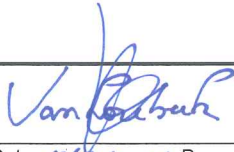
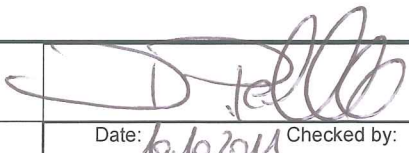
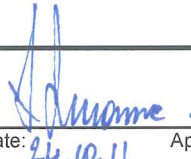


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1 Scope of Application

This Contractor HSE Requirements is applicable to all contractors and contract employees on all Knauf Insulation premises.

2 Aim/purpose

This Requirements contains policies and procedures regarding Health, Safety and Environmental responsibilities which are applicable when contractor works are performed.

Contractors should review with their employees the sections of this Requirements that are appropriate to the work to be performed.

3 General information

- The Contractor HSE Requirements is an important part of the Knauf Insulation HSE program and will be issued as part of the contract documents. Contractors must ensure that their employees, subcontractors and subcontractor employees comply with the provisions of this Requirements while on Knauf Insulation premises.
- Non-compliance with HSE requirements is treated the same as non-compliance with any contract provision, and may result in work stoppage or employee removal from the premises. Willful or repeated non-compliance may result in contractor dismissal and contract termination
- Rules/regulations, laws and ordinances issued by the trade associations and government authorities are not superseded by this Requirements, but are explicitly declared to be part of this Requirements.
- Contractor's managers and supervisors are responsible for preventing incidents or conditions that could lead to incidents, injuries, illness or fatalities. The ultimate success of the HSE program depends on the cooperation of every employee. The contractor's management must ensure that HSE rules and procedures are enforced and that effective training and education programs are employed.
- KI reserves the right to interpret, to revise or to depart from HSE policies and procedures at any time. A notification of the changes will be send to the respective contractor companies. KI also reserves the right to dictate HSE standards during the course of a contract as necessary in the interest of HSE.

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4 Policy

Knauf Insulation is committed to:

- Continual improvement in performance with regard to matters of product quality, environment and health and safety.
- Responsible energy management as part of its environmental strategy.
- Monitoring and controlling its use of energy and emissions to air, water and land from our production processes.
- Ensure, as a minimum, that the company meets the relevant statutory requirements of the countries in which it operates.
- Achieving customer requirements with regard to the quality of our products and services, whilst complying with relevant legislative, regulatory and other requirements.

Our overall objectives include:

- Ensuring the health and safety of our employees, contractors, neighbors and other persons who may be affected by our activities.
- Creation of a positive culture for safety, quality and environment within plants in order to reduce the number of accidents, incidents and other business losses, where employee behavior is a contributory factor.
- Contributing and supporting the development of sound policies, laws and regulations.
- The development and provision of products which are safe and fit for their purpose.
- Provision of appropriate resources in order to ensure that adequate, information, training and supervision is provided to employees and contractors with regard to health, safety, environment and energy issues.
- Ensuring the effective management of risk during design, construction, operation and maintenance of business facilities and production processes.
- Management systems that are integrated and meet recognized standards in the area of quality, safety, environment and energy and use structured approaches to identify business improvements and achieve corporate goals as defined by the company senior management.
- Monitor and review our activities, targets, and progress with regard to safety, health, environment and energy. Produce and communicate an annual report on these matters.
- Improve the sustainability of the companies operations and production processes through the minimization and management of waste, product design and efficient use of transport.

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5 Definitions and Acronyms

The definitions and acronyms listed in this section are terms used throughout this Requirements. Definitions that apply only to a specific section of the Requirements are provided in that section.

Contractor	A firm contracted by Knauf Insulation to perform specified work in Knauf Insulation premises. For this Requirements, references to “contractor” mean the contractor’s company, and the companies of their subcontractors, consultants, vendors and suppliers.
Contract employee	An employee of a contractor and the employees of subcontractors, consultants, vendors and suppliers.
Contractors management	Personnel employed by a contractor who are responsible for managing, supervising or directing activities and non-Knauf Insulation employees on site.
Competent person	An individual who has a recognized degree, certificate or professional standing or extensive knowledge, training and experience and who has successfully demonstrated the ability to resolve problems related to the work.
Hazardous material	A substance or mixture of substances that may produce adverse effects on the Health or Safety of a human being or to the Environment, due to characteristics such as being explosive, flammable, poisonous, irritating or corrosive.
KI representative	An authorized KI employee responsible for work performed by a contractor. This can be the Project Manager, the Construction Manager and/or the Technology Manager, Project responsible and/or the Pant Project Manager
KI HSE Manager	The HSE Manager who has been dedicated by KI to the concerned project. This can be the plant HSE Manager or for a greenfield project the project HSE Manager
PPE	Personal Protective Equipment.
HSE	Health, Safety and Environment
KI	Knauf Insulation
MSDS	Material Safety Data Sheet

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6 Organizational requirements

6.1 Contractor's HSE Program

HSE program

Contractors are responsible for establishing and implementing a HSE program for their employees. This program will include maintaining and auditing HSE performance for compliance with applicable rules/regulations, laws and ordinances issued by the trade associations and government authorities.

The contractor's HSE program must cover the following legal responsibilities:

- Assessing, planning and coordinating the work to avoid personal injury, property damage, environmental risk and loss of production.
- Establishing and maintaining a system for early detection and correction of unsafe practices and conditions.
- Providing adequate protection of public and private properties and the environment and ensuring the safety of the public.
- Establishing and conducting HSE education programs designed to stimulate and maintain the interest and participation of employees through use of the following:
 - Safety meetings and communication.
 - Proper work procedures, PPE and mechanical guards.
 - Safety instructions for individual employees and group HSE training programs.
 - Accident, illness and potential HSE incident investigation and reporting to determine causes and corrective actions.
 - Records of accidents and losses and accident/loss experience summaries.
 - Proper waste disposal and emission control procedures.
- Developing an emergency plan for the work.

Contractors are required to administer their own safety activities and are responsible for the safety of their employees. If requested by KI, contractors will submit a written copy or description of their company's HSE program.

Contractor/ contractor employee Duties and Responsibilities

Contractors

- Are responsible for ensuring that their employees adhere to the directives of the HSE program when performing work for KI. The contractor will submit to the KI representative a list of individuals and their respective duties.
- Are required to designate a qualified HSE manager who is knowledgeable in HSE and fire prevention. Contractors are also required to designate a competent person for certain tasks, such as scaffolding, fall protection, trenching, hazardous energy control (lock-out/ tag-out) if applicable.
- Are to arrange for the proper use, maintenance and repair of work equipment.

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Contract employees:

- Must not work in unsafe surroundings or in an unsafe manner.
- Are responsible for learning, understanding and following the rules and regulations applicable to the work and for reporting observed or anticipated hazards to their supervisor(s). If such hazards are not rectified/solved, employees must report the conditions to the KI representative.

Disciplinary actions

The progression of disciplinary action will be determined by the severity of the incident and other mitigating factors. The emphasis is to be on the desire for KI to promote HSE through a cultural shift and not through enforcement activities. However, non-compliance with HSE requirements may result in work stoppage if an immediate threat exists.

Disciplinary actions will progress – based on the severity – as follows:

- Documented verbal warning.
- Written warning with corrective action required.
- Dismissal from KI premises for the duration of the project assignment.
- Ban from working on KI premises and contract termination.

Immediate and permanent removal from KI premises may occur if a contractor's manager, supervisor or employee engages in any of the following activities:

- Openly exhibits disregard, defiance or disrespect for the HSE program.
- Knowingly falsifies investigative documents or testimony involving an investigation.
- Participates in fighting, violence, threats of violence, theft or destruction of property.
- Violates established HSE rules, regulations or codes that endanger themselves, others or the environment.

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6.2 HSE orientation and induction training

General information

This section establishes basic training and instruction activities to ensure that contract employees are trained in hazard recognition and are informed of their responsibilities in carrying out their assignments in an efficient and accident free manner.

Induction training

Prior to starting work, ALL contractor employees must go through the induction training. This induction is given via a meeting/ video and in addition always by a leaflet. The program covers at least the following items:

- Site lay-out;
- HSE rules of the site (PPE, working on heights, waste management, traffic on site, hazardous substances, pollution prevention, work permit, etc.);
- Emergency procedures;
- Fire safety instructions;
- Incident and accident reporting;
- Information regarding access, security and facilities (sanitary, refectory, etc);
- A check if the given information is understood (e.g. via a test). If the contractor employee hasn't understood all necessary information, he/she must be trained more thoroughly before the actual work may be commenced.

Persons passing this test will receive an identity card, which must visibly be worn by the individual at all times while performing his duties on-site.

Together with the induction, a formal verification takes place to determine if the employees of the contractor can (training, experience, certificates) carry out safely the tasks they have been contracted for.

The induction training is site specific. Therefore attendance at a separate orientation is required for work performed at each KI site.

HSE meetings, records and minutes

Regular HSE meetings:

Contractors must hold regularly scheduled safety meetings and require attendance by employees. Accident prevention must have a prominent place on the agenda and the meeting records must state the specific items discussed.

Toolbox meetings:

Each contractor supervisor will hold a HSE training meeting in their work area with their entire crew. These meetings, "toolbox meetings" are to be held incident driven. Subject matter will cover specific HSE procedures pertinent to the crew's activity. The meeting provides an opportunity to point out any hazardous conditions or unsafe work practices and discuss HSE rules and regulations, safe working procedures, analysis of accidents and potential hazards.

Meetings shall be documented and such be provided on request by KI.

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Site safety meetings:

KI may call such special HSE meetings as deemed necessary. Attendees will be notified verbally or in writing. Attendance will be mandatory. Failure to attend will result in immediate contractual action. KI may, for any reason of clarification, corrective measure or training, conduct an immediate HSE meeting with contractor supervisors and employees. Attendance will be mandatory.

Unsafe behavior

Unsafe behavior, when noticed must be addressed by everybody. The necessary corrective actions must be taken immediately.

Qualification of the labor force

All the personnel deployed on the site should have:

- the necessary experience and expertise for their assigned work. They are bound to ensure a good and smooth cooperation with the employees of other companies. Employees lacking in expertise and experience will have to be replaced upon request of the KI representative. Similarly, personnel who violate these Contractor HSE Requirements regulations are being send off-site and will have to be replaced.
- A valid medical certification (fit for the job). All companies who shall be working on the construction site will have to provide proof to the KI representative upon request that their employees have undergone the occupational health screening required by local legal legislation.
- Anyone needing to operate construction equipment (cranes, lifts, forklifts, aerial work platforms, etc.) may only do so if he is in possession of the required license or permit. The qualification/certificate to operate such equipment must be provided on request to the KI representative and/or the KI HSE Manager. In addition, such operators of said construction equipment must be authorised in writing by their companies to be allowed to do so. This authorisation should also be provided upon request of the KI representative and/or the KI HSE Manager.
- Where foreign employees are deployed, the contractor supervisor must ensure that they have a valid residence and work permit issued by the respective local, regional and/or state authority in accordance to the legal regulations of the country, in which the work is to be performed. Contractor companies are solely responsible to obtain all such legally required documents. Any such legally required document must unsolicitedly be presented to the KI representative or the KI HSE Manager prior to commencing work on-site. Anyone failing to produce those legally required documents will not be allowed access to the site.

All written statements made by the employees shall be in the local language of the country, which the construction site is located at. Foreign-language statements and certificates must be submitted duly translated into English and the local language.

All firms engaged for work must ensure that all their on-site work force, who are not capable of understanding and speaking the local language, is accompanied by a person capable of translating all necessary verbal and written communication. This shall apply in particular to the necessary training to be provided by the work supervisors of the firms. If the firms fail to fulfil this obligation, the KI representative or the KI HSE Manager is authorised to hire an interpreter at the expense of the relevant contractors/subcontractors.

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6.3 Occupational health requirements

Alcohol and drug abuse

Contractors must develop and enforce a policy that prohibits the possession, distribution, use and abuse of drugs and alcoholic beverages by employees while on KI premises.

KI is entitled to refuse entry to the site to persons, who are under the influence of drugs or alcohol, or to expel such persons from the site and to call on their supervisors to carry out their duty of care. The contract company in question shall be responsible for the consequences that may arise from the same, such as missed deadlines, increased cost, etc.

Smoking policy

There is a general ban on smoking outside the specifically designated smoking areas and locations.

Violations of the smoking ban may result in expulsion from the site.

Consumption of food and drink

The consumption of food is allowed only during break times and in areas designated for this purpose. Drinking water/soft drinks that are carried along into the site may only be stored in plastic containers or cans; glass bottles are not allowed.

Asbestos/insulating material with ceramic fibres

Any use of asbestos or asbestos-containing materials is prohibited.

First-aid equipment, first responders

All contractor companies are obliged to ensure that a sufficient number of suitable personnel (depending on the size of the work force) is trained in first aid and that appropriate first-aid material is readily available at the site to guarantee adequate primary care in case of an accident.

The names of the first-aid trained staff must be provided to the KI HSE Manager.

Hazardous areas

Areas classified as hazardous for an extended time period shall be marked in the construction site plan and shall also clearly marked in the field. Hazardous areas of shorter duration shall be indicated with markings in the field and coordination and communication concerning those shall take place during the daily coordination meetings.

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6.4 Security program

General information

KI provides security 24 hours per day, seven days per week. This service does not however relieve contractors of their contractual duties, obligations and responsibilities to ensure that their trailers, vans, vehicles, equipment, tools and storage areas are properly secured at the end of each workday.

KI facilities are not to be used by contractors, contract employees or subcontractors without prior authorization.

On-site working time is defined by the KI representative. Should governmental approvals be required for the execution of extra work hours, then these must be obtained by the contract companies themselves and be presented to the KI representative prior execution of such extra work.

Visitors must be escorted while on KI premises.

Taking pictures by any means is prohibited in all KI plants. Exceptions can only be granted by the KI representative.

Contractor registration and identification badges

Contractor employees must register daily before entering the site. They must wear a KI identification badge in plain sight on the premises, which is to be returned at the gate when leaving the site. Personnel without a proper badge will be questioned regarding their presence and may be asked to leave the premises.

Visitor to KI facilities will be admitted through a security post, where they will sign in and be issued a visitor pass. The contractor is to provide visitors with any required PPE before they enter a work area. Visitors must follow the same procedure as other personnel when entering or exiting the work area through a designated security post.

Visitors must be escorted at all times.

Deliveries

Delivery drivers for contractors, subcontractors and suppliers must report to a designated security post upon arrival at the work area. A security officer will clear entry to the work area through the KI representative or the appropriate contractor.

The driver will sign-in, receive a visitor pass and be directed to the appropriate area for receiving and unloading. Upon completion of the delivery, the driver must sign out and leave the visitor pass with the gate. Drivers must remain in the delivery or receiving dock area until they are ready to leave the site.

Weapons/ explosives

It is prohibited to carry arms and explosives of any kind into the site. For special construction specific measures and procedures involving the use of guns or explosives, the KI representative shall grant special permissions on request and shall specify appropriate security measures, which shall be implemented by the respective work supervisor(s) under the supervision of the KI HSE Manager.

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Driving of vehicles on the site

Driving into the work/construction site with private vehicles is allowed for loading and unloading purposes. Entering the site with vehicles for other purposes is to be approved by the KI representative.

The general traffic regulations apply to all on-site driving of vehicles. All traffic signs must be duly observed.

All vehicles and equipment must be safe for transport and operation. The vehicles must be marked uniquely with the name of the respective company.

When reversing vehicles with obstructed view, guidance is mandatory.

Access routes for emergency services such as police, fire and rescue trucks shall always be kept free of obstruction and shall not be restricted in any way. Improperly parked vehicles will be removed at the expense of the offender. No liability shall be accepted for any resulting damages.

Diesel vehicles used within buildings must be equipped with a particles filter.

Securing Work areas

All companies shall be responsible to ensure construction security of their work areas, to properly segregate construction and production areas by means of temporary fencing, and to assure overall construction safety (duty of care). Fences must be erected and secured in such a manner that unauthorised persons will not be able to Requirements shift those without using tools.

Fences must be closed at all times, except for material delivery and/or transport.

Safety signs (command/prohibition/warning signs, etc.) should be applied so as to be permanent and prominently visible.

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6.5 Emergency Management

General information

Site emergency procedures are applicable as introduced during the induction program.

Definitions

All Clear – When an emergency situation is over, the site HSE Manager in charge notifies security to authorize employees to return to normal work activities.

Call list – This is an approved list of individuals appointed to be the designated coordinators of emergency response for each contractor.

Emergency – Any unplanned event that adversely affects personnel, the environment or KI business is considered an emergency.

General Emergency reporting procedure

In case of emergencies, and when evacuation of the site or part thereof is required, assembly points have been defined to which all persons on-site have to gather without delay. Assembly points are being marked in the construction site plan and are clearly signposted in the field. During the safety induction as well as during the construction coordination meetings, contractors are being informed about which assembly point belongs to which construction area. Contractor supervisors are responsible for informing their workforce about their assembly point.

Warning signs have to be posted clearly visible throughout the construction site.

Supervisors of all contract companies and their subcontractors must post the alarm plan, given by the KI representative, in all their residential- and office-containers.

Evacuation

- Security and/or HSE personnel will determine if evacuation of buildings and site structures is required. An individual can initiate a building evacuation by pulling a fire alarm pull station or call the emergency numbers.
- Security and/or HSE personnel will determine the evacuation route and assembly area.
- Leave the affected location by the designated route and proceed calmly to the designated assembly location.
- Security and/or HSE personnel will stay in the affected area as long as it is safe to ensure that all personnel have evacuated.
- After arriving at the assembly area, contractors and the KI representative must report to security or HSE personnel any problems relating the emergency.
- When evacuation is complete, contractors must account for their personnel.
- A KI evacuation requires also that contract employees evacuate.

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Accidents involving serious injury or death

- In the case of an accident, call the KI emergency telephone numbers for immediate assistance and to obtain necessary first aid.
- Outside medical assistance should be requested by calling 112 when needed.
- Clear the area and keep away non-essential personnel.
- Provide assistance to rescue personnel if requested.
- After proper evacuation of the injured employee, do not disturb or remove anything in the immediate area of an accident scene without KI permission.
- The responsible contractor must make a full investigation and submit a copy to the KI HSE Manager within 12 hours of the occurrence.

Fire or smoke

- In the event of a fire, use the nearest fire alarm pull station. If not available, call the emergency telephone numbers from the nearest phone located in a safe area.
NOTE: security will contact the fire department and escort them to the scene.
- Contract employees are not required to fight a fire, but are expected to attempt to extinguish the fire after activating the fire alarm system if they are trained and can do so safely.
- Keep non-essential personnel away from the fire.
- If explosive materials or compressed gases are involved or other hazards may exist, ensure that affected personnel are immediately evacuated to a safe distance.
- Contractor employees are to evacuate to assigned KI assembly areas. Once evacuation is complete, contractors must account for everyone for whom they are responsible.

Chemical or Hazardous Materials Spill

- In case of a spill, call the emergency telephone numbers immediately. Isolate and contain the spill if it is safe to do so, as determined by a competent person.
- The responsible or affected contractors must make a full investigation and submit a copy to the KI HSE Manager within 24 hours of the occurrence which includes the following information:
 - Description of the spill or release event.
 - Names of individuals involved.
 - Date and time of spill or release.
 - Copy of the MSDS for the material spilled or released.
 - Estimated quantity and type of material spilled or released.
 - Duration of the release.
 - Steps taken or planned to reduce, eliminate and prevent recurrence of the spill or release.

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Property Damage

- If property under KI control is damaged, notify the KI representative immediately.
- Protect against further damage where possible.
- Keep non-essential personnel away from the area.
- The responsible or affected contractors must make a full investigation and submit a copy to the KI HSE Manager within 24 hours of the occurrence

Bomb Threat

- The receiver of a bomb threat telephone call should attempt to transfer to call to security. Security will notify local police, fire department or bomb disposal authorities.
- When a bomb threat is received, security will determine if an evacuation of the site or buildings is required. Once evacuation is complete, each contractor will account for their employees.
- If a contractor receives a bomb threat, a bomb threat report should be completed by the person receiving the call.

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6.6 Reporting and investigation of incidents and accidents

Definitions

Accident – An (unplanned and/or undesired) event which causes personal injury or illness, environmental damage, financial loss or liability.

Incident – An (unplanned and/or undesired) event or occurrence which causes or has the potential to cause personal injury or illness, environmental damage, financial loss or liability.

Near Miss – An (unplanned and/or undesired) event or occurrence which had the potential to cause personal injury or illness, environmental damage, financial loss or liability.

Lost Time Accident (LTA) – Is defined as an injury or occupational illness resulting in time lost from work of on full day/shift or more.

Medical Treatment (MT) – Is defines as any work related injury or disease (including loss of consciousness) requiring the treatment of a medical practitioner (or registered medical personnel).

First Aid Case (FAC) – Defined as any once-off treatment and/or subsequent observation of minor scratches, cuts, burns, splinters, etc which do not require professional medical treatment.

Restricted Work Case (RWC) – Or sometimes referred to as alternate duties, is defined as an injury or occupational illness that results in the injured person returning to their normal duties with some restrictions; returning to their normal duties with or without restrictions and/or on a graduated return to normal hours; being assigned to a different position on a temporary basis; or attending training course's applicable to their work

Occupational Disease – Of an employee is any abnormal condition or disorder, other than one resulting from injury, caused by exposure to environmental factors associated with employment i.e. cases resulting from anything other than instantaneous events. It includes acute (resulting from short duration exposures) and chronic (long duration), occupational illness or diseases which may be caused by inhalation, absorption, ingestion, direct contact, musculoskeletal disorders or vibration.

Environmental Damage – An unplanned, uncontrolled or undesirable event or occurrence which adversely affects the environment (i.e. land, air, water, fauna, flora).

Days lost – The total number of complete working days or shifts lost from work as a result of the injury (commencing with the shift or day following the shift or day of the injury). The number of working days lost refers to the total number of working days, irrespective of the number of hours that would normally have been worked each day. Occurrences that result in a fatality should be assigned a time lost of 12 months (220 standard working days). The count of lost days for an accident is calendar days (not the assigned to work days) and includes weekends, holidays, vacation and sick days.

Reporting and investigation

All events as covered under the definitions mentioned above must be reported and investigated.

The KI representative and the KI HSE Manager must be notified immediately of any incident/accident that happens on the site.

The contractor for the area involved in the incident or accident will conduct investigations.

The detailed investigation report incorporating the above mentioned items must be delivered to the KI HSE Manager.

After the incident has been analyzed and the causes have been identified, control measures must be defined.

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6.7 Inspection and Auditing

Control of workplace safety is achieved only when each contractor fulfills contractual and statutory responsibilities by implementing practical steps to maintain safe, healthy and environmentally sound work practices and conditions.

Therefore contractors will establish an inspection and audit program to help eliminate unsafe practices by their employees establish a hazard-free workplace and protect the environment.

Contractors are responsible for conducting continuous monitoring of their operations to ensure that they are aware of the probable sources of potential injury, illness or loss due to unsafe acts or conditions.

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7 HSE Procedures

7.1 Permit to work

General information

The Permit to work system is a formal written system to control certain types of work which are identified as potentially hazardous.

Within the scope of this Requirements, ALL contractor works carried out on KI premises are subject to the Permit to work system.

Definitions

Permit Issuer – is a person that has been authorized by the KI representative to issue permits.

Permit user – are persons given the responsibility to execute the work.

Permit approver – is a person of the area in which the work will be carried out and who signs of the permit for acknowledgment.

Hot work – is all work implying the use of naked flame or use of equipment that may develop sparks or enough heat to ignite flammable material. Examples of hot work: brazing, cutting, grinding, pipe thawing, welding & torch applied roofing.

Confined space – means a place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk.

Responsibilities

Permit Issuer

The permit issuer shall evaluate the precautions to be taken and tick them off or indicate them in writing in the permit form. Furthermore he shall ensure following:

- That the work is made ready.
- That gas tests are carried out if applicable.
- That all related equipment is disconnected and tagged.
- That the correct columns in the permit form are signed.

Permit user

The permit user is responsible for collecting all necessary permits prior to the start-up of the work.

Furthermore he is responsible for following:

- He shall provide the permit issuer with a correct work description well in advance of the start-up of the said work. He is not allowed to carry out any tasks not listed in the approved work permit.
- He must brief the involved team before work commencement about risks & hazards related to their activity as well as the surrounding operations. For critical activities such as entering a confined space, this has to be documented.
- He must observe his team closely during the execution of the task on hand. He must carry a copy of this work permit on work locations at all times.

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- He is also responsible that fire extinguishing materials, PPE and other necessary equipment are in place according to the risk of the work.
- He is overall responsible that all HSE regulations are carried out and adhered to.

Permit Approver

The permit approver is responsible for the briefing of his team that works covered by a work permit will be carried out in their work area.

All Personnel

All personnel on site shall:

- Have a good general understanding of the Permit to work system and procedures that are operated in any location at which they may have to work.
- Have a detailed working knowledge of the Permit to work system and procedures as it applies to their own job.
- Ensure they do not start working on any job requiring a permit until one has been issued and approved.
- Ensure that the conditions and precautions set out and specified in the permit issued for work, which they will be involved with, are fully understood.
- Ensure that all precautions and safety measures specified in the permit and instructions are strictly adhered to.
- If any circumstances or conditions change, seek advice from the Permit Issuer.
- If in doubt stop and ask for assistance.
- Carry out all works in a professional manner.

Permit to work system

The Permit to work system is a way to formalize the agreements made between the contractor (permit user) and KI (permit issuer) on the way how the recognized HSE risks will be controlled during the execution of the work.

Types of permits.

- Cold work permit
- Hot work permit
- Confined space permit
- Lifting permit.
- Excavation permit

Attachment 1 include examples of the lay-out of the above mentioned permit forms. The lay-out of the permit form can differ from KI site. Always the local applicable format has to be used.

Validity

A permit is not valid until all required signatures have been applied. The same person cannot sign the permit as both Permit Issuer and Permit User.

The work permit is normally valid for 8 hours, maximum for 12 hours. The same permit can in addition be renewed for maximum of 12 hours. Where appropriate and approved by the KI representative, a longer validity of the work permit can be considered, e.g. for well-defined areas of work.

Issuance of work permits

Conditions linked to the various sections in the work permit are described below. These points must be considered in all work permits.

- The date and time of work start-up.
- Unit in which the work shall be carried out.
- The Permit User provides a short description of the kind of work to be carried out. The description shall make clear to the Permit Issuer what shall be done and how the work is expected to be carried out in a way that no misunderstandings and dangerous situations will arise.
- The Permit Issuer evaluates which measures shall be carried out before the permit may be issued by ticking off "yes". Complete preparatory work is signed for each individual point.
- In certain cases special signatures may be required. Normally this is determined by additional instructions and procedures. Beyond this, the Permit Issuer may, when necessary, request statements/permits from others.
- If the original scope of the work is changed, a new permit is required.
- In case of working in/entering a confined space a gas test shall be undertaken to ensure that the work atmosphere is free of dangerous gas concentrations before work starts. In the case of hot work, the area is tested for flammable gases and upon entry also for oxygen and/or hazardous gases. Requirements pertaining to the type of gas tests to be carried out as well as to which gases are to be examined and the results stemming from these tests will be indicated on the work permit.
- The time, the recorded concentration and gas type(s) shall be documented. Qualified personnel perform the measurements with approved measuring equipment subject to documented maintenance and calibration.

The Permit Issuer ensures that the gas test results are indicated on the permit.

- The Permit Issuer may point out special conditions, which will require special measures linked to the execution of the work. For example the work might require special safety equipment, or the Permit User must be especially attentive to conditions linked to equipment in the vicinity that may require extra cover, etc. In case of open questions the KI HSE Manager has to be consulted.
- The Permit User will collect the permit and inform the persons who will carry out the work about all conditions and actions linked to the work permit before the work is started (Task Briefing).
- The Permit Issuer and the Permit User sign that work permit application is correctly filled in and in accordance with the work to be done.
- Prior to the approval of a confined space work permit and in case of hot work activities the KI HSE Manager has to be involved to cross check the precautions. Without the written approval of the KI HSE Manager nobody is allowed to enter a confined space.

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7.2 Lockout Tagout

General information

This section establishes the minimum requirements for the lockout, tagging, and trying of energy systems to prevent injuries to personnel from moving parts, electrical shock, and pressure release by locking out and tagging the energy systems before work is started on any equipment or machinery.

Definitions

LOTO – Lockout Tagout

Authorized person – is a person who implements a lockout or tagout procedure on machines and equipment to perform servicing or maintenance.

Affected employee - an employee whose job requires him to operate, use, or be in the area of a machine or equipment on which servicing or maintenance is being performed under lockout or tagout.

Energy isolation - the disconnection or the blocking and bleeding of sources of stored energy.

Energy isolation device - including but not limited to block valves, circuit breakers, fusible disconnect switches, plug and receptacles, and blind flanges.

Stored energy - residual or available energy including but not limited to electrical, mechanical, hydraulic, pneumatic, chemical, and thermal energy.

Lock - sturdy padlock with no duplicate keys.

Lockbox - a secure, lockable container used for holding keys for individual locks applied under group lockout procedures.

Multilock device- a clamping device manufactured for the purpose of holding up to six locks which prevent the lockout hasp from opening.

Tags - tags containing the warning "DO NOT OPERATE", supplied with electrical tie-wraps for fastening to locks or manufactured locking devices; used for lockout identification when using the lockout procedure and used directly for tagout identification with the tagout procedure.

Job coordination

The contractor shall be responsible for the implementation of a lockout and tagging of energy systems procedure. The contractor is obligated to undertake any action which may be necessary or required to establish and maintain safe working conditions at the job site.

The contractor's supervisor shall notify the KI representative that specific machinery or equipment must be locked out and define the circumstances that require the lockout or tagout procedure.

The KI representative will supply the contractor with specific information as to which energy isolation devices apply to the machinery or equipment to be worked on. Where more than one energy source is involved the KI representative will also provide a sequence of isolation. The KI representative will coordinate shutting down of the machinery or equipment.

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LOTO steps

Preparation before shutdown

Prior to activity on machinery, equipment or systems the authorized person shall:

- Know the type and magnitude of the energy associated.
- Identify all energy sources (including potential energy).
- Know the hazards of the energy to be controlled.
- Know the method or means to control the energy.
- Gather the appropriate control devices.

Communication and notification

Prior to activity on machinery, equipment or systems the authorized person shall review and coordinate intended activities with the KI representative.

All affected employees shall be informed of the intended activities.

Shut down

The machinery, equipment or systems must be shut down using normal stopping procedures:

- Push 'stop' button, use switch etc.
- Using the safety interlock is NO normal stop mechanism.

Isolation

Isolate the machinery, equipment, or systems from its energy sources. Blocking of energy sources involving pipelines shall be accomplished with shutoff valves or disconnection of pipes. Blocking of energy sources may also include installation of blind flanges. The *authorized person* may employ redundant energy isolation at his discretion.

Electrical sources shall be isolated directly at a fused disconnect switch, power plug, or circuit breaker. Indirect isolation by means of a pushbutton, selector switch, or other control circuit device is **NOT PERMITTED** !

Equipment with potential for motion shall be securely blocked to prevent motion.

Release stored energy

Discharge residual energy downstream of the isolation points:

- Block elevated parts.
- Block/ release springs.
- Relieve system pressure (air, steam etc).
- Drain fluids.
- Vent gasses.
- Allow system to cool down.
- Discharge capacitors (lasers).
- Stop rotating flywheels.

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LOTO

Following isolation and discharge of residual energy, all authorized persons shall individually attach locks and tags to all energy isolation devices. Only the authorized person placing the lock shall have a key to the lock.

If securing of isolating devices is not possible, disconnection of the energy source shall be required. Following disconnection of the energy source, locks shall be installed to prevent reconnection without their removal.

Each authorized person shall connect a "Do Not Operate" tag to the secured lock by means of a non-reusable, nylon electrical tie-wrap and list name, time, and date on the tag.

Verify isolation

When locks and tags are in place, and prior to activity in the lockout/tagout area, all energy sources shall be tested to insure that the systems and equipment have been properly assessed and locked out. Authorized persons shall insure that all personnel are clear of the machine or equipment being tested. Testing shall include trying "start" pushbuttons and attempting to open or close locked out valves. Return controls to "neutral", "stop", or "off" position after the tests.

Perform servicing

The planned intervention/ work can be carried out. Make sure to avoid doing anything that could potentially reactivate the equipment.

LOTO release

After the service and/or maintenance is complete and the machinery, equipment of systems is ready for normal operations, The authorized person(s) check(s) the area to ensure that no one is exposed.

After all tools have been removed, guards have been reinstalled; the authorized person(s) can remove their LOTO devices.

Only the person(s) who attached the LOTO devices are authorized to remove them.

If the person(s) who one(s) the lock is no longer on the KI premises; the following procedure must be followed:

- Call the person who owns the lock and ask if it is safe to remove the lock and re-energize the machinery, equipment or system.
- If this person can not be reached, the KI representative determines if it is safe to remove the lock. He/she must also inspect the machinery/ equipment or system to determine if it is safe to re-energize.

LOTO specials

Group LOTO

When the number of authorized persons makes individual lockout procedures impractical, group lockout procedures may be substituted.

A single authorized person shall assume the authority to administer a lockbox, maintain a list, and monitor individuals working under the group lockout procedure.

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Single locks shall be applied to the locking devices in the field. Keys for these locks shall be stored in a lockbox kept by the authorized person who shall lock this box, keep possession of the lockbox key, and maintain a list of employees working under the group lockout procedure.

If all personnel working under the group lockout are employees of a single contractor, the KI representative may authorize the contractor to administer the group lockout procedure. If more than one contractor is involved, each contractor shall maintain a list of its employees working under the group lockout procedure and provide its list to the KI representative

The single authorized person shall remove names of persons completing work under the group lockout procedure. When all names are removed, the single authorized person shall verify that activity is complete, all personnel are clear of potential hazards, and the system or equipment is ready for re-energising. LOTO devices shall then be removed.

Shift or Personnel changes

If shift or personnel changes occur on machinery or equipment under lockout procedure, off-going and on-coming authorized persons shall insure an orderly transfer:

- The on-coming personnel shall notify the off-going personnel that they are ready to begin work on the machine or equipment.
- All LOTO devices attached to the machine, equipment or system by the off-going personnel shall be removed and immediately replaced with like devices by the on-going authorized personnel.

Training

Each authorized employee must be trained in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace and the methods and means necessary for energy isolation and control.

Each affected employee must be instructed in the purpose and use of the LOTO procedure.

All other employees whose work operations are or may be in an area where LOTO procedure may be utilized, must be instructed about the procedure and about the prohibition relating to attempts to restart or re-energize machine, equipment or systems which are locked-out and tagged-out.

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7.3 Handling and use of hazardous materials

General information

Contractors must establish and maintain a written hazard communication program that comply with applicable laws and regulations and includes:

- A list of hazardous materials in the workplace.
- Material Safety Data Sheets (MSDS).
- Provisions for container labelling.
- An employee training program.

Hazardous materials list

- Contractors must prepare and submit an electronic copy of their hazardous materials list and MSDS's tot the KI representative before the hazardous materials are brought on site.
- The hazardous materials list must contain:
 - The chemical name or the common name used on the MSDS or container label.
 - The quantity usually stored on site.
 - The area where the hazardous materials are stored and to what extent they may be stored at altered temperature or pressure.
- The hazardous materials list must be updated in case of addition or removal of a hazardous substance, or when the quantity stored changes.

Material Safety Data Sheets

Contractors must maintain the must current MSDS provided by manufacturers and distributors of the substance. As a general guideline, and MSDS dated three years earlier than the submission date should not be submitted to KI without verification that it is the latest version of the document.

A copy of each MSDS must be maintained at the work site. The copy must be easily accessible to contractors, employees and KI personnel.

Container labels

Contractors must ensure that labels on incoming containers are not removed or defaced, and that containers are clearly marked.

Each container must be labeled, logged, or marked with the identity of the hazardous chemical it contains, and it must show appropriate hazard warnings for employee protection. The hazard warning can be messages, words, pictures, or symbols used to convey the hazard. Labels must be legible, in English (plus any other language required), prominently displayed, and meet local legal requirements.

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Hazard communications

Contractors must establish a training and information program for employees potentially exposed to hazardous substance in their work area at the time of initial assignment, and whenever a new hazard is introduced to their work area. The discussion topics must include at a minimum:

- Existence of the hazard communication standard and its requirements.
- Operations in the work area where hazardous materials are present.
- Where the contractor will keep the written hazard evaluation procedures, communications program, hazardous materials list, and the required MSDS's.

Where necessary, KI will provide training on the unique hazards that contractors may encounter in KI facilities.

Contractors must report to the KI representative any illness or injury known or suspected to be associated with hazardous material use or potential exposure while on KI premises.

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7.4 Personal Protective Equipment

General information

This section defines the requirements for the use of personal protective equipment (PPE) to control or eliminate hazards or exposure to illness or injury.

Unless otherwise noted, contractors are to provide the required and needed PPE, medical clearance, and the training described in this section and are responsible for the compliance of their employees. The contractor's designated safety representative will make regular field inspections to verify compliance.

Contract employees must be trained on the use, inspection, care, and storage of all personal protective equipment.

Head, Eye and Face protection

Wearing an approved safety hat is mandatory in construction areas and designated areas at all times.

Construction areas and designated areas require eye protection at all times. Minimum eye protection includes approved safety glasses with side shields or mono-goggles. Dark safety glasses are prohibited when working indoors.

Eye protection is required to protect against flying particles, molten metal, hazardous material, gases, vapors, and light radiation. Employees must wear appropriate eye and face protection during certain tasks, including but not limited to:

- Welding, burning, or cutting with torches
- Using abrasive wheels, grinders, circular saws, or files
- Chipping concrete, stone, or metal
- Working with materials subject to scaling, flaking, or chipping
- Drilling
- Working under dusty conditions
- Waterproofing
- Using powder-actuated or pneumatic tools
- Working with compressed air or gases
- Working with chemicals or hazardous materials
- Using chop saws, chain saws, masonry saws, or similar equipment
- Working in the immediate area of operations listed above
- Working in laboratories

Respiratory protection

Respiratory protection devices must be worn by employees exposed to hazardous concentrations of dust, fumes, mists, gases, smoke, sprays, vapors or other hazards as required legal requirements.

A respiratory protection program must be established that includes medical surveillance; training; equipment selection, storage, and maintenance; fitness testing; and recordkeeping

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Hearing protection

Approved hearing protection must be worn by employees exposed to noise levels above 85 decibels and in designated areas. Hearing protection must attenuate noise levels to less than 85 decibels.

A hearing conservation program must be established as required by legal requirements.

Fall protection

Fall protection is required for work performed at certain heights as established by local legal requirements.

One or a combination of the following fall protection systems can be used on KI sites:

- A fall arrest system consisting of a full body harness, shock absorbent lanyard(s), or a self-retracting lifeline
- Guardrail systems
- Work platforms with standard guardrails
- Interior and exterior safety nets.

Body harnesses, shock absorbent lanyards, and self-retracting lifelines, regardless of configuration, must be subjected to a documented inspection by the contractor. Inspection records are to be maintained by the contractor so that they are available upon request to appropriate KI representatives.

Personal fall arrest systems shall be inspected prior to each use for wear, damage, and other deterioration and defective components shall be removed from service.

Footwear

All personnel in construction and demolition areas are required at all times to wear safety footwear meeting the applicable requirements for toe-cap protection.

Contractors must ensure that the appropriate protective footwear is worn by employees in areas where safety shoes signs are posted and in areas where workers are exposed to foot injuries due to falling or rolling objects, objects piercing the sole, or where workers' feet are exposed to electrical hazards.

Hand and Skin protection

Wear appropriate hand protection when handling objects or substances that could cut, burn, injure the hand, or be absorbed into the skin, and when exposed to harmful temperature extremes.

Shirts with sleeves must be worn at all times.

Shorts are prohibited in project and non-public areas

Welding, Cutting and Burning

Wear a welding helmet with welding hood (combination hard hat) when welding. Soft caps are prohibited.

Face shields or goggles that fit on hard hats must be worn along with approved safety glasses during grinding operations.

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For overhead work, wear fire-resistant hard hats and fire-retardant shoulder covers.

Keep clothing free of oil, grease, and flammable material. Button collars and cuffs, and turn pant cuffs inside pants. Pockets must be covered with flaps and buttoned, or removed from the front of vests, shirts, and aprons.

Welders and their helpers must wear gloves and proper infrared/ultraviolet eye protection in addition to safety glasses.

Workers engaged in oxy-acetylene welding or cutting must wear a welding helmet or safety goggles that are equipped with suitable filter lenses.

Workers who are engaged in electric arc welding must use shields or helmets that are equipped with suitable filter lenses that fit on a hard hat.

Wear approved safety glasses or goggles under a combination hard hat or welding hood.

Do not perform welding, burning, or open flame work on staging suspended by fiber or synthetic rope

Additional PPE

The contractor must furnish any additional equipment required by unusual circumstances (such as high temperature work or handling corrosive liquids) and not specifically covered in this section. Use of such must be reviewed with the KI representative.

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7.5 Welding, Cutting and Burning

General information – Permit to work

Welding, cutting, or spark-producing work is prohibited until the required permits have been issued.

Handling and storage of cylinders

- A suitable cylinder truck with chain or other secure form of fastening must be used to keep cylinders from being knocked over while in use or in storage. An acceptable cylinder wrench must be installed on each cylinder truck.
- Do not store cylinders of oxygen near cylinders of acetylene or other fuel gas. Do not place cylinders where they can contact an electrical circuit.
- Keep oxygen cylinders, cylinder valves, couplings, regulators, hoses, and apparatus free from oil and grease. Do not handle oxygen cylinders or apparatus with oily hands or gloves.
- Keep cylinders in storage away from sources of heat, flame, and direct sunlight. Remove combustibles from the storage area.
- Close valves on empty cylinders. Keep valve protection caps in place except when cylinders are in use or connected for use.
- Provide a suitable platform when moving cylinders by crane or derrick. Do not use slings, hooks, or electric magnets. Cylinder caps should remain installed on the cylinder until connected to equipment. Keep the cylinder cap near the cylinder when in use.
- Do not store or take compressed gas cylinders into closed or confined areas, or near elevators or stairs.
- Store compressed gas cylinders in well-ventilated, proper construction storage racks that are labeled for the type of gases to be stored. If a leak develops in a cylinder and it cannot be immediately corrected, move the cylinder to a safe location outside the building.
- Visually inspect cylinders to ensure they are safe before use.

Welding, cutting and other Hot Work Operations

Welding, cutting, or spark-producing operation requires a fire watch depending on the risks.

- A fire watch consists of a properly trained person standing by with an approved fire extinguisher provided by the contractor.
- The fire extinguisher must be of a size and type that will extinguish a fire that may ignite on materials being welded or cut or on materials immediately adjacent to welding and cutting operations.

Ensure adequate ventilation.

When welding overhead, take precautions to prevent sparks from falling on other workers.

Do not use regulators, leads, torches or other associated equipment that is damaged or defective.

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7.6 Electrical Safety

General information

This section applies to the installation of temporary and permanent electrical work and the use of electrical power to operate equipment and electrical power tools.

Approved procedures, depending on country specific legislation must be followed for work on electrically charged components.

Definitions

Extra Low Voltage (ELV) – Normally not exceeding 50V a.c. or 120V d.c. whether between conductors or to earth.

Low Voltage (LV) – Normally exceeding ELV but not exceeding 1000V a.c. or 1500V d.c. between conductors or 600V a.c. or 900V d.c. between conductors and earth.

High Voltage (HV) – Normally exceeding LV.

Live – at a voltage by being connected to a source of electricity.

Isolated – separate from all other systems

Dead – means that the electrical equipment is neither live nor charged.

Charged – means electrical equipment that has acquired a charge either because it is live or because it has become charged by other means such as by electrostatic or induction charging, or has retained or regained charge due to capacitance effects even though it may be disconnected from the rest of the system.

Basic safety clearance – is the minimum distance, which is considered to be safe, from any point on the live electrical equipment to any part of a person, including conductive tools, plant, equipment etc, with which the person may be in contact.

General

- All personnel that are to carry out tasks related to operation, maintenance, repairs and modifications of electrical installations and equipment must be qualified.
- All work on electrical installations requires an approved work permit.
- All electrical equipment shall be assumed to be live unless arrangements have been made to make it dead.
- Where special tools, including insulated tools, equipment and protective clothing are specified as part of the safe system of work, these shall be used.
- When working on or near temporary connections, the same safety precautions shall be taken as in the case of permanent connections.

ELV and LV

- Electrical equipment to be worked on must be isolated and proved dead. Adequate precautions shall be taken to prevent such electrical equipment from becoming electrically charged during work if danger may thereby arise.

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- A written instruction which details the isolation and the earthing procedure of the system must be put together.
- Working on or near electrical equipment with live exposed conductors shall only be carried out where justified by one or more of the following conditions:
 - When it is not practicable to carry out the work with the conductors isolated, e.g. live testing.
 - When greater hazards would be created by isolating the electrical equipment.
- Where live working is justified, as safe system of work must be documented and implemented.
- When work on or near live electrical equipment is permitted, then suitable instruments, tools and protective equipment must be provided and used.

HV

- All high voltage equipment shall be kept secured against unauthorized access.
- Except for testing purpose, work shall not be undertaken on live high voltage equipment.
- Before work is to be carried out on isolated and, if required, earthed high voltage electrical equipment, a written instruction shall be produced detailing the isolation and earthing procedure, the procedure for issue and cancellation of safety documentation and the requirements for accompaniment.
- Work shall not be undertaken near live and exposed high voltage electrical equipment which might require a person and any equipment being used to infringe the basic safety clearance as stated in the applicable legislation.
- This clearance may be maintained by the use of permanent and/ or temporary screens, fencing, notices or supervision.
- Where it is necessary for testing to be carried out on live high voltage equipment, this shall be detailed in a written instruction which shall include a safe method of carrying out the testing, the procedure for the issue and cancellation of safety documentation and the requirement for accompaniment. However, at all times while testing is being carried out, no part of a person shall infringe the basic safety clearance.

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7.7 Roof work

General information

Any work on a roof is high-risk. High safety standards are essential however long or short term the work is. The nature of the precautions needed may vary from one job to another, but not providing any safeguards is unacceptable.

Precautions for all roof work

Is the work necessary?

If roof work can be avoided, this must be implemented without any exception.

Risk assessment

A risk assessment should be carried out for all roof work.

Risks needs to be identified before the work starts and the necessary equipment, appropriate precautions and systems of work are provided and implemented.

Safety method statements must be prepared. They should be specific and relevant to the job in hand and describe clearly the precautions and system of work identified during risk assessment. Everyone involved in the work needs to know what the method statement says and what they have to do. A copy of the composed method statement must be provided to the KI HSE Manager.

Roof access

A secure means of entry and exit is essential in case of roof work. A properly secured ladder is the minimum requirement.

Edge protection

Edges of the roof must be protected to avoid falling from height.

Work platform

As well as edge protection it is just as important to provide an adequate and secure working platform. 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.

Fall arrest equipment

Providing adequate platforms and edge protection may not always be possible or reasonably practicable. If so either safety nets or harnesses will be required.

Nets must be properly installed by competent riggers as close as possible below the roof involved to minimize the distance fallen. Installing a net **does not** mean that proper working platforms and edge protection can be ignored.

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Harnesses must be securely attached to a sufficiently strong anchorage point and they must be worn always.

Falling material

It is prohibited to throw material from a roof. Use enclosed rubbish chutes or lower material to the ground instead.

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.

Particular care is needed where there is public access close to roof work.

Weather conditions

Do not work on roofs in icy, rainy or windy conditions.

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7.8 Scaffolds and Ladders

Scaffolds

Scaffold erection

- Scaffolds must be designed, erected, altered and dismantled by a competent person in accordance with the legal requirements.
- Scaffolders should always adopt a safe system of work during the erection, altering and dismantling of scaffolds.
- The platform of a general purpose scaffold should be at least four boards wide.
- All scaffolds, including 'independent' scaffolds, should be securely tied or otherwise supported. More ties will be required if:
 - The scaffold is sheeted or netted due to the increased wind loading.
 - It is used as a loading platform for materials or equipment.
 - If hoists, lifting applications or rubbish chutes are attached to it.
- System scaffolds should be erected following the manufacturer's instructions.

Safe use of scaffolds

- Do not take up boards, move handrails or remove ties to gain access for work.
- Changes should only be made by a competent person.
- It is prohibited to work from platforms that are not fully boarded.
- Do not overload scaffolds. Make sure they are designed to take the loads put on them. Store materials so the load is spread evenly.
- Make sure there is suitable stair and ladder access onto the working platform.

Scaffold inspection

Scaffolds must be inspected by a competent person:

- Before first use.
- After substantial alteration.
- After any event likely to have affected their stability (e.g. following strong winds).

Before contractors allow their employees to use someone else's scaffold they must make sure it is safe.

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Scaffold Tag

The contractor erecting the scaffold must attach a standard industry tag to a completed scaffold at the point of access to signify the scaffold was designed and erected by a competent person and is safe for use.

The tag must state the intended purpose of the scaffold and indicate the level of PPE required to use the scaffold. The tag and the handwriting on it must be capable of withstanding extended periods of inclement weather.

Protecting the public

- Scaffolds must be designed to prevent materials falling. Provide brickguards, netting or sheeting. Where the risk is high, or for example during demolition or facade cleaning, provide extra protection in the form of scaffold fans or covered walkways.
- Stop unauthorized access onto the scaffold, for example by removing all ladders at ground level, whenever it is left unattended.

Ladders

Ladder management

Ladders must only be used as a workplace for short-term work. They are only suitable for light work.

Only approved and tagged ladders are to be used. Defect equipment must be tagged, taken out of service and locked away until they are repaired or removed.

If ladders are to be used, make sure:

- The work only requires one hand to be used.
- The work can be reached without stretching.
- The ladder can be fixed to prevent slipping.
- A good handhold is available.

Light tools must be carried in a shoulder bag or holster attached to a belt so that both hands are free for climbing. Heavy or bulky loads must not be carried up or down ladders.

In order to use a ladder safely, the person should be able to reach the work from a position 1 meter below the top of the ladder.

For safe use the ladder needs to be strong enough for the job and in good condition:

- Check the stiles are not damaged, buckled or warped, no rungs are cracked or missing and any safety feet are not missing.
- Do not use makeshift or home-made ladders or carry out makeshift repairs to a damaged ladder.
- Do not use painted ladders, as the paint may hide faults.
- Do not use wooden ladders.
- Do not attempt to repair the ladder.

Check the ladder is secure. Ladders are only safe when they rest on a firm, level surface. They must be secured by rope or other suitable stabilization devices (to prevent that the ladder runs sideways or slides away from the wall).

The ladder must be angled to minimize the risk of slipping outwards (one out for every four up).

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The top of the ladder must rest against a solid surface.

If the ladder cannot be fixed, a second person foots the ladder while it is being used (this also applies while the ladder is being fixed).

The ladder extends a sufficient height above any landing place where people will get on and off it unless some other adequate handhold is available.

Where ladders are used in a run measuring a vertical distance of more than 9 m, suitable landing areas or platforms have to be provided.

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7.9 Excavation and Trenches

Definitions

A trench is referred to as a narrow excavation in which the depth is greater than the width, with the width not being greater than 5 meters.

Permit to work

Every excavation works requires a work permit.

Designing adequate protection

Some of the considerations contractor shall take into account in design of protection:

- Soil classification.
- Depth of cut.
- Water content of soil.
- Changes Due to Weather and Climate.
- Superimposed loads.
- Vibrations.
- Other operations in vicinity.

The excavation need to be protected against collapsing of the walls:

- Slope the sides to a safe angle. The angle varies with different kinds of soil and shall be determined on each individual project. When an excavation has water conditions, silty material, or loose boulders, or when it is being dug in areas where erosion or slide planes are apparent, the safe angle shall be flattened.
- A second method of support is shoring-sheeting, tightly placed timber shores, bracing, trench jacks, piles, or other materials installed in manner strong enough to resist the pressures surrounding the excavation. Contractors may also use a trench box, a prefabricated, movable trench shield composed of steel plates welded to a heavy steel frame. All of these means mentioned above should be specified by the project documentation.

Underground lines, equipment and electrical cables shall be identified and located prior to beginning excavation work.

Physical barriers shall be placed around or over trenches and excavations. Flashing light barricades must be provided at night.

Vehicles with obstructed view, moving next to an excavation need to be guided by a second person.

Specific protection measures must be diploid when water is present in the excavation.

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7.10 Cranes and Rigging

General information

Contractors whose activities require the use of cranes are responsible for proper set up and operation. Cranes may be rejected for any defect, no matter how minor.

The KI representative defines when a lifting plan is necessary. Lift plans must be approved by the KI HSE Manager or an authorized representative. Lift plans must contain crane, rigging and load details as well as sketches or electronic drawings that include both a plan view showing swing direction and crane placement with respect to the facility and a crane elevation showing the boom angle and extension extremes of the lift.

A lifting plan is mandatory for the following lifts:

- Any lift exceeding 75% of the crane's rated capacity at the required lifting configuration.
- Any lift that requires the use of more than one crane or is made in combination with other lifting equipment.
- Any lift located in an area where there is exposure to electrical hazards, overhead piping systems, vessels, operational buildings, etc.

If a material or equipment lift does not require a formal lift plan according to the above criteria, a Job Hazard Analysis of the lift must be performed prior to the lift. Evidence of such an analysis may be demanded at any time by the KI HSE Manager or an authorized representative.

For all lifts, a pre-lift meeting shall be conducted for all personnel involved with, or in the area of, the lift so that all are aware of the planned activity and the potential hazards associated with the lift.

Prior to any lift, contractors will provide the KI HSE Manager and/or the KI representative with documented evidence of the legal inspections in accordance with local legal requirements for all crane, hoisting, and associated rigging equipment brought onto the site. If the inspection record is not produced or if the crane or its associated rigging exhibits any damage or excessive wear, the crane cannot be used.

The crane operator or other competent person will perform a daily inspection of cranes. The person performing this inspection will document results in writing, and the documentation will be available for examination upon request. In addition to daily inspections, if a crane is moved or the process changes during operations it must be re-inspected prior to performing the lift in order to reflect the changes.

At no time will any lift be made over occupied space. At no time will lifts be made over personnel.

Recordkeeping

Records pertaining to crane inspections will be kept on site with the crane or in the contractor's temporary office.

The crane operations and maintenance Requirements shall be available for inspection at each crane or hoisting equipment.

Operator qualifications and operating procedures

Only designated crane operators who have been licensed by an approved agency may operate cranes and hoisting equipment.

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No one other than the designated operator will be in or on the crane during operations.

Rigging requirements

- A qualified rigger must inspect rigging equipment prior to each use and immediately remove from service and destroy any damaged or defective slings.
- Rigging devices, including slings, must have permanently affixed identification stating size, grade, rated capacity, and manufacturer.
- Remove rigging not in use from the immediate work area.
- Hang rigging and slings on a rigging frame to eliminate bends and kinks.
- Do not leave slings lying on the ground or exposed to dirt or the elements.
- Do not shorten slings using bolts, knots, or other devices.
- A licensed engineer or the manufacturer must certify lifting beams and spreader bars as to their configuration and lifting capacity

Work platforms suspended from cranes

Cranes may be used to hoist, lower, and suspend personnel on a work platform **ONLY** when such action results in the least hazardous exposure to employees. This activity must be approved in writing by the KI HSE Manager.

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7.11 Fire prevention and protection

Fire prevention and protection procedures

Temporary heating equipment:

- Temporary heaters are prohibited unless approved by the KI representative. A hot work permit is required.
- Operation and maintenance of temporary heating equipment is the responsibility of the contractor. Heaters must bear the CE label.
- A tip over shut-off device must be included for space heating equipment.
- Operators must be trained for the use of fire extinguishers.
- Provide adequate ventilation when using liquid fuels in an enclosed environment, and conduct atmospheric testing as needed.

Flammable and Combustible Materials:

- Storage and use of flammable liquids is prohibited without the written approval of the KI HSE Manager or the KI representative.
- Store and handle flammable and combustible materials with regard to their fire characteristics. Materials must be clearly labeled.
- Store flammable liquids and gasses outdoors in an approved manner and dispense only in approved safety containers.
- Separate and store combustible materials or equipment in non-combustible containers in a proper manner.
- If approved for use, do not store more than a one day supply of combustible materials or containers in one location within the building. Locate supplemental firefighting equipment in the vicinity of these containers and materials.

Fire extinguishers should only be used by employees who have received documented fire extinguisher training within the past 12 months.

Provide access to the work area and around the perimeter.

Remove combustible waste materials, rubbish, and debris immediately. Provide proper safety waste cans for disposing oily rags or combustible materials.

Replace temporary firefighting or fire protection equipment immediately after use, and remove when the work is complete.

Gasoline or diesel powered portable generators must be approved by the KI representative and used only when a qualified operator is present.

Post "No Open Flame" signs when combustible materials are stored.

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Temporary fuel tanks

Temporary fuel tanks (gasoline, diesel, and fuel oil) are only allowed when approved by the KI representative.

Temporary fuel tanks may require a permit in accordance with local and state regulations.

Temporary fuel tanks shall have required marking and signage. Provide secondary containment where feasible.

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7.12 Hygiene and Housekeeping

General information

Good housekeeping is mandatory. Contractors must keep their work area neat, clean and orderly.

If a contractor's work area is not kept clean, KI may have the area cleaned and charge the cost to the contractor. KI may also stop work until the area has been cleaned.

Personal Hygiene

A high standard of personal hygiene shall be maintained on the site at all times.

Overalls and clothes must be kept as clean as possible in a serviceable condition and laundered at regular intervals. Overalls and clothing saturated with oil, grease, chemicals, etc., must be changed and laundered.

Washing hands before the consumption of food is essential in all cases, particularly when work has involved the handling of leaded products, chemicals etc.

Housekeeping principles

The following is a summary of basic housekeeping precautions:

- Stairways shall be kept clear of all materials and should be adequately lit.
- Stair treads shall be kept clean of slippery substances (outside stairways are particularly vulnerable in wet/icy weather).
- All walkways and escape routes shall be kept clear of obstructions at all times.
- Stacked materials shall not protrude into walkways (especially at eye level).
- Tools, etc. shall not be left on overhead work platforms, where they can fall and strike personnel below.
- Floors shall be kept clear of slippery substances (e.g. oils etc.) which can cause slipping or falling injuries.
- Improper stacking and storage of materials is prohibited.
- Storage and waste collection areas shall be conveniently located where the work force will use them.
- Books and papers shall be kept in proper places (e.g. files, folders, etc.) and not permitted to lie haphazardly around the offices.
- Areas around working machines shall be kept clean and free of obstructions.
- An area for scrap materials shall be allocated.
- All waste materials shall be disposed of in an approved manner (in appropriate waste container).

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7.13 Environmental issues

Hazardous waste management

Contractors are responsible for the safe use and disposal of chemicals and hazardous materials brought onto KI premises in compliance with applicable laws and regulations, and for complying with the applicable requirements for generators of hazardous waste.

Contractors that generate hazardous waste must comply with local and other applicable regulations. No hazardous waste may be disposed in KI waste containers. If there are questions, consult the KI HSE Manager for disposal directives.

The disposal of waste materials such as asbestos, lead paint, hazardous construction debris, or contaminated soil resulting from demolition, excavation, or maintenance activities that are not the result of hazardous materials or petroleum products brought on site by a contractor must be approved by KI. These waste streams must be transferred to the KI HSE Manager for disposal or be disposed of in accordance with local regulations.

Spill prevention and control

To minimize the risk of spills or releases to the environment, contractors must employ appropriate protective procedures such as double containment, employee training, overflow protection, and other measures as part of activities involving the use, storage, or handling of petroleum products or hazardous materials on KI property.

Containers of hazardous materials and petroleum products must be stored in order to prevent releases to the environment. This requires selecting locations and methods to minimize exposure to rainfall, surface water, and the ground. Enclosures, shelters, and secondary containment must be used where appropriate. Containment pans must be placed under equipment where there is the potential for a leak or discharge. In the event that secondary containment is used in an area that is exposed to rainfall, the following requirements apply:

- Prior to discharge of a containment system to the storm water system, inspect the primary container for signs of leakage, and inspect the containment system by visual observation for color, foam, outfall staining, visible sheens, and dry weather flow. The discharge of a containment system that has evidence of contamination is prohibited.
- The responsible contractor must maintain a log indicating the individual making the observations, description of accumulated storm water, and the date and time of release.
- Submit a copy of the log to the KI HSE Manager.

Discharges to storm water sewer systems.

A discharge to a storm water sewer system refers to any discharge to a storm water drain, parking lot, ditch, loading dock, or ground that is not connected to a sanitary sewer. The following types of non-storm water discharges may be discharged to the facility's storm water sewer systems:

- Uncontaminated groundwater
- Water from foundation drains and footing drains
- Air conditioner condensate without added chemicals
- Springs
- Uncontaminated potable water
- Waterline, sprinkler system, and fire hydrant flushing

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No other water discharges are permitted.

An unauthorized or unpermitted non-storm water discharge is classified as an environmental accident and must be reported and documented in accordance with the applicable procedures.

Erosion control

Settling basins and/or straw barricading around storm sewers is required for ground breaking or any condition that could cause silt to enter a storm sewer.

Open burning

Open burning of debris on KI premises is prohibited.

Disposal of waste in sanitary sewers

No hazardous materials, chemicals or other products must be disposed in sanitary sewers.

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7.14 Confined Space Entry

General information

A confined space means any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk.

Entry in a confined space is not allowed unless a confined space permit is being issued.

Personnel, equipment and supplies needed for the entry must be present at the confined space before beginning work.

All employees authorized to work in a confined space, employees authorized to issue a work permit, the attendants and the employees that are member of an emergency team must be trained in confined space entry procedures.

Potential hazards in a confined space

Danger can arise in confined spaces because of:

- Oxygen deficiency: < 19,5% or > 23,5%.
- Poisonous gas, fume or vapor. These can:
 - build-up in sewers and manholes in pits connected to the system,
 - enter tanks or vessels from connecting pipes,
 - leak into trenches and pits in contaminated land, such as old refuse tips and old gas works.
- Liquids and solids which can suddenly fill the space (e.g. blockages which can collapse unexpectedly), or release gases into it.
- Fire and explosions from flammable vapors, excess oxygen, excess dust.
- Residues left in tanks, vessels which can give off gas, fume or vapor.
- Burns to heating up the vessel (e.g. by steam).
- Electrocution.

Some of the above conditions may already be present in the confined space. However, some may arise through the work being carried out, or because of ineffective isolation of plant nearby, eg leakage from a pipe connected to the confined space. The enclosure and working space may increase other dangers arising through the work being carried out, for example:

- Machinery being used may require special precautions, such as provision of dust extraction for a portable grinder, or special precautions against electric shock;
- Gas, fume or vapor can arise from welding, or by use of volatile and often flammable solvents, adhesives etc;
- If access to the space is through a restricted entrance, such as a manhole, escape or rescue

Entrant versus Attendant

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Entrant – This is the employee who will physically enter the confined space to perform the work.

Attendant – This is the employee who remains outside the confined space and monitors the entrant(s). He guards the confined space against unauthorized entry. He warns the entrant(s) of any unusual conditions. He summons the rescue personnel if needed. He does NOT enter the confined space himself in case of rescue.

Risk Assessment

The contractor must carry out a suitable and sufficient assessment of the risks for all work activities for the purpose of deciding what measures are necessary.

For work in confined spaces this means identifying the hazards present, assessing the risks and determining what precautions to take. In most cases the assessment will include consideration of:

- The task.
- The working environment.
- Working materials and tools.
- The suitability of those carrying out the task (physically and mentally).
- Arrangements for emergency rescue.

Safe System of work

Appointment of a supervisor

Supervisors must be given responsibility to ensure that the necessary precautions are taken, to check the safety at each stage and may need to remain present while work is underway.

Isolation

Mechanical and electrical isolation of equipment is essential if it could otherwise operate or be operated inadvertently. If gas, fume or vapor could enter the confined space, physical isolation of pipework etc needs to be made. In all cases a check must be made to ensure isolation is effective.

The isolation must be made effective by applying Lockout Tagout.

In case of residue left in the confined space, this must be cleaned before taken the next step.

Ventilation

- Use mechanical ventilation by using fans, air horns.
- Ventilate at the rate of at least 4 volumes per hour.
- Make sure the air supply used for the ventilation is not contaminated. The air supply must come from fresh air, uncontaminated with flammables, toxins etc.

Pre-entry meeting

The responsible supervisor will organize a pre-entry meeting at which all concerned employees (entrant(s) and attendant(s)) must attend.

During this meeting, the following topics must be discussed:

- A review of the hazards of entry and the hazards of the work.
- A review of the PPE necessary to perform the job and the PPE necessary to perform a rescue.
- A review of the procedure for contacting rescue personnel.

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At the end of the meeting, the confined space permit must be completed and signed off by all parties.

Atmosphere testing

Atmosphere testing must be performed:

- Prior to every entry.
- After a 10 minute ventilation period (if ventilation is necessary).
- At least every hour.

The atmosphere inside the space must be tested on:

- Check for oxygen content: at least 19,5% and less than 23,5%.
- Check for flammables.
- Check for toxic gasses.

The air quality must be tested at various levels in the confined space to be sure that the entire space is safe.

Any time a limit – as stated on the confined space work permit – is exceeded, all personnel shall immediately exit the confined space, and nobody shall enter until the atmospheric conditions are returned to safe levels.

Entering the confined space

- The attendant must be present near the entrance for the WHOLE duration of the work.
- The attendant must be in constant communication with the entrant(s) while the job is in progress.
- The entrant(s) must wear the necessary PPE (as defined via the risk assessment made) suitable to perform the job.
- The entrant(s) must wear a safety harness to assure an efficient rescue when necessary.
- All entrant(s) must be mentioned on the work permit.

When the job is done

- Remove all personnel, tools and debris from the confined space.
- Remove the LOTO devices.
- Sign of the confined space permit.
- Close the confined space.

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8 Attachments

Attachment 1 Work Permits

Attachment 2 Contractor Acknowledgement Form

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Attachment 1 Work Permits



Cold Work Permit



Hot Work Permit



Confined Space
Permit



Lifting Permit



Excavation Permit

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Attachment 2 Contractor Acknowledgement Form

I, _____, as the representative of _____, hereby attest and affirm that all Contractor employees that _____ represents (including subcontractors) on any Knauf Insulation jobsite: 1) have either received copies of, or been trained in, and by their signature on a Contractor Safety Training Log understand and agree to abide by Knauf Insulation Contractor HSE Requirements.

The KI representative will provide the Contractor with any additional information in regard to workplace hazards and environmental, health and safety rules, and procedures that must be adhered to in the performance of the particular job task to be undertaken while performing work at a Knauf Insulation manufacturing facility.

_____ Safety Representative shall disseminate and ensure compliance with all environmental, health, and safety information to all contractor employees (and their subcontractors, if applicable) prior to the commencement of work on any Knauf Insulation manufacturing facility or jobsite.

Contractor is in agreement that failure to follow and comply with these rules and procedures will result in a warning and then removal from the property or jobsite, this includes individual personnel up to the entire company/group.

Contractor Project Manager or Safety Representative

Date Signed

Knauf Insulation Purchasing Manager

Date Signed

(Sign and Return to the Knauf Insulation Purchasing Office)