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كصپيٽن دان عالم سكيتر
Safety, Health and Environment
National Authority

INDUSTRY GUIDANCE NOTE

TOPIC: LIFTING OPERATIONS AT THE WORKPLACE				Reference Number: 2024/IGN/02
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1. INTRODUCTION

The Workplace Safety and Health Order, 2009 (**WSHO, 2009**), the Workplace Safety and Health (Construction) Regulations, 2014 and the Workplace Safety and Health (General Provisions) Regulations, 2014 place duties on persons, occupiers, employers and principals who own, operate or have control over any lifting equipment as well as manufacturers and suppliers. This includes all organisations whose employees are involved in the use of lifting equipment, whether owned by them or not. All lifting operations involving lifting equipment as listed under Fifth Schedule (Part I) of the WSHO, 2009 must be properly planned, appropriately supervised, and carried out in a safe manner by a competent person.

The legislation also requires that all equipment used for lifting is safe, fit for purpose, appropriate for the task, suitably marked and subject to certification and statutory periodic thorough examination and inspection by an authorised examiner. Records must be kept of all thorough examinations and inspections and any defect or failure found by the authorised examiner on the lifting equipment (including accessories) must be reported to the person responsible for the equipment; and any defect or failure found by any person including the authorised examiner or the competent person as the case may be, on lifting machines such as cranes including any crane accident must be reported immediately to both the person responsible for the lifting machine.

There is also a need to inform the Safety, Health and Environment National Authority (SHENA), as soon as reasonably practicable, if the examination shows that the lifting equipment cannot continue to be used safely (which can cause an imminent risk of serious personal injury) unless repairs are made. Further details are stated in SHENA's Note to Industry (Reference no.: 2024/NTI/03).

2. GLOSSARY OF TERMS AND ABBREVIATIONS

ABBREVIATIONS	TERM	DEFINITION
AE	Authorised Examiner	A person approved by SHENA under Section 33 of the WSHO, 2009 for the purpose of carrying out any prescribed examination or test of hoist and lift, lifting gear, and lifting appliance or lifting machine. (as defined under the WSHO, 2009)
ERP	Emergency Response Plan	A written plan which outlines the steps to be taken in the event of an emergency.
PTW	Permit-to-Work	A formal process in the form of a written document used to control high-risk activities. This system authorizes and defines the operation to be carried out along with the potential risk hazards involved.

RA	Risk Assessment	Risk Assessment is a process to identify, analyse, and evaluate the potential risk hazards for a particular activity or operation, which must be conducted before starting an activity or operation.
SWL	Safe Working Load	Maximum safe load in which lifting equipment can lift, lower, suspend, or move without damage or failure to equipment.
TPIA	Third Party Inspection Agency	It is a business organisation, which complies with the ISO 17020 standards. Such organisations are third-party inspection agencies which must not be involved in any activities other than inspection, examination, and testing.
WSH Officer	Workplace, Safety and Health Officer	Workplace, Safety and Health Officer appointed under Section 28 of the WSHO, 2009.
WSH Co-Ordinator	Workplace, Safety and Health Co-Ordinator	Workplace, Safety and Health Co-Ordinator appointed under Section 29 of the WSHO, 2009.
WSHO, 2009	Workplace Safety and Health Order, 2009	Primary Law on Workplace Safety and Health in Brunei Darussalam, introduced in 2009 sets the general framework to which all workplaces must comply and has been enforced with effect from 1st August 2013.

3. DEFINITIONS

Key definitions for this IGN are listed below:

TERM	DEFINITION
Lift	Any lifting appliance or lifting machine used for carrying persons, whether together with goods or otherwise. (as defined under the WSHO, 2009)
Lifting Appliance	A pulley block, gin wheel and chain block or set of chain blocks. (as defined under the WSHO, 2009)
Lifting Equipment	Generic term used in this IGN which encompasses the terms hoist and lift, lifting gear, lifting appliance and lifting machine.
Lifting Gear	(a) any chain, rope, chain sling, webbing sling, rope sling, ring, hook, shackle, swivel or eyebolt; and (b) any cage or work platform used for carrying persons while it is suspended from the load line of a crane. (as defined under the WSHO, 2009)
Lifting Machine	(a) any crane, crab, winch, teagle, runway, transporter, piling frame or piling machine; and

	(b) any work platform or suspended scaffold capable of being raised or lowered by climbers, winches or other powered device. (as defined under the WSHO, 2009)
Employee's Lift	Powered car operating in guides and used primarily to carry persons in a substantially vertical direction (as defined under the WSH (Constructions) Regulation, 2014)
Project Manager	Person who is stationed at a worksite and who has overall control of all the works carried out in the worksite, and includes any competent person appointed by the occupier of the worksite in the event that the project manager is unable to perform his/her duties under these Regulations. (as defined under the WSH (Constructions) Regulation, 2014)

Appendix A provides images (non-exhaustive) of common lifting equipment.

4. **PURPOSE**

The purpose of this Industry Guidance Note (IGN) is to serve as a guidance and reference for any matter pertaining to the lifting requirements at the workplace in Brunei Darussalam governed under the WSHO, 2009.

This guidance elaborates in detail regarding good practices of the lifting plan that must be created, developed and practiced upon the initiation of the lifting operation. Once the approved lifting plan, along with the risk assessment, permit-to-work, emergency response plan, trained and competent workers, and AE/TPIA certified lifting equipment are established, these aspects shall be discussed and finalised to ensure safe lifting operation.

5. **SCOPE**

This document applies to all lifting operations in the workplace in Brunei Darussalam with the use of lifting equipment as defined in the WSHO, 2009 and its regulations thereunder. However, this IGN excludes any lifting requirements related to man-riding operations.

This guidance also provides safe lifting practices for personnel involved in the planning as well as implementation phases of the lifting operation.

Site managers/supervisors/operators can use the IGN as a guidance in terms of: -

1. Creating a lifting plan;
2. Identifying the risks using the risk assessment method;
3. Applying a permit-to-work system;
4. Identifying and practicing possible emergencies and response plans;
5. Ensuring the training and competency of lifting equipment operators; and
6. Ensuring lifting equipment is inspected and certified.

6. APPLICABLE LAWS AND REGULATIONS

This section provides the relevant legal provisions under the WSHO, 2009 and its regulations thereunder that are applicable to lifting operations. As additional guidance, SHENA has developed a self-assessment checklist which can be found in **Appendix B**.

6.1 Duties of Occupier

Section 11(c) of the WSHO, 2009 imposes the duty of every Occupier to take, so far as is reasonably practicable, measures to ensure that any machinery or equipment kept in the workplace is safe and without risks to health to everyone within those premises, whether or not that person is at work or is an employee of the occupier.

For example, an Occupier must ensure the collapse zone area (the area where the jib, hook and counterweight are located) of the tower crane is within the worksite boundary. Unless there is a mitigation in place, such as the collapsed zone lying within uninhabited areas or non-public access areas, the zone of collapse is mitigated by the building structure.

Regulation 22 of the WSH (General Provisions) Regulations, 2014 states that it shall be the duty of the Occupier to keep a register containing such particulars as the Authority may specify with respect to lifting gears, lifting appliances and lifting machines to which regulation 20 and 21 apply.

It is advisable for the register to include, but not limited to:

- Valid certification;
- Repair and maintenance reports; and
- Manufacturer manuals.

6.2 Duties of Employer

Section 12 of the WSHO, 2009 requires the Employer to take, so far as is reasonably practicable, such measures as are necessary to ensure the safety and health of his employees at work.

These measures include ensuring that adequate safety measures are taken with respect to any machinery or equipment used by the employees. The Employer shall also ensure that persons at work have adequate instruction, information, training, and supervision as is necessary for them to perform their work.

6.3 Duties of Persons at Work

Section 15(2) of the WSHO, 2009 requires that no person at work shall wilfully or recklessly interfere with or misuse any appliance, protective clothing, convenience, equipment or other means or thing provided (whether for his use alone or for use by him in common with others) pursuant to any requirement under this Order for securing the safety, health or welfare of persons (including himself) at work.

6.4 Duties of Manufacturers and Suppliers

Section 16 of the WSHO, 2009 imposes the duty of the manufacturer and supplier of any machinery or equipment for use at work to ensure, so far as is reasonably practicable to ensure it is safe, and without risk to health, when properly used.

These include ensuring that lifting equipment to be in full compliance with international standards and codes, and that it is equipped with all the required safety devices stipulated by the applicable design standards and codes at the time it is manufactured or constructed.

6.5 Duties of Authorised Examiner (AE)

Regulations 19(13), 20(5) and 21(15) of the WSH (General Provisions) Regulations, 2014 imposes the duty of an Authorised Examiner (AE) to exercise all due diligence in making any certification or in conducting any test or examination of any hoist, lift, lifting gears and lifting machine respectively.

Thorough examination and inspection are also stated in Regulation 136 of the WSH (Construction) Regulations, 2014, which applies to any crane, employee's lift and material handling machinery.

6.6 Duties of Owners of Lifting Equipment

Regulations 19(1), 20(1) and 21(1) of the WSH (General Provisions) Regulations, 2014 state that no hoist or lift, lifting gears, lifting machines and appliances shall be used in a workplace unless an authorised examiner tested and examined.

Furthermore, Regulations 20(10) and 21(16) of the WSH (General Provisions) Regulations, 2014 state that it shall be the duty of the owner of a lifting equipment to ensure it is of good construction, sound material, adequate strength and free from patent defect, as well as properly maintained.

As the Owner of the lifting equipment, it is highly advisable to maintain a Lifting Equipment Register which includes, but limited to:

- Valid certification;
- Repair and maintenance reports; and
- Manufacturer manuals (for traceability and reference until the lifting equipment is sold or scrapped).

6.7 Risk Management

Regulation 3 of the WSH (Risk Management) Regulations, 2014 requires employers, self-employed persons and principals of the workplace to ensure activities in the workplace are risk-assessed to ensure that a risk assessment is conducted in relation to the safety and health risks posed to any person who may be affected by his undertaking in the workplace,

in this case, activities such as lifting operations. Employers, self-employed persons and principals at the workplace shall eliminate or reduce the risk to an acceptable level, i.e. as low as reasonably practicable (ALARP) when any conducting lifting operations.

6.8 Incident Reporting

Regulation 4 of the WSH (Incident Reporting) Regulations, 2014, requires that in an event where a dangerous occurred had occurred at a workplace, the occupier of the workplace is to notify SHENA of the occurrence, as soon as is reasonably practicable.

Reference is further made to Paragraph 2 of the Second Schedule of the WSHO, 2009 related to dangerous occurrence which include the collapse or failure of a crane, derrick, winch, hoist, piling frame or other appliance used in raising or lowering persons or goods, or any load-bearing part thereof (except breakage of chain or rope slings), or the overturning of a crane.

6.9 Crane and Lifting Machine Operator

Regulation 21(12) of the WSH (General Provisions) Regulations, 2014 requires that a lifting machine shall only be operated by a trained and competent person. This means that the operator must have the relevant knowledge and competency to execute the work/ activity properly and safely.

6.10 Maintenance

Section 17 (5) of the WSHO, 2009 imposes a legal duty on the Owner of lifting equipment to ensure that it is properly maintained at all times and to ensure the precautions to be taken for the safe use of the lifting equipment and for health hazards associated with the lifting equipment is available to the person using the equipment. This would include ensuring that the crane is fit for purpose and maintained properly in accordance with the Manufacturer's recommendations and that all the required safety devices (such as a safe load indicator) are in good working order.

Regulations 19(9)(a) of WSH (General Provisions) Regulation, 2014 imposes additional requirements to lifts used in the workplace, whereby an efficient automatic devices shall be provided and maintained to prevent the cage or platform from over-running.

Regulations 20(10) and 21 (16) WSH (General Provisions) Regulation, 2014 imposes a duty of the owner of a lifting gear, lifting appliance or lifting machine to ensure that it is of good mechanical construction, sound material and adequate strength, free from patent defect and properly maintained.

6.11 Strength and Stability

Regulation 134 of the WSH (Construction) Regulations, 2014 requires a crane and lifting machine shall have enough strength and stability. For example, a tower crane shall have enough rated capacity to carry the weight of the intended load and shall be set up as per the manufacturer with design approved foundation and tie-backs, and sufficient counterweight, so the crane will not collapse during lifting operation.

6.12 Load Capacity Chart

Regulation 135 of the WSH (Construction) Regulations, 2014 requires any crane to have a load capacity chart be made available to assist the operator for safe loads and to not exceed the rated capacity of the crane.

7. FACTORS AFFECTING SAFE LIFTING OPERATIONS

7.1 General

A lift can be categorised as a **routine lift** if it is performed regularly, repetitive in nature and involves loads that are similar in shape, size and weight, i.e., multiple lifts of similar items. The underlying principle is that the risks involved in a routine lift are already known and mitigated.

A **non-routine lift** refers to a complex lifting operation, carried out for the first time or lifting close to the lifting capacity of the crane. For example, a tandem “tilt-up” operation (i.e. lifting using two or more cranes to tilt a long structure from a horizontal position to a vertical) is a complex non-routine lift. It will require a detailed risk assessment and method statement before the lift is carried out. Specific control measures to mitigate the risks involved in such a complex operation need to be put in place. For example, in order to address the risk of a long structure buckling during a tilt-up operation, the numbers and location of lifting lugs will need to be considered in the design and built into the structure to be lifted. In short, a non-routine lift will require extensive planning.

Notwithstanding the above, it is a misperception to assume that as long as the weight of the load is below a certain tonnage, it can be classified as a routine lift and therefore require less planning or supervision.

Many factors can affect a lifting operation and personnel involved in lifting operations must be aware of such factors. Broadly, they can be classified as:

- **Machine:** Selection of appropriate lifting equipment for the job as well as the integrity of the equipment to perform the job;
- **Material:** Load that is intended to be lifted;
- **Medium:** Environment in which the lifting operation is to be carried out and includes

- the setting up and stability of the equipment;
- **Man:** Competency, roles and responsibilities of personnel involved in the lifting operation; and
 - **Method:** Planning and procedures to be adopted for the lifting operation.

7.2 Machine

7.2.1 Sizing of the Lifting Equipment

One of the most critical factors in planning a lifting operation is to ensure that the lifting equipment selected for the job has **sufficient lifting capacity and reach** to handle the intended load.

In the case of equipment of a tower, mobile, crawler or lorry crane, the lifting capacity is dependent on the load radius of the crane boom. Hence, it is important in the selection of the crane that the distance from the load to the crane is known. The loading and unloading points within the worksite must be carefully considered in relation to the location of the crane. For lifting operations involving multiple loads, precautions must be taken on the heaviest load to prevent overloading.

7.2.2 Maintenance of the Lifting Equipment

Another important aspect is the maintenance of the lifting equipment to ensure its **structural integrity**. Attention needs to be focused on the following sub-sections which list **critical load-bearing parts**.

7.2.2.1 Wire Ropes

There are many types of wire ropes for different usages and therefore, the correct type must be selected for the equipment. The wire ropes must be properly maintained to prevent the ropes from snapping during operation.

7.2.2.2 Braking Mechanism

The ability of the lifting equipment to lift or suspend a load is dependent on the brakes connected to the hoisting mechanism. Any failure in the brakes will result in an unintended free fall of the suspended load.

7.2.2.3 Safety Devices

Most lifting equipment is equipped with safety devices such as limit switches or sensors. The safety devices will stop or prevent the lifting equipment from entering into an unsafe mode of operation. For example, an anti-two-blocking device on a crawler crane prevents the hook block

assembly from coming into contact with the boom sheave assembly. It is therefore critical to ensure that such safety devices are functioning properly. They shall never be bypassed during a normal operation.

7.2.2.4 Hands Free Lifting

Hands free lifting is subject to risk assessment and planning such as push or pull sticks and tag lines to avoid or reduce direct contact of workers with lifted loads while lifting operation. It should only be used during normal operating condition to adjust and guide load to a stable position.

7.3 Load

Some key factors to consider in lifting a load are:

- Weight;
- Centre of Gravity; and
- Method of Lifting and Rigging.

7.3.1 Weight

This is the most important parameter that must be determined to **prevent overloading** of the lifting equipment. When the load is part of an assembled item, the weight of each component can be determined from the engineering drawings. Other times, one must rely on the calculation of the density and volume of the load that is being carried such as the concrete or rebars. Special attention is essential when the load comprises different materials such as rubbish buckets containing waste and debris. As a safety precaution, an estimation of the heavier weight is required rather than assuming the lighter weight for the activity.

7.3.2 Centre of Gravity (CG)

During lifting operation, it is critical to **maintain the CG of the load directly beneath the load line**, i.e., the hook. Otherwise, when the load is lifted, it will cause danger to anyone close by who can get hit by the swinging load. In addition, it is dangerous and will destabilise the crane if the load is being pulled or dragged.

Depending on the shape and size of the load, the CG may or may not be obvious. If in doubt, it is advisable to consult an engineer.

7.3.3 Method of Rigging

Different methods of rigging are well established in the industry such as vertical hitch, basket hitch, choker hitch, choker hitch double wrapped, etc. The objective

of the rigging method is to ensure that the **load is stable throughout the lifting operation**. Loose items such as bricks and bags of concrete must be secured using an appropriate receptacle such as safety nets or metal cages to avoid any accidental dislodgement in mid-air.

7.4 Medium

Once the lifting equipment is selected and the load is determined, the planning must then focus on the environment in which the lifting equipment is operating and how the lifting equipment is set up. Besides environmental weather conditions, every worksite will have to consider the **specific localized hazards** which have to be eliminated or mitigated to ensure a safe lifting operation.

The factors which must be considered in lifting a load are presented using the acronym **GOLDEN** which stands for:

- G: Ground
- O: Obstacles
- L: Lighting Condition
- D: Demarcation
- EN: Environment

7.4.1 Ground

The stability of the lifting equipment is highly dependent on the ground condition of the location where the lifting equipment will be set up. Special care must be taken to ensure that the **ground is level and has sufficient bearing capacity**. Cranes that are equipped with outriggers shall be evenly and fully extended. In addition, when using mobile or crawler cranes, it is recommended that steel plates with strength and size are used to provide firm ground support for the crane outriggers in order to prevent any crane toppling incidents.

7.4.2 Obstacles

Any **fixed or temporary installations** such as buildings, overhead power lines, bridges or underground utilities/ pipelines that are within the proximity of the operation zone are considered obstacles during a lifting operation. There is a risk of the lifting equipment or load coming into contact with the installations which can result in an accidental dislodgement of the load. Such obstacles can also refer to blind spots or entrapment points during manoeuvring of the load or lifting equipment, especially in congested areas.

7.4.3 Lighting Condition

Adequate illumination, particularly during a night operation, is very crucial. Depending on the lift, the operator, rigger or banksman will need to see the suspended load clearly in order to guide it to its safe destination.

7.4.4 Demarcation

The zone of operation shall be clearly demarcated (e.g. using physical barrier and safety signages) to inform and prevent persons who are not involved in the lifting operation from entering the zone unintentionally. In areas where tower, dockside and overhead travelling cranes are continuously in operation and span a wide area, it is important to designate the affected zone of operation.

In addition to that, other measures shall also be taken to prevent any person from walking under the suspended load such as the deployment of more signalmen to guide the load or installing an audible alarm to warn workers about the ongoing lifting operation. Tag lines can be used to control the load swinging out of its demarcated area especially when the load is moved close to the ground or when maneuvering the load across fixed ground obstacles.

7.4.5 Environment

Weather conditions such as heavy rain, haze, strong wind, and thunderstorms will impact the visibility of the lifting team. It is also important to remember that wind speed is stronger at higher ground as it may swing the suspended load out of balance and radius thus making the lifting appliance unstable. During the planning of any lifting operation, the anticipated wind speed at the site must be taken into consideration and refer to the crane manufacturer operation manual for the wind speed limit. It is advisable to stop all lifting operations and restore the lifting appliances to their original state when the weather conditions deteriorate.

7.5 Man

Every single member of the lifting team (operator, rigger, banksman and lifting supervisor) must be **adequately trained and competent** to carry out their duties properly. They must also be fully conversant with the actual lifting procedures applicable to the lifting operation and not just the generic procedures. Section 11 provides details on the Lifting Team.

7.5.1 Fit for Duty

Besides the prerequisite for competency (i.e., ability to read load capacity charts), the fitness of the personnel, preexisting medical conditions or number of working

hours that can adversely affect their ability to discharge their duties must also be considered.

7.5.2 Roles and Responsibilities

The roles and responsibilities of each individual involved in the lifting operations must be clear. There must be proper leadership within the lifting team so that instructions are relayed appropriately. In addition, all personnel shall be empowered to stop work if the operation is or has become unsafe.

7.5.3 Communications

Providing communication devices such as a walkie-talkie or application of standard crane hand signals will ensure there is a common understanding between members of the lifting team. Employers must take into consideration the local workforce which comprises workers from various countries with different languages when forming the lifting team.

More information on communication is further described in Section 11.3.

7.6 Procedure

Most general types of lifting operations rely on established procedures after determining factors such as Machine, Medium and Man as discussed earlier. Whether the lift is routine or non-routine, there are other important factors in the life cycle of a lifting operation that need to be considered such as:

- Knowing the weight of the load and the load radius (refer to Section 7.3.1);
- Securing the load using appropriate lifting gears and rigging method (refer to Section 7.3.3);
- Conducting a lift test to ensure stability and not overloading test lift, which is simply lifting the load just slightly off the ground and stopping to observe for any abnormalities. This is a critical discipline that all operators must abide by.
- Maintaining the centre of gravity (CG) of the load directly beneath the load line i.e., the hook (refer to Section 7.3.2);
- Ensure the stability of the suspended load during movement or slewing of the crane. While moving or slewing the crane, the load shall be prevented from jerking or swinging at all times;
- Precautions taken during the lowering/ releasing of the suspended load. Toward the end of the lifting operation, the load must be placed on a stable ground. If the load is placed at a height, extra care must be taken to ensure there is no risk of the load falling off the edge. Often times, the load is lifted beyond the line of sight of the operator. Under such circumstances, the banksman and/ or lifting supervisor is responsible to ensure the stability of the suspended load.

8. RISK ASSESSMENT, PERMIT-TO-WORK FOR LIFTING OPERATION AND EMERGENCY RESPONSE PLAN

8.1 Risk Assessment

Risk Assessment (RA) is the process of evaluating the probability and consequences of an injury or illness from exposure to an identified hazard and determining the appropriate measures for risk control. As such, there are three basic steps to RA as identified below.

- **Step 1 - Hazard Identification**

Identifying the hazards associated with each work activity and the type of potential accidents/ incidents that can result from the hazards.

- **Step 2 - Risk Evaluation**

Risk evaluation is the process of estimating the **severity** of an injury or damage and the **likelihood** of the occurrence. For example, the risk level of workers working underneath a suspended pre-cast component shall be assessed as a high-risk hazard as the consequences of the load dropping can result in killing the workers underneath.

- **Step 3 - Risk Control**

This is a critical last step as it identifies appropriate risk control measures (mitigation measures) to reduce the risk level to an acceptable level (i.e. As Low As Reasonably Practicable). Following the previous example of a suspended pre-cast component, an appropriate risk control measure will be to prohibit workers from working directly underneath a suspended load. The lifting zone shall also be demarcated to prevent any unauthorised entry.

8.2 Permit-To-Work

A Permit-To-Work (PTW) System is a formalised system of controlling certain types of hazardous work (lifting operations included). A proper PTW involves the following:

- A person applying for permission to carry out a certain work activity. In the application, the person is required to state the scope and conditions in which the work will be carried out;
- An independent inspection is then conducted on-site to verify that appropriate control measures have been taken to mitigate any foreseeable risks;
- After confirming that the measures have been taken, the application will be approved by an authorised person (i.e., the project manager). The authorised person shall have oversight on the entire work process to avoid any conflicting or incompatible work that is carried out at the same time;

- The work can commence only after the permit has been approved.

With reference to Regulation 19 of the WSH (Construction) Regulations, 2014, if the project manager of a worksite, after issuance of a PTW for any high-risk construction work is of the view that the carrying out of such work will pose or is likely to pose a risk to the safety, health and welfare of persons at work in the worksite, he may order such work to cease immediately and revoke the PTW.

8.3 Changes to Risk Assessment and Permit-To-Work

As the RA and PTW are developed based on a pre-determined set of parameters and considerations, any significant changes shall result in a temporary stoppage of the lifting operation and a review of the RA and PTW.

Scenarios that result in a need to review the RA and PTW include (but are not limited to):

- Changes to the **type and capacity** of lifting equipment used;
- Changes to the **sequence of operations**;
- Changes requiring **reconfiguration** of the crane (boom/ jib length, outrigger beam length reduction, parts of hoist line, etc);
- Changes in the **rigging details** which could result in a reduction in rigging strength or a significant increase in rigging weight;
- Changes in the **surrounding environment** such as the sudden presence of a temporary structure obstructing the operation;
- Changes in the **weather and environmental conditions** which have an adverse impact on the lifting operation; and
- Changes to **safety-critical personnel**.

8.4 Emergency Response Plan

All lifting operations shall have a documented Emergency Response Plan (ERP) that covers all aspects of the operations. The ERP identifies the requirements and actions to be carried out for any unforeseeable emergency (with or without any casualty) in a clear and precise manner. These include but are not limited to:

- Toppling of the lifting equipment;
- Structural failure of the lifting equipment such as boom fracture;
- Dislodgement of the suspended load;
- Entanglement of load with nearby structures; and
- Recovery of injured personnel in locations where access is limited such as within a tower crane.

This ERP must be communicated to all personnel involved in the lifting operation and made available at prominent locations in the workplace. The **contents of the ERP** shall include but not limited to:

- Details of emergency personnel and their contacts including first-aiders;
- Evacuation/ escape route during an emergency;
- Emergency communication flowchart;
- Roles and responsibilities of the emergency management team;
- Emergency services contact details;
- Managing injured persons; and
- Frequency of exercise and drill to be carried out.

The documented procedures shall be tested by conducting **ERP drills** involving all lifting operation personnel. Such ERP drills must be documented and recorded as part of the safe system for work. The drills may be conducted as a desktop review which includes all relevant personnel in the tabletop exercise. However, physical exercise and drills shall be carried out whenever possible.

The ERP must include the **emergency contact details** of relevant persons and agencies. The contingency procedure shall outline all possible emergencies and identify the recovery actions to be taken if they occur. Relevant personnel shall ensure they are aware of the requirements under the **WSH (First-Aid) Regulations, 2021**. Reference can also be made to SHENA IGN on First Aid Requirements in a Workplace (reference no. 2023/IGN/01).

Lifting operations may be carried out from the ground level or at a high point such as on the top of a multi-storey building or in confined areas such as in a tunnel or factory. Each location provides specific challenges for the provision of medical and evacuation support. As such, the ERP shall as much as possible identify access to the location to facilitate expeditious medical and evacuation support.

9. EQUIPMENT

This section provides guidance for the selection, maintenance and other aspect of the lifting equipment.

9.1 Selection of Equipment

An equipment assessment must be completed as part of the RA. The objective of the equipment assessment is to identify the hazards and assess the risks associated with the equipment for the foreseeable range of lifting operations, for example, the applications, loads and configurations of the equipment that will be used. Based on this assessment, the appropriate lifting equipment for the lifting operation may then be selected.

The equipment assessment shall consider, but not necessarily be limited to the following:

- Is the equipment **designed** for the intended type of lifting operation?
- What is the **age** of the lifting equipment?
- Were there any **authorised modifications** made to the equipment?
- What are the **dismantling and assembly** process?

- How are components of the lifting equipment **transported** to the site for assembly?
- What type of **pre-erection examination or Non-Destructive Testing (NDT)** is required?
- How is the lifting equipment **controlled** e.g. via pendant or within the operator cabin?
- What are the **access and egress** for the operator to reach the cabin?
- What are the **dismantling and storage** requirements?
- What **transportation methods** to use for continued integrity?
- Is the hard hat required to protect the head of the operator from injuries in the event of failure of lifted materials falling onto the operator cabin?

In general, structural modification of lifting equipment **shall not** be undertaken except by a competent person. Owners of lifting equipment must not install additional components that may affect the structural integrity of the lifting equipment, e.g. adding counterweights beyond what is specified in the manual. If the lifting equipment has to be modified, a detailed engineering design must be undertaken in consultation with the manufacturer or a professional body. The design must take into account prevailing design codes, standards and practices as well as compliance with all applicable regulations.

9.2 Equipment Positioning and Installation

The term '**positioning**' refers to mobile equipment being set up in a particular location to carry out lifting operations. The term 'installation' refers to the assembling of lifting equipment at the selected location.

A process shall be established to ensure that the positioning/installation of the lifting equipment is reviewed to eliminate or mitigate the risks. All hazards identified concerning the position/installation of the equipment shall be addressed in the RA and Lifting Plan.

The process of positioning or installation is important to:

- Eliminate or reduce the risks to public or buildings near the lifting operation;
- Avoid having the load being manoeuvred over people;
- Avoid striking, trapping or crushing people;
- Avoid striking any other structures such as buildings;
- Ensure that entrance and exit paths of existing passageways are not compromised by risks arising from the lifting operations;
- Avoid collision with other lifting equipment being used simultaneously; and
- Provide suitable gates/ barriers to prevent inappropriate/ unsafe access to any hoist area.

The above list is not exhaustive. Any lifting equipment must be positioned or installed such that the risks of injuring people or damaging assets are minimised during a lifting operation.

In general, whenever lifting equipment is disassembled and reassembled, it shall be subjected to a thorough re-inspection and load tested as per legal requirements by an

Authorised Examiner. This is to ensure the integrity and stability of the equipment during the reassembly process.

10. IDENTIFICATION OF LIFTING EQUIPMENT

Every lifting equipment and its component parts shall be identified with a **visible marking including the safe working load (SWL)**. The markings serve the following purposes:

- Communicate clearly the maximum SWL of the equipment;
- Communicate clearly the maximum number of persons it can carry if it is used for lifting people; and
- Facilitate the identification of the equipment and its components including whether it is genuine and compatible with the equipment.

Where practicable, the SWL shall be marked on the equipment prominently. However, where this is not possible (i.e., a small lifting gear), a coding system can be used to provide the user with the required information. Examples of such systems include colour coding or attaching some form of label.

Where a number of lifting accessories are assembled to form a single lifting equipment which is not dismantled after use, the assembly shall be marked to indicate its safety characteristics to users.

Where there are other characteristics which may cause a lifting accessory to become unsuitable for use in a particular application, this information shall be marked or otherwise made available to the user.

10.1 Lifting Equipment with Variable Safe Working Load

Some lifting equipment is designed to operate with variable SWL. Examples of such lifting equipment include a mobile crane equipped with a telescopic jib that can be raised or lowered. Tower cranes are also designed to have variable SWL. In principle, the closer the load is to the body of the crane, the higher will be the SWL of the equipment.

For such lifting equipment, besides the mandatory load capacity chart, they must be equipped with a **load radius indicator** to indicate to the operator the SWL of the crane at that configuration (long radius).

It shall also provide a **visual and audible warning** to the operator if the load lifted is close to the SWL. Consequently, due to the variable SWL, the crane operator must exercise extreme care whenever he lowers the jib or telescopes the boom outwards with a load. This will lead to a reduction of the SWL and will result in crane overloading.

For lorry cranes, if the load radius indicator is not feasible, it must be equipped with fully hydraulic protection valves and a pressure relief system to prevent crane overloading.

Some modern cranes are designed such that a different load capacity will apply depending on whether the outriggers are fully or partially extended. Under such circumstances, the operator must be fully aware of the configurations and make the necessary adjustments to the parameter settings of the indicator. Information on how changes to the configuration can affect the SWL must be provided in the operator's cabin. The information shall be placed in the operator's cabin and not in the office as it needs to be easily retrieved by the operator while carrying out a lifting operation.

Before use, the operators of lifting equipment and accessories shall perform a **pre-use check** to identify any faults in the equipment. This shall be a daily check at the start of each shift. This daily inspection is not intended to replace the periodic preventive maintenance checks by the mechanics.

11. LIFTING TEAM

The Lifting Team refers to a group of personnel that are appointed to be directly involved in a lifting operation. For simple routine lifts, it typically includes the site supervisor, lifting supervisor, crane operator, riggers and banksman. For more complex lifting operations, it shall include other personnel such as the appointed person who had planned for the lift, and banksmen who will serve to coordinate other equipment or personnel movement near the zone of operation.

Key factors to consider in selecting a Lifting Team include:

- Competency;
- Team Composition;
- Clear Communication;
- Lifting Supervisor;
- Operator;
- Rigger; and
- Banksman.

11.1 Competency

Only **suitably trained and competent** personnel shall be deployed as part of the Lifting Team. During the lifting operation, if any personnel in the team is not confident of carrying out the lift, e.g. rigger may be unsure of how to rig up the odd-shaped item with the limited lifting gears that he has, the personnel must stop the operation and request assistance.

11.2 Team Composition

It is good practice to try to maintain the same group of individuals in a Lifting Team so that **trust and rapport** among team members can be built up over time. Trust becomes very important when the operator does not have a line of sight to the load and has to rely on the instructions that the personnel received from the team therefore it's important that the

Lifting Team is familiar with one another. This is especially critical in an emergency. Care shall be taken to ensure that new members of a lifting team are appropriately inducted and briefed on the procedures. To facilitate identification, members of the Lifting Team shall be clearly identifiable by the use of reflective vests or other conspicuous clothing or markings.

11.3 Clear Communication

The Lifting Team must ensure any communications within the team (i.e. during Toolbox Talk) are easily understood and clear. Any miscommunications can result in accidents hence care shall be taken when forming a Lifting Team involving individuals from different countries and nationalities. Although the Lifting Team adopts the standard crane hand/voice signals to facilitate the lifting operation, it is not possible to use crane hand signals when the operation involves lifting an item from the ground to the rooftop of a tall building. For further guidance regarding toolbox talk, reference is made to SHENA IGN on Guidance for Toolbox Talk (reference no.: 2021/IGN/09).

11.3.1 Lifting Hand Signals

It is common for lifting teams to communicate using hand signals. These are reliable when other forms of communication are not feasible, e.g. unable to verbally communicate or absence of walkie talkie. If hand signals are to be used, this is to be included in the Lifting Plan. Hand signals must also be agreed on and practiced with the lifting team. This is to prevent any miscommunication and to ensure that lifting activities are executed safely.

Appendix C illustrates common hand signals that are used during crane operations. These signals can be adopted (as necessary) for lifting operations involving other types of lifting equipment.

11.4 Lifting Supervisor

In general, all lifting operations must be supervised by the appointed lifting supervisor as the **main person leading and coordinating the operation**.

This position is defined as the **person who is in charge of actively supervising the lifting operation on site**. The lifting supervisor shall be appointed in writing by the contractor. The appointed lifting supervisor could be a foreman, shift supervisor or other similar capacity. The lifting supervisor shall be attired in such a way that he/ she will be distinctively identified as the lifting supervisor.

A lifting supervisor may be allowed to supervise more than one lifting operation at any point in time provided that he/she can discharge his/her duties appropriately e.g., when the two operations are side by side within close proximity. If requested, the lifting supervisor shall assist in developing the Lifting Plan and seek approval from management.

Thereafter, the appointed lifting supervisor should (but not limited to):

- Apply permit-to-work for lifting and ensure permit validity at all times;
- Coordinate all lifting activities in accordance with the Lifting Plan;
- Brief all lifting team members on the Lifting Plan, safe lifting procedure and RA;
- Ensure that only competent crane operators, riggers and banksman participate in any lifting operation involving the use of crane or lifting equipment;
- Ensure that the ground conditions are safe for any lifting operation to be performed;
- Ensure access and egress routes for the lifting team are clear;
- Be present during all lifting operations to ensure that the lift is carried out in accordance with the lifting plan;
- Keep within his/her sight and view of all the lifting operations and have the authority to stop the lifting operation if it is in his view dangerous to proceed; and
- Take suitable measures to rectify unsafe conditions so that the lifting operation can be conducted safely.

11.5 Operator

There are different types of lifting equipment, and the operator is one of the most important personnel of the Lifting Team as the person is in charge of the lifting equipment. One of the key competencies of the crane operator is the **ability to read and understand the load capacity chart** and to **differentiate the Gross Capacity and Net Capacity** of the lift. The operator needs to know the **SWL of the crane relative to the radius** to prevent overloading of the crane.

The competent operator should:

- Carry out the lifting operation in accordance with the Lifting Plan;
- Inspect the lifting equipment before and after use to check for abnormalities;
- Check and ensure the configuration and counterweight provision for the lift are correct;
- Check that load radius indicator and other safety devices are functioning properly;
- Ensure that the ground is stable, and the surrounding is free from any structures or materials that may obstruct the lifting operation;
- Establish clear communication with banksman such as signal and instructions that will be used before lifting operation;
- Carry out lifting operations only when a lifting supervisor is present on site;
- Disengage from any manoeuvre that is dangerous;
- Monitor environmental effects such as thunderstorms and strong winds that will affect the safe operations of the lift;
- Contribute and participate in Toolbox Talk;
- Report any defects immediately to the lifting supervisor and record such defects in maintenance log records;
- Stop the lift whenever unsafe conditions occur; and
- Check the crane wire rope to ensure it is still within safe use.

11.6 Banksman

The banksman (or signaller) shall be attired in such a way that he/ she will be distinctively identified as the banksman.

The banksman should:

- Ensure the load is correctly rigged up and the area around for any loads to be lifted is clear;
- Check for potential objects dropped from load;
- Not perform any other job while lifting is in progress;
- Be responsible for directing the operator using hand signals and/or verbal code during initial lifting, to ensure the load does not travel / move over anybody and does not come into contact with anyone or any other object
- Give correct and clear signals to the lifting equipment operator to manoeuvre the load safely from the point of lift to the destination;
- Ensure communication is maintained with the lifting equipment operator throughout the lift in accordance with the lifting plan;
- Ensure the lift is controlled throughout the duration of the operation;
- Contribute and participate in Toolbox Talk;
- Ensure that the immediate areas within the lift (start point and final position) are clear of any hazards during the manoeuvre; and
- Maintain his/ her position to ensure line of sight during the controlled phase of the lift and to ensure this position is free of danger.

11.7 Riggers

The appointed rigger shall be attired in such a way that he/she will be distinctively identified as the rigger.

The appointed riggers should:

- Maintain a safe position during lifting activity;
- Contribute and participate in Toolbox Talk;
- Ensure all slings, webbings, shackles and other lifting gears used to rig the load are as per the required specification, i.e. length for slings and within the SWL of the lift, in good condition and duly certified;
- Ensure that the load is rigged up in such a manner that it is stable, balanced (centre of gravity beneath the hook) and secured (i.e., no loose items);
- Ensure that the lifting equipment operator has been informed of the weight of the load;
- Establish tag lines to control the load spinning or to stabilise as it is being manoeuvred; and
- Conduct visual checks of the lifting gears before rigging and report any defect or safety concerns/issues in the lifting/rigging and materials to the lifting supervisor.

12. INSPECTION AND CERTIFICATION OF LIFTING EQUIPMENT

Inspection and certification of lifting equipment are essential to ensure the safety and reliability of the operator of the lifting equipment as well as the lifting equipment itself during lifting operations.

Inspection requires a **thorough examination by an Authorised Examiner (AE) or by a Third-Party Inspection Agency (TPIA)** to identify any defects or problems that may affect its effectiveness and safety, as well as the control measures set if any problems arise. This will evaluate if the lifting equipment can be used for project operations. As per the WSHO, 2009, AEs and TPIAs for lifting equipment must be approved by the Authority, i.e. SHENA.

These inspections can occur according to a specific regular schedule or when needed based on the type of equipment and its usage. The examination period by an AE for lifting equipment based on the WSH (General Provisions) Regulations, 2014 is stated in Table 1.

EQUIPMENT	EXAMINATION BY AN AUTHORISED EXAMINER	
	FREQUENCY OF USE	INTERVALS FOR EXAMINATION
Hoists and Lifts Regulation 19(3) and 19(10) of WSH (General Provisions), 2014	Regular use and not in regular use	At least once every six months – mechanically powered. At least once every year – non-mechanically powered.
Lifting Gear Regulation 20(4) of WSH (General Provisions), 2014	Regular use	At least one every six months – chains used in connection with molten metal or slag At least once every year – in any other case
	Not in regular use	Only when necessary
Lifting Appliance/Machine Regulation 21(1)(3) of WSH (General Provisions), 2014	Regular use and not in regular use	At least once every year

Table 1. Examination period by an AE for Lifting Equipment

Once the inspections are conducted and evaluated, **certification** will be issued which means that the lifting equipment has been inspected and has met all safety standards. Testing is conducted and results are documented, to ensure the equipment is fit for use.

This certificate must be made readily available at the workplace for inspection.

13. LIFTING PLAN

The Lifting Plan is a set of plans which is created for use in any crane lifting operation. All lifting operations shall be accompanied by a **lifting plan supported by a risk assessment, a safe work procedure and/or method statement, and PTW.**

Frequent or routine lifting operations may only require a basic lifting plan supported by an on-site risk assessment and briefing to related personnel. A sample of a lifting plan is provided in **Appendix D**. However, non-routine lifts require additional engineering design efforts to ensure that the lifting is conducted safely.

13.1 Importance of Lifting Plan

The lifting plan is a document specifying how and by whom the lift will be completed, and it is essential for ensuring the lift is done safely. This plan must be developed before the work begins, and the entire lifting team should be briefed clearly on the procedures of the plan.

A lift plan is required for every mobile and pedestal crane lift. If the lift deviates from the plan, make it safe and stop the job. The lift planning process describes the systematic assessment of important load factors and site factors. It is as applicable to the "cherry-picker" placing a pump on its foundation as to the "big lift" crane setting a 350-tonne module.

13.2 Ownership and Usage of the Lifting Plan

Every member of the Lifting team shall be familiar with the lifting plan and ensure that the operation is carried out according to the plan. The Lifting Supervisor must take ownership of the lifting plan and cascade it to other members of the Lifting team. This is to allow common understanding amongst the lifting crew for a safe outcome. The underlying principle is that all foreseeable risks have been assessed and eliminated or mitigated. The lifting plan can be developed by persons who have the expertise and relevant knowledge of the intended lift. After which, the team involved has to sign and agree upon the developed lifting plan.

13.3 Elements and Factors that affect a Lifting Plan

The lifting plan shall include but not be limited to the following considerations:

- The **personnel required**;
- The personnel's **roles, responsibilities, and competencies**;
- **Compliance** with statutory requirements and manufacturer's operation manual for the lifting equipment;
- **PTW system** which is mandatory for all lifting operations;
- **Sequence** of the lifting operations, including any special considerations as required;

- Nature, weight and dimension of **load** – including the net and gross weights;
- Type and location of **lifting/ rigging points**;
- **Selection** of appropriate lifting equipment, lifting gear and appliances;
- Application of the correct lifting **methods**;
- **Position** of lifting equipment, personnel and the load, before and after the lift operation;
- The **worksite operation** including proximity of other lifting equipment and work activities. A **sketch or diagram** of the worksite including the zone of lifting operation would be useful;
- Requirements to **erect / dismantle** the lifting equipment;
- Assessment of the need for a **tag line** to control the movement of the suspended load;
- Means of **communication** during lifting operations;
- **Physical and environmental factors** detrimental to the lifting operations such as ground conditions, adverse weather, wind, and poor illumination;
- Ensuring a system for **reporting** any defects or concerns is in place;
- Provision of a **safe place of work** for all personnel during lifting operations; and
- The necessity to demarcate or cordon off the area where lifting is being carried out and in particular where members of the public (anyone not concerned with the lifting operation) may be present.

13.4 Harmonisation of the Lifting Plan, Risk Assessment and Permit-To-Work

An RA for lifting operation shall specify control measures such as the appointment of competent personnel, usage of appropriately maintained lifting gears, demarcation of the lifting zone, and taking into account the physical environment. These factors are necessary and useful for the RA.

The Lifting Plan and the PTW are part of the Risk Control stage of the RA process. The purpose of a proper Lifting Plan/ PTW is to verify that the necessary control measures have been taken. They are complementary and shall not be seen as mere paper exercises.

13.5 Changes to Lifting Plan

In any case where the actual information presented at the lifting site does not tally with or deviate from the Lifting Plan, any stakeholder in the lifting operation has the right to cease further progress of the lifting operation until the plan is reviewed according to the operation's requirements.

Never vary from the approved Lifting Plan without another full review and final approval by the responsible persons who approved the original Lifting Plan.





14. REFERENCES

- Workplace Safety and Health Order, 2009
- Workplace Safety and Health (General Provisions) Regulations, 2014
- Workplace Safety and Health (Construction) Regulations, 2014
- Workplace Safety and Health (Risk Management) Regulations, 2014
- Code of Practice on Safe Lifting Operations in the Workplaces, WSH Council, Singapore
- Worker's Safety Handbook for Rigger and Signalman (Revised 2019), WSH Council, Singapore
- Worker's Safety Handbook for Lorry Crane Operator (Revised 2019), WSH Council, Singapore
- Health Safety Executive (HSE) GOV UK Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- International Association of Oil & Gas Producers – Report 376/August 2022: Lifting and hoisting recommended practice
- SHENA's IGN on Guidance to Risk Management (Reference no. 2020/IGN/04)
- SHENA's IGN on Guidance to Permit to Work (Reference no. 2020/IGN/03)
- SHENA's IGN on Guidance for Toolbox Talk (Reference no. 2021/IGN/09)

APPENDIX A: COMMON LIFTING EQUIPMENT

Below are examples (non-exhaustive) of lifting equipment.

EXAMPLE OF HOISTS AND LIFTS

 <p>Hoist Source: SafetyLiftinGear</p>	 <p>Vehicle Lift Source: Performance Tool & Equipment</p>
 <p>Passenger/ Employee's Lift Source: Lui Elevators</p>	 <p>Goods/Cargo Lift Source: LG Lift</p>

EXAMPLES OF LIFTING GEAR



Chain Slings

Source: [Safety LiftinGear](#)



Eyebolt

Source: [Safe Lifting Solutions](#)



Wire Rope Sling

Source: [Mazzella Companies](#)



Shackle

Source: [All Lifting](#)



Webbing Sling

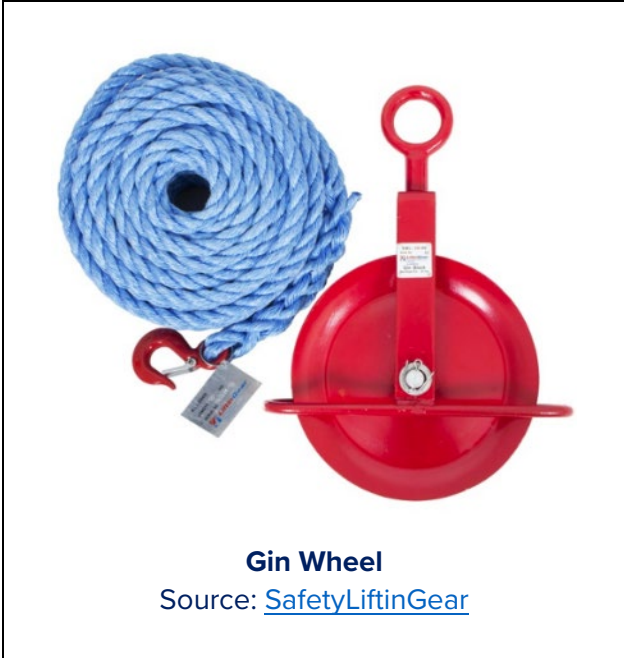
Source: [Modi Ropes](#)



Swivel

Source: [All Lifting](#)

EXAMPLES OF LIFTING APPLIANCE



EXAMPLES OF LIFTING MACHINE



Luffing-Jib Crane
Source: [Terex Corporation](#)



Forklift
Source: [LTMG Forklift](#)



Mobile Crane: Crawler Crane
Source: [TWC](#)



Mobile Elevating Work Platform (MEWP)
Source: [Central Training Services](#)



Mobile Crane: Truck-Mounted Crane
Source: [TWC](#)



Crab Winch
Source: [Lifting Machines Manufacturer](#)



Offshore Pedestal Crane
Source: [NOV Training](#)



Manual and Powered Winch
Source: [Loadmate](#)



Overhead Crane (and Runway)
Source: [Kino Cranes](#)



Piling
Source: [Liebherr](#)




Tower Crane
Source: [Global CE](#)



Transporter
Source: [Easy Lift Equipment](#)

APPENDIX B: SELF-ASSESSMENT CHECKLIST

This is a self-assessment checklist for lifting requirements in the workplace.

	اوتوريټي ڪي بي شين ايم ايس كميٽي دن عالمي سڪيورٽي Safety, Health and Environment National Authority	SELF-ASSESSMENT CHECKLIST: LIFTING OPERATIONS AT THE WORKPLACE	DOC NO.: SHENA/CID/REG/ 5-207 (Rev 1) OCTOBER 2024
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This self-assessment checklist is a tool to ensure that Employers, Occupiers and Principals have complied with the requirements for lifting operations in the workplace with respect to the Workplace Safety and Health Order, 2009 (WSHO, 2009), the Workplace Safety and Health (General Provisions) Regulations, 2014, and the Workplace Safety and Health (Construction) Regulations, 2014. These regulations are available on the SHENA website.

This checklist **only acts as a guide** and should not be construed as implying any liability nor should it be taken to encapsulate all the responsibilities and obligations of the Employers, Occupiers and Principals under the law. If you answer, 'No', you are advised to fix the gaps or hazards that you have identified at your workplace. You may need to do more than one assessment and you are advised to reassess your workplace as and when required to ensure you always maintain a safe workplace.

This checklist does not require submission to SHENA unless SHENA explicitly instructs you to do so. However, a copy of the filled-in checklist should be always kept by the HSE focal point of your company/organization.

SHENA reminds all Employers, Employees, Occupiers and Principals to comply with their legal obligations under the laws of Brunei Darussalam including, but not limited to, the Employment Order, 2009 (S 37/2009) and the Worker's Compensation Act (Chapter 74).

GENERAL DETAILS

NAME OF COMPANY & OFFICE ADDRESS			
PROJECT TITLE			
WORKPLACE SITE ADDRESS			
DATE AND TIME OF LIFTING OPERATION		VALIDITY PERIOD OF LIFTING OPERATION	
TOTAL NUMBER OF WORKERS AT WORKPLACE		NAME AND PHONE NO. OF KEY CONTACT PERSON	
		EMAIL ADDRESS OF KEY CONTACT PERSON	

DETAILS OF THE LOAD TO BE LIFTED						
DESCRIPTION OF LOAD(S)						
OVERALL DIMENSION		WEIGHT OF LOAD				
DETAILS OF LIFTING EQUIPMENT						
TYPE OF LIFTING EQUIPMENT						
MAXIMUM SWL		DATE OF LAST EXAMINATION				
		EXPIRY DATE OF CERTIFICATE OF LIFTING EQUIPMENT				
TYPE OF LIFTING GEAR (IF ANY)		ARE THE LIFTING GEARS CERTIFIED?				
SWL OF LIFTING GEAR		COMBINED WEIGHT OF LIFTING GEARS				
			YES	NO	N/A	REMARKS/ JUSTIFICATION/ EXPLANATION
A	PROJECT DESCRIPTION					
1	Please tick the most appropriate description of your workplace:					
	i.	Project involves lifting operations/procedures.				
	ii.	Project involves the use of hoists and lifts.				
	iii.	Project involves the use of lifting appliances or machines.				
	iv.	Project involves the use of lifting gears.				
	v.	Project requires a Permit-To-Work.				
B	HOISTS AND LIFTS					
2	In reference to the Section 19 of the WSH (General Provisions) Regulations, 2014: -					
	i.	Has the hoist/lift been tested and examined after installation?				
	ii.	Have the hoist/lift been issued and signed a certificate of test and examination (with specification of SWL)?				
	iii.	Is the certificate of test and examination of the hoist/lift available (in case of inspection)?				
	iv.	Has every hoist/lift been thoroughly examined by an authorised examiner at least once every six months?				

	v.	Is every hoistway/liftway equipped with efficient protection in terms of a substantial enclosure fitted with gates?				
	vi.	Is every gate for the hoistway/liftway fitted with an efficient interlocking device?				
	vii.	Is every hoist/lift marked conspicuously with the maximum working load?				
	viii.	Has the operator made sure that the load to be lifted has not exceeded its maximum working load?				
3	For additional requirements of lifts used in a factory: -					
	i.	Are the efficient automatic devices provided and maintained?				
	ii.	Is every cage on each side from which access is afforded to a landing, fitted with a gate with efficient devices?				
	iii.	For the cage or platform of the lift which is suspended by rope or chain, is the cage or platform separately connected with at least 2 ropes or chains?				
4	For hoists and lifts which is not powered with mechanical power: -					
	i.	Is the gate kept closed and fastened (except when the cage or platform is at rest at the landing)?				
	ii.	Has an authorised examiner conducted a thorough examination at least once every year?				
5	For a hoistway or liftway inside a factory building which passes through 2 or more floors: -					
	i.	Has the hoistway or liftway been completely enclosed with fire-resisting materials (except the top)?				
	ii.	Has it been ensured that all means of access to the hoist or lift are fitted with doors of fire-resisting materials?				
C	LIFTING GEARS					
6	In reference to the Section 20 of the WSH (General Provisions) Regulations, 2014: -					
	i.	Has an authorised examiner tested and examined the lifting gear?				
	ii.	Has an authorised examiner issued and signed a certificate of test and examination which specifies the SWL of the lifting gear?				
	iii.	Is the certificate of test and examination available (in case of inspection)?				
	Note that 6 i, ii, and iii do not apply to fibre ropes or fibre slings.					
	iv.	Has an authorised examiner thoroughly examined every lifting gear at least once every year?				

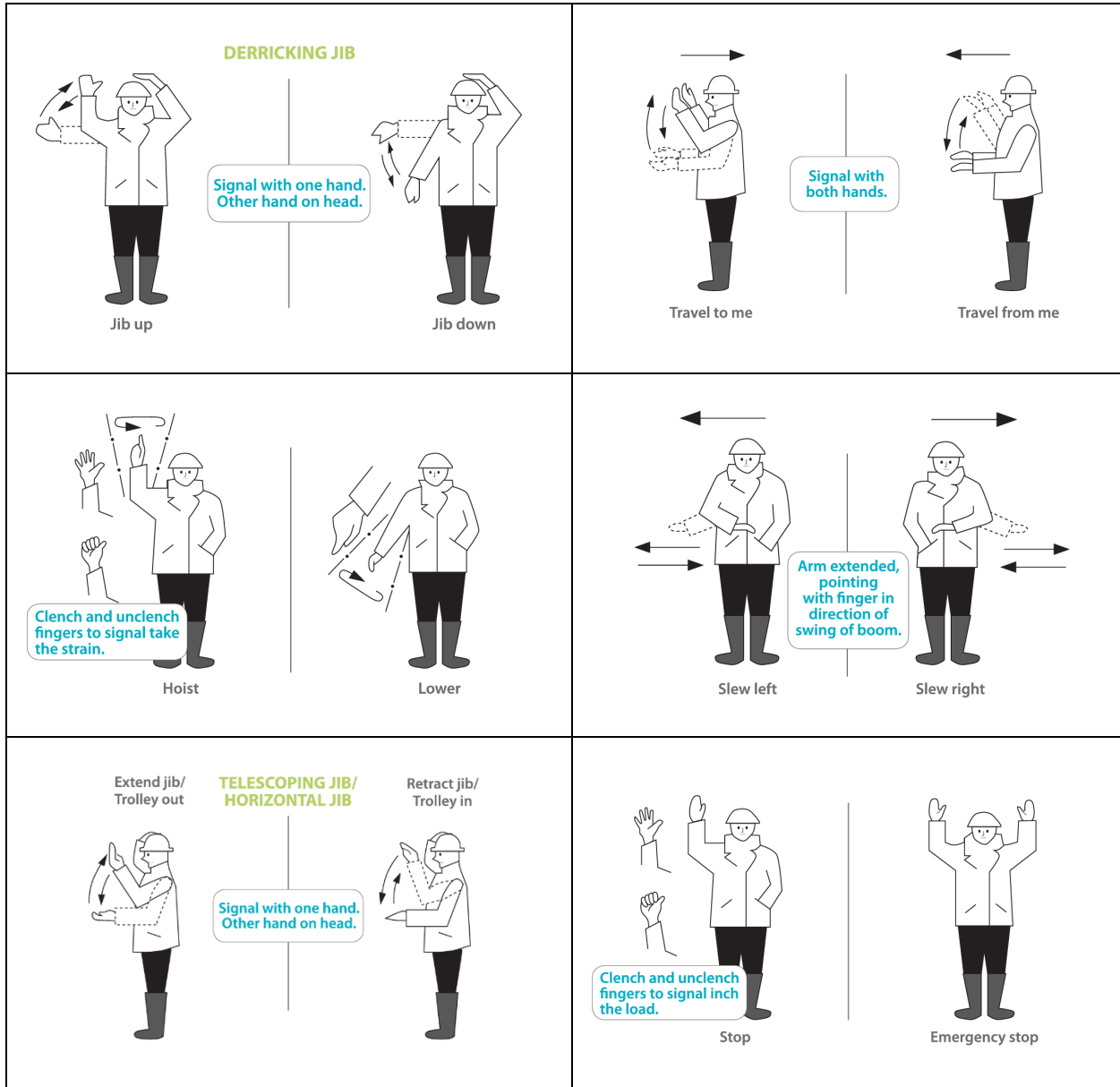
	<p>v. Has every lifting gear been annealed: -</p> <p>a. If in regular use,</p> <p>i. At least once every six months (in case of chains used in connection with molten metal or molten slag)?</p> <p>ii. At least once every year?</p> <p>b. If not in regular use, when necessary?</p> <p>Please note that this does not apply to the classes of lifting gear stated in section 20 sub-regulation (5) of the WSH (General Provision) Regulations, 2014.</p>				
	vi. Has every lifting gear been checked to ensure it is not loaded beyond its SWL (except by an authorised examiner or an inspector for testing purposes)?				
7	The lifting gear: -				
	i. Has good construction, sound material and adequate strength?				
	ii. Is free from patent defects?				
	iii. Is properly maintained?				
D	LIFTING APPLIANCES AND LIFTING MACHINES				
8	In reference to the Section 21 of the WSH (General Provisions) Regulations, 2014: -				
	i. Has an authorised examiner tested and examined the lifting appliance/machine?				
	ii. Has an authorised examiner issued and signed a certificate of test and examination which specifies the SWL of the lifting appliance/machine?				
	iii. Is the certificate of test and examination available (in case of inspection)?				
	iv. Has an authorised examiner thoroughly examined every lifting appliance/machine at least once every year?				
	v. Is every crane, crab and winch provided with a readily accessible and efficient brake or other safety device?				
	vi. Is every hand winch fitted with an efficient pawl that is capable of sustaining the SWL?				
	vii. Is every lifting appliance/machine conspicuously marked with its SWL and a distinctive number of other means of identification?				
	viii. In the case of a jib crane, does it have an accurate indicator which is placed to be clearly visible to the driver, showing the radius and SWL of the jib crane?				

	ix. Has it been checked if the load that is loaded in the lifting appliance/machine is within its SWL? (except for an authorised examiner or an inspector for testing purposes).				
	x. Is every lifting appliance and lifting machine adequately and securely supported?				
	xi. Does every equipment in section 21, sub-regulation 8 of the WSH (General Provision) Regulations, 2014 have good construction, sound material and adequate strength?				
	xii. For all rails on which a travelling crane moves, and every track on which the carriage of a transporter or runway moves: -				
	a. Have proper size and adequate strength?				
	b. Have an even running surface?				
	c. Have been properly laid, adequately supported, or suspended?				
	d. Have been properly maintained?				
	xiii. Has it been ensured that effective measures are considered to ensure the crane does not approach within 6 metres of any person at work in the factory which is on or near the wheel tracks of an overhead travelling crane?				
	xiv. Have effective measures been taken to warn regarding the approach of cranes to those above floor level who are liable to be struck by a crane (unless the work of the person is connected or dependent on the movements of the crane)?				
	xv. Is it ensured that those operating lifting machines are trained and competent to operate? Or under the direct supervision of a qualified person (for a person in training)?				
	xvi. Is it ensured that the operator of the lifting machine is of the age of 18 years or above?				
	xvii. Is it ensured that the operator of the lifting machine is of the age of 18 years or above?				
	xviii. Does the lifting appliance or lifting machine: -				
	a. Have good mechanical construction, sound material and adequate strength?				
	b. Properly maintained?				
9	Register of lifting gears: -				
	i. Is the register containing particulars with respect to the lifting gears, lifting appliances and lifting machines (regulations 20 and 21) kept?				

E	MEASURES TO BE TAKEN TO PREVENT FALLS				
10	i. Is the register containing particulars with respect to the lifting gears, lifting appliances and lifting machines (regulations 20 and 21) kept?				
	ii. Has a substantial handrail been provided and maintained for every staircase in a factory building which has an open side?				
	iii. Has the open side of a staircase in a factory been guarded by the provision and maintenance of a lower rail?				
	iv. Has every teagle opening or similar doorway been: -				
	a. Securely fenced?				
	b. Provided with a secure handhold on each side of the opening or doorway?				
	v. Is every fencing properly maintained?				
	vi. Is every fencing kept in position? (In terms of when goods or materials are being hoisted or lowered at the opening or doorway)				
F	CRANES, EMPLOYEE'S LIFTS AND MATERIAL HANDLING MACHINERY				
11	In reference to the Part XV of the WSH (Construction) Regulations, 2014: -				
	Does the equipment: -				
	i. Have good construction, sound material and adequate strength?				
	ii. Free from patent defects?				
	iii. Properly maintained?				
	iv. Positioned and operated as to be stable?				
12	In terms of capacity chart: -				
	i. Is the chart provided in the worksite where the crane capacity used is variable?				
	ii. Has the chart been posted and maintained in the crane to be clearly visible by the operator?				
	iii. Has the chart been set out in terms of the safe loads for various lengths of jib at various angles and radial distances?				
	iv. Has the chart been prepared and certified by an authorised examiner (unless it is furnished by the manufacturer or builder of the crane)?				

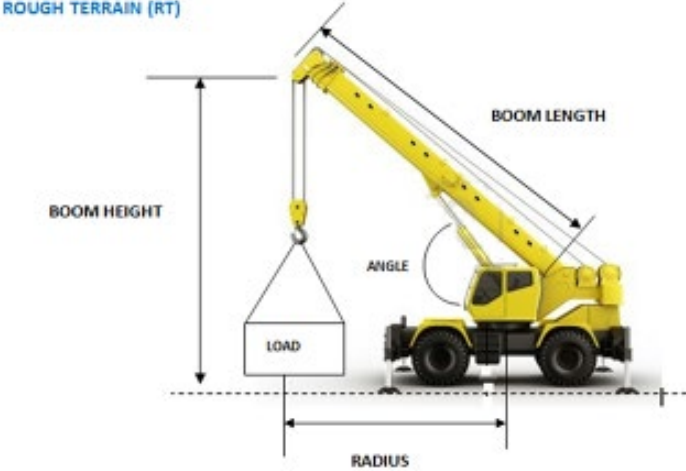
	v. Has the chart specified the safe loads with and without the use of outriggers?				
13	Have the equipment been thoroughly examined and inspected by a competent person or authorised examiner (in terms of a crane or employee's lift)?				
14	For handling of suspended loads:				
	i. Has the operator taken necessary measures to ensure the suspended load is not moved over any person in the work site?				
	ii. Has the employer/principal taken necessary measures to ensure loads which tend to swing or turn freely during hoisting are controlled by tag lines?				
15	Has the employer/principal taken necessary measures to ensure no person rides on the loads, buckets, skips, cars, slings or hooks of the machinery?				
16	Has the operator taken necessary measures to ensure that no load is left suspended on the crane or machinery when not in use?				
17	In terms of operators of employee's lift: -				
	i. Has the occupier ensured that no employee's lift is operated unless there is a designated person in charge as the attendant?				
	ii. Has the occupier ensured that no person other than the lift car attendant moves the car off the lift or opens the car door or gate?				
	iii. Did the lift car attendant ensure that the load is prepared for movement before causing the lift car to move?				
NOTE: The checklist above is a compilation of requirements from WSH (General Provisions) Regulations, 2014, and WSH (Construction) Regulations, 2014.					
Prepared by: (Signature, Name, Designation & Date)		Verified by: (Signature, Name, Designation & Date)			

APPENDIX C: COMMON HAND SIGNALS USED FOR CRANE OPERATIONS



Source: Worker's Safety Handbook for Rigger and Signalman (2019), and Worker's Safety Handbook for Lorry Crane Operator (2019)

APPENDIX D: SAMPLE OF LIFT PLAN

Description of lift:																																																										
Location:	Permit to work Number																																																									
Generic Lift plan No.	Risk assessment No.																																																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #003366; color: white;"> <th colspan="3">1. CRANE DATA</th> </tr> </thead> <tbody> <tr><td>Crane Reg. No.</td><td colspan="2"></td></tr> <tr><td>Inspection Date</td><td colspan="2"></td></tr> <tr><td>Next due date</td><td colspan="2"></td></tr> <tr><td>Crane capacity</td><td></td><td style="text-align: right;">Ton</td></tr> <tr><td>Max working radius</td><td></td><td style="text-align: right;">Mtrs</td></tr> <tr><td>Max boom length</td><td></td><td style="text-align: right;">Mtrs</td></tr> <tr><td>Max lifting height</td><td></td><td style="text-align: right;">Mtrs</td></tr> <tr><td>Parts of line</td><td></td><td></td></tr> </tbody> </table> <p>The crane capacity charts must be consulted for operation restrictions i.e. over the rear only, outriggers fully extended</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #003366; color: white;"> <th colspan="3">2. LOAD DATA</th> </tr> </thead> <tbody> <tr><td>Object to be lifted</td><td colspan="2">Various</td></tr> <tr><td>Weight of Load</td><td colspan="2">3 Ton</td></tr> <tr><td>Container</td><td style="text-align: center;">YES</td><td style="text-align: center;">NO</td></tr> <tr><td>Awkward Shape</td><td style="text-align: center;">YES</td><td style="text-align: center;">NO</td></tr> <tr><td>COG Known, could it change</td><td style="text-align: center;">YES</td><td style="text-align: center;">NO</td></tr> <tr><td>Certified lifting points</td><td style="text-align: center;">YES</td><td style="text-align: center;">NO</td></tr> <tr><td>Special Rigging required</td><td style="text-align: center;">YES</td><td style="text-align: center;">NO</td></tr> <tr><td>Special rigging techniques required</td><td style="text-align: center;">YES</td><td style="text-align: center;">NO</td></tr> <tr><td>Other: Chain block used to balance</td><td colspan="2"></td></tr> </tbody> </table>	1. CRANE DATA			Crane Reg. No.			Inspection Date			Next due date			Crane capacity		Ton	Max working radius		Mtrs	Max boom length		Mtrs	Max lifting height		Mtrs	Parts of line			2. LOAD DATA			Object to be lifted	Various		Weight of Load	3 Ton		Container	YES	NO	Awkward Shape	YES	NO	COG Known, could it change	YES	NO	Certified lifting points	YES	NO	Special Rigging required	YES	NO	Special rigging techniques required	YES	NO	Other: Chain block used to balance		
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3. RIGGING REQUIRED								
Shackle set 1	Type	BOW	Capacity	kg	Quantity	2	Weight	kg
Shackle set 2	Type	BOW	Capacity	kg	Quantity	2	Weight	kg
Sling set 1	Type	WEB	Capacity	kg	Quantity	2	Weight	kg
Sling set 2	Type	WEB	Capacity	kg	Quantity	2	Weight	kg

4. RIGGING WEIGHT		
Description	Weight	Units
Main hook block		kg
Load line		kg
Fly Jib		kg
Auxiliary hook block		kg
Rigging i.e. sling shackles		kg
Man basket		kg
Other rigging attached		kg
Total (With Aux hook)		kg

5. RIGGING CALCULATION		
Description	Weight	Units
Object weight (2)		kg
Contingency %		kg
Rigging weight (4)		kg
Total weight		kg
Maximum Radius		Mtrs
Lift height		Mtrs
Boom length		Mtrs
Capacity chart rating at radius & boom length		kg
% of chart capacity		Utilization

6. CATEGORY OF LIFT (Tick whichever is applicable)

Routine Lift plans shall be written by Lift Planner and approved by person in charge (PIC) of the lifting operation.

Non-Routine Lift plans shall be written by Lift Planner and approved by person in charge (PIC) of the lifting operation.

7. HAZARDS CRANE SET-UP/OPERATING AREA

7.1 Underground Hazards

Utilities – Gas, Water etc
 Storm Drain
 Sewer
 Recent excavations
 Others [Please describe] :

7.2 Ground level Hazards

Members of the public
 Workers
 Vehicles/machinery
 Buildings
 Ground conditions
 Others [Please describe] :

7.3 Above ground Hazards

Electrical cables
 Telephone cables
 Lampposts
 Other cranes
 Trees
 Conflicting tasks in area
 Others [Please describe] :

Access road: Concrete/Bitumen/Gravel/soft/Other

Crane Set-Up Area: Concrete/Bitumen/Gravel/Soft/Slope /Other

The lifting activity requires the following to be considered, note this list is not exhaustive

Cultural, communication and language difficulties	Environmental conditions including weather and permissible limits
Weight, size, shape and centre of gravity of load	Illumination in the pick-up and lay-down areas
Availability of approved lifting points on load	Proximity of hazards, obstructions in the path of load
Method of slinging/attaching/detaching the load	Contingency plan in case the task changes
Overturning/load integrity/need for tag lines	Access and emergency escape routes
Initial and final load positions and how it will get there	Experience, competence and training of personnel
Lifting over live plant/equipment	Number of personnel required for the task
Number and duration of lift(s)	Pre-Use Inspection of equipment by Operator
	PTW, Tool Box Talk, including Safety and Stopping the job

8. APPROVALS

Required lift Approvals	Name	Signature	Date
Lift plan prepared by			
Lift plan reviewed by			
Lift Plan approved by			

Lifting details (step by step)

Method statement for lifting activities.