

Appointed person

Note: It is recommended that you read the Supporting Information page before you read this factsheet.

Planning and regulatory requirements *(Regulatory requirements)*

- The role or duties of the appointed person (AP) or lift planner are described within codes of practice such as LOLER 1998. Other guidance such as BS 7121 identifies the responsibilities, attributes and requirements of the role, and what should be taken into account when the planning of lifting operations is undertaken.
- The AP remains responsible for the execution and safety of the lifting operation although may delegate other duties, although not the responsibility, to other persons such as the LE (Lifting Equipment)/crane or lifting operations supervisor.
- For a lifting operation to be carried out efficiently and without incident, the AP needs to seek, analyse, calculate and specify a procedure and detail the method of executing a lifting operation or operations whilst conforming to both good practice and regulatory requirements. They are further expected to relay the information in a clear and coherent manner to the members of the lifting team, via relevant documentation and other forms of instruction. Investigations of lifting operations incidents have shown that a lack of effective planning is a main cause.
- The aim of this factsheet is to highlight issues that have occurred with lifting operations within the construction and allied sectors, of which the AP should be aware. It further aims to reiterate some of the areas of responsibility for an AP and what they may need to take into account when planning lifting operations.
- A lift plan is normally constructed that, in principle, includes the risk assessment for the operation, a method statement outlining how the risks should be controlled, identification of personnel required, the technical data relating to the lifting equipment (LE/crane), loads, accessories and working area, the sequence of operations and actions to be taken in an emergency or where alternative arrangements need to be made.
- The AP needs to consider and stipulate the competencies and skills required based on the required role, and the number and type of personnel needed for each part of a lifting operation. For example, the AP needs to consider and specify that the chosen slinger/signaller has sufficient knowledge of the attaching procedures where specialist lifting accessories are being used.
- The AP also needs to ensure that the chosen LE/crane supervisor is able to give clear instructions to other members of the lifting team, especially if the AP is not present at the lift. Although the lift plan specifies skills and competencies, it would not normally need to define the fitness levels of an individual – this would be an employer issue.
- In certain circumstances, the slinger/signaller role may be divided amongst various members of the lifting team, each having a defined task. For example, a slinger may connect the load but several signallers may guide it along a travel route if the load is complex, or where specialist lifting equipment is being used.
- To minimise any incidents such as trapped limbs, the lift plan needs to ensure that the slinger directs initial movements to the LE/crane operator whilst the load is being slung, before handing control over to the designated signaller.
- The AP must consider environmental aspects, such as a change in the weather, which can affect the lifting operation in terms of load control, visibility and ground support. Exposure of the lifting team to poor or extreme weather is another factor to consider.
- When specifying the positioning of a LE/crane, other nearby LE/cranes need to be taken into account. On sites where there are several tower LE/cranes working in near proximity to each other, the AP needs to ensure that the paths of each LE/crane's radius do not overlap. If this is not possible, other considerations such as different jib heights or motion limiters need to be considered.
- LE/cranes sometimes need to be positioned within confined areas where there is restricted room, particularly when they are smaller LE/cranes or lifting-type plant such as 360 excavators. Where space around the machine is limited, the AP needs to consider trapping points around the slew or travelling area of the machine and specify an exclusion zone to minimise these trapping points if the gap is less than 600 mm.

- The planning of a complex lift where two LE/cranes are lifting a single load needs further considerations with one of the many being that the proportion of the total load being lifted by each LE/crane needs to be accurately identified and a suitable factor of safety specified. A procedure that ensures good co-ordination between each LE/crane operator during the lift should be determined within the lift plan.
- Regulations and guidance relating to lifting operations require that the planner of lifting operations is both experienced and has appropriate knowledge and expertise. As the factors within a lifting operation can vary considerably depending on sector, location and LE/crane type, APs need to know their limitations.
- If they are inexperienced in certain aspects, they should seek appropriate guidance accordingly. Because of the varying nature of lifting operations, regulations also require that lifting operations are appropriately supervised, with the definition that the required supervision is proportionate to the risk of the operation.

Lifting equipment and accessories *(Equipment and accessories)*

- Lifting accessories (gear) come in a variety of types including chain slings, wire rope slings and fibre-type webbing slings. There is also specialist equipment such as lifting beams. The type of load to be lifted determines the type of accessory used, but each accessory has its limitations and the selection of the incorrect type has caused loads to detach or fall from the accessory when being lifted.
- For example, although very versatile, the links of a chain sling can be easily damaged if they are used to lift steel beams that have protruding edges. Another example is that a wire rope sling cannot be effectively bent around tight corners and may not grip loads sufficiently.
- Lifting accessories should be marked with the safe working load (SWL) but are also rated by the working load limit (WLL). In terms of definition, the WLL is the maximum load that the accessory can, by design, lift and this never changes. The SWL is the maximum load that the accessory can lift under particular service conditions, and this can vary depending on application.
- The SWL of a pair of slings normally only applies (in general) up to an included angle of 90 degrees and, if this angle is exceeded, the SWL can be greatly reduced. For example, if a two-legged chain sling is lifting a load of 10 tonnes with each leg vertical, the load in each leg is half of the total – in this case, 5 tonnes.
- If the (included) leg angle is increased beyond 90 degrees, the load in each leg is increased to 10 tonnes. If the accessory was working near to its SWL, it would be overloaded. Where the included angle increases beyond 120 degrees, then in general, the accessory cannot be used and must be substituted for the correct type such as a lifting beam.
- When a multi-legged chain sling is attached to a load, it needs to be specified that the open end of each hook should be facing out or away from the load, which minimises the chance of a hook slipping out of the load's lifting eye.
- When attaching the master link of a multi-legged chain sling to the hook of a LE/crane, the plan needs to ensure that the master link is large enough and can articulate freely when on the hook. If more than one set of slings is being connected to the hook of a LE/crane, a shackle of sufficient size and load capacity should be specified to prevent damage to the hook and each set of slings.

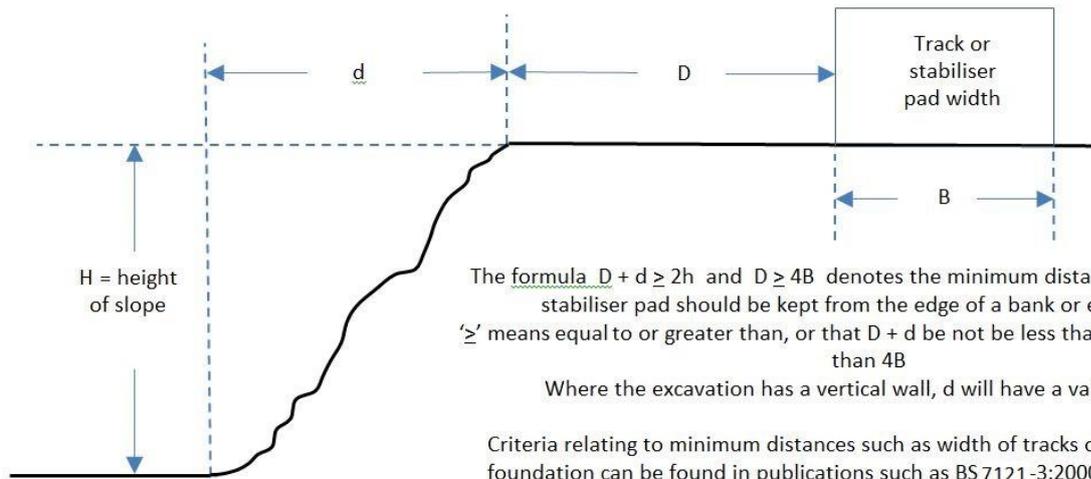
Lifting and controlling loads *(Working tasks)*

- To effectively plan a lifting operation, the maximum rated lift capacity of the LE/crane must be known and any de-rating, or increases in a factor of safety, considered if particular operating requirements will be encountered.
- APs need to be aware that the rated capacity of a LE/crane only applies to a freely suspended load, and does not apply at all times or for all situations. For example, if a load is still attached to a structure, vehicle etc. or embedded in the ground, the increased resistance when being lifted can overload the LE/crane.
- The AP, as stated earlier, will need to specify the number and type of personnel for each lift. According to regulations, a signaller is required when the LE/crane operator cannot see the full path of the load, and several signallers should be specified when signaller cannot see the full path of the load.

- When lifting operations occur near other workers or pedestrians, lifting guidance states that wherever possible, the moving of a suspended load above other workers or pedestrians should firstly be avoided. Only where this is not possible can other measures such as netting around a load or additional securing or protection features then be considered.
- All proximity hazards and conditions on site need to be taken into account and a LE/crane's position planned so that is kept well clear of any overhead power lines. The jib or boom of a LE/crane must be kept well clear of any overhead power lines. Guidance issued by the energy networks utilities indicates what minimum distances must be kept from overhead power lines and the higher the voltage in the power line, the greater the distance that must be kept. This is to reduce the danger of arcing if the jib or boom is close to but not actually touching the power line.
- Where the lifting of persons is being planned, the plan needs to take into account additional considerations such as a reliable evacuation procedure at height in case of an emergency or LE/crane malfunction. A reliable method of communication must be established between the personnel in the cage and the lifting team before lifting commences.

Lifting equipment stability *(Stability)*

- Instability and overturns of LE/cranes still occurs for a variety of reasons including changes to operating conditions, unknown or unconsidered factors (such as ground support), insufficient consideration of safety, deviation from the lifting plan or errors in calculations. Proper siting and support of the LE/crane should minimise many of the instability issues.
- The AP needs to determine the ground loading pressure to be exerted by the LE/crane in all configurations and loads, that the weight of all known loads is determined and calculated correctly, and that the ground can safely support the required pressure. The AP also needs to account for dynamic forces applied by the LE/crane through the ground and determine an appropriate factor of safety accordingly.
- LE/crane manufacturers now commonly supply exact data on ground-bearing pressures for the various configurations of their LE/cranes but where this is not available, in principle, the formula: $(0.75 \times \text{gross weight of LE/crane}) + \text{gross weight of the load}$, can be used to calculate the expected weight acting on the ground through each outrigger. Guidance documents, such as CIRIA C703, provide more detailed methods.
- If the LE/crane is to be positioned near to a trench or slope, a minimum distance needs to be kept and stipulated. Guidance (for example BS 7121) specifies that the formula used to calculate the minimum distance required is $D + d > 2 \times H$, with D & d combined being the horizontal distance from the foot of the slope to the LE/crane/outrigger and the H the vertical height of the slope. The diagram shown at the end of the factsheet outlines the application of the formula.
- Stability is also affected when the LE/crane is not level and, although the majority of types are fitted with level indicators, another acceptable method noted in guidance where a level indicator is not fitted is the use of the hoist rope to act as a plumb line
- When travelling to a site, or when even on a site, a mobile-type LE/crane may need to travel or manoeuvre on temporary roadways or haul roads. In some cases this can involve large distances and driving up or down long and steep inclines. In most cases, these types of temporary roads do not have kerbs.
- Driving too close to the edge of a temporary or minor roadway can and has caused the sides of the roadway to collapse LE/cranes have been known to overturn when driving too close, with severe injuries received by the driver. The AP needs to ensure that roadways are capable of supporting the weight and size of the LE/crane and that all issues are relayed to the lifting team and LE/crane hirer accordingly.



Sample questions

The following questions are based on the text within this factsheet and indicate how the questions and answers are structured. Based on the factsheet, there is only one correct answer. The correct answer to each question is indicated at the end of this factsheet.

Q1. What do regulations and guidance require of a person planning a lifting operation?



That they have at least two years' experience of planning lifting operations



That they have at least one year's experience on each LE/crane type that they are specifying



That they are independent of the organisation carrying out the lift



That they have appropriate knowledge

Q2. On lifting accessories, what is the definition of safe working load (SWL)?



The maximum load that can, by design, be lifted by the accessory



The maximum load that can, under particular service conditions, be lifted with the accessory



The rated capacity of the crane is equal to the SWL of the accessory



The maximum load that can be lifted when each leg is plumb

Study checklist

This checklist aims to act as a study aid to ensure that the reader has identified and understood the relevant parts of this factsheet.

Do you know?

1. Why the AP needs to specify who is involved with the lifting operation.
2. Why the slinger needs to provide initial movements to the lifting equipment/LE/crane operator before a separate signaller, where specified, takes over.
3. What does an AP need to consider when a LE/crane is being used in a confined area or area of restricted space.
4. What additional factors should be taken into account when two items of LE/cranes are lifting a single load.
5. Why should an AP be aware of their limitations or lack of experience in certain types of lift.
6. What determines the level of supervision required for a type of lifting operation.
7. How the links of a chain sling can be damaged.
8. What the difference is between WLL and SWL.
9. What constitutes the total weight of the load being lifting by the LE/crane.
10. What the result would be if a sling is used beyond an included angle of 90 degrees.
11. What needs to be taken into account when specifying the type of lifting accessory for a lifting operation.
12. What should be specified if more than one set of lifting accessories are being connected to the hook of a LE/crane.
13. When the rated capacity of a LE/crane applies.
14. What the distances are that LE/cranes need to be from overhead power lines.
15. What the procedures are if the lifting of persons needs to take place.
16. Why ground pressure loadings need to be known and how they can be calculated.
17. What should be specified when LE/crane dynamic forces are involved.
18. What the minimum distance is that LE/cranes need to be kept away from slopes.
19. How temporary roadways can affect the safe passage of mobile-type LE/cranes.

Answers to sample questions: Q1: D and Q2: B