

Presentation on 8th October 2007

Lifting Operations for Sites

James Stapleton, Geographic Team Leader, Laing O'Rourke

James explained the role of his Company, and that of his division within it, by showing examples of large Midlands projects. He went on to say that the current Lifting Operations and Lifting Equipment Regulations (LOLER) replaced three previous sets of legislation in 1998. Their main provisions were a requirement for lifting equipment to be: -

- Strong and stable enough for use and marked with the Safe Working Load
- Positioned and installed to minimise risks
- Used safely in a planned way by competent people
- Subject to ongoing, thorough examination and, where appropriate, inspection by competent persons

James went on to say that it was important to realise that the definition of **Lifting Equipment** covered anything used at work to power or lift loads, including Tower Cranes, Fork lift trucks, hoists, Mobile Elevating Work Platforms and vehicle inspection platform hoists. Attachments used for anchoring, fixing or supporting them and Lifting Accessories, such as chains, slings, eyebolts, shackles swivels and spreader beams are also covered. Equipment for lifting person must also be clearly marked as such. Other specific requirements are: -

- Lifting equipment (and its accessories), before being used for the first time, must be thoroughly examined.
- Thereafter, this should be done at least every 12 months
- Where used for lifting persons, inspections should be every 6 months.
- Weekly crane inspections should be done by the driver and kept in the cab to provide a history. All faults should be reported immediately and actioned immediately

Typical lifts might be: -

- Construction steelwork frames
- Placing of concrete
- Lifting plant around the site
- Placing of cabins
- As a slave crane to erect a larger crane
- Lifting kerbs using vacuum attachment on JCB/FLT/Road Vehicle with Hoist.
- Lifting pre-cast items (A growth area in reducing work at height)

At the centre of any lifting operation is the "Lifting Team": -

- The Crane **Appointed Person** plans the operation



- The **Crane Supervisor** controls the overall lifting operation
- The **Crane Operator** operates a specific crane
- The **Slinger/Signaller/Banksman** attaches the load and guides the operator to manoeuvre it in blind spots.
- There is also a **Crane Co-ordinator** when there are multiple cranes on site

Laing O'Rourke has produced a **Safe slinging guide and "Safe operations of cranes"** booklets to improve safety and it is a contractual requirement to comply with them and to use important working documents. The fundamental element is the Lifting Operation Plan to include the following: -

- Details of all the lifts to be undertaken
- Confirmation of the Team structure and hazards
- Pictorial representation of each item and how it is to be lifted
- Display of a Safe System of Work
- Clear means of communication with radio or hand signals

The selection of the right type of crane is vital and depends on the following: -

- Weight of load: -
- Rating charts
- Consultation with crane experts
- Extent/Radius of lift, which is crucial on many sites, may need to address
- Oversailing rights
- Luffing jib maybe be better than saddle jib on tower crane
- Zone protection/SMIE programming
- Number, frequency and type of load to be lifted
 - Mobile/ Tower cranes?
 - 360° Excavator vs. Backhoe Excavator?
- Space available for crane access, erection, travelling, operation and dismantling (make sure any crane mast sections can be lifted out after construction is complete)
- Chains come in various types: Metal; Fibre; Wire rope. All need careful storage and examination. Be aware that some loads can cut through fibre rope, whereas others may distort metal chain/wire ropes. Do NOT use them as tow ropes
- Organise an independent check by A.N.Other!
- Ground Stability is vital: -
 - Starts with notification of conditions from the Client – required by CDM Regs.
 - If this information is not available – your 'alarm bells' should ring!
 - You need specialist advice about huge dynamic forces on outriggers.
 - Check for manholes, voids and services
 - Ensure that the 'Temporary Work Co-ordinator' is involved for checks on ground conditions

Regarding specialist Lifting, James said: -

- Tandem Lifting
 - Occasionally used for exceptionally large loads
 - Each crane should be de-rated by 20%

- Hoist ropes to remain vertical at all times
- Good communications are crucial
- Use Mobile Cranes ONLY – never tower cranes!
- Temporary Works
 - Ensure reinforcement wall panels/cages are designed specially
 - The TWC needs to have an input to ensure that the panel is strong enough to be lifted and will not collapse in on itself



Double Wrapping Chains

Securing of irregularly-shaped loads is also a high priority consideration. It is crucial that tag lines must not 'catch' the load onto site structures. 'Double wrapping' of loose loads on chains is essential and nets are an important precaution under palletised loads to catch and items that may become dislodged by impacts.



Other types of cranes have their own special characteristics to consider such as: -

- Lorry-mounted Hoists
 - Some are very powerful and need careful handling
 - Lifting of cabins can be awkward for smaller hoists as the chain angle can be very low – creating a massive force on the chains
 - Often used for delivery of loose-load items such as pipes & bricks
 - Operator needs training and experience to develop sufficient competence before operating
- Tele-handlers
 - Increasingly used on sites
 - Used to bridge the gap when goods hoists are not used on low to medium height buildings
 - Can have very long reaches

- Must be used with safe method of receiving loads at height with use of special movable barrier
- Condition of pallets is crucial. Often used with fork attachment that may introduce its own manual handling hazard as it can weigh over 25 kgs.
- Tower Cranes
 - Some are exceptionally complex and need a thorough familiarisation briefing. A CTA card is needed. Beware of fakes – always check number on back of card with the CPCS helpdesk
 - Control handles have touch controls and it has been known that calluses affect machine handling
 - Make sure crane drivers do not suffer from vertigo – it has happened!
 - Ensure that drivers get an adequate break time. It can take 20 minutes to get from cab to canteen – so build that into the operating plan!
 - Hold regular ‘Crane Team’ meetings – to avoid clashes

James then dealt with the sensitive issue of “Contract Lift”, where employers do not have enough in-house expertise to plan and execute the lifting task. In such cases the appropriate expertise may be hired from an outside source, known as a ‘contract lift party’ to carry out: -

- Before entering a contract, the employing organisation must undertake a competence check to ensure that the lift party will comply with BS 7121. This would also be necessary under the CDM Regulations.
- All necessary planning, provision of personnel, equipment and lifting operation
- The contract lift party will provide the Appointed Person

James went on to explain some of the pitfalls in any lifting operation: -

- Wind loadings are ignored. Gusting winds should be allowed to die down before starting
- Loads lifted out of sight of the crane driver, resulting in poor communication
- Directions taken from persons other than the appointed crane team members
- Improvised loads not assessed properly for competent slinging and lifting
- Crane hook accidentally catches another part of the structure and pulls it down
- Collapse of pallets
- Threads pull out of purpose-built sockets in pre-cast concrete loads, due to cross thread or wrong attachment inserted
- Single wrapping of loose loads

In conclusion, James advised: -

- Assess the lift, implement control measures, communicate the SSOW to the lifting team and monitor the operation
- Carry out Post-lift Reviews
- Pre-fabrication off-site will increase the demand for cranes
- Used wisely, cranes are a valuable asset
- Without proper planning, lifting operations can be very dangerous

Members' Questions

Construction Chairman **Gerry Mulholland of Laing O'Rourke** launched this session by reiterating James' earlier about prefabrication leading to more demand for lifting operations, with a matching reduction in manual handling and more machines on sites. He added that another latent hazard was that a crane hire firm sometimes would send a 130Tonne crane when the 110 Tonne size that had been ordered was not available. This could be unacceptable under the proposed lifting plan, for a variety of valid, technical reasons. Finally, he mentioned that planned communications could become unacceptable after darkness in the winter months.

Bob Cole of Morgan Est commented that on some sites, it was unacceptable for tele-handlers to travel with some types of loads, with outriggers to maintain stability. James agreed sharp turns and tracking manoeuvres were a high risk.

David Hughes of Hughes Business Services raised the question of rescue from Tower Cranes and James replied that there were various systems available. **The Secretary** added that suspension trauma was a crucial factor in rescue plans that was greatly misunderstood, as was the unsuitability of most harnesses for supporting victims in a healthy position for many minutes. Consequently, most rescue plans were dangerously deficient.

Peter Warne of Carillion Roads asked if a waste skip was considered to be an Accessory or as part of the load? This deceptively innocuous question sparked off such an intense discussion, that it was no surprise that there did not seem to be a clear answer. Examination of Guidance Paragraph 46, treats refuse bins as part of the load, although they generally weigh a lot less than most Construction skips!

Bob Peabody of Forum Training UK asked if pallets should be marked with a Safe Working Load. The consensus opinion was that they were not.

Steve Parton asked if it was acceptable to appoint a subordinate Appointed Person on a site for a contract lift and could that person be a Scaffolder? James stated that Laing O'Rourke only had one Appointed Person on each site. **Ed Friend** said that this might imply that the sub-ordinate person had limited competence and that HSE would ask very searching questions about that arrangement!

Warwick Adams of Interserve Project Services asked if a CPCS Appointed Person was not doing a high volume of lifting operations, his competence would suffer and he would not be able to record many entries in his logbook. In that situation what action would he have to take at the end of the five-year period? James thought that this would mean retraining before starting again.

Bob Cole asked what pre-use checks should be made. James replied that this was covered by the Laing O'Rourke guidance and included use of a Lifting Operation Assessment Form, an Inspection Form, Thorough Examination Report and a team briefing.