

# Irish Mobile Crane Hirers Association

*Representing Mobile Crane  
Hire Companies Nationwide*

## Ground Conditions for Safe Operation of Mobile Cranes



*Presentation by Members of The Irish Mobile Crane Hirers Association from Dublin – Cork – Galway*

# Ground Conditions for Safe Operation of Mobile Cranes

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### What will be covered today:

- Types of Hire
- Ground Conditions – Safe Operation on site
- Legislation and Standards – Hirers Responsibility for Ground Conditions:
  - Clause 6.6.2 - NSAI I.S. 360:2019 Code of Practice: Safe use of Crane in the Construction industry
  - Clause 5 - Irish Mobile Crane Hirers Association: Conditions of Hire
- Understanding Ground Pressures
- Grounds to Proceed – What to be aware of

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## Types of Hire

### Standard Hire

***The Hirer (Employing Organisation) Must:***

- Comply with I.S 360: 2019.
- Appoint the Appointed Person
- Plan the Lift and operate the safe system of work
- Ensure that the crane hired is a suitable type and capacity
- Check the credentials and the certification supplied by the owner

***The Owner must:***

- Provide a safely maintained, tested and certified crane
- Provide a Competent Operator

### Contract Lift

***The Hirer (Employing Organisation) Must specify:***

- The works are to be completed to I.S. 360: 2019
- That the Employer (Owner) appoints the Appointed Person
- Provide all information on services in writing.

***The Owner must:***

- Supply the Appointed Person
- Plan the lift and operate the safe system of Work
- Manage and Control the Lifting Operation

\* The hirer is responsible for ground conditions for a standard hire and a contract hire

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## Ground Conditions – Safe Operation on Site

Where a crane and/or Appointed Person is hired on Standard and/or Contract Hire lift basis, it remains the sole responsibility of the hirer/user organisation to confirm to the crane hire owner in writing or by a detailed drawing clearly indicating the location and nature of any/all underground sewers/ voids/ services/drains/rivers and/or ground conditions that may make the areas over which a crane and/or equipment may travel over and/or set up upon hazardous/unstable/dangerous/unsuitable for the loads that may be exerted.

The hirer/user organisation may request a geotechnical survey to establish the details of the ground conditions. In the absence of the aforementioned letter and/or drawing and/or Geotechnical survey the crane hire owner will operate under the understanding that no underground hazards/sewers/voids/services/drains/rivers are present in the areas where a crane/or equipment may travel over and/or set up upon.

# Legislation and Standards

## Responsibility



### NSAI I.S. 360 - CODE OF PRACTICE: SAFE USE OF CRANES IN THE CONSTRUCTION INDUSTRY - PART 1: GENERAL

#### **6.6.2 Crane standing or support conditions**

The Project Supervisor Design Process (PSDP) and the Project Supervisor Construction Stage (PSCS) shall coordinate with all parties involved in the lifting operation to ensure that the crane set up location is fit for purpose.

The appointed person should obtain an assessment by a competent person as to whether the loads imposed by a crane that is not permanently installed in a fixed position can be sustained by the ground or any means of support.

# Irish Mobile Crane Hirers Association

- Conditions of Hire for Mobile Cranes
- Clause 5. Ground Conditions

## 5. Ground Conditions

5.1 Notwithstanding the NSAI CoP IS360, the Hirer shall ensure that ground conditions, including access and egress routes are suitable for the Crane's imposed loads. If, in the opinion of the Hirer, the ground (including any access and or egress route) is soft or unsuitable for the Crane to operate on, then the Hirer shall not operate the Crane, or permit the Crane to be operated, in such conditions unless and until it ensures that it provides all necessary and suitable supports to cater for the imposed loads.

### Conditions of Hire for Mobile Cranes

All hires are undertaken strictly in accordance with the NSAI Code of Practice for the Safe use of Cranes in the Construction Industry IS360 (Hereinafter referred to as NSAI CoP IS360)

#### 1. Definitions

- 1.1 The "Contract" is the contract between the Owner and the Hirer for the hire of the Crane, which consists of the Offer and these Conditions of Hire.
- 1.2 The "Crane" covers all classes of cranes, machinery, equipment, and accessories which the Owner agrees to hire to the Hirer.
- 1.3 A "Day" shall be no period less than 8 hours unless otherwise specified in the Contract.
- 1.4 The "Hire Period" shall commence from the time when the Crane leaves the owner's depot or place where last employed and shall continue until the Crane is received back at the Owner's named depot or equal.

Owner's Crane on hire and

the Crane to be hired, the  
be incorporated into the

their successors, assigns or

and supersedes all prior  
written or oral. Any  
be deemed to be excluded

personnel supplied by the  
ons of the Hirer. Where a  
all purposes in connection  
agents of the Hirer. Such  
undertake work other than  
between the Owner and the

without the authority of the

hired without the Owner's  
s rated capacity and in  
turn on the completion of  
ated or used in an unsafe  
any damage, loss, costs,

and/or unsatisfactory state of environment, the Hirer shall be solely responsible for any damage, loss, costs, expense or accidents whether directly or indirectly arising therefrom.

#### 4. Repair

- 4.1 The Hirer shall not repair the Crane without the written authority of the Owner. The Hirer shall allow, and hereby authorises and grants a licence to the Owner, his agents and or his insurers to have unobstructed access to the Crane to inspect, test, adjust, repair, or replace the same. Without prejudice to any other right under the Contract, the Hirer hereby grants the Owner, his agents and or his insurers an irrevocable licence to enter upon the site unimpeded to remove the Crane from the site for any reason whatsoever and this right shall survive termination of the Contract.



# Guide to Ground Pressures

Approximate pressure exerted by the foot of a typical human male

40kN/m<sup>2</sup>



Max loading exerted by an outrigger of a 750ton crane on 5m x 4m timber mats

102kN/m<sup>2</sup>



Typical Loading exerted by an outrigger of a 100ton crane resting on 3m x 1m timber mats

138kN/m<sup>2</sup>



Pressure exerted by a medium sized passenger car

218kN/m<sup>2</sup>



Mountain Bike

245kN/m<sup>2</sup>



Typical loading exerted by an outrigger of a 35ton crane resting on 800mm diameter nylon pads

315kN/m<sup>2</sup>



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## Grounds to Proceed – What should the Hirer be aware of:

### Ground Conditions

- Greenfield site
- Brownfield (Filled) sites
- Services and utilities
- Paved areas
- Suspended slabs

### ***What information is required:***

- Site Investigation
- Services records
- Determine soil bearing pressure
- Loading Data sheets
- Timbers Grillage
- Larger Crane Mats
- Temporary works etc.

### Have you checked for the following:

- Electricity Cables
- Gas / Water / Drainage pipes
- Culverts
- Uncompacted material
- Covered shafts and manholes
- Recently backfilled excavations and trenches
- Voids under old concrete foundations
- Cellars and basements



## When Hiring a Mobile Crane:

Carry out the Ground condition checks

Are ground conditions adequate for the hire?

This image shows a crane company who set up their new 250-ton crane on a suspended slab without adequate or correctly placed back propping - Once the first outrigger punched through the slab, it caused a progressive collapse...

***Don't be this company...***