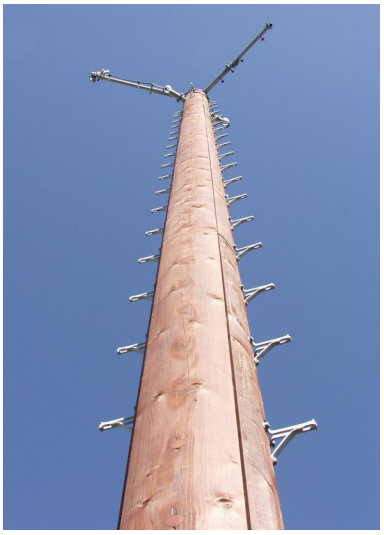
Mast & Tower Safety Group

Guidance Note GN-019

Mast and Tower Guidance for Derrick Usage on Radio Structures



MATS Group Guidance Note

Mast and Tower – Guidance for Using Derricks on Radio Structures

1 Introduction

This document provides guidance on the use of lifting equipment known as a Derrick and associated accessories for lifting/lowering activities. The use of a Derrick is a specialist activity and requires a high level of competence and control.

This document is intended to relay the level of practice required to meet a good level of safety and comply with legislation where it can be applied to this type of equipment. The guidance references factors to be considered for the safe operation and control of documents.

To successfully use this type of equipment the planning must consider all aspects and onsite teams must be competent in rigging operations, safe lifting and lowering techniques and the use of any associated equipment for example winches.

2 Planning

All work on structures requires a site-specific risk assessment and method statement suitable for all tasks to be undertaken. The exact detail required will depend on the magnitude of the task and in some cases the Construction Design and Management Regulations (CDM) will also apply.

Due to the temporary nature of Derricks works must be planned within BS5975 Code of practice for temporary works. The standard gives recommendations for temporary structures on building sites, with practical guidelines on design, specification and construction.

The Derrick although a relatively simple piece of equipment; due to its low usage, the environmental conditions and skill set required to install and use the equipment is complex. As such lifting with a Derrick is to be considered a complex lift and requires planning as per Lifting Operations & Lifting Equipment Regulations.

As with all lifting and working at height operations the planning of the activity must be completed prior to any works taking place in accordance with **Lifting Operations and Lifting Equipment Regulations (LOLER) and** all other relevant legislation. The plan should clearly set out each step of the operation and identify the responsibilities of those involved. The degree of planning and complexity of the plan will vary and should be proportionate to the level of foreseeable risks involved in the work**.**

The plan must address the foreseeable risks and identify the appropriate resources (including people) necessary for safe completion of the job. Factors to include may be any or all the following:

- Working under suspended loads
- Positioning of Derrick and loading areas
- Derrick attachment points / clamps / anchorage
- Visibility
- Attaching / detaching / securing loads
- Environment
- Location
- Proximity hazards
- Overload
- Complexity of the load

- Pre-use checking
- Continuing integrity of the equipment

Due to the mounting of this type of equipment the structure must be assessed adequately by a qualified competent person to ensure that the stress of the equipment or the lifting itself will not cause overloading. A competent person to an appointed level of BS7121 pt1 General (Code of Practice for Safe Use of Cranes). A plan of the lift and mocked lifting and lowering path to demonstrate that no force can be applied in a manner that can cause equipment failure should be completed. This should be completed using a recognised structural appraisal technique and must consider the equipment, accessories, load and lifting dynamics.

If an alteration to the set up is required a full review of the proposed changes are to be verified as above.

3 Derrick Manufacturing Requirements

A Derrick is designed to the task that is being undertaken. The equipment design and purpose must include the following considerations:

- The type of structure the Derrick is to be fitted to and attachments e.g lattice, monopole
- The attachments to the structure and how the Derrick is to be mounted and at what height you plan to work at
- The type of lift that is being conducted along with the position of the lifting and lowering zones
- The weight of the items being lifted and lowered

There is no specific industry guidance on the Manufacture of a Derrick; a similar standard and best practice is to manufacture the equipment to EN 1090 requiring a CE marking. The equipment must be manufactured in accordance with all relevant British/European codes or using other rational methods where appropriate. The codes that must be reviewed but not limited to are:

- Loading to BS 6399 or EN 1991.
- BS8100 Parts 1,3 & 4 in conjunction with BS EN 1991 & Corresponding National Annexe.
- Steel design to BS 5950 or EN 1993.
- Aluminium design to BS 8118 or EN 1999.
- Basis of Structural Design EN1990.
- Lighting Columns/Monopoles BS EN 40 & ILE TR7 (or PLG 07).

All equipment is to be designed and manufactured by a competent manufacturer with experience in specific lifting equipment. In cases where the equipment is designed by the user or third party the designer of the equipment must have the competence and experience to design this lifting equipment and are accountable (the manufacturer must ensure the fundamentals of the for mentioned standards for fabrication are met but the competence in this case for design is the user or third party).

A reasonable assessment must be made regarding a manufacturer's experience in manufacturing equipment that has/will be used for lifting/lowering activities. The same assessment is to be made where a separated designer of the equipment in being used. The manufacturer must hold a relevant Factory Production Control Certificate and issue CE Mark certificates for their products. All lifting equipment commercially purchased and supplied with a Derrick should be CE marked.

In accordance with LOLER a safe working load (SWL) is to be hard stamped or otherwise permanently marked on the Derrick. If multiple configurations exist, these shall be explicitly referenced with appropriate SWL. All other lifting equipment used in association with the Derrick must be assessed for the SWL or Working Load Limit (WLL), which must consider the full SWL of the Derrick.

Suppliers of products shall supply an Operation and Maintenance Manual (OMM). This manual shall describe the equipment, its intended configuration(s), method(s) of use, inspection and maintenance requirements and provide residual hazards and limitations.

4 Derricks and Associated Equipment

The two main types of Derrick available for tower works are Fixed and Floating. You must be experienced and competent to use either device in all instances.

A Derrick is designed to either be specific to a task and structure or versatile to be used across a range of structures with different attachments. Derricks must be used for the intended and designed use on the structure which may vary and, in some cases, have multiple fitments which must form part of the planning. Not all devices fit all structures, however some are designed to have a versatile attachment and are designed to accommodate different operating methods.

All lifting/lowering works must be undertaken within the tolerance of the Derrick and all associated equipment being used must be assessed for restrictions on loading carrying. The positioning of the equipment should be as such that forces created by the load or the way in which the load is lifted should not exceed the safe working load of any equipment or impede the structure.

There are many ways to set up a Derrick and this will be determined by the lift including the type of Derrick head which can allow additional movements. To allow for safe lifting/lowering all associated equipment must be adequate to fulfil the planned works within the safe working loads and the equipment selected.

If a mechanical winch is to be used it must be inspected and maintained in line with current industry practice and legislation. Winches must be secured in place using an appropriate attachment positioned in a way that does not cause additional stress or opposing forces on equipment or the structure.

Derricks and the associated equipment must be stored safely and appropriately to avoid damage and loss of essential parts. Parts that are lost can not be substituted with items that are not intended to be used.

5 Provision of Competent Resource

It is the responsibility of the organisation to ensure that the correct level of competence and resource is in place for any work activity to be conducted. When working with Derricks there are multiple skill sets required to safely plan and carry out the Operation.

MINIMUM COMPETENCE CHART			
Role	General Training	Knowledge/experience	Skills
Planning	■ Training to satisfy BS7121 part 1 General ■ CDM awareness ■ Design awareness ■ Lifting competence LOLER specific for planning lifting operations ■ Structural competence	■ Risk and methods statement writing ■ Risk reduction techniques ■ Lift planning and site climbing activities ■ Structural understanding ■ Lifting accessories	■ Lift planning ■ Winch and Derrick installs and lifts ■ Site planning and set up
Supervision	■ Lifting and lowering/use of rope techniques and devices ■ Competent climber/rescuer (As per industry standard) ■ Installation and use of a Derrick (as per training guidance in this document)	■ Rigging principals ■ Assemble and erecting Derrick (specific to type) ■ Winch setup ■ Derrick load testing ■ Strength and stability check for its intended use	■ lifting plan understanding ■ Pre-use checks of all equipment on site ■ Identify the components of the Derrick

	■ Winch use and lifting and lowering ■ Lifting supervision and LOLER minimum entry level training ■ Slinging and signals ■ CITB Managing Lifting Operations in Construction	■ Factors that Reduce Capacity ■ Determining Load Weights and lateral forces ■ Full understanding of the install process ■ Communication between top and bottom is maintained at all times. ■ Equipment Inspection. ■ Competency requirements	■ Selection of lifting equipment required for the task ■ Conditions affecting employee safety ■ Ensuring standards are met
Installation Operative	■ Slinging and signals ■ Full climber (As per industry standard) ■ Lifting and lowering/use of rope techniques and devices ■ Installation and use of a Derrick ■ Winch use and lifting and lowering ■ LOLER basic training	■ Rigging principals ■ Pre-use checks ■ Assemble and erect Derrick ■ Installation and use of a Derrick ■ Capstan winch setup ■ Derrick load testing ■ Strength and stability check for its intended use ■ Factors that Reduce Capacity ■ Determining Load Weights	■ lifting plan ■ Pre-use checks ■ Identify the components of the Derrick ■ Selection of lifting equipment required for the task ■ Conditions affecting employee safety ■ Inspection of the Derrick ■ Inspection of lifting equipment

Recording the activities and experience of Derrick operators and planners is essential to demonstrate a good track record of safety.

Competency log books are an efficient way of recording this specialist activity and building up records of evidence-based experience and competence.

MINIMUM EXPERIENCE CHART	
Role	Minimum Experience
Planning	■ 2 years experience in telecoms sector ■ 2 years experience in planning lifts ■ 2 year experience at a project management/delivery level
Supervisor	■ Recommend 3 year's experience in telecoms (site level operative) ■ 2 years experience in supervision of at height works and lifting/lowering ■ 2 years experience (or 20 lifts) with Derricks – not transferable to a Derrick that is not being used e.g floating vs fixed.
Operative	■ 2 years experience in telecoms (on site)

	■ 2 years experience (or 20 lifts) with Derricks – not transferable to a Derrick that is not being used e.g floating vs fixed.
Trainee	■ 2 year programme of shadowing experienced team as above with the training parameters in the competency chart and training criteria.

6 Provision of Specific Derrick Training & Criteria

It is the responsibility of the organisation to ensure that the correct level of competence resource is in place for any work activity to be conducted.

As there are no specific industry training requirements for the use of Derricks below is a guide to training and experience requirements and recommendations.

MINIMUM TRAINING CRITERIA	
Derrick Usage Training	Content of Training
■ 8hrs classroom training course for fixed Derrick usage ■ 8hrs classroom training course for floating Derrick usage	■ LOLER General understanding requirements ■ Pre-use checks and thorough exam ■ Risks assessment and associated lift planning ■ Structural reviews ■ Site set up ■ Derrick types, differences and capabilities ■ Derrick installs ■ Lifting and lowering using the Derrick and winch attachments (Specific to equipment) ■ Derrick removal
■ 8hrs practical training course for fixed Derrick usage ■ 8hrs practical training course for floating Derrick usage	■ Review documentation ■ Review training ■ Deploy site set up ■ Install Derrick ■ Lift/lower equipment in multiple locations (link to winch training) ■ Decommission Derrick ■ Remove site set up
■ Refresher	■ Every 2 years or yearly if not used with 12-month period

7 Thorough Examination & Maintenance

All equipment being used must be maintained and examined to ensure its adequacy. Any weakness in equipment could lead to catastrophic failure. All maintenance regimes must be completed in line with legal practice.

In addition to the requirements for safe design, construction and manufacture, all lifting equipment must be checked and maintained as necessary to keep it safe for use:

- Daily pre-use inspections carried out & recorded prior to use
- After assembly and before use at each location
- Formal 6-monthly inspections to be specified and recorded for Derrick and all lifting accessories

- NDT (non-destructive testing) and load testing which the designer or inspector considers necessary

All thorough examinations must be recorded and held with the equipment when in use. The records must clearly identify the equipment and the examination that took place along with a history log.

If the equipment or any accessories has been identified as being inferior or damaged they must be removed from service with immediate effect. Techniques such as dye penetration can be used to review the integrity of the equipment if damages or degradation are observed.

All Derricks must be examined by a competent person each time it is re-installed. The complexity of the installation requirements will largely determine the extent of the thorough examination required and should be based on the findings of a risk assessment.

General maintenance of the equipment is required, any moving parts especially those with bearing assembly must be maintained properly and fully lubricated. The level of maintenance depends on time periods and usage and should be of reasonable frequency.

8 Lifting/Lowering

The position of mobile lifting equipment or the location of fixed installations can have a dramatic effect on the risks involved in a lifting operation. It is vital that all practical steps are taken to avoid people being struck by loads or the equipment itself during use. Consideration must also be given to the positioning of the equipment in that it minimises the potential to lift over people. Due to the temporary nature of the equipment a method of test loading above the lifting weight should be applied before use.

Measures must be taken to reduce the risk of load drift (eg spinning, swinging, etc); and of the load falling freely or being released unintentionally. Setting up of the device requires thorough pre-planning, set up and deployment in line with any pre- planning and the works carried out under strict supervision. A mock lift should be applied to ensure the capabilities of the set up.

You should ensure that any lifting accessories used for securing the load are compatible with it, taking into account any attachment points on the load, the environmental conditions in which the accessories will be used and their configuration of use.

Suspended loads and counter forces from lateral loads are to be planned and calculated to ensure no overload on the structure or the equipment. The set up on site must be in accordance to the lifting plan and must be carried out as per the defined method statement and risk assessment.

The use of lifting equipment in the open air should be halted where the weather (meteorological condition) deteriorates to the point that it could affect the integrity of the lifting equipment or expose people to risks.

The structure must be assessed by a structurally qualified and competent person using recognised structural techniques to ensure the use of the equipment and the plan of lifting does not overload or cause any damages to the structure or equipment that is being used.

9 Supervision

Due to the installation and decommissioning of the Derrick and non-permanent nature of the device all Derrick lifts must be supervised.

Supervision criteria can be met in a variety of ways by experienced personal on site. A supervisor must have all the competence to understand the site set up, qualifications required to complete the works and use of the equipment in its entirety for the activity. The supervisor must be able to understand the lift plan documentation and associated risk assessments for adequacy and to ensure the site set complies.

The supervisor can be the person in charge of the works/manager providing the criteria above is met. It is not appropriate to use a supervisor from another discipline of works e.g electrician or someone who cannot operate a Derrick even if they are trained in other areas such as crane lifts.

The supervisor will be expected to challenge the install and set up of the works to ensure the safest possible method is used.

All members of the team must be pre-agreed, and the supervisor identified written before the works.

8 Communications

Due to the nature of the attachment of Derricks and the distance between those on the ground and those working at height adequate and effective communications are always required. There are a variety of methods to do this including radios and hand signals.

An assessment must be made as to the most appropriate ways in which to communicate based on environmental conditions, line of sight and activity taking place.

A full and thorough induction is also required on the site where the plan and risk assessment is fully communicated to all on site.

9 Approval

If you use an outsourced model and the activities are being sub contracted the following checks must be made prior to the works and use of a supplier:

- Full and thorough management audit of the company paying attention to:
  - Lifting and lowering protocols
  - Work at height protocols
  - Insurance
  - Training and certification
  - Derrick type
  - Maintenance and testing of all equipment
- Reviewing competency logs for those using the Derrick, planning and supervising
- Documented history and experience of the company activities to include:
  - Rigging/climbing
  - Lifting/lowering
  - Derrick usage
  - Winches
- Assessing the adequacy of the health and safety management and resource to conduct safety management in the organisation.

If the above is applicable you should consult the CDM regulations for duties when managing construction works.

10 Construction, Design and Management (CDM)

It is foreseeable that any work activities involving a Derrick on site will be governed under CDM. The duties and duty holders under CDM are clear. Where there is a designated Client it is the function of this role is to ensure appropriate selection of Principal Designer/Contractor is made for this specific works and management is applied along with design control.

The Principal Designer will be required to ensure that when installing structures that require the use of this type of equipment for ongoing maintenance and general works it must be done so minimising all associated risks to a reasonable level. The use of the equipment must be communicated fully in the health and safety file and all operations manuals being specific around use and maintenance.

It must be pre-planned when using this type of equipment. The method in which installation or decommission of equipment is done must be done up front and, in a way, that risks are eradicated or reduced to a reasonable level.

The Principal Contractor has the duty of managing and monitoring the Derrick activity at delivery. Where the Principal Contractor is outsourcing to a sub contracted specialist the specialist must be adequately vetted and appointed against all criteria in this document, best practice and legal requirements. In the case of the Principal Contractor outsourcing the specialist activity the Principal Contractor is still expected to understand the legislation that applies to the works and must ensure that a level of monitoring and measuring is in place.

Note: *This section is not intended to be a conclusive list of CDM requirements, it is purely to remind of the obligations of the regulations placed upon those delivering this specific type of activity.*

11 Related Documents

- MATS Group Guidance Note GN-001 – Working at Height Training
- MATS Group Guidance Note GN-003 – Construction Design & Management for Multi-site Projects in the Broadcast and Telecommunications Sector
- MATS Group Guidance Note GN-005 – Medical requirements for climbing masts & towers
- MATS Group Guidance Note GN-006 – Principles for Access to Radio Sites
- MATS Group Guidance Note GN-009 – First Aid Guidance
- Construction, Design and Management Regulations
- Lifting Operations and Lifting Equipment Regulations
- Provision and Use of Work Equipment Regulations
- Work at Height Regulations

****

The information in this document does not absolve contractors or suppliers from their responsibility to identify and comply with all relevant legislation, regulations and legal standards nor does it take precedence over laws, regulations and external standards.