Global H&S Standard – Rigging & Lifting

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Contents

1 Principles

Rigging and lifting activities form an integral part of network deployment. Modern Network design and deployment techniques mean that the loads lifted often exceed those covered by the methods specified in normal Work at Height training and Nokia's Working at Height Standard.

This Global H&S Rigging & Lifting standard defines the Nokia non-negotiable requirements required to ensure that lifting and rigging activities are conducted safely. The requirements are in addition to the requirements stated in the Nokia Work at Height Standard and in the event of a conflict between the two, the requirements in this standard are to be followed. The non-negotiable requirements of this standard are based on the following principles:

- **Only competent people and companies may conduct rigging and lifting activities.**
- **All lifting activities must be conducted using approved, appropriately rated, and tested equipment that meet the minimum requirements defined in this standard.**
- **A structural assessment must be undertaken on the site, covering condition and integrity prior to any lifting activities.**
- **A lift plan and process documentation must be completed before any lifting activities of 100Kg or more.**
- **Where mechanical lifting is to be employed, verification of structural calculation must be undertaken to confirm the capacities of the structure and lifting setup.**

Using this Document

This standard applies to all Nokia business units and all contractors and service providers conducting work on Nokia's behalf and are in addition to local legal and regulatory requirements.

Section 3 contains Nokia's minimum requirements. If these cannot be achieved, a written request for an exception, setting out the reason why an exception is required and the duration of the exception, needs to be presented to and agreed upon by PS&S in writing.

Section 4 explains who is responsible for ensuring that the requirements are implemented.

Key Definition and Scope

Scope

The principles in this standard apply to all rigging and lifting tasks where the loads being lifted exceed 100kg.

The table below details where the Working at Height and the Rigging & Lifting Standard will apply:

Load	Definition	Applicable Standard	Non-Negotiable
Up to 10Kg	Considered as Manual Handling	Working at Height Standard	Working at Height Standard – Non-Negotiable
Between 10kg and up to 50kg	Considered as Simple Rigging	Working at Height Standard	Working at Height Standard – Non-Negotiable
Between 50kg and up to 100kg	Considered as Rigging requiring the use of Capstan winch	Rigging and Lifting	Working at Height Standard – Non-Negotiable Rigging and lifting standard – Principles must be reviewed and used
Over 100kg	Considered as complex Rigging	Rigging and Lifting	Working at Height Standard – Non-Negotiable Rigging and Lifting Standard – Non-Negotiable

Definitions

2.1 LIFTING

- **Lift plan** is a documented risk assessment and method statement that details the site-specific aspects of a lift.
- **Lift supervisor** is a nominated person with responsibility for the completion of a lift in line with the designated plan.
- **Lifting Equipment** includes any item or component utilized as part of a lifting rig.
- **Lifting Appliance** is a machine designed for lifting e.g., Mobile Crane, Tirfor, Capstan Winch.
- **Lifting Accessory** is any certified item used to connect loads to the lifting appliance e.g., slings, chain sets, shackles.
- **Lifting attachment** is point on a load dedicated for the attachment for lifting. If this is detachable it is considered an accessory for lifting.
- **Lifting Weight (parameters)** up to 10kg is considered manual handling. For loads between 10kg and 50kg, Manual Lifting Devices are to be employed. For loads between 51kg and 100kg, Mechanical Lifting appliance are required. For loads over 100kg, this requires a greater level of lifting and planning considerations as detailed in this document.
- **Gin pole/ Lifting Beam / Derrick** (derived from Gin, a three-legged lifting device), is a supported pole which uses a pulley or block and tackle on its end to lift loads. One end is braced or set in a shallow hole or braced against a structure and positioned so the opposite end lies above the object to be lifted. Lifting Beams are horizontal steel poles or members, braced across a structure or from a rooftop, with a lifting eyelet where the load can be connected for lifting into position. A Derrick is a vertical pole solution, usually surmounted at the top of a structure, often with a rotating function to pick a load from a lower level to raise it to the top of a structure.
- **Capstan** is a mechanical winch used to reduce the manual effort required to lift a load, normally electric and run from generators or the power supply from the site and must be stably secured in line with the lifting line for correct use.
- **Pulley Wheels** [block & tackle] are suspended wheels supporting the lifting ropes to direct the lifting of loads, when used in multiple arrangements can also reduce the pulling force needed to lift the load which produces a mechanical advantage.

- **Non-return device** is a support line attached to a load with a slip limiter that will restrain the load from fall if the lifting ropes fail, similar in principle to a fall arrest system, but for lifting loads.
- **Shackles** Chain shackles are also known as D-shackles. Both refer to the "D" shape design. A D-shackle generally has a threaded pin or pin close. The smaller loop is designed to take high loads primarily in line. These are used to support the connection of slings, pulley wheels, and loads for lifting.
- **Carabiner** is an oblong metal ring with one spring-hinged side that is used typically in climbing activities as a connector and to hold a freely running rope. These are PPE (personal protective equipment) and not to be used for lifting loads.
- **Slings** are synthetic web preformed slings which are generally constructed of nylon, or occasionally polyester, material. They are pre-made and must be rated for load lifting and come in a range of lengths and load capacities. Web Slings are used for supporting fragile loads where chains may damage surfaces or crush the load to be lifted.
- **Anchorage Point** – A structural member, at height or at ground level to which a lifting appliance, or any part of the lifting rig is attached to i.e., head block, guide wire or deviation pulley.

2.2 STRUCTURAL

- **Structural survey** means an evaluation of the structural strength and condition of a structure which is undertaken by a competent engineer.
- **Structural Capacity & Wind Loading** are the design calculations of a supporting structure based on the geometric shape, materials construction and its geographic and topographic location which is also affected by the wind force calculated to be exerted on a structure from the wind given the calculated surface area of the structure and equipment.
- **Designer** – The designer is the nominated engineer responsible for the calculation and planning of the proposed installation or lifting solutions to be employed.
- **Structural Engineer** – a qualified engineer with structural engineering abilities

2.3 METHOD

- **Rigging** means the process by which equipment and connecting materials are fitted to a structure.
- **Lifting** means the mechanism by which loads are lifted onto a structure with mechanical means.
- **Crane Appointed Person** – a competent person with the ability to plan crane lifting activities.
- **SWL Safe Working Load**. – The load that can legally be lifted or supported by an item or rig. Note, the SWL of any item may vary depending on its position or configuration.
- **WLL Working Load Limit** – The maximum load or force that an item is authorised to support.
- **PTW Permit to Work** – A pre-works form for ensuring the set up and coordination of works are all in place and checked prior to an activity. E.g., permit to lift, permit to work adjacent to overhead lines are examples.
- **FOS** – Factor of Safety. The ratio between the SWL of the equipment and its maximum breaking load.

Requirements

The requirements listed in this Standard apply to all Nokia operations and apply equally to all contractors, suppliers and partners working on behalf of Nokia. The requirements are in addition to those stated in the Working at Height Standard. They are non-negotiable.

Training and qualification non-negotiable requirements

1.1 General

1.1.1 Everyone Working at Height must be medically assessed as fit to climb and have received training as defined in the Nokia Global H&S Standard for Working at Height.

1.1.2 The supervisor and at least one of the on-site team members must have completed rigging and lifting training.

1.1.3 All members of the team must be trained in the use of the equipment and method planned for the tasks they are completing.

1.2 Competence and Supplier Qualification

1.2.1 Only suppliers that have been H&S qualified are permitted to conduct rigging and lifting activities for Nokia.

1.2.2 Where a company is directly contracted by the customer, Nokia expects the customer to provide a lift Supervisor to oversee the lifting operations. If no lift Supervisor is present, the Nokia Project Manager must be contacted before work starts. Work must not start without a competent lift Supervisor.

1.2.3 Where local legal requirements exist for company or personal qualification or registration, Nokia must ensure that only qualified, and where required, registered, persons and companies are used to complete lifting operations.

1.3 Lift Supervisor

1.3.1 A lift supervisor must be designated for all lifting activities.

1.3.2 The lift supervisor must be trained in the requirements of the role, which as a minimum mean that they must be:

- Trained as detailed in Nokia Global Work at Height Standard
- Responsible for the accuracy of the lift plan
- Responsible for the development of the risk assessment and method statement that supports the lift plan.
- Responsible for the delivery of the works in line with the lift plan
- Responsible for ensuring everyone working on the lift is appropriately trained, has the correct equipment and understands their role in the lifting process.
- Responsible for assessing the safety of the site before lifting starts, stopping work should any concerns arise during the lift and making sure that the customer / site owner / operator is made aware.

1.3.3 The lift supervisor must be competent as detailed in applicable legislation. These requirements must be met as a minimum.

Structural evaluation non-negotiable requirements

1.4 Structural Evaluations

1.4.1 A structural evaluation must be undertaken by a competent structural engineer to determine the condition and capacity of the location of equipment installations, this covers towers, masts, or rooftop type structures.

1.4.2 A structural calculation should be provided and made available by the owner of the property or appointed designer. If this is not available, the following must be completed:

- Inform Nokia project manager before starting work.
- An assessment to be completed taking into account the impact of the addition of all equipment that is being installed together with the weight of the hoisting and rigging equipment that will be imposed on the structure.

Where Nokia has accepted the responsibility for completing the evaluation or calculation, Nokia must engage a competent structural engineer using recognized methods.

1.5 As built drawings

1.5.1 As built drawing should be obtained for any structure prior to work being conducted and should be updated following any installation work. If no drawings are available, any modifications or changes must be documented and returned to the responsible project manager responsible.

1.5.2 If there are any changes to the site or equipment shown in the design documents to what is actually on site, this difference should be noted and returned to the person / company who conducted the structural evaluation and loading calculations for review before the lift proceeds.

1.6 Pre-climb assessments

1.6.1 A pre-climb assessment (see Appendix) must be completed where a “safe to climb” declaration or certificate is not provided or where the documentation is more than 12 months old, or there are materials differences as noted in 3.5.2.

1.6.2 Where the site visit for the design did not involve a member of the installation team that is completing the works, a pre-climb assessment must be completed which covers the following:

- Verify that the design and method of installation provided is suitable for the installation.
- Conduct a visual check of basic structural integrity, record and highlight any issues that may make the structure unsafe to climb. If any hazard is identified, the structure should not be climbed.

1.7 Site Survey and Evaluation

1.7.1 Prior to any lifting operation a site survey must be completed. The survey must include or confirm the following:

- The structure type matches the provided design information.
- A visual check has been made of basic structural integrity for condition and stability.
- The existing loading and equipment location is located where it states on the design information, and it matches that used in the structural calculation.
- The location of the additional equipment must be checked such that it can be installed as per the design information.
- The structure is of a design and construction on which the lifting methods used by the teams can be safely deployed.
- Site access / egress and working space is appropriate for the intended method.

1.8 Lift Plans

1.8.1 A lift plan must be completed for every site and must include the following activities or information:

- A detailed survey of the site to obtain the location of the equipment proposed position and therefore the location of the lifting beam, Gin pole or derrick.
- A survey of the ground and surrounding area, to locate the offloading and lifting position, this must include any underground service ducts that would impact the load bearing of the equipment used.
- Detailed measurements for the heights, distance away from structure and angles to calculate the forces and SWL for lifting.
- A description of the planned lifting method including, as a minimum, the type of equipment that will be used, the number of people involved in the lift, the points of attachment and connection, location/distance to high voltage power lines, any drop zone requirements, and any space restrictions.
- Drawings or Diagrams for the site team to have full visibility of the lifting layout at positions.
- Documentation of the name of the designated lift supervisor as the responsible person
- Details of emergency arrangements and contact details.

1.9 Lifting Method Preference

Lifting method selection is normally determined by the following factors:

- The load being lifted – weight and nature.
- The availability of equipment to lift.
- The access to and the nature of the site

When determining the method by which lifting will occur, the following order of preference should be considered:

Lifting Method	Pros	Cons
Crane lifting	Good control over the load Large capacity Remote operation – reduces the number of people in direct contact with the lift.	Limited availability Limited height – for most operations practical max height is 20 meters. Expensive and requires accurate scheduling. May require permits and licences. Requires good access
Lifting Beams, Gin Poles, and Derricks with Capstan Winches	Large lift capacity Flexible Can be used in comparatively small spaces	Requires large teams and people in direct contact with the lifting operation. Requires expertise to set up and work safely. 100kg to 500kg MAX
Lifting with Pulley system and Capstan Winches	Simple equipment to set up and use. Low cost	Limited lift capacity. Maximum Recommended is 51kg to 99kg – this must be calculated for each scenario.
Manual Lifting with Pulley system	Simple and low cost Low loading on structure Flexible to set up	Limited lift capacity. Maximum Recommended is 20kg to 50kg – this must be calculated for each scenario.
Manual lifting with Pulley	Simple and low cost Low loading on structure Flexible to set up.	Limited lift capacity. Manual handling limits of 20kg.
Manual Handling	Simple and low cost Covered under Working at Height Training program.	Limited lift capacity Manual Handling limits of 10kg

Tools and Equipment non-negotiables

1.10 Winches and lifting aids.

1.10.1 Lifting aids are required to be used for all loads that exceed 10 KG.

1.10.2 Mechanical lifting aids (winches etc.) are to be used for all loads that exceed 50kg.

1.10.3 All winches and mechanical lifting equipment must be used with a SWL safety factor of at least 150% of load. e.g., If a load of 100Kg is lifted, the SWL on the lifting equipment must be at least 150Kg.

1.10.4 All winches and lifting equipment must be identity tagged, maintained in line with manufactures recommendations and a record maintained of inspections of all in use equipment.

1.10.5 All lifts that require mechanical lifting must have a lifting calculation carried out for placement and safe working.

1.10.6 All winches and lifting equipment must have a mechanism that prevents the load from dropping when the rope or control mechanism is released.

1.10.7 All lifting aids are to be in good condition, rated and meet the lifting specifications. PPE must not be used in the use of winches and lifting aids.

1.11 Shackles and connecting equipment.

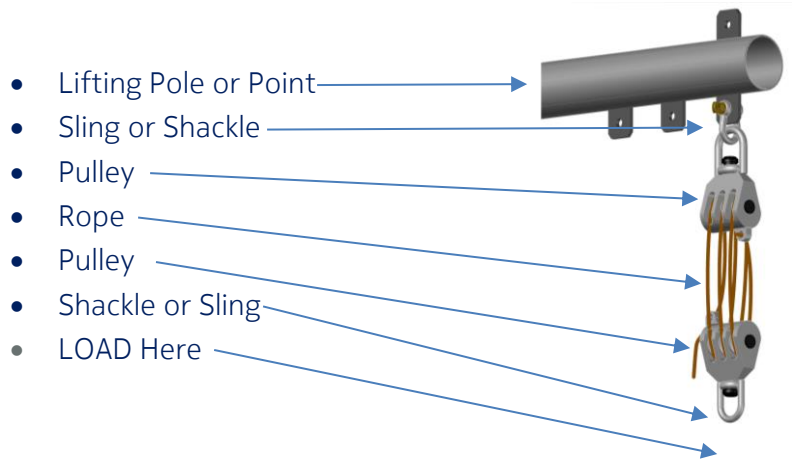
1.11.1 All shackles and lifting connections must be rated for the weights and purpose for which they are used.

1.11.2 All shackles and lifting connections must be individually identified, inspected, and recorded on a register.

1.11.3 Connecting equipment must be in the form of D shackles, preformed Web Slings, load rated Pulley wheels, or multiple wheel blocks; PPE must not be used for lifting loads.

1.11.4 All ropes, slings and straps must be rated for the weights and use for which they are intended, regularly inspected by a competent person, and immediately taken out of use and destroyed when a fault / excessive wear is identified.

1.11.5 The typical arrangement for the connection of lifting must be in the form of:



1.11.6 Lifting Rope and Non-Return Lines must be tied off using professional knots, fit for purpose, and tied by a competent person responsible for the activities.

1.12 Load bearing equipment and connectors

1.12.1 Gin poles, lifting beams or derricks must be of sufficient construction, sourced from certified providers, individually identified, be SWL stamped and inspected and recorded on a register.

1.12.2 The connection of the Gin Pole, Lifting Beam or Derrick must be planned and designed using specific connectors for the product and connected at “strong point” locations which must be identified at the pre-survey stage of the planning.

1.12.3 Access for installing safely the location of the placement of the Gin Pole, Lifting Beam or Derrick must be part of the planning process.

1.13 Cranes and Mobile Lifting Equipment

1.13.1 All cranes and lifting equipment must be operated by trained and, where required, certified people that are aware of the hazards associated with the usage cranes and their assembly and disassembly.

1.13.2 Professional / Competent crane companies must be employed to carry out Contract Lifting where the crane company provides all of the planning and persons to control the lifting. If Nokia directly controls this activity, then a “Crane Appointed Person” qualification is required to perform a “Hire lift”, including all competent personnel (Slinger, Banksman etc.) and insurances.

- All cranes and lifting equipment must be operated within their safe working load limits, which must be documented as part of the lift plan.
- The stability of a crane depends on the surface over which it is operating, this must be considered as part of the lift plan.

1.13.3 The crane assembly/disassembly prior to or following the completion of a site lift must only be done by competent and trained people. Tower climbers / Riggers must not assist with this process.

Implementation Expectations

1.14 Every business group leader must ensure, within their area of responsibility, that the requirements of this standard are implemented.

1.15 PS&S must ensure for every location in which Nokia operates that the minimum requirements defined in section 3 are adapted for local implementation, captured in local documentation, consulted with local stakeholders, and communicated to all relevant parties. The “location” covered in a local supplement to this standard can be:

1.15.1 Specific to a country.
1.15.2 Defined across a region where there is regional alignment or Nokia requirements exceed local requirements in all listed areas.
1.15.3 Tailored based on customer requirements or expectations; or
1.15.4 Based upon local legal requirements and restrictions.

1.16 Procurement must ensure that where companies or individuals are sourced to provide rigging and lifting work that:

1.16.1 The requirements in section 3 are clearly communicated, understood and that the supplier can meet these expectations when they are awarded work.
1.16.2 The supplier is made aware of Nokia reporting requirements related to rigging and lifting.

1.17 Contractors/Third Parties are responsible for ensuring that minimum requirements defined in section 3 are locally adopted, clearly communicated to their employees, understood, and implemented within their area of work.

5. Recommendations

The requirements listed in section 3 apply to all Nokia operations, but the geographical spread of the business means that the extent of implementation varies. The recommendations contained in this section aim to provide guidance on how to achieve the requirements. Should these be deviated from, that decision needs to be documented.

Rigging and Lifting is a risk factor to which Nokia field employees and suppliers, contractors and partners working for or on behalf of Nokia may be exposed. The consequences of an incident related to rigging and lifting can be severe, up to and including death.

The requirements of this standard apply to all of these groups, and implementation must be conducted on a risk-based approach. In order to determine the extent to which the requirements of this standard apply each business unit should conduct an assessment of the risk posed to their operation.

The requirements in section 3 detail *what* is expected. As the measures needed to reach this standard vary around the world, the appendices attached to this standard should be read in conjunction with this standard.

Appendix Contents

- Tower Inspection Document - Example
- Record of Examination Document – Example
- Lifting Plan Document – Example
- Structural & Safe to Climb Document – Example

Tower Safety Check

Site ID Number		Owner of Structure	
Site ID Name		Date of Attendance	
		Person in Charge Name	

5 simple tower checks prior to climbing or site works.

If the answer to any of these questions is YES, stop and alert management for a specialist assessment!

Are there any missing structural members on the tower?

YES ☐ NO ☐

Is the Tower Twisted or Leaning Over [not straight]?

YES ☐ NO ☐

Are the bolts and bolted connections loose or missing?

YES ☐ NO ☐

Is the Tower Severley Rusted and Corroded?

YES ☐ NO ☐

Is the Climbing Access Ladder Loose or incomplete?

YES ☐ NO ☐

Record of the Thorough Examination of Lifting Equipment

The item of Lifting Equipment detailed below has been Thoroughly Examined on the date indicated by the signing competent person.

Equipment Owner	TAG Ltd, Waterside Mill, Chew Valley Road, Greenfield, Saddleworth, OL3 7NH
TAG Ref	
Item Description	
Serial Number	SWL

Date of examination	Result	Signed	Name	Comments

This document is to be retained the life of the equipment and 5 years after Withdrawal / Scrapping

LIFTING PLAN

Company or Organisation

Site Address and location of Lifting Operation

Date | Time

Description of Lift including weight of lifted load

Equipment Used (attach location plan if required)

Item	Description	Serial No	SWL	Date of last Inspection

SWL of Lifting Assembly, including where applicable max lifting height and radius

Kg at m radius or reach

Personnel	Name	Signed
Appointed Person		
Crane / Hoist Operator		
Slinger/ Signaller		
Others		

Details of pre lift Test or Inspection

Signed | Postion

Date | Time

Structural Certification

Site ID	<Site Number>	
Site Name	<Site Name>	
Structure Type and Height	XX.0m	<Type>
Date of Issue	<DD.MM.YYYY>	

Delmec Group Ltd. herby certifies that the site as detailed above has been audited by Delmec; the site concurs with the Structural Analysis Report as summarised in the following:

Gold Certificate:

Delmec hereby certify that all structural measurements , loading (and heights) and design parameters pertaining to this site are accurate and that the structure is structurally sound, according to the latest version of the codes, to carry the existing and any proposed future loading as stated in the applicable referenced Delmec report. The foundation aspect of this certificate is issued based on the foundation dimensional information received from the site as being accurate within reason. The site is fully compliant, safe to climb and checked by Delmec.

Originator Report Company	Delmec Engineering Ltd
Date of Report	<DD.MM.YYYY>
Design Code	BS8100 Pt 1, 1986
Design Wind Speed	XX.XX m/s
Max Leg Stress	XX.XX%
Max Bracing Stress	XX.XX%
Max Bolt Stress	XX.XX%
Max Deflection [if provided]	X.XX degrees

Name: *Kealan Delaney* **Signature:** **Date:** **<DD.MM.YYYY>**

Delmec Engineering Ltd, 10a Barrowside Business Park, Sleaty Road, Graiguecullen, Carlow, Co. Carlow, Ireland

6 Change History

Ver	Status	Date	Author	Owner	Reviewed by	Reviewed date	Approver	Approval date	Description of changes
1.0	Approved	2017-01-31	Andrew Eadie	Andrew Eadie					1st Issue
2.0	Approved	2023-11-13	Sameh Eisa	Sameh Eisa	Rodney Van Wyk	2023-11-20	Paulo Conceicao	2023-11-20	Modifications include document ownership, rebranding, and organizational changes.