the job site and will provide hands-on training and guidance concerning the health, safety and environmental requirements. The supervisor will complete Form and submit to the project HSE department for records.

## 7.10. Emergency HSE Meeting

Emergency meetings will be called in response to a stop work notice issued or a major, incident, or near miss. Attendance is mandatory for the VAMED Project Director Project Manager, Project HSE Manager and the Project Manager of any sub-contractors which may be involved. The purpose of the meeting is to identify root causes and formulate an action plan for prevention. This meeting must be successfully completed before work may re-commence and then only after approval from the ERA - E. The place and time for the meeting will be arranged by VAMED.

### 7.11. Weekly HSE Meeting with ER and ERA-E

Once a week a meeting will be chaired by the ER the Project HSE Manager or Sr. HSE engineer will attend. Minutes of these meetings will be distributed to the Site team.

#### Monthly HSE Meeting with Client (if required)

Once a Month the Client will conduct a HSE meeting, the meeting will be half Health and Safety and one half conducted by the client Environmental team. Minutes of these meeting will be explained to the project team once received.

## 8. MANAGEMENT OF SUBCONTRACTORS

### Selection

All sub-contractors that wish to bid for potential work activities must complete a HSE pre-qualification form; this form will be part of the tendering process and the project HSE Manager will review

- Declaration and confirmation of an appropriately written HSE system in place meeting governmental safety standards and regulations. They hold adequate insurance cover for plant and employees
- Report of their HSE performance for the last five (5) years.
- Signed statement that will comply with the project requirements and conduct regular inspection of their activities while on the projectsites.
- Agreements that will allow VAMED to conduct Monthly site HSE audit of their HSE system.
- VAMED Project Controls Manager will maintain an approved list of sub- contractors.
- All subcontractors must submit their own HSE Plans which must be approved by the Project HSE Manager a soft copy of the VAMED Health, Safety & Environment Plan will be issued at the Kick off meeting. Form will be signed by the sub-contractor MD and returned to the HSE department
- All sub-contractors project managers are responsible for the administration of their comprehensive HSE Plan.
- Sub-Contractors HSE performance will be audited monthly by the project HSE team.
- Sub-contractors HSE personnel CV must be submitted prior to the commencement of work to get approval by the VAMED project HSE Manager.

## 8.1. HSE System Implementation

The completeness of the VAMED HSE Management System will be used as the bench mark to measure the effectiveness of the overall HSE PLAN. Correspondingly, the completeness of the project HSE Plan will be used for the effectiveness of HSE efforts for the project.

The level of completeness will be measured through audits, both internal and external. Project specific audits will be conducted to measure effectiveness of the project HSE PLAN

Action plans will be developed based on audit findings to detail steps needed for continuous improvements. Actions will be tracked and monitored via the Action Tracking Registry.

Communication of themes which are common will be passed down via alerts this will include lesson learnt. This will include all environmental issues which are raised.

Project HSE statistical reports including key issues/ highlights shall be reported to the ER on weekly/ monthly basis.

## 8.2. HSE Performance Measurements, Statistics & Charts

The project shall include as a minimum in the Monthly/Weekly report the following HSE statistics:

### Reporting Category:

- Man-hours worked this period
- Training hours
- Audits / inspections
- Work days lost due to incidents
- Fatalities
- Lost workday cases restricted workday injuries and medical treatment case.
- Number of first Aid cases
- Number of Safety Violations issued by ERA-E
- Number of Environmental Non Conformance
- Near-miss incidents

### 8.3. Audit And Inspection Frequency

CARRIED OUT BY	AUDITS	INSPECTIONS
Internal Audit	Every 6 months	Monthly
External Audit	Once a Year	Once a Year

## 9. HSE DISCIPLINARY CODE

HSE violation notices will be utilized to formally notify the contractor of issues and act as backup to Work Stoppage Notices. Note that work may be stopped at any time if there is imminent danger present and or if adequate controls are missing.

Three types of notices are to be utilized.

### 9.1. HSE Violation Notice

Presented to the sub-contractor immediately and followed through with a transmittal. This notification requires an immediate written response regarding corrective action taken as well as a specific time line for corrective action. These notices are primarily for non-compliance to safety or environmental problems for which time may be allotted for correction. Continued HSE breaches may result in contractual penalties being occurred. If there is no improvement from the sub-contractor then the HSE department will recommend they be removed from the project.

### 9.2. Work Stoppage Notice

This notice will be issued for a severe safety problem or failure to comply with a previous HSE Violation Notice. Immediate action is required and contractor is to cease work in all related areas until the correction is made. This notice will be delivered to the sub - contractor immediately and followed through with a transmittal. In order for work to begin again the violation needs to be corrected and a meeting is to be conducted. This meeting will involve affected company managers and VAMED to discuss methods of prevention.

### 9.3. NCR (Non Conformance Report)

None Conformance reports will be issued to All Sub- contractors if found breaching HSE on site, These NCR has to be closed out within 24hr from date of issue or acted upon immediately if depending on the nature of the breach, NCR notices will not be taken lightly and has a cost impact ( Please refer to VAMED Quality plan )

## 9.4. Statutory Improvement, prohibition and other notices

In the event of an improvement or prohibition notice or any other statutory notice being served on and in respect of the contractor's work or services on site in regards to health & Safety, the contractor/ sub-contractors shall comply with the terms of such notices.

The contractor's/ sub- contractors EHSS Officer shall carry out safety inspections upon the site and shall co-operate as appropriate with the requirements or results of such inspections.

## 10. Security

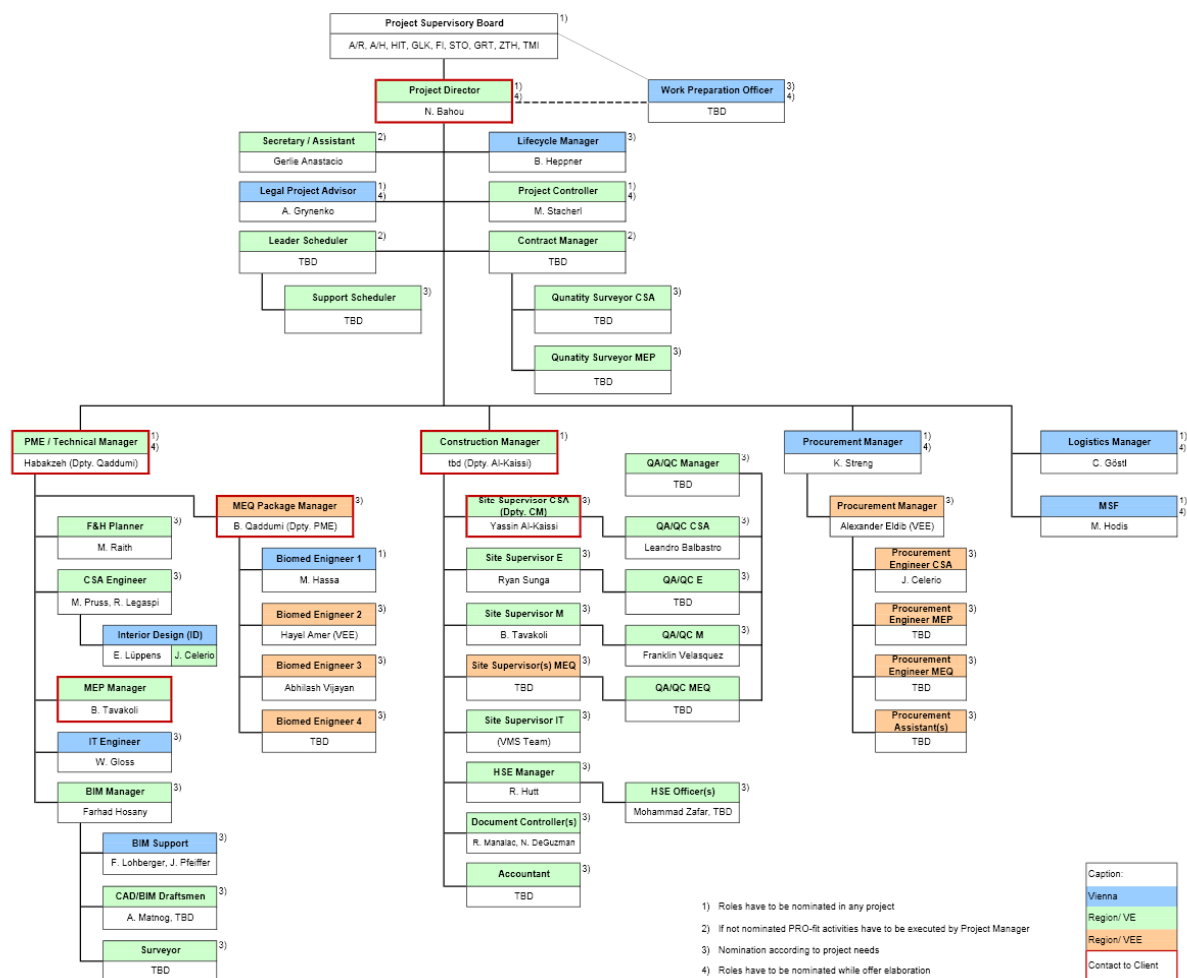
Site security is covered in the site security plan which is a separate document and should be read along with this HSE Plan.

- Main access to the site is provided by local security company all workers must respect their authority and comply with their requirements
- Gates inside the project will be manned by a 3<sup>rd</sup> party Security services under the control of VAMED in house security officers
- The landside security team may conduct random inspections of all vehicles and person(s) entering and exiting the project.
- All personnel working on the project must be in possession of a pass. Access passes must be applied for via VAMED safety department.
- No materials or machinery are to be removed from site without authorization from the VAMED Safety department & Project Director.
- All scaffoldings shall be inspected by a member of VAMED site team prior to entry to the project & prior to use; inspections raised shall contain a copy of the scaffolding inspection record and a highlighted location map.
- All types of cranes must have a valid pass issued from the VAMED safety department before entering and leaving the site.
- Access to the site shall only be allowed to authorize personnel.
- Constant and direct contact by VAMED HSE team shall be maintained with the gate security at all times
- Vehicles entering site must be safe, road worthy and in good working order.
- Persons displaying signs of intoxication, showing disregard to safety or who may not be mentally fit shall not be allowed on-site.
- Checking and monitoring movements of plant, equipment and materials entering and leaving the construction site.
- Conducting random security checks of site offices areas and subcontractors facilities throughout the construction period.
- Conducting routine and non- routine security patrols of the perimeter fence.

- Enforcing traffic and parking regulations within and outside the entrances of the construction site.
- Reporting, investigating and following up on all security infringements.
- Securing the site during non - working hours.

## 11. PROJECT ORGANISATION, EHS PERSONNEL ROLES & RESPONSIBILITY CHART

### 11.1. Project Organization Chart



## 12. EHS ROLES AND RESPONSIBILITIES

### 12.1. CEO / Managing Director (Top Management)

Lead the development of appropriate EHS management through the integration of EHS into the entities management structure, processes and culture and the regular monitoring and review of EHS performance.

EHS roles and responsibilities include:

- Ultimately responsible for the entities EHS performance;
- Set a clear EHS policy; allocate adequate resources for EHS management (e.g. budget, human resources, equipment, etc.);
- Allocate responsibility for EHS management and delegation of authority; ensure
- Implementation of the risk management program(s);
- Ensure effective systems for the provision of EHS information, training and supervision;
- And ensure effective emergency procedures.

### 12.2. Directors / Department Managers / Senior Managers

Develop and implement appropriate EHS management by ensuring EHS management systems are in place and operating effectively.

EHS roles and responsibilities include:

- Ultimately responsible for all HSE matters of this project.
- Signs the HSE Policy Statement and ensures effective compliance
- Manage the project in a senior managerial approach so that the highest HSE standards are maintained at all times.
- Approves VAMED HSE Plans and Procedures (when applicable). And ensures implementation
- Ensures adequate resources for the project are provided for HSE.
- Attends HSE Management Review
- Allocate responsibility for EHS management and delegation of authorities;
- Ensure adequate budget and resources for EHS management; ensure appropriate EHS supervision of employees; implement and monitor effectiveness of risk management program(s);
- Ensure appropriate hazard and incident investigations;
- Regularly discuss EHS issues at meetings of departments,
- Divisions or senior management; ensure provision of EHS information, training and supervision;
- And ensure appropriate emergency procedures are developed.



### 12.3. Supervisors

Integrate appropriate EHS management into processes and culture. Ensure that staff has the knowledge to meet their responsibilities and that EHS risks are identified and controlled.

EHS roles and responsibilities include:

- Provide EHS information, training and supervision;
- Assist with the preparation of risk assessments;
- Ensure application of appropriate risk control measures; and reporting of EHS hazards and incidents.

### 12.4. Employees/ Contractors/ Visitors

EHS roles and responsibilities include:

- Comply with reasonable EHS instructions and safe working procedures;
- Use of appropriate personal protective equipment and safety systems;
- Be familiar with emergency and evacuation procedures;
- Not willfully or recklessly endanger anyone's health and safety;
- Assist with the preparation of risk assessments; and report EHS hazards, incidents, and issues.

### 12.5. EHS Managers.

EHS roles and responsibilities include:

- Reports directly to the Project Director/Manager.
- Overall responsibility for maintaining and implementing ISO 14001 & 18001 standards
- Liaise with Specialist Consultants, Government Officials and Professional Bodies.
- Develops suitable HSE Objectives and Targets.
- Develop implement and maintain a health and safety loss event reporting and recording system Conduct accident, incident, near miss and dangerous occurrence investigations, reports and preventive actions. Provide management with monthly data, and when necessary safety improvement plans
- Responsible for strategic Health, Safety and Environmental activities at all facilities and service sites.
- Prepare, review and authorize the HSE Management Review Report for the HSE Management Review Committee.
- Promotes HSE throughout all projects, advises on HSE workshops with staff and Sub-contractors
- Advise the management on potential hazards and significant environmental aspects on new work before commencement.
- As a senior business manager, lead the business ensuring strict adherence to the Company's core values.

- Conduct and oversee all audit activities of company (ISO 14001-OHSAS 18001)
- Overall responsibility for advising on all applicable HSE legislation and monitoring compliance.
- Overall responsibility HSE management.
- Risk coordinator, development of standard and nonstandard risks project wide.
- Development and delivery of HSE partnering workshops project wide.
- Work with regional business leaders to identify and place HSE resources necessary to support the business.
- Drive the preparation of monthly, quarterly and annual company HSE reporting.
- Ensure that all audits of critical suppliers and internal processes are managed so as to minimize risk and maximize return.
- Motivate, coach, and encourage all personnel in HSE matters.
- Drive HSE training within the Company.
- Provide advice and recommendation to the management on the measures to be taken in the interest of safety, health, environmental protection and quality assurance including review of method statements to ensure appropriate mitigation measures are implemented prior to execution of work
- Define the HSE audit and inspection program used to verify compliance and identify any overlooked significant aspect and hazard. Report the finding with recommendation for correction and improvement to the management
- Perform root cause analysis on non-conformance and ensure follow-up with corrective and preventive action as necessary.
- Approve HSE promotional activities used to promote the HSE awareness to the workforce.
- Maintain up-to-date codes of practice and new safety and environmental literature and ensure this information is circulated various employees to induce international and local safety and environmental knowledge.
- Leadership of the development, implementation and maintenance of an appropriate EHSMS;
- Provide specialist advice and support to senior management regarding the management of workplace hazards and risks;
- Ensure effective two way communication between senior managers and the EHS department; and ensure that EHS programs are consistent with the company policies and procedures.

## 12.6. EHS Engineer/Officer/Representatives

EHS roles and responsibilities include:

- Reports directly to the Site Manager with a reporting role to the HSE Manager
- Ensure that a high standard is maintained on site in accordance with the HSE Policy and Project Health Safety & Environmental Plan
- Advise the site management as to measures to be taken in the interest of Health Safety and Environmental
- Inspect the workplace to identify potential hazards and report the findings with recommendations for correction to the site management

- Investigate accident / incident (with or without personal injury) and dangerous occurrences and report with recommendations for prevention to the site management
- Prepare daily reports in respect to all Health and Safety activities
- Ensure site management are complying to legal and contractual requirements affecting health safety environmental and welfare of the employees and Contractor
- Assist the site management on potential hazards on new contracts before work commences.
- Review risk assessments
- Carry out inspections in association with the Health Safety Environmental to see that only safe plant, equipment and method of working are in operation, that the work is carried out in a safe manner
- Record information on injuries, damage, losses.
- Keep records, reports and all necessary documents which are required by law or the Company
- Implement training of all levels of employees on health safety and environmental
- Report to the HSE Manager employees violating safety regulation and / or Company health safety and environmental procedures and requirement
- Perform Safety Inductions are carried out for all Employees and visitors
- Assist Health and Safety Manager in carrying out health and safety audit and inspection
- Assist in emergency drills
- Maintain all safety equipment, ensure all fire extinguishers are inspected and service regularly
- Complete weekly unsafe act condition reporting

## **12.7. NON-EHS DEPARTMENTS**

### **12.7.1. Human Resources:**

- Include EHS roles and responsibilities in job descriptions, induction training and performance management programs;
- Facilitate and organize EHS training;
- Provide information and statistics to assist in the calculation and analysis of key performance indicators;
- Participate in the development of EHS strategy and implementation plans;
- And participate in the development and awareness of EHS policies and procedures.

### **12.7.2. Finance / Procurement:**

- Include EHS requirements in tender and procurement procedures and documents;
- And ensure EHS performance is included when evaluating and monitoring service providers / contractors overall performance.

### **12.7.3. Administration and Support Services:**

- Provide appropriate supervision; identify risks and hazards arising from projects and activities;
- Prepare and implement identified control measures; and provide appropriate personal protective equipment to relevant personnel.

### **12.7.4. Facilities and Property Services:**

- Ensure safe designs and construction of buildings and facilities;
- Maintain buildings and facilities in a safe manner;
- Prepare building maintenance plans detailing activities, protocols and budget;
- Prepare for and participate in the management of emergencies;
- And provide expert information and advice in building and facilities EHS issues.

### 13. PROJECT INFORMATION: To be changed

Project: Design and Build of Al-Reem Integrated Healthcare Center

Start Date: 14/05/2018

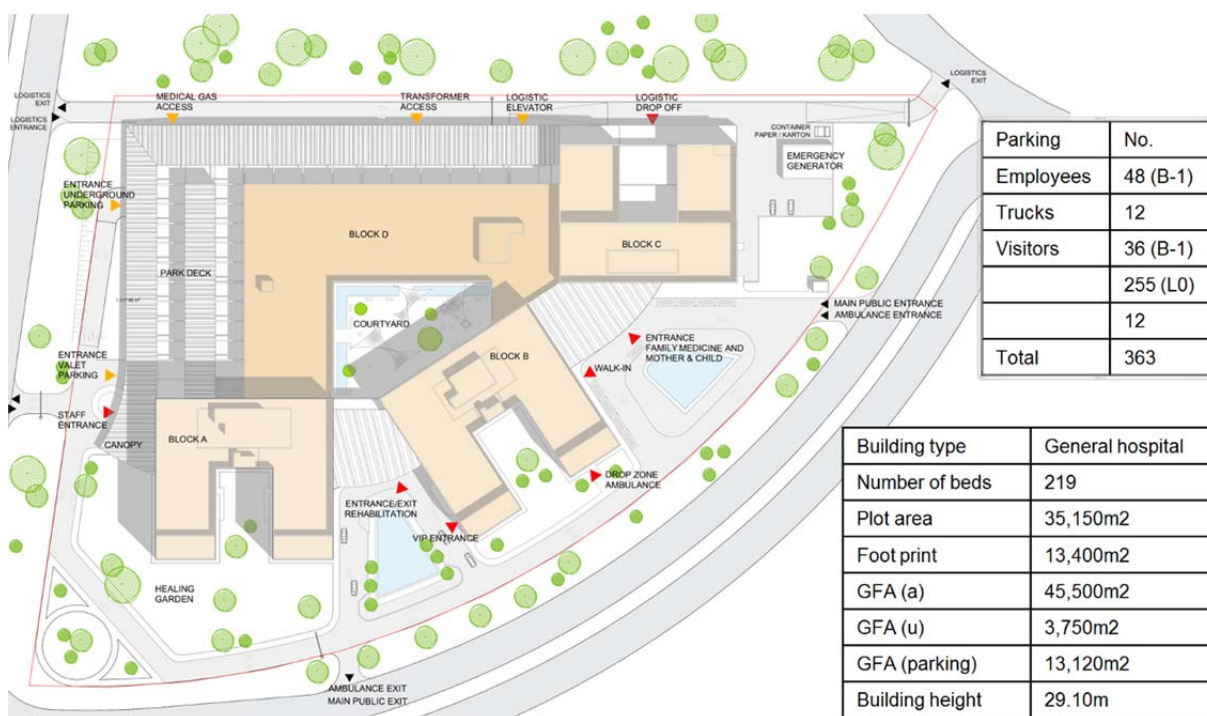
Completion Date: April /2021 (Expected)

Client: BlueApple Hospital LLC

Main Contractor: VAMED Engineering GmbH – Abu Dhabi

Location of Project: Plot RT6-C38, Al-Reem Island, Abu Dhabi, UAE.





### 13.2 VAMED CONTACTS FOR KEY PERSONNEL:

[illegible]




## 14. SAFETY INDUCTION/ SITE ORIENTATION TRAINING

MINIMUM CONTENT OF SITE INDUCTION/ORIENTATION TRAINING (As Appropriate To Recipients)

- Welcome
- General information of the project
- Key personnel
- Site Plan
- Housekeeping
- PPE (Personal Protective Equipment)
- Hazards
- Welfare
- Fire Procedures
- First Aid
- Accident and Emergency Procedures
- Rules of the project

Example:

NEW STAFF/EMPLOYEE ENVIRONMENT, HEALTH AND SAFETY INDUCTION	
PROJECT	
Date: _____	
This form shall be signed by the staff/ Employee after the EHS Induction and explanation of topics as mentioned below.	
I, Mr. _____, EMP# _____, Designation _____ _____, Company Name: _____, Mob# _____	
_____ Confirm that the following regulations / topics have been explained to me up to my satisfaction and that I have no doubts in understanding these Safety Regulations.	
I acknowledge the receipt of a copy of this form and confirm I will abide by these instructions / regulations as a condition of work/ employment with VAMED.	
<ol style="list-style-type: none"><li>1. Project Information (Name, details of client, contractor....etc.)</li><li>2. General Safety Regulations (EHS Policy, Use of PPE, Barricade, Signs, Assembly Point, rules...etc.</li><li>3. Environment (Housekeeping, waste handling, segregation, disposal, pollution, dust, noise...etc.)</li><li>4. Permit to Work System (Work at height, hot work, confined space, Excavations...etc.</li><li>5. Incident / Accident / Near miss / First aid.</li><li>6. Emergency Plan (Fire, Vapors, Explosion, natural calamities...etc.</li><li>7. Basic Fire Fighting and Fire precautions and types of fire extinguishers</li><li>8. Smoking Policy: NO SMOKING ALLOWED ON SITE / OFFICE ( ONLY ALLOWED IN SMOKING ZONE)</li></ol>	

## 15. EHS TRAINING OF SUB-CONTRACTORS WORKFORCE

Prior to mobilization, all Sub-contractors must ensure that their workforce has received EHS training which is commensurate with the work being carried out within the current contract. Basic EHS Induction/ Orientation shall be given to each employee before engaging in the work. Every employee shall attend the VAMED Induction Training program before engaging them into work.

The Sub-contractor shall provide a training plan and maintain records to demonstrate compliance to the plan.

## 16. EHS REPORTING

The Sub-contractor shall prepare and submit to VAMED a monthly EHS report. These reports shall include but not limited to:

- Incident/ accident statistics and trends with regards to Health, Safety, and Environmental
- Lost Time Injury Frequency rate
- Severity rate
- EHS training undertaken
- EHS inspections undertaken
- Violations
- Corrective action closed out
- EHS audits undertaken
- Number of safety alerts / communications
- Resource consumption and waste generation and disposal .

## 17. WELFARE

### 17.1. Smoking/ Smoking Areas ( Reference AD EHSMS COP 9.0 )

VAMED holds a strict policy of **NO SMOKING** in all areas of our projects. Smoking areas will be assigned outside the boundary of the project including smoke bins and fire suppression equipment.

### 17.2. Entertainment

While working on VAMED projects the playing of Cd's, radios, i-pods, Mp3's, Psp's or any other form of music or entertainment is **STRICTLY** prohibited.

Playing of loud music or any other kind of entertainment on the project may affect the ability of yourself and or others to hear Safety Critical Information such as Emergency Communications and construction machinery alarms.



### 17.3. Drugs & Alcohol

Any persons found in possession or to be under the influence of drugs or alcohol will be removed from the project with immediate effect!

If you are found in possession or under the influence of drugs or alcohol and damage is caused to person/persons or property, both you and your employer will be held responsible for the cost of any repairs and loss of revenue due to lost time on the project.

### 17.4. Pan Masala/ Beetle Nut/ Edible Tabaco

The use of either Pan Masala & or Bettle nut or any other form of edible tobacco is strictly prohibited from any VAMED project.

### 17.5. Work in Hot or Cold Environments

The risk to the health of workers increases as conditions move further away from those generally accepted as comfortable. Risk of heat stress arises, for example, from working in high air temperatures, exposure to high thermal radiation or high levels of humidity, such as those found in warmer climates, foundries, glass works and laundries. Cold stress may arise, for example, from working in cold stores, food preparation areas and in the open air during winter.

Assessment of the risk to workers' health from working in either a hot or cold environment needs to consider both personal and environmental factors. Personal factors include body activity, the amount and type of clothing, and duration of exposure. Environmental factors include ambient temperature and radiant heat; and if the work is outside, sunlight, wind velocity and the presence of rain or snow.

#### Actions arising from your assessment may include:

- Introducing engineering measures to control the thermal effects in a workplace environment, for example heat effects, may involve insulating any plant which acts as a radiant heat source, thereby improving air movement, increasing ventilation rates and maintaining the appropriate level of humidity. The radiant heat effects of the sun on indoor environments can be addressed either by orientating the building so that it doesn't suffer from the effects of solar loading, or where this is not possible, by the use of blinds or shutters on windows. Where workers are exposed to cold and it is not reasonably practicable to avoid exposure you should consider, for example, using cab heaters in fork-lift trucks in cold stores;
- Restriction of exposure by, for example, re-organising tasks to build in rest periods or other breaks from work. This will allow workers to rest in an area where the environment is comfortable and, if necessary, to replace bodily fluids to combat dehydration or cold. If work rates cause excessive sweating, workers may need more frequent rest breaks and a facility for changing into dry clothing;
- Medical pre-selection of employees to ensure that they are fit to work in these environments;

- use of suitable personal protective clothing (which may need to be heat resistant or insulating, depending on whether the risk is from heat or cold);
- Acclimatisation of workers to the environment in which they work, particularly for hot environments;
- Training in the precautions to be taken; and
- Supervision, to ensure that the precautions identified by the assessment are taken.

### 17.6. Heat related illness (Heat Stress) ( Reference AD EHSMS COP 11.0 )

- Although human beings possess considerable ability to compensate for naturally occurring heat stress, many occupational environments and/or physical activities expose workers to heatloads which are so excessive as to threaten their health and productivity. Interventions fall into five categories: maximizing heat tolerance among exposed individuals, assuring timely replacement of lost fluid and electrolytes, altering work practices to reduce exertion heat load, engineering control of climatic conditions, and use of protective clothing.
- Factors outside the worksite, which may affect thermal tolerance, should not be ignored in the evaluation of the extent of exposure and developing preventive measures. For example, the total burden to the body and the potential risk of heat disorders will be much higher if heat stress continues during off-duty hours through work at second jobs, strenuous leisure activities, or living in hot quarters. In addition, the state of the body is linked to patterns of eating and drinking, which may also change with season or religious observances. Worker in hot trades should be generally healthy and possess suitable physical attributes for the work to be done. Obesity and cardiovascular disease are conditions that add to the risks, and individuals with a history of previous unexplained or repetitive heat illness should not be assigned to tasks involving severe heat stress.
- Various physical and physiological characteristics which may affect heat tolerance are discussed below and fall into two general categories: inherent characteristics beyond the control of the individual, such as body size, gender, ethnicity and age; and acquired characteristics, which are at least partly subject to control and include physical fitness, heat acclimatization, obesity, medical conditions and self-induced stress.
- Employee's through-out the Louvre project will be informed of the nature of heat stress and its negative effects as well as the protective measures provided at the workplace.
- They will have a basic understanding that heat tolerance depends to a large extent upon drinking enough water and eating a balanced diet.
- In addition, all employees will have an understanding of the signs and symptoms of heat stress which include dizziness, faintness, breathlessness, palpitations and extremethirst.

- All employees will understand the basic first aid treatment this will be done via tool box talks given by the site nursing team. A Heat Stress Management plan has been implemented on site and is in accordance with AD EHSMS RF- COP 9.2.

The project will ensure that the following is provided on site to help with re hydration.

- Safe, palatable water will be located at each work area this will be in the form of igloos
- Water coolers will be placed in each rest area
- Rest areas will be provided that will give shade and be air conditioned
- Sub-contractors will be required to submit a Heat Stress plan prior to the summer months.

### 17.7. High Winds and Dust.

References can be made to the Site General Lifting plan which is a separate document that is designed for general site wide lifting with description for wind speeds and the usage of Cranes

When high winds create a hazard to the work being performed i.e. Instability in elevated areas, limited visibility due to dust or particles in the air, unmanageable materials, supervision will stop work activities, and they will reassign work areas, properly store and secure materials which might blow away, injure someone or damage securing equipment.

Appropriate materials will be made available on the project to facilitate the of property, materials and equipment.

Although the storm may have passed, hazards may still exist because of unstable or other hazardous conditions. Therefore, a safety and property damage assessment will be conducted by the Construction team and passed to the HSE team structures on site, for planned clean up prior to the startup of normal construction activities.

### 17.8. Strong Winds.

Watch out for lying debris or loosely fixed materials that may be blown from higher levels, Tree limbs that may break; Street signage that may become loose during strong winds.

When possible take cover under a shelter or inside/ besides a building, stand clear of road ways or leading edges as gusts may blow you over and or into on-coming vehicles.

Avoid elevated areas such as scaffoldings, shuttering tables. Avoid anything that may have contact with downed powerlines and contact a member of the safety team.

- Do not touch anyone who has been shocked, indirect or direct contact with power lines and or supply. You may also become a second victim. Call for medical attention as quickly as possible by calling emergency services and onsite safety teams. Stay with the victim and ensure no one else puts them self in danger and or direct contact.
- When driving, keep both hands on the wheel and slow down. Watch for objects blowing across the roadway and into your path.

- Take care with high profile vehicles these are more prone to be turned over due to high wind speeds
- Keep a safe distance from other vehicles
- Plant equipment's such as tower cranes and mobile cranes, operators should ensure loads are made safe and operations be halted and that the operator vacates the cabin

## 17.9. SAND STORMS

Weather forecasts are required to be monitored for the likelihood sand storms. Management will monitor the severity of the reports and also site conditions, action should be taken to remove persons to safe areas if the dust levels could put health and safety at risk.

## 17.10. RAIN

Rain does not occur often in the region but it can create serious problems in the form of floods. The main issues to be considered on site are excavation flooding, excavation wall collapse, drowning, structure collapse and electrocution. When there has been heavy rain all excavations and slopes will be checked before the work can commence, extra care should also be taken when working on scaffolding due to potential slipping.

## 17.11. Foggy Weather

Fog is hazardous when it becomes thick, due to reduced visibility and ability to see roads, surrounding buildings, vehicles, pedestrians and signage's etc.

Crane operations during foggy weather shall be halted until it clears to ensure safe lifting operations.

- Avoid driving until cleared.
- Stay a safe distance from leading edges.
- Drive with lights on low beam, high beam will only reflect back impairing visibility.
- Reduce your speed hazards may be ahead and unseen till on top of you.
- Open your window and listen for traffic.
- Use the right side edge of the road and markings as a guide.
- Be patient and take your time
-

## 17.12 SUMMER WORKING HOURS ( Reference AD EHSMS COP 11.0 )

Between June 15<sup>th</sup> and 15<sup>th</sup> September no outside work that consists of being under direct sunlight shall be conducted. Working hours shouldn't exceed 8 hours in morning or nightshifts.

## 18. MEDICATION (Reference AD EHSMS COP 4.0)

On arrival of any VAMED-projects you will be required to declare any medications given by a physician including a medical certificate showing fit for work.

**In accordance with any medical treatment you may require if an accident occurs your medical record can be given to the emergency services on arrival.**

### 18.1. First Aid

#### What to do in an emergency

#### Priorities

Your priorities are to:

- Assess the situation – do not put yourself in danger;
- Make the area safe;
- Assess all casualties and attend first to any **unconscious** casualties;
- Send for help – do not delay.
- Check for a response
- Gently shake the casualty's shoulders and ask loudly, 'Are you all right?' If there is
- No response, your priorities are to:
- Shout for help;
- Open the airway;
- Check for normal breathing;
- Take appropriate action.

**UNRESPONSIVE**

**SHOUT FOR HELP**

**OPEN AIRWAYS**

**NOT BREATHING NORMALLY**

**CALL EMERGENCY SERVICES**

**CHEST COMPRESSIONS UNTIL EMERGENCY SERVICES ARRIVE**

## **A= Airways**

To open the airway:

- Place your hand on the casualty's forehead and gently tilt the head back;
- Lift the chin with two fingertips.

## **B= Breathing**

Look, listen and feel for normal breathing for no more than 10 seconds:

- Look for chest movement;
- Listen at the casualty's mouth for breath sounds;
- Feel for air on your cheek.

If the casualty is breathing normally:

- Place in the recovery position;
- Get help;
- Check for continued breathing.

If the casualty is not breathing normally:

- Get help;
- Start chest compressions (see CPR).

## **C= CPR**

To start chest compressions:

- Lean over the casualty and with your arms straight, press down on the centre of the breast-bone 4-5 cm, then release the pressure;
- Repeat at a rate of about 100 times a minute;
- After 30 compressions open the airway again;
- Pinch the casualty's nose closed and allow the mouth to open;
- Take a normal breath and place your mouth around the casualty's mouth, making a good seal;
- Blow steadily into the mouth while watching for the chest rising;
- Remove your mouth from the casualty and watch for the chest falling;
- Give a second breath and then start 30 compressions again without delay;
- Continue with chest compressions and rescue breaths in a ratio of 30:2 until qualified help takes over or the casualty starts breathing normally.

## 18.2. Sever Bleeding

**If there is severe bleeding:**

- Apply direct pressure to the wound;
- Raise and support the injured part (unless broken);
- Apply a dressing and bandage firmly in place.

## 18.3. Broken bones and spinal injuries

If a broken bone or spinal injury is suspected, **obtain expert help. Do not move casualties** unless they are in immediate danger.

## 18.4. Burns

**Burns can be serious so if in doubt, seek medical help.** Cool the affected part of the body with cold water until pain is relieved. Thorough cooling may take 10 minutes or more, but this must not delay taking the casualty to hospital.

Certain chemicals may seriously irritate or damage the skin. Avoid contaminating yourself with the chemical. Treat in the same way as for other burns but flood the affected area with water for 20 minutes. Continue treatment even on the way to hospital, if necessary. Remove any contaminated clothing which is not stuck to the skin.

## 18.5. Eye Injuries

All eye injuries are potentially serious. If there is something in the eye, wash out the eye with clean water or sterile fluid from a sealed container, to remove loose material. **Do not attempt to remove anything that is embedded in the eye.**

If chemicals are involved, flush the eye with water or sterile fluid for at least 10 minutes, while gently holding the eyelids open. Ask the casualty to hold a pad over the injured eye and send them to hospital.

## 18.6 Record Keeping

It is good practice to use a book for recording any incidents involving injuries or illness which you have attended. Include the following information in your entry:

- The date, time and place of the incident;
- The name and job of the injured or ill person;
- Details of the injury/illness and any first aid given;
- What happened to the casualty immediately afterwards (e.g. went back to work, went home, went to hospital);
- The name and signature of the person dealing with the incident.

**The above information can help identify accident trends and possible areas for improvement in the control of health and safety risks.**

## 19. SECURITY

A 24 hour security post will be assigned at the entrance of the project under the control of VAMED this consists of a barrier that will be in the closed position at all times to prevent unwanted traffic or persons from entering the project construction area.

Adequate lighting is to be provided at the security post during the night and the barrier should be reflective.

It is the duty of the security watchman to ensure that any vehicle and or persons entering the project sign on entry and exit to the project though out the day to ensure we know of your where about in the case of an emergency.

### 19.1. Site Vehicle & Plant Equipment Inspections (REFERENCE AD EHSMS COP 36.0)

The security watchman will also be responsible to ensure all new Vehicle & Plant Equipment entering into the site should be inspected and approved by VAMED HSE personal/inspector.

The VAMED inspector have the full rights to take a copy for records, this will include the following:

Inspection and Certification of Equipment / vehicles / Drivers / Operators shall conform to ADEHSMS requirements.

Inspection and certification of Cranes by a third party shall be made every (12) months. Such certificates shall be made available for any verification.

Inspection and certificates of all lifting tackles i.e. slings, belts, shackles etc. shall be made every (6) months by Client approved 3<sup>rd</sup> Party. Certificates shall be available on site. All lifting tackles shall be color coded as per VAMED HSE plan requirements.

Crane operators shall be in possession of valid operating certificate by a recognized authority and valid U.A.E license

All drivers of Vehicles / Equipment shall be in possession of UAE valid driving license and shall third party certified by a recognized authority.



All Machinery / Equipment shall be properly safe guarded and safe guards to be maintained in place to protect personnel from coming into contact with moving parts, Rotating parts or hot services.

Each Vehicle / Equipment shall be provided with a First Aid Kit & Fire Extinguisher.

The above items also apply for VAMED Sub contractor Vehicles / Equipment / Machinery and Operators / Drivers.

All vehicles and material entering the project will require a security gate pass from VAMED to enter the construction area.

**Example:**

SECURITY GATE PASS				
PROJECT NAME				
Drivers Name: _____		GATE PASS No#: _____		
Vehicle Registration: _____				
Company: _____		Date: _____		
Crane lift required: Y <input type="checkbox"/> N <input type="checkbox"/>		Time: _____		
<b>* All material lifting requires 48hrs notice</b>				
Sr #:	Item Description	UNIT	QTY	Remarks (Please specify) Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Head of Department/ Storeman: _____				
VAMED HSE Department: _____				
Security in charge: _____		PASS : _____		
		IN OUT		

## VAMED

(Visually) CHECKED	GOOD	FAIR	POOR	REMARKS
Tires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Windows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mirrors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Horn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Brakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fluid Leakages (oil, fuel, Hydraulics)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Safety Equipment (PPE)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Entry Permitted:</b>	<b>Y</b>	Security: _____
	<b>N</b>	
Reason for Rejection of Entry:		

[illegible]

**Vehicles without the above and or with any of the following defects will be rejected entry to the construction area:**

- Damaged or poorly maintained fuel and or hydraulic lines
- Damaged or poorly maintained Fire prevention equipment
- Damaged or poorly maintained vehicle warning lights or pedestrian sounders
- Damaged or poorly maintained tires

**Lifting and Drilling equipment shall be inspected prior to operation.**

### **19.2. Speed Limits & Traffic Routes (REFERENCE AD EHSMS COP 44.0 & 8.0)**

On entering the project all vehicles are requested to sound the horn on passing the entry gate and to have hazard warning lights engaged at all times. A maximum speed limit of 10km will apply at all times, truck routes will be allocated to ensure the safety of employees/ visitors and members of the public.

All transport entering the project must be inspected before entering to ensure the vehicle is in good condition and inspection reports are up to date.

### **19.3. Floors and Traffic Routes**

‘Traffic route’ means a route for pedestrian traffic, vehicles, or both, and includes any stairs, fixed ladder, doorway, gateway, loading bay or ramp.

There should be sufficient traffic routes, of sufficient width and headroom, to allow people and vehicles to circulate safely with ease.

Horizontal swinging barriers used as gates at car park or similar entrances should be locked open or locked shut (preferably by padlock) so that they do not swing open and constitute a risk to oncoming vehicles.

Upward-opening doors or gates need to be fitted with an effective device to prevent them falling back. Provided that they are properly maintained, counterbalance springs and similar counterbalance or ratchet devices to hold them in the open position are acceptable.

To allow people and vehicles to move safely, the best approach is to keep vehicles and pedestrians apart by ensuring that they use entirely separate routes. If people and vehicles have to share a traffic route, use barriers or clear markings to designate a safe walkway and, where pedestrians need to cross a vehicle route, provide clearly marked crossing points with good visibility.

It is often difficult for drivers to see behind their vehicle when they are reversing; as far as possible, plan traffic routes so that drivers do not need to reverse. For such cases this should be achieved by using one-way systems and drive-through loading areas.

Route markings and signs are to be provided so that drivers and pedestrians know where to go and what rules apply to their route, so they are warned of any potential hazards.

Floors and traffic routes should be sound and strong enough for the loads placed on them and the traffic expected to use them. The surfaces should not have holes or be uneven or slippery, and should be kept free of obstructions and from any article or substance which may cause a person to slip, trip or fall.

Criteria for defects such as subsidence, unevenness, pot holes, collection of surface water, cracks and ruts should be determined and set, and maintenance systems developed to undertake repair when these limits are exceeded.

#### 19.4. Parking Areas

Parking areas for staff/ visitors etc. shall be allocated outside of the boundary fence, information of parking areas will be given during the orientation.

- All vehicles shall be reversed parked into the parking bays provided, to allow safe and organized removal in the event of an emergency.

#### 19.5. Barriers (REFERENCE AD EHSMS COP 22.0)

Where hazards are present and the need for barricading is required these shall be provided and maintained until the hazard has been removed.

- Where there is danger of a person and or material falling from a height
- Being struck by a fall object
- Separation of pedestrian/ plant equipment and or vehicles entering the project
- Where there is a danger of injury from equipment, processes and or maintenance of equipment.

#### 19.6. Site Visitors

All visitors to the project will be allowed to enter via site security entrance/gate where they will be required to sign in and must report to the site office and safety department for induction before entering the construction area.

Visitors to the project shall not be permitted to enter the construction area without an escort and will be requested to wear PPE: Hard helmet, Safety footwear ~~and high visibility vest~~ and will also be issued with a visitor safety vest

**Example:**

Name:	Company:	Badge No#:	Date:	Time In:	Time Out:	Location:
XXX	XXX	XXX	XXX	XXX	XXX	XXX

## **20. SITE OFFICES (REFERENCE AD EHSMS COP 8.0 & 43.0)**

Site cabins supplied to the project require considerations:

### **20.1. Room Dimensions and Space**

Workrooms should have enough free space to allow people to move about with ease. The volume of the room when empty, divided by the number of people normally working in it, should be at least 11 cubic meters. All or part of a room over 3.0 m high should be counted as 3.0 m high. 11 cubic meters per person is a minimum and may be insufficient depending on the layout, contents and the nature of the work.

### **20.2. Ergonomic Considerations**

Ergonomics involves arranging the environment to fit the person. In the workplace, ergonomics helps to adapt the job to fit the person, rather than force the person to fit the job. Adapting the job to fit the worker can help reduce stress and eliminate many potential injuries and disorders associated with the overuse of muscles, bad posture, and repetitive motion.

### **20.3. Workstations and Seating**

Workstations should be suitable for the people using them and for the work they do. People should be able to leave workstations swiftly in an emergency. If work can or must be done sitting, seats which are suitable for the people using them and for the work they do should be provided. Seating should give adequate support for the lower back, and footrests should be provided for workers who cannot place their feet flat on the floor.

### **20.4. Trailing Leads**

An adequate number of outlet sockets should be provided and the running of cables and/or wires across floors must be avoided. If it is necessary to run a cable or electrical cord across the floor, a cable cover should be used to protect the wiring and to prevent tripping.

## 20.5. Filing Cabinets/ Bookcases

Filing cabinets and bookcases can be dangerous if used incorrectly.

In the case of four-drawer filing cabinets, the second drawer from the bottom should be filled before the others to weight the bottom and to prevent it from tilting over.

Drawers and doors should be returned to the closed position when not in use so as to prevent bumping and tripping. Under no circumstances should more than one drawer, or door, at a time be open.

Filing cabinets and/or bookcases should be placed where their use will not interfere with office traffic patterns.

Filing cabinets or bookcases taller than 1.5 meters should be secured or anchored to the wall to prevent toppling over.

## 20.6. Electrical Equipment

Electrically operated equipment can be hazardous in offices. It must be properly used and maintained, especially items which are moved frequently.

Frayed electrical cords, loose or broken electrical wires, broken outlet covers and receptacles and worn or broken electrical plugs are dangerous and should be repaired or replaced before being used again.

Moisture and electricity do not mix. Placing liquids on or around electrical equipment (such as computers, radios, copiers, printers or microwaves) increases the risk of electrocution if the liquid spills and gets into the electrical equipment. This includes wet or sweaty hands.

Do not block electrical panel doors. If an electrical malfunction should occur, the panel door, and anything else in front of the door, will become very hot.

Electrical panel doors should always be kept closed, to prevent 'electrical flashover' in the event of an electrical malfunction.

## 20.7. Cleanliness and Waste Materials

Every workplace and the furniture, furnishings and fittings should be kept clean and it should be possible to keep the surfaces of floors, walls and ceilings clean. Cleaning and the removal of waste should be carried out as necessary by an effective method. Waste should be stored in suitable receptacles reducing hazards such as slips, trips and falls as well as removing material that could fuel a fire.

## 20.8. Temperatures in Indoor Workplaces

Environmental factors (such as humidity and sources of heat in the workplace) combine with personal factors (such as the clothing a worker is wearing and how physically demanding their work is) to influence what is called someone's 'thermal comfort'.

Individual personal preference makes it difficult to specify a thermal environment which satisfies everyone. For workplaces where the activity is mainly sedentary, for example offices, the temperature should normally be at least 16 °C. If work involves physical effort it should be at least 13 °C (unless other laws require lower temperatures).

## 20.9. Ventilation

Workplaces need to be adequately ventilated. Fresh, clean air should be drawn from a source outside the workplace, uncontaminated by discharges from flues, chimneys or other process outlets, and be circulated through the workrooms.

Ventilation should also remove and dilute warm, humid air and provide air movement which gives a sense of freshness without causing a draught. If the workplace contains process or heating equipment or other sources of dust, fumes or vapours, more fresh air will be needed to provide adequate ventilation.

Windows or other openings may provide sufficient ventilation but, where necessary, mechanical ventilation systems should be provided and regularly maintained.

## 20.10. Windows

Operable windows, skylights and ventilators should be capable of being opened, closed or adjusted safely and, when open, should not pose any undue risk to anyone.

## 20.11. Lighting

Lighting should be sufficient to enable people to work and move about safely.

## 20.12. Sanitary Conveniences and Washing Facilities

Suitable and sufficient sanitary conveniences and washing facilities should be provided at readily accessible places. They and the rooms containing them should be kept clean and be adequately ventilated and lit. Washing facilities should have running hot and cold or warm water, soap and clean towels or other means of cleaning or drying. If required by the type of work, showers should also be provided. Men and women should have separate facilities unless each facility is in a separate room with a lockable door and is for use by only one person at a time.

### **20.13. Accommodation for Clothing and Facilities for Changing**

Adequate, suitable and secure space should be provided to store workers' own clothing and special clothing. As far as is reasonably practicable the facilities should allow for drying clothing. Changing facilities should also be provided for workers who change into special work clothing. The facilities should be readily accessible from workrooms and washing and eating facilities, and should ensure the privacy of the user, be of sufficient capacity, and be provided with seating.

### **20.14. Facilities for Rest and Meals**

Suitable and sufficient, readily accessible rest facilities should be provided.

Seats should be provided for workers to use during breaks. Rest areas or rooms should be large enough and have sufficient seats with backrests and tables for the number of workers likely to use them at any one time, including suitable access.

Where workers regularly eat meals at work, suitable and sufficient facilities should be provided for the purpose. Such facilities should also be provided where food would otherwise be likely to be contaminated.

Work areas shall not be counted as rest areas and as eating facilities.

Where provided, eating facilities should include a facility for preparing or obtaining a hot drink. Where hot food cannot be obtained in or reasonably near to the workplace, workers may need to be provided with a means for heating their own food (e.g. microwave oven).

Food storage area to be provided with means of keeping the food fresh and to prevent illness.

Air conditioning units are to be provided.

All surfaces must be washable with means to dispose of waste food and wrapping. Vermin control to be provided to the outside perimeter of the rest area.

Suitable rest facilities should be provided for pregnant women and nursing mothers. They should be near to sanitary facilities and, where necessary, include the facility to lie down.

### **20.15. Drinking Water**

An adequate supply of high-quality drinking water, with an upward drinking jet or suitable cups, should be provided. Water should only be provided in refillable enclosed containers where it cannot be obtained directly from a mains supply. The containers should be refilled at least daily (unless they are chilled water dispensers where the containers are returned to the supplier for refilling). Bottled water/water dispensing systems may still be provided as a secondary source of drinking water. Drinking water does not have to be marked unless there is a significant risk of people drinking non-drinking water.



## **20.16. First Aid Facilities** (REFERENCE AD EHSMS COP 4.0)

The location of the site First Aid station should be clearly marked and all employees and visitors to be aware of the location, information of this will be provided in the site induction on your arrival to the project.

## **20.17. Site Accommodation Fire Safety**

No site accommodation shall be located within building(s) being built / refurbished.

Every office should consider fire or other emergency hazards and plan for escape in the event of an emergency.

Where the fire break is less than 6m temporary accommodation shall be constructed to achieve 30 minutes fire resistance

If the accommodation is double stacked, the roof/ floor assembly, and members supporting it shall achieve at least 30 minutes fire resistance.

The space between raised floors of the site accommodation shall be enclosed to prevent the accumulation of rubbish (fuel to fires and to prevent rodent infestation) while still allowing for under floor ventilation.

Where applicable, Fire certification shall be applied for in accordance with local regulations.

Electrical installations/ testing and inspections shall be in accordance with local regulations.

Fire extinguishers shall be established throughout all site offices and places of welfare accommodation.

Fire extinguishers shall be positioned adjacent to the exit points on suitable brackets with the operating handle approximately 1m from floor level.

Every office should post accepted evacuation routes in conspicuous places and have at least one practice office evacuation drill per year.

A predetermined emergency meeting place should be established so that an office head count can be taken after the office is evacuated. This will help determine who may or may not still be in the building for the emergency response personnel.

Office doors should always be free of obstructions, to permit egress in case of an emergency.

All new office employees should be trained in the accepted evacuation practices for the office.

Everyone should be aware that there are a surprising number of flammable materials used in offices. They can be innocent-looking products, such as glue, whiteout, and fingernail polish or cleaning solvents.

Fire points shall be positioned around the project construction and office areas.

Appropriate fire detection system(s) shall be installed in welfare facilities used for cooking.

Each site office shall contain the following fire extinguishers:

DRY CHEMICAL EXTINGUISHER: suitable for a combination of **Class A, B and C fires**. These are filled with foam or powder and pressurized with nitrogen.

- **BC** – Dry chemical extinguisher. It is filled with sodium bicarbonate or potassium bicarbonate. **BC** variety leaves a mildly corrosive residue which must be cleaned immediately to prevent damage to materials.
- **ABC** – Multipurpose dry chemical extinguisher. ABC types are filled with monoammonium phosphate, a yellow powder that leaves a sticky residue that may be damaging to electrical appliances such as computers.

Dry chemical extinguishers have an advantage over CO2 extinguishers since they leave a non- flammable substance on the extinguished material, reducing the likelihood of re-ignition.

Each extinguisher shall have an inspection tag fitted and be checked every month to make sure this is in good working order if not this must be replaced (to be sent for calibration once a year)

IT IS VITAL TO KNOW WHAT TYPE OF EXTINGUISHERS YOU ARE USING.  
USING THE WRONG TYPE OF EXTINGUISHER FOR THE WRONG TYPE OF FIRE CAN BE LIFE THREATENING.

- **Class A:** extinguishers are for ordinary combustible materials such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish.
- **Class B fires** involve flammable or combustible liquids such as gasoline, kerosene, grease and oil. The numerical rating for **Class B** extinguishers indicates the approximate number of square feet of fire it can extinguish.
- **Class C:** fire involves electrical equipment, such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish **Class C** fires- the risk of electrical shock is far too great! **Class C** extinguishers do not have numerical rating. The **C** classification means the extinguisher agent is non- conductive.
- **Class D:** fire extinguishers are commonly found in a chemical laboratory. They are for fires that involve combustible metals, such as magnesium, titanium, potassium and sodium. These types of extinguishers also have no numerical rating, nor are they given multi- purpose rating – they are designed for **Class D** fires only.

## 20.18. Safe Office Work Practices

- Guard the sharp edges of furniture to prevent personal injury.
- Practice good housekeeping. Keep floors free of items that might cause tripping.
- Keep garbage cans out of the way; do not overfill them.
- Prevent slipping and accidents by cleaning up spills immediately.
- Report all defects such as loose tiles, broken steps, railings and doors immediately to
- Do not participate in horseplay.
- Keep razor blades, tacks and other sharp objects in closed containers.
- Use the proper tool for the job at hand (e.g. a staple remover to remove staples).
- Jewellery, long hair, and clothing must be kept clear of moving parts of all office machines.
- Do not place furniture, equipment, or materials in locations that will interfere with air movement around thermostats.

## 21. PERSONAL PROTECTION EQUIPMENT (PPE): (REFERENCE AD EHSMS COP 2.0)

### Refer to Annex for color codes for PPE

Contractors are responsible to ensure all employees are supplied with well-maintained personal protection equipment that bears a 'CE' mark and complies with the Personal Protective Equipment Regulation 2002 (SI 2002/1144) concerning the design or manufacture of PPE with regard to health and safety, before commencing with any works.

On arrival to the project this will be checked by the appointed Health & Safety Officer and recorded. Personal protection should be worn at all times while carrying out your duties, Fashion items or loose clothing will not be accepted as well as items of jewellery.

Person's employee and or visitors found not complying with PPE requirements will be issued with a violation that may also consist of a fine as per VAMED Matrix and may also be instructed to leave the project.

### 21.1. Head Protection

Suitable head protection means an industry safety helmet conforming to British Standard **BS EN 397** or equivalent standard. Helmets to **BS EN 397** may include optional, but nevertheless Strongly recommended, comfort features such as sweat-bands.

This must be worn at all times while on the project unless in eating quarters, offices or while driving vehicles.

All safety helmets shall be inspected and a report to be submitted to VAMED at the start of project and then inspected yearly thereafter, As per UAE regulations safety helmets must be replaced yearly.

## 21.2. Foot Protection

Protective foot ware shall be worn at all times by each employee and or visitors no exceptions

<b>EN 345-1: 1992 – Safety foot ware for professional use - Specification</b>	
<b>Superseded by EN ISO 20345:2004</b>	
<b>Basic requirements</b> – Safety foot ware must have a 200J toecap. Other properties: (may not all apply to some designs of foot ware)	
<b>P</b> – penetration resistance <b>C</b> – conductive <b>A</b> – anti- static <b>HI</b> – insulated against heat <b>CI</b> – insulated against cold <b>E</b> – energy absorbing seat region <b>WRU</b> – upper resistant to water penetration / absorption <b>HRO</b> – outside sole resistant to hot contact	
<b>Classification I</b> – (made from leather and other materials, but not all-rubber or all-polymeric types)	
<b>SB</b> – basic requirements for safety foot ware met <b>S1</b> – basic requirements plus closed and energy absorption seat region, and anti-static <b>S2</b> – as <b>S1</b> plus water penetration and absorption <b>S3</b> – as <b>S2</b> plus penetration resistance and cleated sole	
<b>Classification II</b> – (all rubber or polymeric types)	
<b>SB</b> – basic requirements for safety foot ware met <b>S4</b> – basic requirements plus energy absorption seat region, antistatic <b>S5</b> – as <b>S4</b> plus penetration resistance and cleated sole	

<b>EN 346-1: 1992 – Protective foot ware for professional use - Specification</b>	
<b>Superseded by EN ISO 20346:2004</b>	
<b>Basic requirements</b> – Protection foot ware must have a 100J toecap. Other properties: markings as for <b>EN 345-1</b>	
<b>Classification I</b> – (made from leather and other materials, but not all-rubber or all-polymeric types)	
<b>PB</b> – basic requirements for protective foot ware met <b>P1</b> – basic requirements plus closed and energy absorption seating region, and antistatic <b>P2</b> – as per <b>P1</b> plus water penetration and absorption <b>P3</b> – as per <b>P2</b> plus penetration resistance and cleated sole	
<b>Classification II</b> – (all-rubber or all-polymeric types)	

<p><b>PB</b> – basic requirements for protective foot ware met  <b>P4</b> – basic requirements plus energy absorption seat region, antistatic  <b>P5</b> – as <b>P4</b> plus penetration resistance and cleated sole</p>
<b>EN 346-2: 1996 – Protective foot ware for professional use - Specification</b>
<b>Superseded by EN ISO 20346: 2004</b>
<b>WR</b> – water resistance for classification I foot ware
<b>Metatarsal protection – M-</b> basic requirements plus metatarsal protection
<b>Cut resistance – CR</b> – basic requirements plus cut resistance

### 21.3. Body Clothing Protection

As well as company uniforms in some areas of work you will be required to provide additional Body protective clothing as follows:

<b>EN 340:2003 – Protective clothing – General requirements</b>
<ul style="list-style-type: none"> <li>- mark identifying the manufacturer</li> <li>- product identifying mark</li> <li># - size or size range designation</li> <li><b>EN ###</b> - specific Standard number</li> <li><b>Pictogram</b> – for specific hazard protection, plus performance levels, where applicable</li> <li>- care labelling. May include maximum number of cleaning cycles (<b>MAX ##x</b>)</li> <li>- single use PPE to be marked “<b>DO NOT RE-USE</b>”</li> </ul>

<b>EN 471:2003 – Specification for high visibility warning clothing</b>
<p>As for <b>EN 340</b>, plus</p> <p><b>Pictogram</b> – for high visibility clothing, and if applicable one or two digits alongside</p> <p># - class garment (1 to 3) based on minimum areas of visible background, retro-reflective and combined performance material</p> <p># - retro-reflective class (1 or 2; 2 is the most reflective) for materials</p>

<b>EN 470 -1: 1995- Protective clothing for use in welding and allied processes. General requirements</b>
<b>Superseded by EN ISO 11611: 2007</b>
<p>As for <b>EN 340</b>, plus</p> <p><b>Pictogram</b> – for protection against heat and fire</p> <p>Dimensional change after cleaning, if more than 3%</p>

<b>EN 50286: 1999 – Electrical insulating protective clothing for low-voltage installations</b>
As EN 340, plus - <b>double triangle symbol, class 00</b> and/ or colour code <b>beige</b> - internal panel on which to mark date of periodic inspection

#### 21.4. Hearing Protection (REFERENCE AD EHSMS COP 3.0)

##### The Noise Regulation 2005 requires

Hearing protection such as earmuffs and earplugs is your last line of defense against damage, you are required to use hearing protection in all areas where sound pressure levels exceeds 70 decibels (dB).

You are required to:

- Provide your employees with hearing protectors if they ask for them and their noise exposure is between the lower and upper exposure action values.
- Lower Exposure action values:
  - Daily or weekly exposure of 80dB;
  - Peak sound pressure of 130dB;
- Upper Exposure action values:
  - Daily or weekly exposure of 85dB;
  - Peak sound pressure of 137dB;

There are also levels of noise exposure which must not be exceeded:

- Exposure limit values:
  - Daily or weekly exposure of 87dB;
  - Peak sound pressure of 140dB;
- Provide your employees with hearing protectors and make sure they use them properly when their noise exposure exceeds the upper exposure action values.
- Provide your employees with training and information on how to use and care for the hearing protectors.

<b>STANDARDS: BS EN 352-1, BS EN 352- 2</b>
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## 21.5. Hand Protection

Appropriate hand protection must be used when the hands are exposed to hazards such as cuts, punctures or abrasions, chemical, absorption, vibration, electrical shocks or burns the following hand protection gloves must be issued by the contractor:

<b>EN 420: 2003 – General requirements for gloves</b>
Mark identifying the manufacturer Product identifying mark # - size designation (normally in range <b>6-11</b> ) - date of obsolescence (if appropriate) # - dexterity performance range <b>1</b> (lowest) to <b>5</b> (highest), if required Markings specific to individual risks, including pictogram
<b>EN 388: 2003 – Protective gloves against mechanical risk</b>
<b>Mechanical properties</b> As for EN 340, plus <b>Pictogram</b> – for mechanical risk, with four digits in a horizontal line, in order: # - abrasion resistance ( <b>0</b> to <b>4</b> ) # - blade cut resistance ( <b>0</b> to <b>5</b> ) # - tear resistance ( <b>0</b> to <b>4</b> ) # - puncture resistance ( <b>0</b> to <b>4</b> ) (highest number= greatest resistance)
Plus if appropriate:
<b>Impact cut resistance:</b> pictogram – for impact cut resistance
<b>Anti-static:</b> pictogram – for anti-static properties
<b>EN 374 – 1: 2003 – Protective gloves against chemical and micro-organisms</b>
As for EN 420 and EN 388, plus
Gloves resisting penetration and permeation: - <b>pictogram</b> with a minimum of 3 letters <b>A</b> to <b>L</b> denoting which chemical have been tested
Gloves resistance micro- organisms: - have achieve performance level 2 in penetration
<b>Note: does not infer protection against virus</b>
Gloves resisting penetration only (low chemical hazard): - <b>Pictogram</b>
<b>EN 12477: 2001 – Protective gloves for welders</b>
As for EN 420, plus <b>A</b> – higher protection but lower dexterity <b>B</b> – lower protection but higher dexterity

## 21.6. Safety Spectacles

- May be separate lenses in a metal or plastic frame (similar to prescription glasses) or single lens/frame moulding.
- Most have side shields.
- Can protect against splashes and/or impact where specified.
- Can incorporate corrective lenses. If safety spectacles are being worn for extended periods, i.e. not only when a short task is being performed, then prescription lenses should be provided if necessary.

## 21.7. Goggles

These are made with a flexible plastic frame and have one or two lenses with flexible elastic headband. They give the eyes protection from all angles as the complete rim is in contact with the face. Some goggles are ventilated and may be unsuitable for protection against gases or fine dust.

## 21.8. Face Shields

These have one large lens with a frame and adjustable head harness or are mounted on a helmet. Most can be worn with prescription glasses. They protect the face but don't fully enclose the eyes.

Protection Offered	Symbol	Product with Protection
Increased robustness	<b>S</b>	Spectacle
Low energy impact	<b>F</b>	Spectacle
Medium energy impact	<b>B</b>	Goggle
High energy impact	<b>A</b>	Face screen
Droplets/Liquid splash	<b>3</b>	Goggle/Face screen
Large dust particles	<b>4</b>	Goggles
Gas & fine dust particles	<b>5</b>	Goggles
Short circuit electric arc	<b>8</b>	Face screen
Molten metals & hot solids	<b>9</b>	Face screen

**STANDARDS: BS EN 166: 2002, BS EN 169: 2002, BS EN 175: 1997**



## 22. RESPIRATORY PROTECTION EQUIPMENT (RPE)

The Contractor is responsible for the supply of respiratory protection for all employees while working in areas where respiratory hazards exist in most areas of work within VAMED **Emirates** projects this can be done using the following means unless otherwise stated by the Health & Safety Officer.

### 22.1. Half-Mask Respirators against Particles Only

- **Respiratory (filtering device).** This uses filters to remove contaminants in the work place air. They should never be used for protection in situations with reduced oxygen levels.

#### Wearer-related factors

**Facial Hair:** Any beard, stubble, thick sideburns, long hair or moustache in the region where the face mask is intended to seal to the face will cause leakage. If this facial hair cannot be eliminated, you should consider the use of loose fitting-face pieces which do not rely on a tight seal in the region. Always remember, the law requires you to prevent exposure to hazardous substances.

**Facial markings:** Deep cuts or scars, wrinkles, moles, warts etc. can affect the seal of the masks to the face. If these are present in the face seal area, consider the use of loose-fitting face pieces.

**Spectacles or contact lenses worn:** Spectacles with side arms are incompatible with full face masks because they break the seal. RPE manufacturers can supply special frames, which fit inside their masks. Spectacles may also interfere with the fit of half-masks-contact lenses may be preferable. Careful consideration and additional training is needed for contact lens or spectacle wearers.

**Relevant medical conditions:** These include claustrophobia, heart disease, hearing defects, asthma and other respiratory illness. Coughs, colds and skin conditions. Pregnancy also falls under this heading.

- **Maximum work rate:** Medium
- **Wear time:** < 1 Hr
- **Fit testing required.**

<b>STANDARDS: BS EN 149, BS EN 1827, BS EN 140 masks and BS EN 143 Filters</b>
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**IF GASES OR VAPOURS ARE PRESENT THEN OTHER MEANS OF RESPIRATORY PROTECTION MAY BE REQUIRED**

## 23. FALL ARREST EQUIPMENT (REFERENCE AD EHSMS COP 23.0)

All safety harness are to be inspected by VAMED safety team before allowing them to be used onsite, weekly inspections shall be conducted for all safety harnesses and a copy shall be submitted to VAMED on a weekly basis.

Any harnesses that are found defective or missing data tags shall be confiscated until the end of the project by VAMED to prevent them being put back into use.

### Legal requirements and standards

The Personal Protective Equipment Regulations 1992 (as amended) require employers to maintain fall arrest equipment in good repair, including appropriate replacement. In addition, the Work at Height Regulations 2005 require that equipment which is exposed to conditions causing deterioration which is liable to result in dangerous situations should be inspected at suitable intervals and each time exceptional circumstances which might jeopardise safety have occurred.

**BS EN 365:2004** Personal protective equipment against falls from a height. General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging gives general requirements for periodic inspection, instructions for use and marking of PPE against falls from a height. To counter the causes of degradation listed in the Introduction, the British Standard states that components should be examined '**at least** twelve-monthly'. This is sometimes taken to be 'annually', although manufacturers of textile products usually recommend inspection more frequently than this.

Employers should establish a regime for the inspection of lanyards that is drawn up by a competent person. The regime should include:

- The lanyards to be inspected (including their unique identification);
- The frequency and type of inspection (pre-use checks, detailed inspection and,

Where appropriate, interim inspection);

- Designated competent persons to carry out the inspections;
- Action to be taken on finding defective lanyards;
- Means of recording the inspections;
- Training of users;
- A means of monitoring the inspection regime to verify inspections are being conducted accordingly;

It is essential that the person carrying out any inspection is sufficiently independent and impartial to allow them to make objective decisions, and has appropriate and genuine authority to discard defective lanyards. This does not mean that competent persons must necessarily be employed from an external company, although many manufacturers and/or suppliers offer inspection services and training in the inspection of their products.

Employers may wish to provide additional lanyards to use as replacements in the event that defective lanyards have to be taken out of use.

Lanyards that are on hire may need special consideration, to ensure that they are subject to detailed inspections (and interim inspections if appropriate) within the period specified in the regime. Hirers should be informed of any use or damage that may affect the safety of the equipment (e.g. use with chemicals).

#### Scope of the inspection regime

- Lanyards should be subject to:
- Pre-use checks;
- Detailed inspections; and
- (as appropriate) interim inspections;

These should be carried out by competent persons, to identify defects or damage that may affect safety.

#### **Pre-use checks**

These checks are essential and should be carried out each time, before the lanyard is used.

Pre-use checks should be tactile and visual. The whole lanyard should be subject to the check, by passing it slowly through the hands (e.g. to detect small cuts of 1 mm in the edges, softening or hardening of fibre's, ingress of contaminants). A visual check should be undertaken in good light and will normally take a few minutes.

These more formal, in-depth inspections should be carried out periodically at minimum intervals specified in the above employer's inspection regime. It is recommended that there is a detailed inspection at least every six months. For frequently used lanyards it is suggested that this is increased to at least every three months, particularly when the equipment is used in arduous environments (e.g. demolition, steel erection, scaffolding, steel skeletal masts/towers with edges and protrusions). Detailed inspections should be recorded.

## Interim inspections

These are also in-depth inspections and may be appropriate in addition to pre-use checks and detailed inspections. Interim inspections may be needed between detailed inspections because the employer's risk assessment has identified a risk that could result in significant deterioration, affecting the safety of the lanyard before the next detailed inspection is due. The need for and frequency of interim inspections will depend on use. Examples of situations where they may be appropriate include:

- Risks from transient arduous working environments involving paints, chemicals or grit blasting operations; or
- Acidic or alkaline environments if the type of fabric the lanyard is made from cannot be determined (some fabrics offer low resistance to acids or alkalis).

**The results of interim inspections should be recorded.**

## Examples of defects and damage

The following defects and damage have the potential to result in the degradation and/or weakening of the lanyard:

- Cuts of 1 mm or more at the edges of webbing lanyards (e.g. where the lanyard may have been choke-hitched around steelwork);
- Surface abrasion across the face of the webbing and at the webbing loops, particularly if localised;
- Abrasion at the edges, particularly if localised;
- Damage to stitching (e.g. cuts or abrasion);
- A knot in the lanyard, other than those intended by the manufacturer;
- Chemical attack which can result in local weakening and softening – often indicated by flaking of the surface. There may also be a change to the colour of the fibres;
- Heat or friction damage indicated by fibres with a glazed appearance which may feel harder than surrounding fibres;
- UV-degradation which is difficult to identify, particularly visually, but there may be

Some loss of color (if dyed) and a powdery surface;

- Partially deployed energy absorber (e.g. short pull-out of tear webbing);
- Contamination (e.g. with dirt, grit, sand etc.) which may result in internal or external abrasion;
- Damaged or deformed fittings (e.g. karabiners, screw link connectors, scaffold hooks);
- Damage to the sheath and core of a kern mantel rope (e.g. rucking of the core detected during tactile inspection);
- Internal damage to a cable-laid rope.

### Withdrawing lanyards from use:

Lanyards should be withdrawn from use and passed to a competent person for a detailed inspection to decide whether they should continue to be used, destroyed or returned to the manufacturer for testing\* to enable a product performance history to be determined, if:

- There is no evidence that a lanyard has been inspected by a competent person within the last six months;
- Identification is not evident (lanyards should be indelibly and permanently marked in accordance with **BS EN 365:2004**. They should be uniquely identifiable so that they can be easily associated with their respective inspection documentation);
- A lanyard is still in use and marked to the old British Standard **BS 1397:1979** Specification for industrial safety belts, harnesses and safety lanyards (i.e. pre **CE**-marking);
- A lanyard is thought to be defective, or if there is any doubt about its safety after a pre-use check or interim inspection.

A lanyard that has been used to arrest a fall should never be reused. It should be withdrawn from service immediately and destroyed or returned to the manufacturer.

## 24. LADDERS AND STEPLADDERS (REFERENCE AD EHSMS COP 37.0)

This selection process has to take into account the hierarchy of controls:

- Firstly to avoid work at height where possible;
- Then to prevent falls from height; and, failing that,
- To reduce the consequences of a fall.

Where work at height is necessary you need to justify whether a ladder or stepladder is the most suitable access equipment compared to other access equipment options. You do this by using risk assessment and the hierarchy of controls.

When considering whether it could be appropriate to use a ladder or stepladder, you need to consider the following factors.

### Suitability

This refers to the type of work and its duration. As a guide, only use a ladder or stepladder:

- In one position for a maximum of 30 minutes;
- For 'light work' - they are not suitable for strenuous or heavy work. If a task involves a worker carrying more than 10 kg (a bucket of something) up the ladder or steps it will need to be justified by a detailed manual handling assessment;
- Where a handhold is available on the ladder or stepladder;

- Where you can maintain three points of contact (hands and feet) at the working position. On a **ladder** where you cannot maintain a handhold, other than for a brief period of time, other measures will be needed to prevent a fall or reduce the consequences of one. On **stepladders** where a handhold is not practicable a risk assessment will have to justify whether it is safe or not.

On a ladder or stepladder **do not**:

- Overload it - the person and anything they are taking up should not exceed the highest load stated on the ladder;
- Overreach - keep your belt buckle (navel) inside the stiles and both feet on the same rung throughout the task.

When working on **stepladders** you should avoid work that imposes a side loading, such as side-on drilling through solid materials (e.g. bricks or concrete), by having the steps facing the work activity. Where side-on loadings cannot be avoided you should prevent the steps from tipping over, for example by tying the steps to a suitable point. Otherwise a more suitable type of access equipment should be used.

You should also avoid holding items when climbing (for example by using tool belts):

- On a **ladder** where you must carry something you must have one free hand to grip the ladder;
- On a **stepladder** where you cannot maintain a handhold (eg putting a box on a shelf), the use of a stepladder will have to be justified by taking into account:
  - The height of the task;
  - A safe handhold still being available on the stepladder;
  - Whether it is light work;
  - Whether it avoids side loading;
  - Whether it avoids overreaching;
  - Whether the user's feet are fully supported; and
  - Whether you can tie the stepladder

### Is it a safe place to use a ladder or stepladder?

This covers the specific place where you are going to set up and use it. As a guide, only use a ladder or stepladder:

- On firm ground or spread the load (e.g. use a board);
- On level ground - for **stepladders** refer to the manufacturer's instructions, for ladders the maximum safe ground slopes on a suitable surface (unless the manufacturer states otherwise) are as follows:
  - Side slope 16° – but the rungs still need to be levelled;
  - Back slope 6°;
- On clean, solid surfaces (paving slabs, floors etc). These need to be clean (no oil, moss or leaf litter) and free of loose material (sand, packaging materials etc) so the feet can grip. Shiny floor surfaces can be slippery even without contamination;
- Where it has been secured.

The options for securing a **ladder** are as follows:

- Tie the ladder to a suitable point, making sure both stiles are tied;
- Where this is not practical, use a safe, unsecured ladder or a ladder supplemented with an effective ladder stability device;
- If this is not possible, then securely wedge the ladder, e.g. against a wall;
- If none of the above can be achieved, foot the ladder. Footing is the last resort and should be avoided, where reasonably practicable, by the use of other access equipment

**Ladders** used for access to another level should be tied. **Stepladders** should not be used for access to another level unless they have been designed for this.

Consider tying a **stepladder** where possible and advantageous to the task (e.g. side-on working or where two free hands are needed).

You should **only** use ladders or stepladders:

- Where they will not be struck by vehicles, by protecting them with suitable barriers or cones;
- Where they will not be pushed over by other hazards such as doors or windows, by securing doors (not fire exits) and windows where possible. If this is impractical, have a person standing guard at a doorway, or inform workers not to open windows until they are told to do so;
- Where pedestrians are prevented from walking under them or near them, by using barriers, cones or, as a last resort, a person standing guard at the base;
- Where **ladders** can be put up at the correct angle of 75°. To judge the angle use the angle indicator marked on the stiles of some ladders or the 1 in 4 rule (1 unit out for every 4 units up);
- Where the restraint devices on **stepladders** can be fully opened. Any locking devices must also be engaged.

On a ladder or stepladder:

- Don't work within 6 m horizontally of any overhead power lines, unless the line owner has made them dead or protected with temporary insulation. If this is a regular activity, find out if the lines can be moved;
- Always use a non-conductive ladder or steps for any necessary live electrical work;
- Don't rest **ladders** against weak upper surfaces (e.g. glazing or plastic gutters). Alternatively, you can use effective spreader bars or effective stand-offs.

### Is the ladder or stepladder safe to be used?

Establish the ladder or stepladder is in a safe condition before using it. As a guide, **only** use ladders or stepladders that:

- Have no visible defects. They should have a pre-use check each working day;
- Have a current detailed visual inspection. These should be done in accordance with the manufacturer's instructions. Ladders that are part of a scaffold system still have to be inspected every seven days;
- Are suitable for work use. Use Class 12,3 or **EN 131** ladders or stepladders at work because domestic (Class 32,3) ones are not normally suitable for use at work;
- Have been maintained and stored in accordance with the manufacturer's instructions.

### What are pre-use checks and detailed visual inspections?

Both are looking for obvious visual defects, they only differ in detail. Both can be done in-house (pre-use checks should be part of a user's training). Detailed visual inspections should be recorded. Ladder stability devices and other accessories should be pre-use checked and inspected in accordance with the manufacturer's instructions. Ladder and stepladder feet must be part of the pre-use check. Ladder feet are essential for preventing the base of the ladder slipping. Missing stepladder feet cause it to wobble. The feet should be:

- In good repair (not loose, missing, splitting, excessively worn, secure etc.); and
- Clean – the feet should be in contact with the ground.

Ladder feet should also be checked when moving from soft/dirty ground (e.g. dug soil, loose sand/stone, a dirty workshop) to a smooth, solid surface (e.g. paving slabs), to ensure the foot material and not the dirt (e.g. soil, embedded stones or swarf) is making contact with the ground.

### Do my ladder-users know how to use them safely?

These are common issues about setting up and using ladders under the direct control of the user. Users should also be aware of the limitations covered in the other headings. People should **only** use a ladder, stepladder or stability device if:

- They are competent - users should be trained and instructed to use the equipment safely;
- The ladder or stepladder is long enough - for **ladders**:
- Don't use the top three rungs;
- Ladders used for access should project at least 1 m above the landing point and be tied; alternatively a safe and secure handhold should be available;



For **stepladders**:

- Don't use the top two steps of a stepladder, unless a suitable handrail is available on the stepladders;
- Don't use the top three steps of swing-back or double-sided stepladders, where a step forms the very top of the stepladder;
- The ladder or stepladder rungs or steps are level. This can be judged by the naked eye. **Ladders** can be levelled using specially designed devices but not by using bits of brick or whatever else is at hand;
- The weather is suitable - do not use them in strong or gusting winds (follow the manufacturer's safe working practices);
- They are wearing robust, sensible footwear (e.g. safety shoes/boots or trainers). Shoes should not have the soles hanging off, have long or dangling laces, or be thick with mud or other slippery contaminants;
- They know how to prevent members of the public and other workers from using them;
- They are fit - certain medical conditions or medication, alcohol or drug abuse could stop them from using ladders. If you are in any doubt, speak to an occupational health professional;
- They know how to tie a ladder or stepladder properly.

On a ladder or stepladder **don't**:

- Move them while standing on the rungs/steps;
- Support them by the rungs or steps at the base;
- Slide down the stiles;
- Stand them on moveable objects, such as pallets, bricks, lift trucks, tower, scaffolds, excavator buckets, vans, or mobile elevating work platforms;
- Extend a ladder while standing on the rungs

## 25. SCAFFOLDINGS (REFERENCE AD EHSMS COP 26.0)

The contractor shall pay particular attention to strength and stability of all types of scaffolding, the provision of guard rails, toe boards, full working platforms, the quality and proper support of timber etc.

Only proprietary scaffold systems will be accepted on site unless prior written consent has been given by the general contractor.

All ladders/access ways provided by the contractor shall be in sound condition, placed at the correct angle, and firmly secured when in use. All scaffolding must be under the direct control of a competent person and be fit for the intended purpose.

The contractor shall provide evidence of training and competence of erectors of scaffolds.

The contractor shall ensure that any scaffold erected, substantially adapted or altered by it shall not be used unless a handover certificate confirming that the scaffold is in good condition has been obtained.

The Work at Height Regulations 2005 requires an assessment to be undertaken before starting any work at height. If the assessment confirms that there is no alternative to working at height, then suitable work equipment should be selected, taking into account the nature of the work.

Mobile access towers are widely used and can provide an effective and safe means of gaining access to work at height. However, inappropriate erection and misuse of towers are the cause of numerous accidents each year. Aluminum and thin-wall steel towers are light and can easily overturn if used incorrectly. Towers rely on all parts being in place to ensure adequate strength. They can collapse if sections are left out.

Before selecting or specifying a tower, you must be satisfied that it is the most suitable item of equipment for the job.

All works shall be covered by a detailed safety method statement which shall indicate how calculations, designs, pre and post loading checks etc. are verified / established. The activity shall be under the direct supervision of a competent person familiar with the relevant standards / guidelines for such works.

### Erecting a tower

The manufacturer or supplier has a duty to provide an instruction manual which explains the erection sequence, including any bracing requirements. If the tower has been hired, the hirer has a duty to provide this information. This information must be passed on to the person erecting the tower.

Towers should be erected following a safe method of work. There are two approved methods recommended by the Prefabricated Access Suppliers' and Manufacturers' Association (**PASMA**), which have been developed in co-operation with the Health and Safety Executive.

The first method, an advance guard rail system, makes use of specially designed temporary guard rail units, which are locked in place from the level below and moved up to the platform level. The temporary guard rail units provide collective fall prevention and are in place before the operator accesses the platform to fit the permanent guard rails. The progressive erection of guard rails from a protected area at a lower level ensures the operator is never exposed to the risk of falling from an unguarded platform.

The second method of erection is the 'through-the-trap' (3T). This allows the person erecting the tower to position themselves at minimum risk during the installation of guard rails to the next level. It involves the operator taking up a working position in the trap door of the platform, from where they can add or remove the components which act as the guard rails on the level above the platform. It is designed to ensure that the operator does not stand on an unguarded platform, but installs the components to a particular level while positioned within the trap door of that same level.

### Stability

Make sure the tower is resting on firm, level ground with the locked castors or base plates properly supported. Never use bricks or building blocks to take the weight of any part of the tower.

Always check the safe working height by referring to the instruction manual. Towers should never be erected to heights above those recommended by the manufacturer.

Always install stabilizers or outriggers when advised to do so in the instruction manual.

Remember, the stability of any tower is easily affected. Unless the tower has been specifically designed for such use, activities such as those listed below should never be carried out:

- Sheeting or exposure to strong winds;
- Loading with heavy equipment; and
- Using the tower to hoist materials or support rubbish chutes.

### Using the tower

There must be a safe way to get to and from the work platform. This must be on the inside of the tower by an appropriately designed built-in ladder. It is not safe to climb up the rungs on the end frames unless the rungs have been specifically designed for the purpose of getting to and from the working platform – these have rung spacing's of between 230 and 300 mm and an anti-slip surface. If you are in doubt, consult the instruction manual.

Falls must be prevented where there is a risk that a fall could result in personal injury. The working platform must be provided with suitable edge protection and toe boards. Guard rails should be at least 950 mm high and an intermediate guard rail should be provided so the unprotected gap does not exceed 470 mm.

### Never use a tower:

- As a support for ladders, trestles or other access equipment;
- In weather conditions which are likely to make it unstable;
- With broken or missing parts;
- With incompatible components.

### Moving the tower:

When moving a tower:

- Reduce the height to a maximum of 4 m;
- Check that there are no power lines or other obstructions overhead;
- Check that the ground is firm, level and free from potholes;
- Push or pull using manual effort from the base only – never use powered vehicles;
- Never move it while there are people or materials on the tower;
- Never move it in windy conditions.

### Inspection and reports

To prevent the use of incorrectly erected or damaged mobile access towers, they must be inspected by a competent person. This is someone with the experience, knowledge and appropriate qualifications to enable them to identify any risks that are present and decide upon the measures required to control the risks. The requirement for inspection is different for small towers under 2 m, and for towers of 2 m and above.

If the working platform is less than 2 m in height, the tower must be inspected:

- After assembly in any position;
- After any event liable to have affected its stability; and
- At suitable intervals depending on frequency and conditions of use.

If the working platform is 2 m or more in height, it must be inspected:

- After assembly in any position;
- After any event liable to have affected its stability; and
- At intervals not exceeding seven days.

A new inspection and report is not required every time a mobile access tower is moved to a new location on the same site. However, if guard rails or other components have to be removed to enable the tower to be moved past an obstruction, then a pre-use check should be undertaken by a trained and competent user to make sure the tower has been reinstated correctly.

Stop work if the inspection shows it is not safe to continue, and put right any faults.

The result of an inspection should be recorded and kept until the next inspection is recorded. The use of a visible tag system (which can be updated each time a check is carried out) to supplement inspection records is acceptable.

- Erect barriers at ground level to prevent people from walking into the tower or work area;
- Minimize the storage of materials and equipment on the working platform;
- **Remove or board over access ladders to prevent unauthorized access if it is to remain in position unattended.**

### Dismantling a tower

To dismantle a tower using the advance guard rail method, the operator starts from the top and reinstates the advance guard rail unit before removing the permanent guard rails and toe boards and descending to the lower level. The advance guard rail units are then relocated to the level below and the process is repeated, with collective fall prevention measures being maintained throughout.

To dismantle a tower using the 3T method, after removing the toe boards, the operator disengages the guard rail hooks furthest from the trap. Guard rail components are then removed with the operator positioned through the trap before descending to the lower level, from where the upper platform and end frames are removed.

## Statutory responsibilities

Responsibilities include:

- preventing the false work collapsing under load;
- ensuring that those constructing and dismantling it can carry out their work safely, with particular regard to preventing falls from height; and
- Minimizing risks to the health and safety of others who may be working on, or passing by, the construction activity. Risks could arise, for example, from falling materials, wind-blown plywood or scaffold boards, noise and dust.

The law requires false work to be erected and dismantled only under the supervision of a competent person (regulation 9(3) of the Construction (Health, Safety and Welfare) Regulations 1996). As early as possible, a person should be appointed for each site as a false work co-coordinator, with responsibility for coordinating the various items and stages of use of the false work.

- The false work coordinator is commonly known as the **temporary works coordinator**.
- On a large contract, the appointed coordinator might be a suitably qualified engineer, whereas on a small building contract the role might be taken on by the site agent or foreman appointed by the contractor.
- Whoever it is, the appointed coordinator is responsible for ensuring that correct false work procedures are followed and that operations are carried out safely.

## Planning

All concerned should contribute towards the preparation of a design brief, which should serve as the starting point for subsequent decisions, design work, calculations and drawings. Initial planning should cover:

- What needs to be supported, and how it should be done; and
- How long the false work will be in use.

## Design

All false work should be designed. This will vary from the use of simple standard solution tables and graphs, to site-specific design and supporting drawings. Designs should be checked. The designer of the temporary works and the person interpreting the standard solutions are commonly known as **temporary works designers**.

The term designer has a broad meaning and includes:

- Anyone who specifies or alters a design, or who specifies the use of a particular method of work;
- Contractors carrying out design work as part of their contribution to a project; and

- Temporary works engineers, including those designing formwork, false work, scaffolding and sheet piling. Designers have duties under the Construction (Design and Management) Regulations 1994 (**CDM**) and must:
- Identify the hazards;
- Eliminate the hazards, if feasible;
- Reduce the risk by design; and
- Provide the information necessary to identify and manage the remaining risks. Standard solutions for scaffolding, false work etc. that comply with recognized codes of practice are often used. Such solutions, when used with the recommended procedures, will normally meet the risk control requirements of **CDM**. However, where such solutions are adapted, consideration needs to be given to whether the risk is still effectively controlled. Particular consideration should be given to the following:
- Stability requirements, lateral restraint and wind uplift on untied decking components;
- designing false work that can be erected, inspected and dismantled safely including how striking will be achieved (it may be craned into position in one piece but could have to be removed piecemeal);
- selecting adequate foundations or providing information to ensure adequate foundations are used; and
- Providing the information that the **temporary works coordinator** will need to manage the interface between the false work and the permanent structure safely.

## Materials

False work should be constructed, or adapted, so as to be suitable for the purpose for which it is used:

- It should be strong enough and stable in use;
- Damaged components should not be used; and
- Different proprietary components should not be mixed, unless expressly approved by the designer.

## Erecting the false work

Before erection begins a risk assessment should be carried out and a safe system of work developed. A method statement which includes how all the hazards are to be managed should be prepared. This should be read and understood by those doing the work.

To ensure safety, false work should be stable at all stages of erection and be regularly checked. Only 'Working Drawings' and not 'Preliminary Drawings' should be used. Erectors should know:

- Where to start;
- Whether the equipment supplied is the same as that ordered;
- At what stage checks or permits are required; and
- Whether checks and permits have already been carried out or issued.

### Loading

Once complete, all false work should be inspected and certified as ready for use (a written permit-to-load procedure is strongly recommended). The frequency of subsequent inspections will depend on the nature of the temporary works. They should be carried out frequently enough to enable any faults to be rectified promptly.

### Striking and dismantling

The temporary works coordinator should agree the time of striking for each section of the false work (a written permit-to-strike procedure is strongly recommended.)

During dismantling, ensure that workers can work safely and cannot be injured by falling objects. A sequence for dismantling should be agreed and detailed.

### Training

Temporary works coordinators, and those erecting and dismantling false work, should be competent and trained in the safety of false work.

## 26. WORKING AT HEIGHTS (REFERENCE AD EHSMS COP 23.0)

**The Work at Height Regulations 2005** set out a hierarchy which should be followed when planning any work at height. The hierarchy should be followed systematically and only when one level is not reasonably practicable may the next level down be considered

Those planning work at height must:

- **Avoid work at height where they can** , e.g.:
- Consider carefully whether cleaning a roof for no other reason than appearances is actually necessary;
- Use a mobile elevating work platform (**MEWP**), telescopic pole with camera attachment or binoculars from a safe position on an adjacent building to carry out an inspection;
- **Use work equipment or other measures to prevent falls where work at height cannot be avoided**, e.g.:
- By using an existing (950 mm minimum Height) parapet wall;
- Erecting edge protection; -using a MEWP to carry out the work; or -using a work-restraint system;



- **Where they cannot eliminate the work at height risk of a fall, use work equipment or other measures to minimise the distance and consequences of a fall should one occur,** e.g.:
  - By using nets, air or bean bags or a fall-arrest harness system.

Those in control of the work must also:

- Always consider measures that protect all those at risk, i.e. **collective protection systems** such as scaffolds, nets, soft landing systems, before measures that only protect the individual, i.e. **personal protection measures** such as harnesses;
- Always consider **passive** systems such as nets (where the individual does not have to do anything to activate the system) before active systems such as harnesses (where the worker has to clip on); and
- Make sure work is carried out only when weather conditions do not endanger the health and safety of workers.

## 27. PRECAUTIONS FOR ALL ROOF WORK OR AT A HEIGHT

### Risk assessment and method statements

You should carry out a risk assessment for all roof work. Simple jobs may not require a great deal. More complex jobs need to be assessed in much more depth. But all roof work is dangerous and it is essential that you identify the risks before the work starts and that the necessary equipment, appropriate precautions and systems of work are provided and implemented.

Except for the simplest jobs where the necessary precautions are straightforward and can be easily repeated (e.g. use a proper roofing ladder to replace a ridge tile), you should prepare safety method statements. They should be specific and relevant to the job in hand and clearly describe the precautions and system of work identified during risk assessment. Diagrams or pictures can often say more and be clearer than text. Everyone involved in the work needs to know what the method statement says and what they have to do. This might need someone to explain the statement for more complicated jobs. There will usually need to be some supervision during the work to check that the correct procedures are followed.

Except for the simplest jobs where the necessary precautions are straightforward and can be easily repeated (e.g. use a proper roofing ladder to replace a ridge tile), you should prepare safety method statements. They should be specific and relevant to the job in hand and clearly describe the precautions and system of work identified during risk assessment. Diagrams or pictures can often say more and be clearer than text. Everyone involved in the work needs to know what the method statement says and what they have to do. This might need someone to explain the statement for more complicated jobs. There will usually need to be some supervision during the work to check that the correct procedures are followed.



## Getting on and off the roof

Getting on and off the roof is a major risk. A secure means of entry and exit is essential. A general access scaffold or tower scaffold (preferably of the stairway design) will provide suitable access. A properly secured ladder is the minimum requirement.

## Edge protection

Wherever anyone could fall, the first line of defence is to provide adequate edge protection to **prevent** a fall occurring. This should include or be equivalent to:

- A main guard rail at least 950 mm above the edge;
- A toe board and brick guard where there is risk of objects being kicked off the edge of the platform; and
- A suitable number of intermediate guard rails or suitable alternatives positioned so that there is no gap more than 470 mm.

Sometimes a roof parapet may provide equivalent protection but if it does not, extra protection will be required.

## Work platforms

As well as edge protection, it is just as important to provide an adequate and secure working platform from which to carry out the work. In many cases the roof itself will provide this. If it does not (e.g. when working on a chimney on a pitched roof), a platform should be provided. If appropriate, a **MEWP** may be suitable for some work where it can be carried out from inside the basket.

## Fall mitigation

**Minimise** Providing adequate platforms and edge protection may not always be possible or reasonably practicable. If so, safety nets or soft landing systems, such as bean bags or inflatable air bags, can the consequences of any fall. If nets are used make sure that they are properly installed by competent riggers as close under the work surface as possible. Personal fall arrest systems such as harnesses, which only protect the individual (unlike collective systems such as nets which protect more than one individual), should be seen as lower down the hierarchy as they do not prevent the fall, only minimise the consequences and protect the individual worker. In addition, these systems require a sufficiently strong anchorage point, user discipline and active monitoring by management.

## Falling material

Keep a tidy site: stop material which could fall from accumulating.

Never throw anything from a roof or scaffold. Use enclosed rubbish chutes or lower material to the ground in containers.

Prevent access to danger areas underneath or adjacent to roof work. Where this cannot be guaranteed, consider using debris netting, fans, covered walkways or similar safeguards to stop falling material causing injury.

## Training

Roof workers need the appropriate knowledge, skills, training and experience to work safely, or should be under the supervision of someone else who has it. They need to be able to recognize the risks, understand the appropriate systems of work and be competent in the skills to carry them out such as:

- Installing edge protection;
- Operating a **MEWP**;
- Manually handling materials;
- Erection of tower scaffolds; and
- Installing and wearing harness systems (including rescue procedures).

Workers need training and experience to achieve these competencies. It is not enough to hope that they will 'pick up safety on the job'.

## Weather conditions

The Work at Height Regulations 2005 specifically state that work should not be carried out if weather conditions could endanger the health and safety of workers. Do not work on roofs in icy, rainy or windy conditions. Anyone carrying a roof sheet can easily be blown off the roof if they are caught by a gust of wind.

Avoid excessive exposure to sunlight by wearing appropriate clothing and using sun creams. Too much exposure to sunlight can cause skin cancer.

## Short-duration work

Short-duration work means tasks that are measured in minutes rather than hours. It includes tasks such as inspection, replacing a few tiles or minor adjustment of a television aerial. It may not be reasonably practicable to provide full edge protection for short-duration work but you will need to provide something in its place. The minimum requirements for short-duration work on a roof are:

- A safe means of access to the roof level; and
- A safe means of working on the roof (e.g. on a sloping roof, a properly constructed roof ladder, or on a flat roof, a harness with a sufficiently short lanyard that it prevents the wearer from reaching a position from which they could fall and attached to a secure anchorage).

Mobile access equipment or proprietary access systems can provide a suitable working platform from which to carry out some work. They can avoid the need for scaffolding and can be particularly appropriate for short-duration minor work.

## Fragile roofs

A fragile material is one that does not safely support the weight of a person and any load they are carrying. The fragility of a roof does not depend solely on the composition of the material in it, the following factors are also important:

- Thickness of the material;
- The span between supports;
- Sheet profile;
- The type, number, position and quality of fixings;
- The design of the supporting structure, e.g. the purlins; and
- The age of the material.

Remember that even those roofs that were deemed to be 'non-fragile' when they were installed will eventually deteriorate and become fragile over time.

Sometimes the entire roof surface is fragile, such as many fiber cement roofs. Sometimes part of the roof is fragile, e.g. when fragile roof lights are contained in an otherwise non-fragile roof. Sometimes a roof is temporarily fragile, such as during 'built up' roof construction when only the liner is installed or sheets have not been secured. Sometimes the fragility of a roof may be disguised, e.g. when old roofs have been painted over. This guidance applies to all these situations.

The fragility, or otherwise, of a roof should be confirmed by a competent person before work starts. If there is any doubt, the roof should be treated as fragile unless, or until, confirmed that it is not. It is dangerous to assume that a roof is non-fragile without checking this out beforehand.

## Prevent unauthorized access

Make sure that unauthorized access to the roof is prevented, e.g. by implementing a permit-to-work regime or blocking off roof access ladders. Make sure that appropriate warning signs are displayed on existing roofs, particularly at roof access points.

## Working on fragile materials

Work on fragile materials must be carefully planned to prevent falls through the roof:

- All work should be carried out from beneath where this is practicable;
- Where this is not possible, consider using a **MEWP** that allows operatives to carry out the work from within the **MEWP** basket without standing on the roof itself;
- If access onto the fragile roof cannot be avoided, edge protection should be installed around the perimeter of the roof and staging should be used to spread the load. Unless all the access and work is on staging and platforms that are fitted with guard rails, safety nets should be installed under the roof or a harness system should be used.

Where harnesses are used, they require adequate anchorage points. They also rely on user discipline, training and supervision to make sure that they are used consistently and correctly.

Support platforms should be of sufficient dimensions to allow the worker to move safely and use any equipment or materials safely.

- Make sure that support platforms are long enough to provide adequate support across roof members. They should span across at least two purlins. Using a platform may spread the load, but it will not provide enough support if the only thing supporting it is the fragile material.

**Never** try to walk along the line of the roof bolts above the purlins or along the ridge, as the sheets can still crack and give way; they are not designed to support your weight.

Workers should not have to constantly move platforms about the roof. It is not acceptable to rely on using a pair of boards to 'leap-frog' across a fragile roof. Make sure there are enough platforms provided to avoid this.

Precautions are needed to prevent a person falling from the platform. Provide the platform with edge protection comprising top rail, intermediate rail (or equivalent protection) and toe board.

### Working near fragile material

Protection is needed when anyone passes by or works near to fragile materials, eg:

- During access along valley gutters in a fragile roof;
- When fragile roof lights or smoke vents are contained in an otherwise non-fragile roof; or
- During access to working areas on a fragile roof.

Wherever possible make sure that all fragile materials 2 m or closer to the people at risk are securely covered and a warning notice displayed. Alternatively, provide continuous physical barriers with warning notices around or along the fragile material to prevent access to it. (Make sure that appropriate precautions are taken when installing such protection, e.g. the use of netting, birdcage scaffold or a harness system.)

Sometimes it will not be reasonably practicable to provide such protection, usually if the proximity to fragile material is irregular and short duration, i.e. a matter of minutes. Safety harnesses will usually be the appropriate solution and may be used in conjunction with any permanently installed running line systems.

Boundaries can be established identifying 'safe' areas containing the workplace and routes to and from it. If these are used:

- The boundary should be at least 2 m from the nearest fragile material;
- The boundary does not need to comply with full edge protection standards, but there should be a continuous physical barrier (a painted line or bunting is not acceptable); and
- Tight discipline is essential to make sure everyone stays inside the safe area at all times.

## Working on sloping roofs

On traditional pitched roofs most people fall:

- From eaves;
- By slipping down the roof and then over the eaves;
- Through the roof internally, e.g. during roof truss erection; or
- From gable ends.

## Roof ladders

On sloping roofs, roof workers should not work directly on slates or tiles, as they do not provide a safe footing, particularly when they are wet. Use roof ladders and proprietary staging to enable safe passage across a roof. They must be designed for the purpose, of good construction, properly supported, and, if used on a sloping roof, securely fixed by means of a ridge hook placed over the ridge, bearing on the opposite roof. They should be used in addition to eaves-level edge protection. Gutters should not be used to support any ladder.

## Industrial roofing

Building and working on steel-framed wide-span industrial roofs involves a number of hazards, such as falls:

- From the roof edge;
- Through gaps in the partially completed roof;
- Through fragile liner panels or roof lights;
- From the leading edge when unprotected gaps are inevitable; and
- From the frame, e.g. when loading out with roof sheets.

These hazards can all arise not only at the working position but also the routes to and from it.

Properly erected safety nets are the preferred solution, in conjunction with edge protection around the perimeter of the roof. When using nets, additional leading edge protection (this is not edge protection on the perimeter of the building) will not normally be required.

## Systems of work

Good planning and consideration of the hierarchy for work at height can significantly reduce the risks involved in industrial roofing. Consider reducing the need for operatives to move around the roof unnecessarily by:

- Arranging for the right sheets to be delivered as they are needed, to the right place at the right time;
- Splitting packs of roof sheets to produce mixed packs in the correct sequence for fixing;
- Arranging access points that are convenient for the working position; and
- Making full use of loading bays.

### Falls from the roof edge

Full edge protection (top rail, toe board and intermediate protection) is required whenever the work requires access within 2 m of the roof perimeter. Edge protection is usually provided by an independent scaffold around the perimeter of the building or by barriers connected to the frame. An independent scaffold gives a higher standard of protection and a good standard of access along the structure. It also assists material loading and storage, e.g. when used with a fork lift/ tele handler.

Where work is carried out 2 m back from the roof edge and no edge protection is in place, you should mark out the working area and routes to it with continuous physical barriers. Tight supervision will be necessary.

Netting capable of providing edge protection in certain circumstances is now available.

On some larger roofs, the consequences of sliding down the whole roof and hitting edge protection at the eaves may be such that intermediate platforms are needed at the work site to prevent this happening.

If the work requires access within 2 m of gable ends, edge protection will be needed there as well as at the eaves. Alternatively, consider using **MEWP** or proprietary access systems, which are easy to transport from site to site, quick to erect and provide good access, as an alternative to fixed edge protection where appropriate for the work you are planning

### Falls through gaps

If the work involves any likelihood of access within 2 m of any gaps they should be covered with a material which is fixed in position and sturdy enough to take the weight of a person. If this is not possible, provide edge protection around the gap or as a last resort install safety netting beneath the gap.

### Falls through liner panels

Liner panels on their own should be considered as fragile unless it has been conclusively confirmed that they are not.

All profiled sheeting should be specified to be non-fragile when fully fixed. Contractors need to be aware that unfixed or partially fixed materials cause the roof assembly to be deemed fragile. Carefully developed systems of work, including leading edge protection and being fully netted out underneath, must therefore remain in place.

### Falls from the leading edge

Whatever system of work you choose, the presence of dangerous gaps is always a possibility as space is created to place the next leading edge sheet.

You must take precautions to prevent falls from these 'leading' edges. Nets and birdcage scaffolds are the preferred options in this instance. However, where these are not reasonably practicable you can consider using work restraint safety harnesses with running line systems or temporary barriers at the leading edge, e.g. trolley systems.

Safety netting is the preferred method of fall protection as it provides collective protection and does not rely on individual user discipline to guarantee acceptable safety standards. Using nets can simplify systems of work and protect both roof workers and others, such as supervisors.

If safety nets are used make sure that they:

- Are installed as close as possible beneath the roof surface;
- Are securely attached and will withstand a person falling onto them; and
- Are installed and maintained by competent personnel.

Trolley systems can be a useful aid, but for many reasons are often not practicable or appropriate for all roofs, e.g. where there are hips or dormers. Remember that installing and moving such systems can involve significant risks.

If trolley systems are used, the system of work needs to be carefully thought out to avoid unnecessary risks, e.g. can roof workers lock the trolley in position after it has been moved forward without stepping over the newly created gap?

Make sure that other measures to minimize falls are also used to protect against potential falls through the gaps created as the leading edge moves forward.

If harnesses and running line systems are used make sure that they:

- Are securely attached to an adequate anchorage point (trolley guard rails are not usually strong enough);
- Are appropriate for the user and in good condition;
- Are actually and properly used – ensuring this requires tight discipline; and
- The running line and harness are compatible.

### Falling materials

Try to avoid leaving materials on the roof when the site is closed, especially at weekends and during holiday periods. If materials are left on the roof make sure that they are secured so that they cannot be blown off the roof by windy weather.

Make sure that toe boards are in place around the roof perimeter.

Control other trades' access to areas underneath roofing work, unless protection such as debris netting is provided which **ensures** protection for anyone working underneath.

### Working on flat roofs

Work on a flat roof is high risk. People can fall:

- From the edge of a completed roof;
- From the edge where work is being carried out; or
- Through openings or gaps.



## Edge protection

Unless the roof parapet provides equivalent safety, temporary edge protection will be required during most work on flat roofs. Both the roof edge and any openings in it need to be protected. It will often be more appropriate to securely cover openings rather than put edge protection around them. Any protection should be:

- In place from start to finish of the work; and
- Strong enough to withstand people and materials falling against it.

Where possible the edge protection should be supported at ground level, e.g. by scaffold standards, so that there is no obstruction on the roof. If the building is too high for this, the roof edge up stand can support the edge protection provided it is strong enough. Edge protection can also be supported by frames, counterweights or scaffolding on the roof. The protection should be in place at all times. Guarding systems are widely available that enable roof repair work to carry on without removing any guard rails.

## Demarcating safe areas

Full edge protection may not be necessary if limited work on a larger roof involves nobody going any closer than 2 m to an open edge. In such cases demarcated areas can be set up, outside which nobody goes during the work or access to it. Demarcated areas should be:

- Limited to areas from which nobody can fall;
- Indicated by a continuous physical barrier (full edge protection is not necessary but a painted line or bunting is not sufficient); and
- Subject to tight supervision to make sure that nobody strays outside them (demarcation areas are unacceptable if this standard is not achieved).

## Short-duration work on flat roofs

'Short duration' means a matter of minutes rather than hours. It includes such jobs as brief inspections or minor adjustment to a television aerial. **Work on a flat roof is still dangerous even if it only lasts a short time. Appropriate safety measures are essential.**

It may not be reasonably practicable to provide edge protection during short-duration work. The minimum requirements for short-duration work on a roof are:

- A safe means of access to the roof level; and
- A safe means of working on the roof – a harness with a sufficiently short lanyard that it prevents the wearer from reaching a position from which they could fall and attached to a secure anchorage. Where safety harnesses are used they must be:
  - Appropriate for the user and in good condition;
  - Securely attached to an anchorage point of sufficient strength; and

Actually used – tight management discipline is needed to ensure this.



## 27. PREVENTION TOWARDS SLIPS, TRIPS & FALLS

- Keep storage areas tidy.
- Plan deliveries to minimize the amount of materials on site.
- Ensure footpaths are safe to use: levelled if rutted, stoned if muddy, gritted when icy.
- Make sure that all corridors, stairways, footpaths or other areas used by pedestrians are kept clear of obstructions at all times.
- Tie up loose cables, particularly along corridors.
- Make sure that steps into site cabins are properly constructed.
- Make sure work areas are kept as tidy as possible while the work's going on.
- Put barriers around, or covers over, all holes and excavations into which people could fall.
- Have a system in place to manage the waste created on the site.
- And most importantly, make sure that everyone knows what they have to do.

**Everyone has a role to play in keeping the site in good order.**

## 28. PLANT/ EQUIPMENT (REFERENCE AD EHSMS COP 36.0)

All Plant equipment will require without exceptions the below documentations prior to entry to the site.

- All activity related to plant/equipment shall be carried out in accordance with **(ADEHSMS) OSHAD-SF Code of practice 36.0. For Plant/Equipments.**
- Appropriate statutory inspection reports and/or certificates
- Evidence of proper and adequate maintenance (if requested)
- Evidence that Operators where appropriate, banks men are trained and competent.

### 28.1. Lifting Operations

Lifting machines shall be operated considering the requirements of Lifting cranes Arrangement and Operation Rules.

Representatives of the Contractor or sub- contractor are responsible for maintenance of construction machines in the operating condition are obliged to provide the conduction of their maintenance service and repair in accordance with requirements of the manufacturing plant operating documents. At construction and assembling operations using machinery the General Contractor is obliged to appoint engineering manpower (from the General contractor staff), responsible for safe operation of these works.

Before the contractor or sub- contractor carries out any lifting operation, it shall provide the following information to the client:

- Appropriate statutory inspection reports and/ or certificates.
- Machinists or lifting appliances and appointed workers must be trained and competent.
- Safety method statement/ risk assessments provides detailed information on the lifting operation to be carried out, the equipment to be used and the name of the appointed craning coordinator.

- The contractor shall ensure before carrying out any lifting operation with a crane or lifting appliance:
- The ground or place where the crane or lifting appliance is standing is suitable and will withstand the loads imposed on it.
- No part of the crane or lifting appliance is likely to encroach dangerously close to personnel, plant or services and that the necessary warnings and/ or protective barriers are erected.
- Checking the regular attendance of employees responsible for proper implementation of checking lifting devices, loose hauling devices, packing and maintenance.
- To ensure safe performance of works by lifting cranes there should be a complete set of drawings of construction and installation. As well as a check list for items on stock, loading and unloading of rolling stock reordered by the employee responsible for the safe work performance.

## 28.2. Work Equipment

Work equipment' is almost any equipment used by a worker while at work including:

- Machines such as circular saws, drilling machines, photocopiers, mowing machines, tractors, dumper trucks and power presses;
- Hand tools such as screwdrivers, knives, hand saws;
- Lifting equipment such as lift trucks, elevating work platforms, vehicle hoists, lifting slings and bath lifts;
- Other equipment such as ladders and water pressure cleaners.

Employers and those who have control over work equipment (e.g. those hiring out work equipment) have responsibilities for equipment provided for use at work it is your duty to make inspections of the equipment being used to ensure it is in sound condition and safe to use prior to commencing with any works.

Things that may or can cause risks for example:

- Using the wrong equipment for the job, e.g. ladders instead of access towers for an extended job at high level;
- Not fitting adequate guards on machines, leading to accidents caused by entanglement, shearing, crushing, trapping or cutting;
- Not fitting adequate controls, or the wrong type of controls, so that equipment cannot be turned off quickly and safely, or starts accidentally;
- Not properly maintaining guards, safety devices, controls etc. so that machines or equipment become unsafe;
- Not providing the right information, instruction and training for those using the equipment;
- Not fitting roll-over protective structures (ROPS) and using seat belts on mobile work equipment where there is a risk of roll over (Note: this does not apply to quad bikes);
- Not maintaining work equipment or carrying out regular inspections and thorough examinations;
- Not providing the personal protective equipment needed to use certain machines safely, e.g. chainsaws, angle grinders.

Make sure the equipment is safe to use:

You are responsible to check the machinery is suitable for the work – think about how and where it will be used. All new machinery should be:

- Safe, that means provided complete with all necessary guards and protective devices;
- CE marked (CE marking is not a guarantee that the machinery is safe, only the manufacturer's claim that the product meets all relevant supply Directive requirements);
- Provided with instructions in English and local languages. These should state how to assemble, install, use, adjust and maintain the machinery, including dealing with blockages. The instructions should also give details on the protective measures to take, such as when personal protective equipment should be provided and used; warn of ways in which machinery must not be used; and of any remaining residual risks that need to be controlled by safe systems of work.

If you think that machinery you have bought is not safe DO NOT USE IT. And report this to your line manager and the appointed health & safety officer.

Guard dangerous parts of the machinery:

Controlling the risk often means guarding the parts of machines and equipment that could cause injury. Remember:

- Use fixed guards wherever possible, properly fastened in place with screws or nuts and bolts which need tools to remove them;
- If employees need regular access to parts of the machine and a fixed guard is not possible, use an interlocked guard for those parts. This will ensure that the machine cannot start before the guard is closed and will stop if the guard is opened while the machine is operating;
- In some cases, e.g. on guillotines, devices such as photoelectric systems or automatic guards may be used instead of fixed or interlocked guards;
- Check that guards are convenient to use and not easy to defeat, otherwise they may need modifying;
- Think about the best materials for guards – plastic may be easy to see through, but can be easily scratched or damaged. If wire mesh or similar materials are used, make sure the holes are not large enough to allow access to the danger area. As well as preventing such access, a guard may also be used to prevent harmful fluids, dust etc. from escaping;
- Make sure the guards allow the machine to be cleaned and maintained safely;
- Where guards cannot give full protection, use jigs, holders, push sticks etc. to move the work piece.

### 28.3. Mobile Work Equipment (REFERENCE AD EHSMS COP 34.0)

This is equipment that carries out work while travelling or that travels from one work area to another, for example tractors, trailers, ploughs and fork-lift trucks. Anyone riding on mobile work equipment needs protection from:

- Falling out of the equipment. Fit cab guard rails, barriers (side, front or rear) or seat restraints;
- The equipment becoming unstable. Fit wider wheels or counterbalance weights to prevent the equipment rolling over. Fit roll-over protective structures (ROPS) and seat restraints;
- Falling objects. Fit falling object protective structures (FOPS). Provide a strong cab or protective cage.

Do not carry people on work equipment unless it is designed for that purpose, except under exceptional circumstances, e.g. trailers used to carry farm workers at harvest time. Under these circumstances the mobile work equipment must have features to prevent people falling from it, such as trailers with sides and/or secure handholds.

### 28.4. Fork- Lift Trucks (REFERENCE AD EHSMS COP 51.0)

Prevention checks:

- Always use the correct fork-lift truck for the task;
- Ensure the braking system is adequate;
- Ensure operators, supervisors and managers are adequately trained;
- Lay out the site to ensure the fork-lift truck can move safely without danger to pedestrians. Ensure adequate lighting is provided;
- Remove any obstructions where possible or ensure they are clearly marked;
- Fit and use seat restraints;
- Fit visibility aids such as mirrors/CCTV, where appropriate.

While operating a fork-lift:

- Do not overreach or overbalance;
- Avoid travelling on uneven or steeply sloping ground;
- Do not travel too fast, in particular around corners;
- Do not overload;
- Lower the load before operating the truck;
- Ensure adequate visibility to avoid collisions with pedestrians and objects;
- Protect obstacles such as support columns, pipework or other plant with impact barriers;
- Ensure each operator has site-specific instructions;
- Ensure that it is inspected and serviced at appropriate intervals and thoroughly examined by a competent person at least every 12 months or at intervals set by the competent person.

## 28.5. Equipment Maintenance

To control the risk regular maintenance and preventive checks are required, and inspections where there is a significant risk. Some types of equipment are also required by law to be thoroughly examined by a competent person.

Inspections should be carried out by a competent person at regular intervals to make sure the equipment is safe to operate. The intervals between inspections will depend on the type of equipment, how often it is used and environmental conditions. Inspections should always be carried out before the equipment is used for the first time or after major repairs. Keep a record of inspections made as this can provide useful information for maintenance workers planning maintenance activities and can help make sure that any defects identified get actioned:

- Make sure the guards and other safety devices (e.g. photoelectric systems) are routinely checked and kept in working order. They should also be checked after any repairs or modifications by a competent person;
- Check what the manufacturer's instructions say about maintenance to ensure it is carried out where necessary and to the correct standard;
- Routine daily and weekly checks may be necessary, e.g. fluid levels, pressures, brake function, guards. When you enter a contract to hire equipment, particularly a long-term one, you will need to discuss what routine maintenance and inspection is needed and who will carry it out;
- Some equipment, e.g. a crane, needs preventive maintenance (servicing) so that it does not become unsafe;
- Lifting equipment, pressure systems, local extraction ventilation systems and power presses should be thoroughly examined by a competent person at regular intervals specified in law or according to an examination scheme drawn up by a competent person.
- Where possible, carry out maintenance with the power to the equipment off and ideally disconnected or with the fuses or keys removed, particularly where access to dangerous parts will be needed. If possible break all phases and lock off equipment using lockable isolators and a padlock. If more than one person is involved use a multi-hasp lock off system. Check the equipment won't restart before working on it;
- Isolate equipment and pipelines containing pressurised fluid, gas, steam or hazardous material. Isolating valves should be locked off and the system depressurised where possible, particularly if access to dangerous parts will be needed;
- Support parts of equipment which could fall;
- Allow moving equipment to stop;
- Allow components which operate at high temperatures time to cool;
- Switch off the engine of mobile equipment, put the gearbox in neutral, apply the brake and, where necessary, chock the wheels;
- To prevent fire and explosions, thoroughly clean vessels that have contained flammable solids, liquids, gases or dusts and check them before hot work is carried out. Even small amounts of flammable material can give off enough vapors to create an explosive air mixture which could be ignited by a hand lamp or cutting/welding torch;
- Where maintenance work has to be carried out at height, ensure that a safe and secure means of access is provided that is suitable for the nature, duration and frequency of the task.

## 28.6. Instruction and Training of Employees in the use of Equipment's (REFERENCE AD EHSMS COP)

Ensure employees have the knowledge they need to use and maintain equipment safely.

- Give them the information they need, e.g. manufacturer's instructions, operating manuals, training courses and check they understand them;
- Instruct them on how to avoid risks, e.g. check that the drive is not engaged before starting the engine/machine and do not use on sloping ground;
- An inexperienced employee may need some instructions on how to use hand tools safely;
- As well as instruction, appropriate training will often be necessary, particularly if control of the risk depends on how an employee uses the work equipment;
- Only competent workers should operate work equipment;
- Never assume an employee can use work equipment safely, especially if they have just started work, even if they have used similar equipment elsewhere.

Training may be needed for existing staff as well as inexperienced staff or new starters (do not forget temporary staff), particularly if they have to use powered machinery. The greater the danger, the better the training needs to be. For some high-risk work such as driving fork-lift trucks, using a chainsaw, and operating a crane, training is usually carried out by specialist instructors.

## 29. EXCAVATIONS (REFERENCE AD EHSMS COP 29.0)

The law requires that you must prevent danger to workers in or near excavations. To maintain the required precautions, a competent person must inspect excavation supports or battering at the start of the working shift and at other specified times. No work should take place until the excavation is safe.

Commercial clients must provide certain information to contractors before work begins. This should include relevant information on:

- Ground conditions
- Underground structures or water courses; and
- The location of existing services.
- This information should be used to during the planning and preparation for excavation work.

### Managers/ Health & Safety

- Ensure that excavations are made safe, by trench supports, battering back, fencing or other equally effective measures
- Be aware that there is no safe minimum depth of excavation
- Provide training for your staff which highlights the risks
- Ensure that adequate inspections, at least weekly, and after bad weather, are carried out on all excavations
- Provide competent supervision
- Ensure that plant does not work too close to the edge of an excavation

## Contractors/ Employees

- Never go into an unsupported trench where there is a risk of collapse
- Never work outside the protection of trench boxes or trench supports
- Keep plant a safe distance from the excavation edge
- Never work underneath an excavator
- Be alert to risks from underground services or undermining adjacent structures

## Risks

- Excavations collapsing and burying or injuring people working in them;
- Material falling from the sides into any excavation; and
- People or plant falling into excavations.
- No ground can be relied upon to stand unsupported in all circumstances.
- Depending on conditions, a cubic metre of soil can weigh in excess of 1.5 tons.

Trenchless techniques should always be considered at the design stage as they replace the need for major excavations.

## Collapse of Excavations

**Temporary support** – Before digging any trench pit, tunnel, or other excavations, decide what temporary support will be required and plan the precautions to be taken.

Make sure the equipment and precautions needed (trench sheets, props, baulks etc.) are available on site before work starts.

Battering the excavation sides – Battering the excavation sides to a safe angle of repose may also make the excavation safer.

In granular soils, the angle of slope should be less than the natural angle of repose of the material being excavated. In wet ground a considerably flatter slope will be required.

## Falling or Dislodging Material

Loose materials – may fall from spoil heaps into the excavation. Edge protection should include toe-boards or other means, such as projecting trench sheets or box sides to protect against falling materials. Head protection should be worn.

Undermining other structures – Check that excavations do not undermine scaffold footings, buried services or the foundations of nearby buildings or walls. Decide if extra support for the structure is **needed before you start. Surveys of the foundations and the advice of a structural engineer may be required.**

Effect of plant and vehicles – Do not park plant and vehicles close to the sides of excavations. The extra loadings can make the sides of excavations more likely to collapse.



### Falling into Excavations

Prevent people from falling – Edges of excavations should be protected with substantial barriers where people are liable to fall into them.

To achieve this, use:

Guard rails and toe boards inserted into the ground immediately next to the supported excavation side; or

- Fabricated guard rail assemblies that connect to the sides of the trench box
- The support system itself, e.g. using trench box extensions or trench sheets longer than the trench depth.

### Inspection

- A competent person who fully understands the dangers and necessary precautions should inspect the excavation at the start of each shift. Excavations should also be inspected after any event that may have affected their strength or stability, or after a fall of rock or earth. A record of the inspections will be required and any faults that are found should be corrected immediately.

## 30. SIGNS MEANINGS & COLOURS

### **RED**

PROHIBITIVE  
(MUST NOT DO)

Example:

- NO SMOKING
- NO UNAUTHORISED ENTRY
- DO NOT TOUCH
- NO VEHICLES

### **BLUE**

MANDATORY  
(MUST DO)

Example:

- WEAR HEAD PROTECTION
- WEAR EYE & FACE PROTECTION
- WEAR HEARING PROTECTION
- SOUND THE HORN



**YELLOW**

CAUTION  
(HAZARD WARNING)

Example:

- FRAGILE ROOF
- HIGH VOLTAGE
- ASBESTOS
- FORK LIFT TRUCKS IN OPERATION
- LOW HEAD ROOM
- ETC

**GREEN**

SAFE CONDITION  
(THE SAFE WAY)

Example:

- FIRST AID
- ESCAPE ROUTE
- ASSEMBLY POINT
- EMERGENCY PHONE
- ETC

Some signs may be a combination of two or more conditions for example  
DANGER LPG (**YELLOW**) NO SMOKING (**RED**).

## 31. PERMITS TO WORK

**The following is required for any welding, hot works and or allied processes**

Arrangements for Securing the Health and Safety of Workers

The Contractor/ Sub-contractor shall, in consultation with workers and their representatives:

- Appoint competent managers as persons authorised to raise permits.
- Ensure that persons receiving the permit have adequate information, instruction and appropriate training to enable them to conduct the task and any tests prescribed on the permit in a competent manner.
- Conduct a thorough risk assessment, plan the work to be carried out and prepare a written safe system of work outlining the hazards, the methods by which they can be avoided and details of any residual risks.
- Determine the need for permit systems; ascertain whether present permit systems apply or whether a new permit needs to be developed
- Determine equipment needs and make available the equipment necessary for test work e.g. gas testers.
- Audit permits use on site (and off site when necessary)
- Review permit operation periodically, modify permits as necessary and implement follow-up action if "failure" incidents occur.

### 31.1. SAFE SYSTEM OF WORK

The Company's Permit-to-Work system is designed to ensure that those affected are consulted at the planning stage to check that all eventualities have been considered when organising such activities and are an important means of minimizing any risks involved.

**The permit-to-work will involve following the steps shown below.**

- Conduct a thorough risk assessment and determine who is at risk, what control measures are necessary to eliminate the hazards and the level of residual risk.
- Prepare a written system of work identifying the following:-
- The level of competence of all operatives and any specialist skills.
- List Isolation / pre-work precautions.
- List prohibited activities (communicate to others as necessary).
- List Plant and Equipment required
- List Personnel Protective Equipment to be used
- List Sequence of events as planned with identified hazards / residual risks and controls clearly defined.

- Emergency procedures for all foreseeable risks (ensure that procedures are conveyed to competent persons and fully understood).

Brief those who will be required to operate under the permit-to-work on the hazards and controls necessary to avoid them being realized.

Ensure that those conducting the task know that the safe system must be followed in full and that no other methods or sequence of work are allowed i.e. work must stop, all persons withdrawn and the safe system reviewed by the Authorized Person.

If the safe system is found to be flawed then the Permit must be cancelled, the system of work reassessed, a new permit raised and those conducting the task re-briefed.

Display the permit at the work site / isolation point to all ensure that those who need to know do so.

Ensure that the work area is clean, tidy and that all safety devices have been replaced and are functioning correctly, prior to inspection by the Authorized person.

Please note the Authorized Person must not sign the 'hand back' section of the form until the area is in fact clean and safe.

### 31.2. RECORD KEEPING

In order to ensure successful auditing of the permit system, records of the following must be kept:

- Details of issued Permits.
- Training provided — subjects covered, names of those trained and the levels of training given
- Servicing and maintenance records relating to equipment used, e.g. gas and oxygen detecting instruments, respiratory protection, protective clothing and rescue/emergency items, etc.
- Incidents where permit procedures "failed" so that permits modifications can be considered.

## 32. DELIVERY OF MEDICAL EQUIPMENT

### STORAGE

The storage facility allocated for medical equipment shall be located as close to the project as possible and shall be large enough to accommodate large items i.e. (large access doors) secure and accessible 24 hours a day, One store key will be allocated to a member of the Vamed logistics team and he or she will be present for all deliveries and collections of equipment.

The storage facility shall be clean at all times all rubbish must be disposed of correctly to ensure the efficient running of the store. Also some of the medical equipment needs to be temperature controlled this must also be calculated when choosing a storage facility. The storage facility must be of sound condition to reduce the risk of the elements being able to enter i.e. (Rain, wind, heat and most important dust) these can all effect the functionality of the equipment.

All equipment delivered to the storage facility should be placed on a palette to raise it from the floor if not already delivered on one again to reduce the risk of damage to the item weather from human error or from the elements.

- After adverse weather the stores must be checked to ensure the equipment and the store is secure
- Where possible lots should be used for each item of equipment as follows:
- All equipment to be stored by supplier
- All equipment to be stored by department to be delivered
- Items must not be stored on top of each other where possible to reduce the risk of damage to the equipment and person/ persons.

(This makes it much easier to find items; equipment shall be stored so it is accessible where possible i.e. leaving a space between units this allows items to be removed more effectively without causing damage to other items as well as reducing the delivery time)

### DELIVERY

All deliveries must be handled with the up most care and attention to reduce the risk of damage to the equipment and person/ persons, things to consider for both too and from the storage facility and to the hospital as follows:

- Were possible the local agent should be present on delivery to the storage facility or transportation to the hospital.
- Route of delivery (shortest route were possible)
- Transport routes will be clearly marked if using trucks or forklifts a speed limit no greater than 10kmph applies at all times.
- Weight of the unit to be transported (this needs to be taken into account in case forklift is required and also some equipment may need special transport systems

- If the use of hospital lifts are required from one floor to the next (check the lift can accommodate the weight and size of the unit)
- Dimensions of the unit to be transported (are doorways, lifts and passage ways wide enough to accommodate?)
- Does the transportation route need protection to the flooring (metal sheets for heavy items to spread the load weight?)
- Weather conditions (if adverse weather and not able to delay delivery, items must be protected to stop the elements from entering the packaging.

### **Deliveries from customs or shipping supplier**

Some items we receive have to pass through customs and sometimes they open the package to check the items, if items have been checked ensure photographs are taken in case of any damages to the equipment and document this also on the receiving invoice.

If the packaging is damaged in any way this shall be recorded and the supplier notified (if not present) as well as re-sealing to protect the item.

## **TESTING OF ELECTRICAL EQUIPMENT**

Electrical testing may be carried out for a number of reasons, for example:

- Quality assurance tests on electrical components;
- Diagnostic testing;
- Fault-finding on electrical plant;
- Routine safety checks.

The guidance contains recommendations to help you prevent or reduce electrical danger. Some of the main ways in which this can be done include:

- Following safe systems of work, for example:
- Taking precautions to prevent people who are not doing the testing coming into contact with exposed live parts;
- Taking precautions to prevent the testers coming into accidental contact with exposed live parts;
- Protecting and insulating both the equipment being worked on and the testing equipment.
- Using test equipment that is suitable for the job;
- Making sure that people doing the work are suitably trained and experienced so that they understand safe working practices and the equipment on which they will be working, equipment being worked on and the testing equipment.
- Using test equipment that is suitable for the job;
- Making sure that people doing the work are suitably trained and experienced so that they understand safe working practices and the equipment on which they will be working.

## Types of testing are covered

This guidance covers electrical testing in situations (mostly low voltage, i.e. not exceeding 1000 V ac or 1500 V dc) where equipment like domestic appliances is being tested. Most of this equipment will be used on mains supply voltages of 230 V ac single phase and 400 V ac three phase. However, there could be internally derived voltages which are much higher and in some cases above the low voltage limits.

Some of the test voltages applied to equipment during testing may be above the low voltage limits. These voltages are not considered dangerous if the maximum output current available from the test instrument is reliably limited to no more 5 mA (traditionally 5 mA ac has been used, but since May 20015 new equipment should be limited to 3 mA ac).

Suitable precautions must be taken to prevent contact with stored charges in excess of 350 mJ. If the skin is pricked or cut at the point of contact, the shock current (and hence the seriousness of the injury) will be higher. Healthy skin may also become damaged at the time of contact either by the burning effect of the current or by penetration from sharp-ended conductors.

## Carrying out a risk assessment

As well as the level of voltage, charge or current and the nature of the environment, there are a number of other factors that need to be considered when you are assessing the risk of injury arising from electrical testing work. A risk assessment should be carried out before testing begins; to help you identify the precautions you need to take.

Some questions to ask when carrying out the risk assessment are:

- Can the work be done with the equipment dead or energised at a safe voltage or current?
- Is it absolutely necessary for someone to be working on or near to equipment that is live at dangerous voltages or current levels?
- What is the maximum voltage on conductors that will be exposed during the work activity?
- Are the testers competent? Are they adequately trained and knowledgeable to do the particular work and ensure that others are not put at risk?
- If testers are not considered fully competent, are they adequately supervised?
- What physical safeguards should be applied to the equipment under test to prevent injury, e.g. the use of temporary or permanent screens?
- Is the test instrumentation of safe design? Has it been properly maintained?
- Is it necessary to set up a permanent test area separate from the rest of the workplace, where equipment can be taken for testing? Is it necessary to set up a temporary test area around the equipment?
- Are the testers able to supervise the working area sufficiently and at all times to prevent danger to others?
- Where testing is part of an 'after sales service' how much must be done at customers' premises? If testing is being done in a customer's home, what special precautions are required to protect the tester and others?
- To what extent should the testers be supervised or accompanied?
- If the testers design, manufacture or use any special test equipment, does it meet **BS EN 61010-1? 6**
- How big is the unit under test and how much space is required around it to undertake the testing in a safe and unconfined manner?

- Are all the other workshop employees competent to avoid danger if there is a need for them to approach the equipment? If not, how can you make sure that they do not do so?
- Will the equipment be left unattended while live, for example while being 'soaking tested'?
- Does the workbench or separate area require a warning, e.g. a light, to show that testing is in progress?
- Is there a need for additional emergency switching devices for use by other employees to reduce the degree of injury to testers?
- Can residual current devices (RCDs) be used to provide supplementary protection? (NB: This guidance and the complementary information sheets 1–4 refer to RCDs or 30 mA RCDs. See the section relating to residual current devices on page 9 for a fuller explanation.)
- Is it possible to reduce the number of available paths to earth to reduce the likelihood of a phase-to-earth shock, e.g. by the use of barriers, screens and insulating mats?
- Is it possible to use unreferenced supplies, e.g. isolating transformers/batteries to reduce the likelihood of a phase-to-earth shock?

### Managing electrical testing

You must provide a safe working environment and establish a safe system of work for your employees. The results of your risk assessment will help to identify the steps you need to take to do this. Employees must co-operate and take reasonable care for their own and other people's safety while they are at work. The following advice needs to be considered for all activities involving testing.

#### Personnel

All personnel must:

- Understand that the risk of electric shock injury will still remain during the testing process, even with the use of earth-free test areas and/or isolating transformers and/or RCDs;
- Fully understand the scenarios in which these electric shock injury risks can arise in the particular workplace(s);
- Be given adequate first-aid training, including cardiac pulmonary resuscitation (CPR) skills.

#### Permanent test areas

These areas must:

- Be under the control of a responsible person;
- Be in an area set apart by barriers to prevent entry;
- Have suitable warnings provided at the entrance;
- Be accessible during testing only to authorised staff or people working under their direct supervision;
- Have suitable warning lights indicating that testing is in progress and other warning lights to indicate when it is safe to enter the area (duplicate red and green lights are often used);
- Have emergency-stop push buttons or equally effective means to cut all test supplies in the event of emergency. These emergency controls should be prominently identified. (NB: The emergency controls should not remove supplies to the general lighting in the area.)
- Display an electric shock poster, e.g. *Electric shock: First-aid procedures*, at prominent locations, showing emergency arrangements, especially telephone numbers;



- Have good housekeeping arrangements, including adequate clear working space.

### Temporary test areas

- In some situations it may not be practicable or desirable to remove equipment to a permanent test area, e.g. because the equipment is too large for the test bay or is located at the customer's premises. If live testing needs to be carried out, a temporary test area should be set up around the equipment. When setting up a temporary test area, all the precautions listed above for permanent test areas should be taken, unless it is not practicable to do so, in which case an assessment needs to be made of what precautions are needed to reduce that risk to as low a level as possible.
- Remember that simple 'Go/No go' plug-in testers will in general only provide a polarity check and an indication that an earth may be present, but not its effectiveness.

### Supplies to equipment under test

Each item of equipment under test should be provided with its own test supply. These supplies should be from designated sockets or terminals provided with covers interlocked with the supply isolator. The supplies should have suitable system protection against overload and over current in the event of faults, e.g. fuses. Note that:

- Where an isolating transformer is used for the supply to the equipment under test this should comply with **BS 615588** and a separate transformer should be used at every test bench. If this is not reasonably practicable, the same isolating transformer may be used for supplies to alternate benches, provided the risk of referencing this supply to earth at any bench is properly controlled and the transformer does not then have an unacceptably high leakage current
- The supply from the isolating transformer should be provided from a single socket outlet and clearly marked 'only for use for making live equipment under test'. No fixed wiring should be connected to the earth terminal of the outlet socket. The face plate of the socket should be made of insulating material. There must be no unnecessarily exposed live parts on equipment under test;
- In certain circumstances Class I equipment under test must be effectively earthed unless supplied via an isolating transformer. This will bring with it an increased risk of electric shock which may be minimized by the use of other precautions.
- When the equipment under test is Class I, any pre-existing earth fault must be detected and corrected before making the equipment live. In the case of the supply from an isolating transformer, failure to do this will mean that there may be a hazardous shock risk in the event of a simultaneous contact between the enclosure of the equipment and one or both poles of the isolated test supply;
- The integrity of the circuit protective conductor (earth) of all portable/transportable Class I equipment must be re-tested after all test-bench work has been completed, to ensure that no earth faults are present before the equipment is used again on a normal mains supply.

### Risk assessment – test equipment and electricity supplies

All measures used to control risk of electric shock should follow the hierarchy given below:

- First and foremost, control as many of the risks as possible by hardware methods;



- Secondly, control all other foreseeable risks by the use of safe systems of work. These must be made known to and fully understood by all staff involved, regularly monitored, and recorded in written form (for reference and to permit refinement or amendment as and when needed); and
- Finally, use of competent staff who must possess the necessary level of technical knowledge and experience (or be supervised by a competent person) to prevent risk of injury.

If the hardware precautions resulting from the risk assessment include the provision of isolating transformers for the source of supply to mains powered test equipment, then such provision should normally be made and the isolation transformer should be separate from the equipment under test. An instrument shelf should be provided for that equipment.

Some of the risks associated with the use of test equipment can be reduced, but not eliminated by placing all test equipment on an insulated shelf immediately above the test bench. This will reduce the chance of simultaneous contact between the test equipment and the equipment under test.

When the hardware precautions resulting from the risk assessment do not include the provision of isolated supplies to the mains-powered test equipment, all supplies to test equipment should be protected by 30 mA RCDs. NB: For supplies in excess of 16 A to equipment under test or where the equipment under test has a high leakage current it may not be practicable to use an RCD because of nuisance tripping.

### **Setting up safe test areas**

It is important to make sure that anyone not involved with electrical testing work is kept free from risk. This can be done by confining testing work to a designated test area. In some workshops, it might be possible to set up a permanent workbench and test area, to which only the testers have access. Otherwise, unauthorised people should be prevented from approaching the equipment under test by physical barriers or other demarcation methods which form part of the test area boundary.

A test area can be:

- A designated room built as a test area with special protection features and fitted with secure doors (possibly interlocked, depending upon the degree of risk) to prevent unauthorized access;
- An area set aside in a workshop with some form of permanent barrier as a demarcation; using purpose-built barriers as demarcation;
- An area around fixed equipment, such as switchgear, or control gear, where skilled people are carrying out repairs, fault-finding or testing during maintenance work.

In workshops where all employees have been adequately trained and instructed in safety practices and all unauthorized personnel are effectively excluded, local demarcation of the workbench or work area where testing is done may not be necessary. All employees need to be aware that those who are carrying out testing should not be distracted by the interference of others who are not involved with the test in progress.

## Protecting the people doing the testing

The measures that are used to protect the people doing the testing need to be effective to prevent them coming into accidental contact with dangerous exposed conductors. This might be either a single-hand contact with a source of energy which has one of its supply conductors

- A work bench which might be designed as a test bench or be used for repairs and testing;
- A designated work position within, or at the end of, a production line;
- A temporary area set up around equipment connected to earth, or another area of conducting surface.

Class I equipment is in this category because the mains at source are earth referenced; so is electronic equipment where a large metal surface (or chassis) is connected to the source. There is also a risk of injury from sources of supply which are not earth referenced and where accidental simultaneous contact with both poles of the supply is possible.

Methods of reducing the risk of a shock from simultaneous contact with conductors include:

- Testing at reduced, non-hazardous voltages and currents;
- Using interlocked test enclosures in which the unit under test is contained;
- Using temporary Insulation;
- Replacing covers which need not be removed for the purposes of the test, for example once supply connections have been made;
- Creating an area which is as earth free as practicable;
- Using isolating transformers connected to the mains supply;
- Using 30 mA RCDs.

The following sections provide more detail about each of these protective measures.

### Safe voltages and currents

It may be possible to test the equipment by energizing it with non-hazardous voltages and current levels. This should always be considered as the first option before deciding to use dangerous voltages and current levels.

### Interlocked enclosures

These can vary in size from a small bench mounted box with an interlocked hinged lid to a large enclosure (large enough for people to enter) equipped with access gates which are secured by interlocks. It is important to ensure that the safety performance of the interlocking system is comparable with that of a switching device used for isolation purposes. The use of a trapped key (key exchange) system interlocked with the access and the isolator can assist. In general, interlocking using the control system alone is not acceptable; the power supply should be isolated by the interlock system.

In certain circumstances there may be the potential for a stored charge to occur, e.g. from the use of capacitors. In these circumstances the supply to the equipment under test should be earthed, preferably automatically, before entry is made. If it is not possible to earth the equipment automatically, it should be manually earthed by the use of a suitably insulated earth tool. Where automatic earth is

used, it is essential to use, in addition, a manual earth device before making contact with any parts that have previously been made live.

Where large enclosures are used, you must make sure that people cannot be inside the enclosure while there is danger from the equipment being tested.

### Temporary insulation

Where there is risk from simultaneous contact with hazardous conductors, do not assume that employees will be able to avoid accidental contact. Consider using temporary insulation which may be in the form of purpose-made screens or insulating sheets or shrouding (rigid or flexible). However, there may be a practical limit on the use of screens when testing compact electronic assemblies.

### Earth-free areas

It is difficult to achieve a true earth-free area, since there is a need to ensure that floors and walls will not conduct current which can give rise to shock injury. Suitable insulating materials, including mats, are therefore needed to construct an earth-free area. These parts will then have to be tested at regular intervals to demonstrate that their insulation properties are being maintained.

An area which is as earth free as practicable can be more easily created, but a thorough risk assessment needs to be done to ensure that the testers will not make accidental contact with any earthed conductors. Items such as heating and water pipes and radiators should be enclosed, or the test area should be situated to prevent simultaneous contact by the tester with the item under test and the earthed item. Earth free areas should have the minimum of exposure of conductive parts. A 30 mA RCD could be used as supplementary protection.

Earth-free areas are often used in conjunction with isolating transformers.

Where it is not possible to make an area earth free because it is necessary for the test equipment and/or the equipment under test to be earthed, it is still possible to reduce the extent of the accessible earthed metalwork.

### Isolating transformers

Isolating transformers connected in the test supply will prevent the risk of electric shock if a person touches a single live conductor of the isolated supply while in contact with an earthed conductor.

It should be clearly understood, however, that an isolating transformer cannot prevent an electric shock if someone makes contact simultaneously with both conductors of the supply on the secondary side of the transformer, unless the output voltage is below 50 V ac (120V dc) in dry conditions and 16 V ac (35 V dc) in wet conditions.<sup>13</sup>

The integrity of the isolation from earth should be tested regularly, or earth fault monitoring devices should be installed, to ensure that dangerous earth faults are detected.

## Residual current devices (RCDs)

These are supplementary protection devices which do not prevent an electric shock, but are able to limit the duration of some shocks by being able to cause rapid disconnection of the electricity supply in the event of a relatively low current flowing to earth, such as may occur during an electric shock. They are, therefore, able to provide a much higher level of protection against the risk of a severe electric shock than could be provided from an unprotected source.

An RCD required to minimize the risk of personal injury should have a rated tripping current of no more than 30 mA and should not have an adjustable time delay. Although the 30 mA versions are often used, those with lower rated tripping currents (typically, 10 mA or below) are readily available and may be used to provide additional protection where nuisance tripping is not a problem.

Where personal safety depends in part upon an RCD, the RCD must be tested using the built-in test facility at appropriate intervals (e.g. portable RCDs before each use, fixed RCDs weekly). In addition, all RCDs should be tested at least annually using an RCD tester which will check the tripping current and the speed of operation.

## Training

All personnel involved in testing should be given specific safety training relevant to the work they are doing. Appropriate training or instruction must also be given to anyone who may attempt to enter test areas and approach test benches.

New training is likely to be necessary whenever any of the following occur:

- Changes to product design, layout and installation;
- Changes to production or working methods;
- Changes to test methods and instruments;
- Changes to test personnel and others who may be affected.

## Competence of testers

Where testing is done by a contractor invited to a site, safe working arrangements must be discussed and agreed before the work starts, preferably at the contract discussion stage. This enables everyone concerned to know who is doing what and who is responsible for what, so that the work can be done safely and without risk to the contractor's employees, the site employees and others who might be affected. In particular, the person who is responsible for the safe isolation and state of the equipment should be identified and agreed.

## Medical gas connections

This will be done under the control of the local medical gas supplier in accordance with local regulations and meeting ADM CoP.

## APPENDICES

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**PROJECT MANUAL  
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ENVIRONMENTAL, HEALTH SAFETY & SECURITY MANUAL**



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