

# IHBA Webinar – ‘Critical Risks in Residential Development’

12<sup>th</sup> October 2023

# ITINERARY

13.00 – Welcome Introductions

\*Ronan Redmond, Executive, Safety & Training

13.05 – Site Safety & Logistics

\*Cathal Mooney, Glenveagh

13.15 – Lifting Operations

\*Joe Byrne, Park Developments

13.25 – Residential Trench Box & Scaffolding Guide

\*Brendan McKeever, DRES

13.35 – Fireside Chat

13.50 – Q & A Session



# Site Safety & Logistics

Cathal Mooney, Glenveagh

# Dignity, Respect and Mental Health

Please remember that some people are carrying a heavy load:

Trauma experiences, stress, work, health, relationship or family problems

Be Kind,

Be Compassionate.



The Lighthouse Construction Industry Charity





# Welfare and Planning



The Site canteen is equipped with:  
Table, chairs, plates, cups, cutlery,  
AA rating equipment's such as fridge,  
microwave, toaster, kettle, coffee  
maker, dishwasher. Recycling &  
general waste bins, liquid soap and  
hand sanitizer.





# Communications



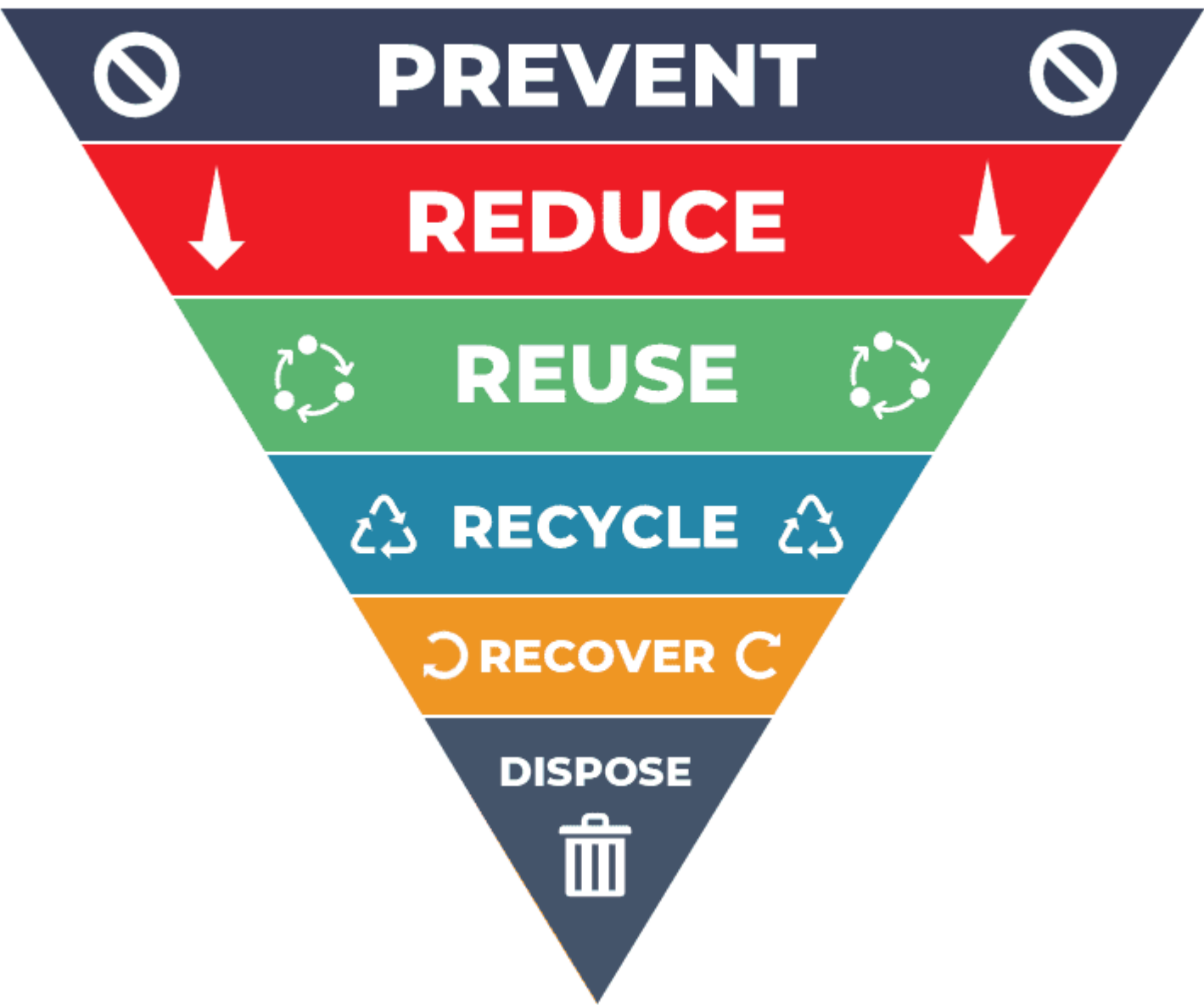


# Completed areas handed over





# Environmental Sustainability



Glenveagh  
Home of the new.

Hydrotreated  
Vegetable Oil ('HVO')



This lighting tower is equipped with 4x150W high efficiency LED floodlights powered by a rechargeable battery pack. It guarantees a great reliability and a perfect sustainability.

- Low noise & carbon dioxide emission
- Can run more than 660 hours without refuelling
- Batteries can be recharged from either an external power source or from the built-in backup generator



**Thank You**



# Lifting Operations

Joe Byrne, Park Development



# Planning of Lifting Activities



## Basic Lift Plan (Suspended Loads)



☐ EXCAVATOR ☐ TELEHANDLER ☐ HIAB

Project	Date of Lift		
Load Details	Load Description	Refer to Schedule of Common Lifts	
	Weight of Load	kg	Load Dimension: _____ m x _____ m x _____ m (high) No. of lifting points: _____
Machine Details	Make & Model	Inspection in place: GA1 <input type="checkbox"/> GA2 <input type="checkbox"/>	
	Max Rate Capacity	kg @ _____ (Note: Refer to and Add load chart to lift plan)	
Site Conditions	Ground conditions	Firm Clay <input type="checkbox"/> Compacted Stone <input type="checkbox"/> Concrete slab <input type="checkbox"/> Other _____	
	Checked for U/G Services	<input type="checkbox"/> Yes	Checked for overhead lines <input type="checkbox"/> Yes
	Detail any interface with others (public / trades etc)		
Equipment	Detail of lifting attachments / shackles / chains / slings etc (GA1 and GA2 inspections in place prior to lifting)	1.  2.  3.  4.  5.  6.  7.  8.	
		Safe Working Load (SWL) 1. Lift Attachment _____ kg 2. Bow Shackle _____ kg 3. Master Ring _____ kg 4. Lifting Hook _____ kg 5. Swivel Ring _____ kg 6. Lifting Clutch _____ kg 7. _____ Nr. Leg Chain _____ kg 8. Sling _____ kg 9. Other: _____ kg	

## BASIC Lift Plan (2 pages)

Lifting using Excavators / Telehandlers / HIABS.

## Basic Lift Plan (Suspended Loads)

Example:  
1 no. 4 ton sling choked for lifting of beam.  
Reduction factor =  $4 \times 0.8$  (Load Factor) = 3.2ton SWL of Sling.

Configuration	SWL (tonnes)
1. 4 ton sling choked	3.2

Figure sketch showing lift including lift accessories used / SWL along with details (Add more details and attach to lift plan if required).

Name	Signature	Date

Capacity of lifting rests with lift contractor and their competent personnel:

Reviewed by PD AP:	Date:

Capacity to carry out lift.  
For all lifting activities.  
Stabilizers (jacks) engaged during lift / use taglines / risk assessment required for working at height.  
Lift equipment (apply working at height hierarchy of controls).  
Lift for lift exclusion zone, include spotter where required.  
Lift, where driver and slinger are not in line of sight.  
Manual is available for the machine.  
Lift plan, before carrying out suspended lift, include Schedule of Common Lifts as appendix to this plan).



## 360° telehandler Lifting Plan development

Park Developments (Dublin) Limited

LIFT PLAN (For all crane lifting and lifting by equipment used as a crane)

Refer to PD SOP for lifting Best Practice

Customer Name: RTW ABM1 Customer No:  

Description of lifting operation: Lifting Precast units into ground level of ABM1 Apartment Block

Package: Customer Lift: ☒ Telehandler: ☒ Start Date: 18.11.21 Duration: 1 week

Lift Plan Title: RTW ABM1 - Telehandler Lift Plan

Revision No: 01 Date: 01.12.21 Revision Ref:  

Signoff: Approved (AP):  Date: 06.12.21

Crane Supervisor: Paul McQuinn

Crane Supervisor is to be a member of the Management assigned with overall responsibility for supervising the lifting operation in the plan. When the CS has passed training, the AP can delegate certain duties to the CS - refer to CTF Lifting Supervisor - Crane Coordinator Course [https://www.parkdevelopments.ie/lifting-supervisor](#)

PSC Review - New full responsibility of lifting rests with lift contractor and their competent personnel.

Approved by PD Management: Reviewed by PD AP: Shane Scully Date:  

Competent Personnel	Name	CSCS (date)	Detail attached (signature) (date)
Telehandler Operator	Ronan Manning	PO 7011 0975	01.12
Designated Slinger	Paul McQuinn	PO 220775 0883	08.12
Slinger		PO 272141 0175	05.20
Slinger			

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### Example:

1 no. 4 ton sling choked for lifting of beam.

Reduction factor =  $4 \times 0.8$  (Load Factor) = 3.2ton SWL of Sling.

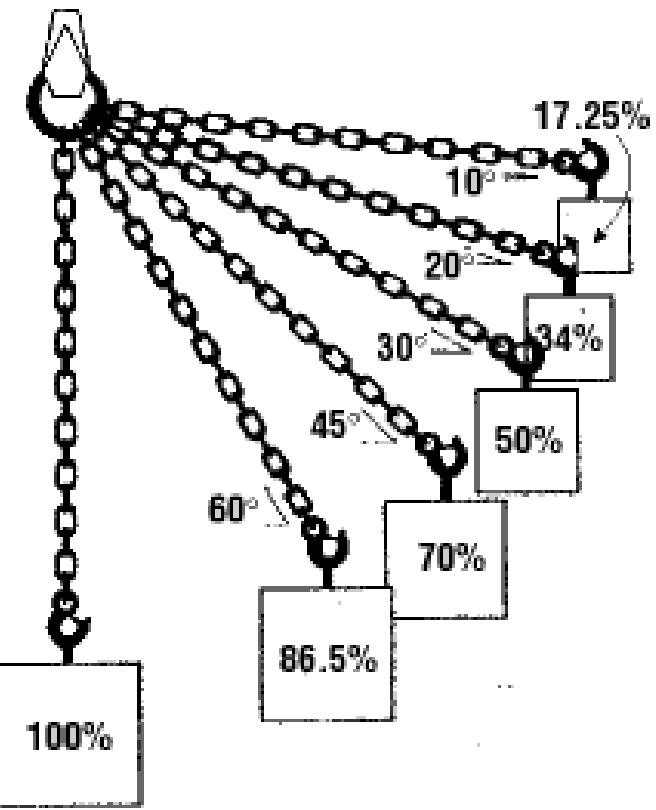
### Reduction Factors

GENERIC LOAD CHART FOR FLAT AND ROUND WEBBING SLINGS:

ROUND SLINGS	FLAT SLINGS	CHOKE	BASKET	30°	60°	90°	120°	60°	60°
L = LOAD FACTOR	L = 1.0	L = 0.8	L = 2.0	L = 1.9	L = 1.7	L = 1.4	L = 1.0	L = 1.7	L = 1.38
COLOUR CODE	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes	W.L.L. Tonnes
Violet	1.0	1.0	0.8	2.0	1.9	1.7	1.4	1.0	1.7
Green	2.0	2.0	1.6	4.0	3.8	3.4	2.8	2.0	3.4
Yellow	3.0	3.0	2.4	6.0	5.7	5.1	4.2	3.0	5.1
Grey	4.0	4.0	3.2	8.0	7.6	6.9	5.6	4.0	6.9
Red	5.0	5.0	4.0	10.0	9.5	8.6	7.0	5.0	8.6
Brown	6.0	6.0	4.8	12.0	11.4	10.3	8.4	6.0	10.3
Blue	8.0	8.0	6.4	16.0	15.2	13.8	11.2	8.0	13.8
Orange	10.0	10.0	8.0	20.0	19.0	17.3	14.1	10.0	17.3



Sling Colours indicating SWL



Consider angle tension and reduction factor when planning lifts

## Planning Lift Equipment



Correct storage and records inspection



# Lifting Devices – *Checking the finer details*

Swivel hook



**Lock Pin missing from Swivel hook**  
**Potential for hook to dislodge**



**Example of Swivel Hook**  
**with Lock Pin in place**



**Attachment Pin cut to allow**  
**fit to machine**



**Bolt too big for pin, is it as**  
**per manufacturers spec?**



**Nail used to hold pin in place**



Inspection Colour Code Tag



Shackle fully tightened  
on Excavator



Manhole Lifters



Glass Lifter hooks  
onto 360 / crane



Material  
Cage



Rescue Cage



Pipe Stillage



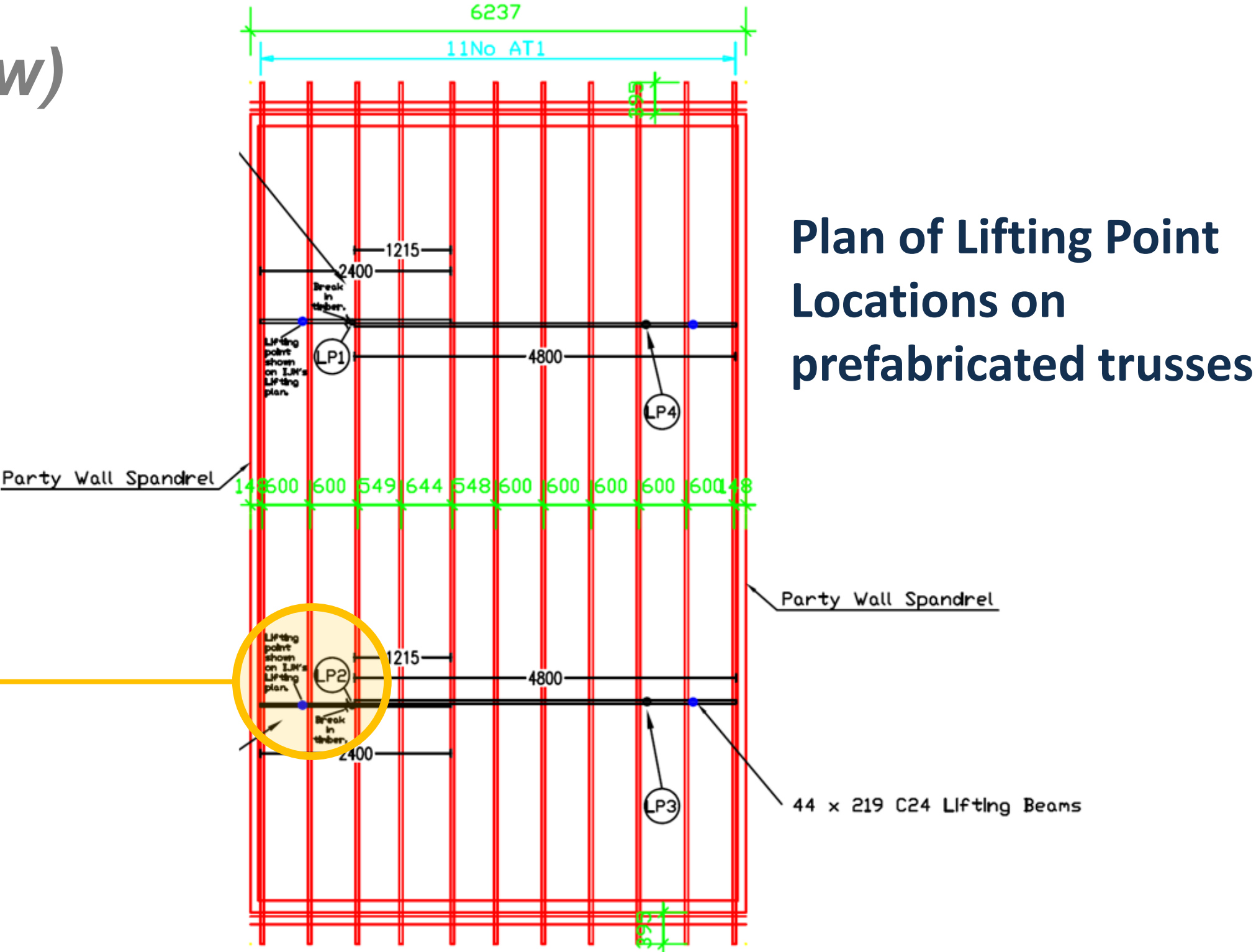
# Timber Frame – Safe Lifting Points (Incident Review)



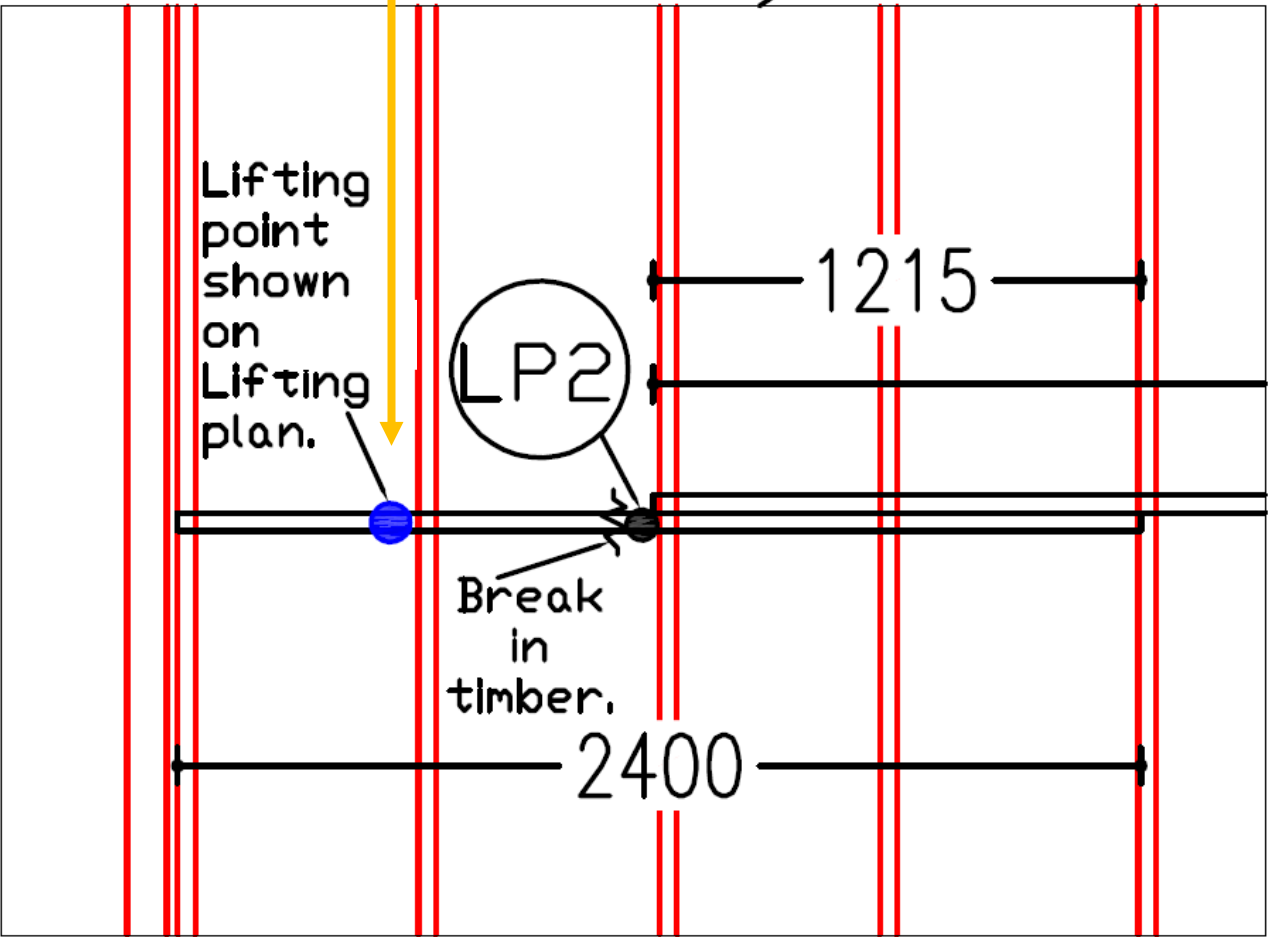
During lifting of pre-fabricated roof section, the lifting chains were hooked on to C24 timber beams at the wrong location (not as per plan).

This resulted in a failure of the timber beams at the lift points causing the section to fall into the lifting exclusion zone.

Following review, the lifting points were reestablished, documented on drawings and communicated with crews.



Plan of Lifting Point Locations on prefabricated trusses



Detail of Lifting Point Locations on prefabricated trusses  
Note: Lifting Point away from splice of 44 x 219 x C24 Lifting Timber Beams



# Lifting Operations – What issues the Industry needs to solve together ?

## Loading out Plasterboard in Houses \_ levels 2 & 3



loading out on Ground Floor Concrete slab during timber frame install – No issues



A) Open slot in floor to manually lift slabs through.



B) Prop flooring and load out slabs using crane during timber frame install.

Problems arise when loading out to levels 2 and 3 where manual lifting of slabs is required. How some house builders deal with issue outlined in A) & B)

## Lifting of Mortar Bins



Image D. Incorrect lift– Pinching Mortar Tub.



Image E. Correct lift– forks through Mortar Tub lifting square-eyes.



Scaffolding ledger obstructs lift when mortar tube is lifted by lifting eyes, There is then a tendency to lift mortar tub by pinching sides of bin.

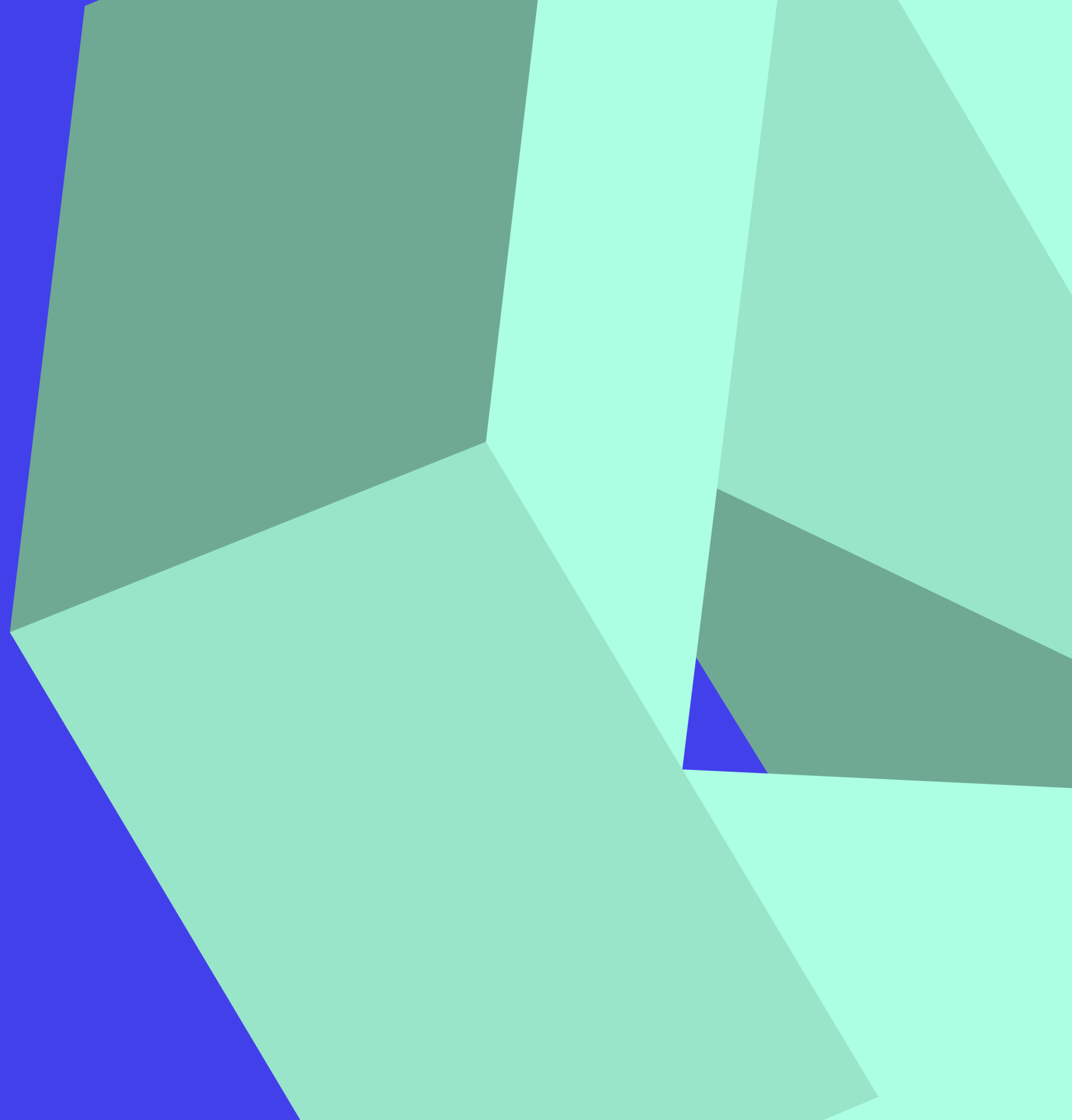


**Thank You**



# Residential Trench Box & Scaffolding Guide

Brendan McKeever, DRES





# Trench Box Use In Residential Construction

Potential for harm greatly underestimated

Trench Boxes in the main only get a passing mention in the Groundworkers RAMS.

These are large heavy pieces of equipment with the potential to cause serious injury.

Works in and around the Trench box are unforgiving and when something goes wrong it is in the main serious.

The risk assessment rarely cover all the associated risk involved in the use of Trench Boxes.



**Danger**  
**Deep excavations**

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# Trench Box Use In Residential Construction

## Addressing the issue

Once we took a closer look at the Trench Box information, we found a lot of information on the building of the Trench Boxes but very little on how to use them safely.

The D/RES Developments safety team got together and brought in our Groundworks Contractors, - directors, supervisors, and operatives to find a safe system of use.

From this we developed our Procedure

**D/RES**

**Procedure for the safe use of Trench boxes**

Third Floor  
Donnybrook House  
36-42 Donnybrook Road  
Dublin 4





# Trench Box Use In Residential Construction

Topics which the procedure had to address

How to correctly assessable a Trench Box

How to correctly place a Trench Box

Access & Egress to the works area in the trench box

Protecting the worker inside the box (especially when close to the ends of the box)

Moving the Trench Box in the Trench

Backfilling as part of the works

Rescue Plan

Associated Risk Assessments



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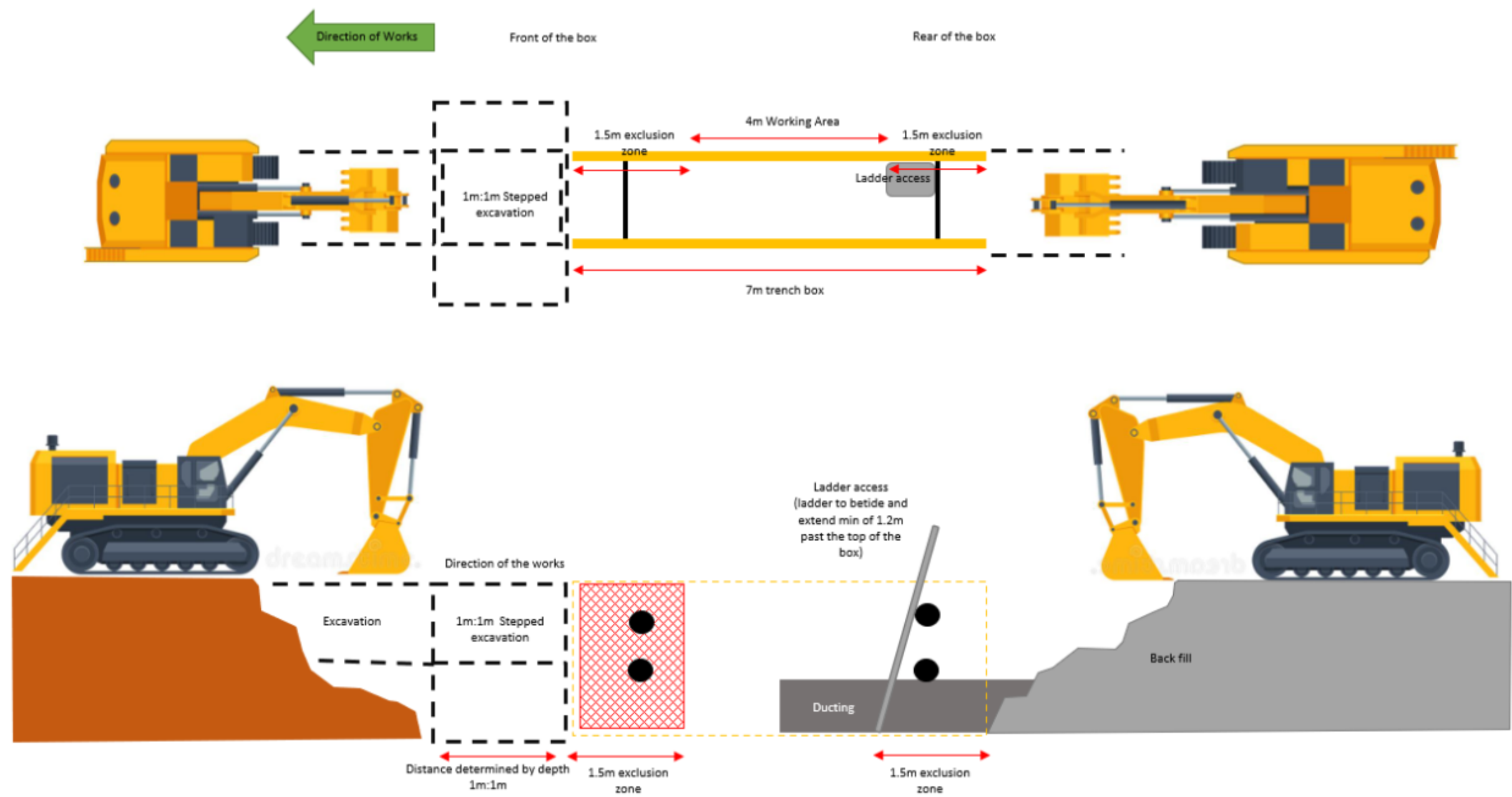


Figure 2



# D/RES Procedure For Safe Trench Box Use

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Dublin 4

Procedure for the safe use of Trench boxes

Before works commence

- All ground works must be thoroughly planned before works commence with a **work specific Risk Assessment carried out by the Civils Contractor completing the works** and a Method Statement created. RAMS to include all safe dig procedures.
- All operatives involved in the works shall be briefed by the Civils Supervisor on the safe method of works and any potential hazards and control measures.
- The Civils Contractor carrying out the works shall ensure all operatives are properly briefed and adequately supervised by a competent person.
- Trench box system manual to be available on site and all operatives required in the work to be briefed on the safe construction and use of the system.
- Before any works commence a Permit to break ground must be issued with map for specific work area attached, no works are to be carried out, outside of the marked area without a new permit being opened.
  - Existing plans to be consulted to identify the locations of any services.
  - Ground to be scanned by a competent and trained person.
  - Any identified services are to be marked, and Civils Supervisor to ensure these do not affect the works, if so works are to be paused and methods reviewed.
  - No works are to be carried out around live overhead or underground services without suitable control measures in place in advance of works.
- Works area to be suitable segregated / barred off to prevent unauthorised access, where excavations are close to access routes or existing structures suitable controls shall be detailed in the Risk Assessment and / or on the works permit and must be installed before excavation works commence.

Assembly of trench box

Each trench box is to be assembled following the manufacturer's instructions in the relevant manual. All manuals for equipment on site shall be provided by the Civils Contractor in advance and copies kept on site for reference.

(See appendix, and video on the link right)

Equipment Identification




Figure 1

1 | Page

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Installation of trench box

Movement of trench box

Removal of trench box and back filling of excavations

- An excavation shall be carried out to the required depth plus an allowance of approximately 100-150 millimetres wider than the box.
- Once the excavation is completed the Trench box can be lowered into the ground, using suitable lifting equipment attached to the marked lifting points (see figure 1), as per the manufacturer's instructions.
- The works area must be fully enclosed with the use of pedestrian barriers with no entry warning signage attached.
- Once in position the edge of the box is designed to act as fall protection, but where this is level with the ground the trench box edge protection system may be used to prevent a fall.
- The top of the box must not be below the ground level, where the required excavation is deeper than the box an extension must be installed as shown in the video above.
- The ground at the front of the box is to be suitably stepped by 1:1, 1 meter back for every meter deep or a 45% slope installed 1 meter out from the trench box to reduce the risk of ground collapse (see figure 2).
- Once in position safe access must be installed. Ladder access at the rear of the box with the ladder tied of to the extension bars and the ladder must extend a minimum of 1.2m past the top of the box (see figure 2), or ramped stone access once the box is pulled forwards.
- At 3 inspection to be carried out at the start of each shift by the ground works supervisor if person entry is required.

- Once the excavation is fully supported and safe access provided, pipes/ducting can be installed.
- Ducting is lowered into the trench with the end located with in the safe work area inside the trench box

- Once the pipe / ducting is installed operatives are to exit the trench before backfilling or movement of the box
- One excavator shall commence backfilling at the rear of the excavation. While a second extends the trench at the front of the drag box.
- Using a suitable 2-leg chain to attach to the marked pulling points, the box can be dragged into the newly excavated trench.
  - Never drag the box while operatives are inside the box.
  - Operatives must never enter an unsupported section of the trench.
- Once the box is in the required location the ground at the front of the box is to be suitably reduced/stepped by 1:1 1 meter back for every meter deep or a 45% slope installed 1 meter out from the trench box to reduce the risk of ground collapse (see figure 2).
- Safety access ladder is installed again and works commence in the box.
- Lift and lower the next pipe/duct into position. Repeat the steps above.

- Once installations are complete, all operatives are to exit the box.
- Backfill loose material and then use a certified 4-leg lifting chain to carefully extract the entire box.
- Once clear the trench can be backfilled and made safe.

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Figure 2

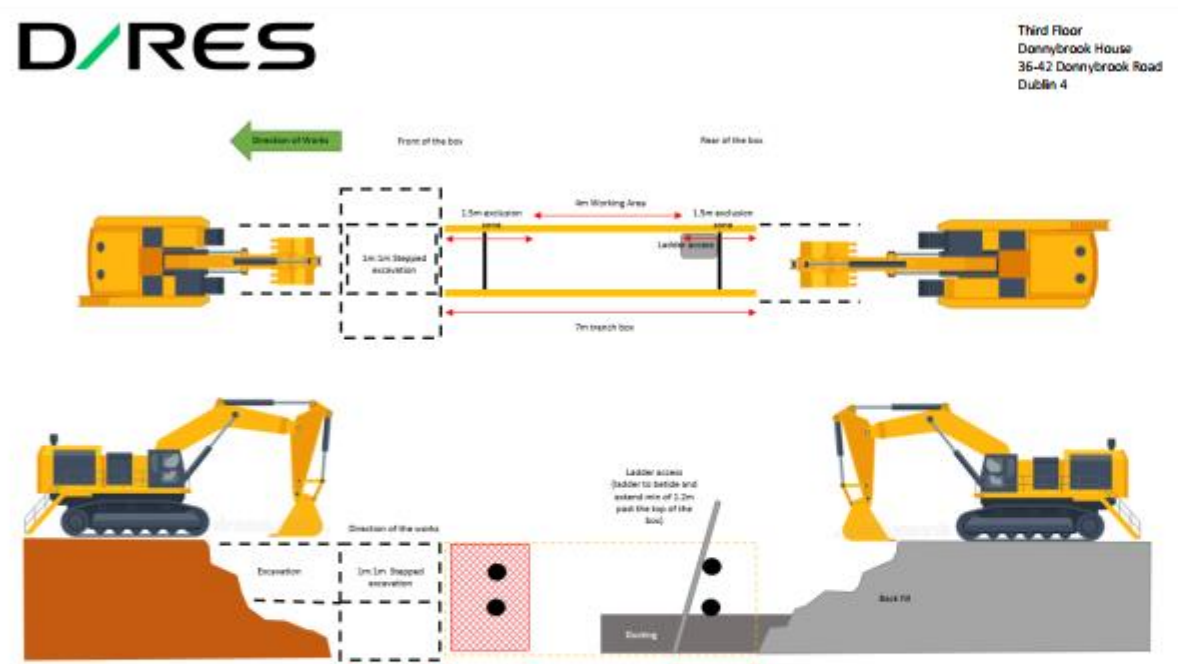


Figure 2

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Safety Requirements of using a trench box

Do	Do Not
<ul style="list-style-type: none"><li>Ensure that all operatives are familiar with the safety and operating instructions</li><li>Ensure the lifting equipment and machine available is of sufficient capacity</li><li>Know the weight of the load and determine the optimum rigging configuration firstly by lifting the load and checking for stability</li><li>Always use the red lifting points</li><li>Ensure the box is assembled correctly and all bolts, pins and clips are in place</li><li>Stay clear of the slewing zone when tilting the box</li><li>Check the ground conditions are suitable for use with a drag box</li><li>Always pre-dig the excavation in front of the box</li><li>Drag the box using the front strut up to 1m wide. (if telescopic struts are fitted, then use the pulling points)</li><li>Use a banksman</li><li>Use a secured ladder to enter and exit from within the box</li><li>Use edge protection where appropriate</li><li>Fill any voids if operators are to approach the box exterior</li><li>Ensure all panel connectors are in place before removal</li><li>Take care to avoid the trapping of fingers</li></ul>	<ul style="list-style-type: none"><li>Intentionally side load the box</li><li>Drag the box by the struts if using a box supplied with adjustable telescopic box type struts</li><li>Apply pressure vertically on the box as a means of installation</li><li>Move/drag the box with operatives inside</li><li>Use damaged or bent struts</li><li>Enter unsupported sections of the excavation</li><li>Hammer the box with the machine bucket</li><li>Use damaged or, un-certified lifting equipment</li></ul>

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No	Task / Subject	Hazard	Initial Risk			Control Measures	Residual Risk		
			Severity	Likely	Risk		Severity	Likely	Risk
		Plant contact with surrounding structures / overhead wires. Plant overturning. Musculoskeletal injuries.				Site logistics / surrounding structures / public zones identified to operatives at site induction. Blind spot assessment to be carried out on plant & and all auxiliary device in good working order. Plant/GA1 & weekly GA2's to be in place Safe manual handling practices, use of manual handling aids & Manual handling training for all operatives.			
3.	Manual Handling.	Musculoskeletal disorders.	3	3	9	Materials moved to task areas with mechanical aids where possible. All employees trained in manual handling (certs provided). All employees to be briefed on CF restrictions 2m apart. Any tools to be labelled for each user and sanitized if not possible using wipes. All loads to be assessed prior to lifting.	3	1	3
4.	Movement of operatives across construction and tasks areas.	Contact with plant. Slips/trips/falls. Open excavations / pits.	5	4	20	Traffic Management Plan to be in place and segregated pedestrian and vehicular routes, to be communicated to operatives at site induction. A spotter will be available for all manoeuvring of plant on site. Area maintained in a clean and tidy condition during works. All debris and rubbish removed after works. Good housekeeping practice at all times. Client to maintain tidy site = clean as you go. Fall protection / barriers to be put in place where required. Wash Hands with soap & clean running water before and after works and close contact with work colleagues.	5	1	5

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No	Task / Subject	Hazard	Initial Risk			Control Measures	Residual Risk		
			Severity	Likely	Risk		Severity	Likely	Risk
5.	Slips, trips, and falls	Operative slipping tripping and falling on handrails, steps or floor	3	3	9	Clean as you go policy to be followed and waste removed. Keep floor clean and clear of oil, grease, mud, rubbish and tools. Clear access routes to be maintained. Always use proper steps and hand holds when climbing onto or alighting from plant machines. All operative to always wear suitable safety footwear (See PPE).	3	1	3
6.	Noise	Noise induced hearing loss / impairment. Tinnitus	4	3	12	For exposures between 1st and 2nd action levels 80dBA – 85dBA (occupational health action bands). Hearing protection to be provided to operatives. For exposures above 85dBA hearing protection is mandatory. Hazardous noise to be reduced where possible and exposures controlled. Operatives to be briefed on above. Ear plugs protection will be provided as required with certain items of plant and hand tools.	4	1	4
7.	People & Plant Movement around trench area	Plant contact with people. Exposure to plant fumes. Serious injury. Death.	5	4	20	GA1 & weekly GA2s to be submitted to DRES Safety Manager. All auxiliary devices, mirrors / cameras/beacons/sounders/sirens etc to be in place and in proper working order. Plant operator to carry out visual blind spot assessment before operating machine. Plant can only be operated by trained CSCS operatives and must be cleaned down adhering to Covid 19 guidelines. The works area must be fully enclosed with the use of pedestrian barriers with no entry warning signage attached. No materials to be set down or off-loaded in public areas.	5	1	5


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Groundforce Shorco

User Guide



1. Once installations are complete, place backfill and then use a certified 4-leg lifting chain to carefully extract the entire box.

2. Any further reinstatement can then continue to ground level.

3. Disassembly is the reverse of the assembly process. All equipment should be cleaned and stored, ready for reuse or collection.

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Appendix 2 – Trench Emergency Rescue Procedure

(Full procedures can be found in the site emergency procedures document)

Equipment for rescue from Excavations / Confined spaces

D/RES Properties shall ensure a safe system is available each project site for the recovery of personnel for excavation and confined space. On some site due to the size of the project area multiple sets of equipment maybe required.

One large project site response vehicle may be used to store this equipment close to the works areas so it can be utilised quickly in an emergency.

Equipment required,

- Communication device (Mobile phone or radio)
- Suitable first aid kit
- Fire equipment
- Spinal boards
- Lifting equipment
- Hand tools including shovels

Inspection and maintenance of rescue equipment

- All equipment used for the rescue of persons from excavations must be checked before use, so as not to cause additional injury.
- Equipment should be kept clean and dry and should be properly stored.
- Equipment should not be altered or repaired. Damaged equipment should be taken out of service immediately.
- Equipment should be subjected to thorough inspections by a competent person in accordance with a predetermined regime specified by the equipment manufacturer.

Pre-start briefing

Before beginning work, look at the specific area where you are digging.

- What is around you that could cause a collapse?
- Is the soil dry, or is there water in the bottom of the trench?
- Is there a safe way to get in and out quickly, such as ladders or banked access?
- Are there any buried utility lines that you could come in contact with?
- Is there anything that could make the air bad? Exhaust from equipment, spilled fuel, decayed plants or animals?

Important Note:

All personnel involved with the works must be notified of the emergency response procedures before works commence.

No persons are to work in a confined space or trench alone, there must always be a second person / spotter at ground level to assist them. In most cases this will be the works supervisor or plant operator.

It is essential that all rescue and recovery is carried out by adequately trained personnel who should be available on site at all times when rescue may be required.

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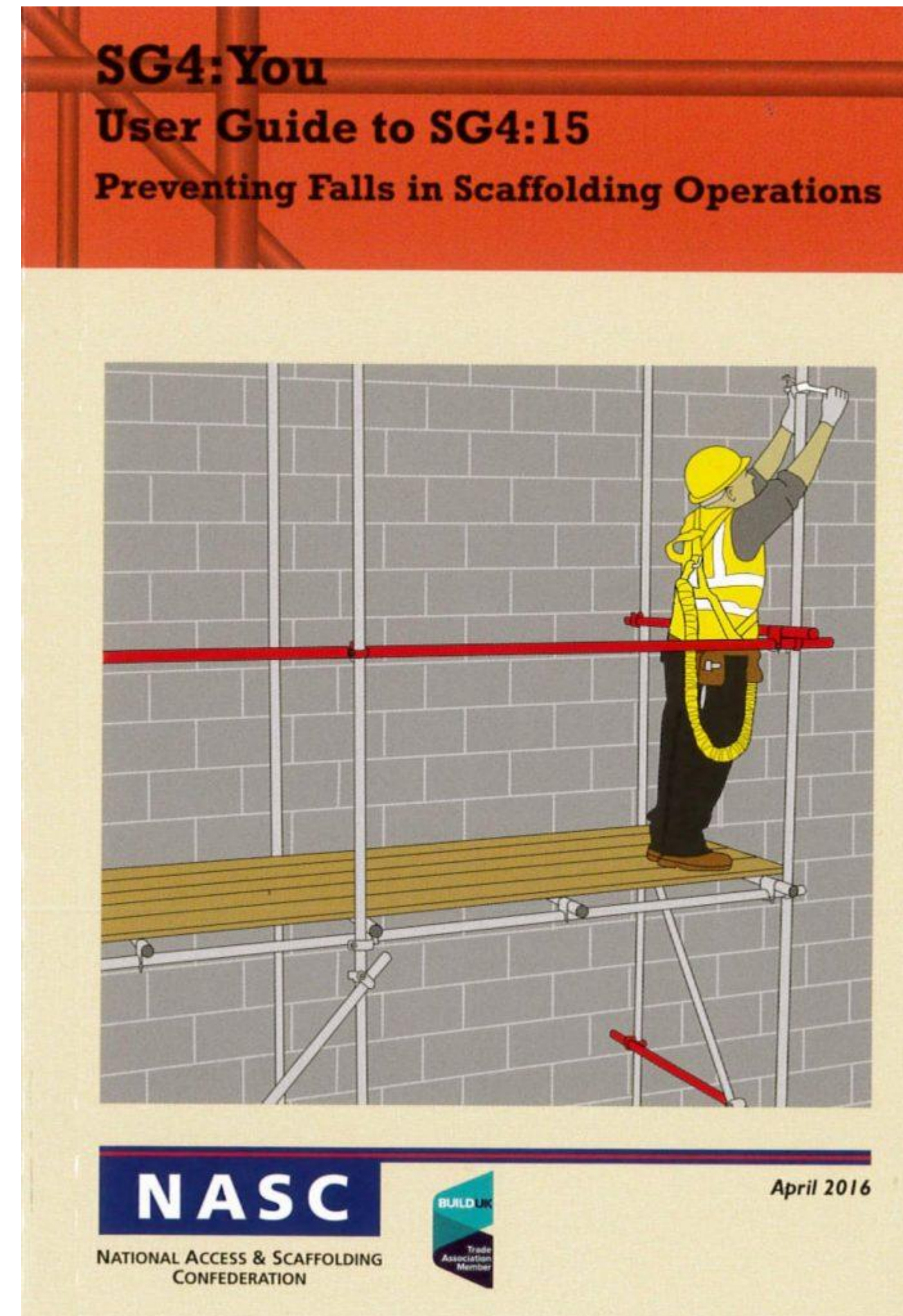
# Scaffold Use In Residential Construction

Residential Scaffolding can be seen as not as high risk by some scaffolding companies as commercial scaffolding

During the erection of the scaffolds, we found a few scaffolders where not working to the standards of SG4

SG4 was developed by the scaffolding industry to protect their workers form falls

it is free to download and should be included in the scaffolding companies R.A.M.S.





# Scaffold Use In Residential Construction

## Scaffolding for timber frame houses

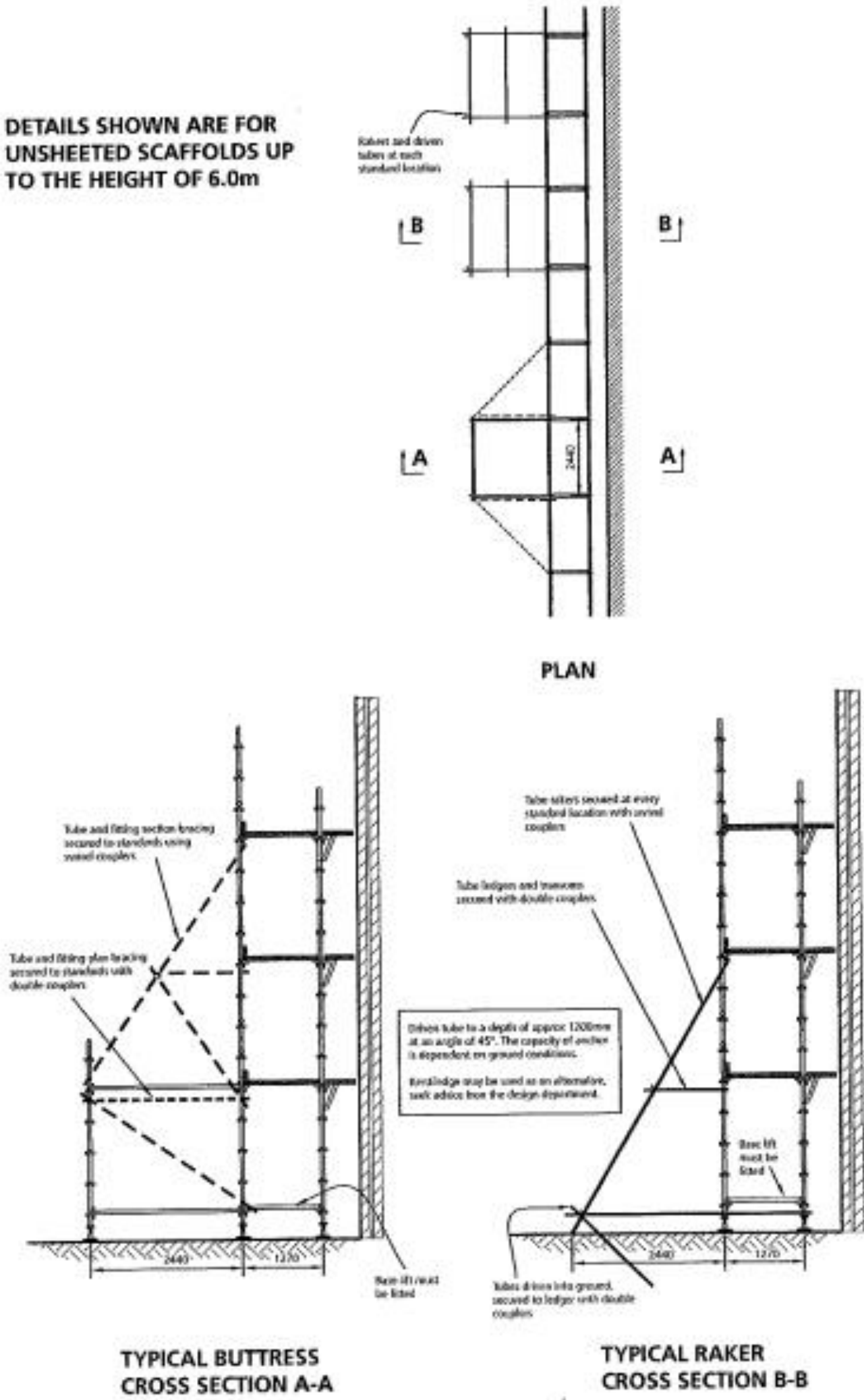
If building timber frame houses the scaffold must be erected before the building is stood so the scaffold cannot be tied into the building.

During visits to projects by HSA inspectors they may ask for a scaffold design as the scaffold is not tied in.

It is possible to erect quick stage scaffolding for timber frame construction without a design, as the manual shows a system for erecting a buttress to support a scaffold up to 6meters

### Untied Climastage Layout

Drawing No. 08/MA/01/3063/1-1





# Scaffold Use In Residential Construction

## Scaffolding for houses

As houses are sometimes looked on by some scaffold companies as the wee brother of construction, they were not sufficiently delivering the scaffolds to our requirements

We found the scaffold companies were handing over scaffolds which did not meet our requirements.

To avoid confusion, we developed the attached scaffold requirement sheet to ensure all parties understood the standard of scaffold required to ensure the safety of all who work on it.



### Scaffold requirements

- Kicker lift legers to be fully installed only removed at house access points.
- Bracing is to be placed on each elevation of the corners starting at the kicker lift and rising to the top with this repeated every 4<sup>th</sup> bay.
- Due the inability to tie scaffold into timber frame the building an 8x8 buttress is required 3 bays in from the end of the scaffolds and every 4<sup>th</sup> bay thereafter, these buttresses, loading bays and ladder access bays must have wing braces starting at the kicker lift rising with 1 wing brace every 2 meters to the top. With diagonal bracing on both sides and the face of the bays with diagonal bracing on the sides of loading bays.
- In addition to this loading bays must have loading bay transoms and eighter 6 standards with 4-foot boards or metal boards used on 8-foot bays, these should also be fitted with up and overs handrails placed at each loading gate.
- Loading bay sole boards should span 2 standards at a right angle to the scaffold walkway with base jacks extending on more than 220mm.
- Ladder bays should also have end bracing and legers placed in every star.
- Where scaffolds are erected close to another house preventing the erecting of a buttress, the gable end of the neighbouring scaffold should be erected with these braced off each other with bracing placed on the ends and after every 3 bays.
- In preparation for the roof works such as spreading trusses, felting, battening and tiling, the top working platform must be placed no more than 300mm below level of the roof wall plate, with this lift having 3 handrails in place if roof pitch is greater than 30 degrees.
- The gable scaffold extending to the peak must rise above the ridge proving a handrail at 950mm and mid rail of 450mm. from the scaffolding extending above the peak 7-meter Scaffolding tubes should be run from the scaffolding at the to of the peak top the Conor providing a double handrail extending the full length of the apex edge of the roof.
- A gate should be placed at the ladder access on the working platform at the peaks.
- A Scaff-tag should be placed at each access point, also the required Signage must be shown on each ladder bay and loading bay. The signage on the loading bays must display the maximum weight permitted on the bay.



# Thank You

Get in Touch

[www.cif.ie](http://www.cif.ie)

[cif@cif.ie](mailto:cif@cif.ie)

