

## 1.0 Purpose and Scope

The objective of this Standards & Guidance document is to provide a common, uniform approach to ensure that lifting operations are performed in accordance with legal requirements and the risks associated with the operation and use of lifting equipment are reduced as low as practicable.

This document applies to all Breheny Civil Engineering Limited (BCE) projects, depots and any location where BCE has responsibility for lifting operations including subcontract works.

## 2.0 References

The following documents have been used in reference:

- Health and Safety at Work, etc. Act 1974
- Lifting Operations and Lifting Equipment Regulations 1998
- Management of Health and Safety at Work Regulations 1999
- Provision and Use of Work Equipment Regulations 1998
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013
- Supply of Machinery (Safety) (Amendment) Regulations 2011
- Supply of Machinery (Safety) Regulations 2008
- Workplace (Health, Safety and Welfare) Regulations 1992
- Construction (Design and Management) Regulations 2015.
- Lifting Operations with Excavators Construction
   Plant-hire Association

## 3.0 Terms and Definitions

The following definitions have been adopted by BCE and are relevant to this Procedure

Term / Abbreviation	Definition
Competent person	Person who has such practical and theoretical knowledge and experience of the lifting equipment to be thoroughly examined which enables them to detect defects or weaknesses and to assess and report on.

Thorough examination	Examination by a competent person in such depth and detail as the competent person considers necessary to enable them to determine whether the equipment being examined is safe to take into use or continue in use.
Lifting	Movement of loads or persons necessitating, at a given moment, a change of level.
Load	Weight which is lifted by the crane.
Lifting accessory	Equipment from which the load can be suspended.
Basic Lift	Lifting operation where the load characteristics are considered straightforward and there are no significant hazards within the working area or on the access route for the crane to the working area.
Intermediate lift	Lifting operation where there are hazards, either within the working area of the crane or on the access route to the working area.
Complex lift	Lifting operation which includes cranes using load enhancement equipment, lifting of persons or when the lifting operation is at a location with exceptional hazards.
Lifting equipment	Work equipment (crane) for lifting or lowering loads, including attachments used for anchoring, fixing or supporting the load.
Appointed person	Person with the training, practical and theoretical knowledge and experience <i>to plan the lifting operation.</i>
Crane / Lift supervisor	Person who controls the lifting operation, and ensures that it is carried out in accordance with the appointed person's safe system of work.
Signaller	Person responsible for directing the crane operator to ensure safe movement of the crane and load.

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Slinger	Person responsible for attaching and detaching the load to and from the crane, for correct selection and use of lifting accessories in accordance with the specifications of the appointed person and for initiating the movement of the load.
Safe System of Work (SSOW)/ <i>Lift Plan</i>	Document produced by the appointed person to describe how the crane installation or lifting operation is to be carried out.

## 4.0 Responsibilities

Line management must ensure that all lifting equipment and accessories (owned/hired/leased) are maintained in accordance with the manufacturer's recommendations and are subject to a thorough examination (by a competent person) and copies of current test certificates are available. Line management must ensure that there are sufficient numbers of trained, competent and authorised persons available to use such equipment.

Employees and sub-contractors shall only use tested certificated and approved items of lifting equipment and accessories for which they are trained, competent and authorised to use. Prior to any operation a pre use safety check must be undertaken with any defects recorded using the lifting equipment daily inspection report form. Significant defects must be reported immediately and the equipment taken out of use, until the defect is repaired.

## 5.0 Procedure

The purpose of this document is to minimise the risk of injury to persons undertaking lifting operations.

## 5.1 Risk Assessments

A Risk Assessment must be carried out to ensure all lifting operations are adequately planned, the correct equipment is available and trained competent people are used to carry out and supervise the task. Any non-standard lifting operation undertaken by a HIAB or a mobile crane must be subject to a permit to work.

Examples of specific hazards that may be associated with lifting operations are detailed below, this list is not exhaustive.

Hazard	Example of how it may occur
Structural failure	A crane component, including the boom, jib, hydraulic rams or wire rope could suffer structural failure without warning. For example, a crane may fail structurally if it is overloaded in the structural area of its load chart or the failure could be from gradual deterioration due to a lack of maintenance.

Crane overturning	<ul> <li>For example, this could occur when a crane is overloaded in the stability area of its load chart or inadequate setup. This may be influenced by:</li> <li>poor ground conditions, e.g. unstable ground, inconsistent compaction or unknown underground services</li> <li>failure to set up crane as per manufacturer's instructions</li> <li>failure to use appropriate outrigger pads</li> <li>failure to level the crane or operating the crane beyond its gradient limits</li> <li>failure to operate crane within manufacturers load charts or guidelines</li> <li>insufficient counterweights are used for the selected load chart</li> <li>load limiting devices not functioning</li> <li>rapid slewing</li> </ul>
	High wind conditions.
Contact or collision with people, other plant and structures	Where there is insufficient clearance between a mobile crane and pedestrian traffic routes or other plant and structures, including other cranes, concrete pumping booms, buildings and overhead electric lines.
Falling objects	Objects falling during erecting and dismantling activities and the way loads are secured during lifting operations may create a risk to workers and other people.
People falling from height	<ul> <li>When working at height including:</li> <li>Carrying out activities associated with erecting dismantling of cranes, undertaking maintenance checks or accessing tower crane cabins</li> <li>Using a work box to lift and position workers.</li> </ul>

## 5.2 Safe System of Work (SSOW)

A safe system of work (SSOW) or lift plan must be completed by the Appointed Person for any lifting operations that will be carried out on Breheny premises and projects. The lift plan must be recorded on (Form 10/20) or produced using the Lift Plan app. An assessment of the ground bearing capacity during lifting operations must be undertaken utilising the Company's Excavator Track Pressure Assessment Tool, the output of this assessment must appended to the lift plan. The tool and its supporting guidance is available for download from the Company's EDMS.

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The SSOW must include the type of lifting equipment (crane, excavator, fork lift etc.) to be used; this must include a factor of safety. The plan must outline in detail how the lifting operation will be performed and what tasks are expected from the lifting team. The accessories that are outlined in the Method Statement must be detailed and any safety factors taken in to account by the appointed person.

Guidance can be taken from BS7121 part 3 and Lifting operations and lifting equipment regulations 1998(LOLER)

## 5.3 General Requirements

All lifting equipment and accessories must be manufactured to the relevant British / European Standard and carry the relevant markings (unique identification number and Safe Working Load or Working load Limit) for each individual configuration. All items must be thoroughly examined by a competent person; a test certificate shall be produced in accordance with the Company Scheme of examination.

Section 8.0 defines the frequency of through inspections for lifting equipment and lifting accessories.

A register of all equipment and accessories must be maintained at each location.

Lifting equipment must not be used for any other purpose other than for which it was designed.

Chains, wire rope or fibre slings must not be used for pulling against fixed loads.

Where lifting and craneage equipment are fitted with outriggers (stabilisers) they must be deployed during lifts and used on sufficiently stable ground. Surcharges to embankments, excavations, cellars, basements etc. must be taken into account.

Loads must not be lifted over people under any circumstances.

Pre-use checks and in-service inspection of cranes, together with a system to rectify any defects disclosed, are required by the Health and Safety at Work etc. Act 1974 [1] Section 2(2) (a); and LOLER 1998 [2] Regulation 9(3) (b) to ensure that the crane is safe to use and that any deterioration is detected and rectified before the crane becomes unsafe. It is legal requirement that in-service inspections are recorded.

Pre-use checks should be carried out at the start of each shift during which the crane is to be used. These are to test the functionality of the crane and visually check for any obvious defects. It is essential that these are carried out from a position of safety. Pre-use checks must be recorded and monitored by the line manager to ensure that all defects that affect the safety of the equipment are rectified.

Pre-use checks and in-service inspections should only be carried out by personnel who have been adequately trained and assessed as competent to carry out the required tasks.

## 5.4 Towing

Chains and wire ropes must not be used for towing; only webbing slings are to be used. Items used for towing must be identified as such and must not under any circumstance be used be used for lifting.

## 5.5 Lifting Accessories

The lifting accessories that are to be used for lifting operations are to be;

- Fit for purpose Safe Working Load (SWL) adequate for the load that is being lifted.
- Be in date the competent person slinging the load must insure that the accessories being used have been examined within 6 months.
- Lifting accessories used must have the relevant colour code for that 6 month period. See table below.
- Inspected before and after use.

Lifting Accessories Colour Coding Examination Cycle								
W/hito	Jan 2020 –	Jul 2021-	Jan 2023 –	Jul 2024-				
VVIILE	Jun 2020	Dec 2021	June 2023	Dec 2024				
Plue	Jul 2020-	Jan 2022 –	Jul 2023-	Jan 2025 –				
Diue	Dec 2020	Jun 2022	Dec 2023	Jun 2025				
Vallow	Jan 2021-	Jul 2022-	Jan 2024 –	Jul 2025-				
reliow	Jun 2021	Dec 2022	Jun 2024	Dec 2025				

## 5.6 Lifting Team

All personal involved in the lifting operation must have been trained for the task that they are carrying out and have proof of the training that was undertaken. This could take the form of CPCS cards or certificates from a training provider.

Appointed Persons, Lift Supervisors and Slinger/Signallers must be appointed in writing. Authorisations must be signed off by either the Contracts Director, Regional Manager or Contracts Manager. Role specific appointment letters are available on the EDMS.

The lifting operation must be:

- Properly planned by an appointed person
- Supervised safely by a lift/crane supervisor
- Carried out safely with qualified slinger/signallers and crane operators.

The above is in accordance with LOLER Regulation 8 – planning the lifting operation and BS7121 part 1 Section 4 Control of the lifting operation.

In certain circumstances, it might be possible to combine some of the roles of members of the lifting team. However, as this may introduce additional risks the combination of roles should only take place following a review of the lifting operation by the Appointed Person. The combination of roles should only be considered if the person undertaking the combined role has achieved the necessary competence for each role. See table in section 7.0, which details personnel required for category of lift and highlights where roles may be combined.

The complexity and size of the job will determine the exact team structure but all roles must be allocated and the duties discharged.

Duties of the person appointed to control the lifting operation are defined in BS7121 part 1 Section 4.

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#### 6.0 Lifting Equipment in Use at BCE

All lifting operations that are carried out within BCE locations must planned and carried out by trained and authorised personal. The plan must comply with all aspects of BS7121 part 1 and in addition they must follow all requirements of LOLER Regulation 8.

### 6.1 Mobile Cranes (Wheeled and crawler mounted)

The Company use mobile cranes in a range of locations and environmental conditions, in-house and on Customer sites. Operating a mobile crane can only be undertaken by trained, competent and authorised operators.

All mobile cranes used on company sites must have, as a minimum, a twelve monthly thorough examination report and a four yearly test certificate, so that site personnel are checking documents with which they are familiar. A six monthly thorough examination report is required for cranes used for lifting persons.

### 6.2 Excavators used as Cranes

Excavator Operators, where the excavator is used as a crane, must hold a valid CPCS or NPORS card for the category of excavator they are operating. This card must include CPCS lifting operations training (A58C/A59C or A10/12 or lifting endorsement in case of NPORS card.

Any Excavator used for lifting operations must be fitted with a load hooking device. This may be mounted on the dipper, the quick hitch or the bucket. If the load hooking device is a hook then this should have a clip or other device which prevents a sling slipping off the hook.

Many quick-hitches provide a load hooking device in the design of the hitch.

If the rated lifting capacity for an excavator or the backhoe portion of a backhoe-loader is greater than 1 tonne (or the overturning moment is greater than 40000Nm) then the machine must be fitted with:

- a) a boom lowering control device on the raising (main) boom cylinder(s) and which meets the requirements of ISO 8643:1997 and
- an acoustic or visual warning device which indicates to b) the operator when the object handling capacity or corresponding load moment is reached

The safe working load of the excavator must be marked on the machine or displayed in the operator's cab, together with a load radius diagram showing "rated object handling capacities".

If utilising a wheeled excavator for lifting activities, the Appointed Person must consider the different rated capacities of the excavator depending on whether they are fitted with outriggers and / or a blade and if these devices are deployed.

#### 6.2.1 **Pick and carry duties**

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level surface. The following guidance should be taken into account when planning a lifting operation involving travelling with a suspended load.

The majority of excavators are not provided with load charts for lifting and travelling with suspended loads. Where a load chart is not provided, the advice of the excavator manufacturer should be sought and recorded in a retrievable format. If advice from the manufacturer is not forthcoming, the excavator should be de-rated by a suitable factor of not less than two, to take account of dynamic loads, load swing and slopes.

Excavators should not be used under any circumstances for the lifting of persons as they are primarily designed for excavating with a bucket and consequently are capable of operating at speeds and movements which make them totally unsuitable for the lifting of persons.

### 6.3 Telehandlers and Forklift Trucks

All lifts with a fork lift truck and telehandlers must only be undertaken after a suitable and sufficient Risk Assessment and a lifting plan developed by the appointed person. The depth and detail of the lifting plan will depend on the complexities associated with the risk. It may range from a simple schedule of lifts to a very detailed plan.

Should a forklift or telehandler be used to lift materials, other than on its forks, then by definition it becomes a crane. In this case, the following points must be observed:

- The load must be lifted from a properly designed lifting point, NOT by hooking a chain onto the forks
- Specially designed, certificated lifting adaptors must be used to centre the load
- If a forklift has a maximum rated lift capacity of more than 1,000kg (or overturning moment in excess of 40,000Nm) it must be fitted with check valves on mast/boom hydraulic cylinders and audible or visual rated capacity indicator
- The safe working load of the forklift must be marked on ٠ the machine or displayed in the operators cab along with a load reach/radius diagram
- If the forklift configuration can be altered, the operator must be provided with clear instructions on which configurations are intended for lifting duties
- Where the stability of the forklift is dependent upon the use of outriggers or the locking of oscillating axles, suitable interlocking devices should be fitted so that in the event of a hydraulic failure during lifting they remain in position
- Some forklifts or telehandlers can be used for lifting . people when fitted with purpose built carriers. These should only be used where other more suitable platforms cannot be provided as they do not provide the same standard of safety or control as a Mobile Elevating Work Platform. The use of forklifts for this purpose is covered by HSE Guidance Note PM28. Forklifts used for lifting people require a thorough examination at intervals not exceeding six months

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- Forklifts and telehandlers should avoid traveling with suspended loads due to the high risk of dynamic instability. The use of a crane is a better option
- If some limited travel with a suspended load is unavoidable, the Appointed Person (Lifting) should agree the limitations and agree appropriate safe systems of work for inclusion in the schedule of common lifts
- Forklift operators must hold a CPCS/NPORS card and use CPCS/NPORS carded Slinger/Signaller's to attach or detach loads

## 6.4 Lorry Loaders

Lorry loaders (often known as HIABs) are common on construction sites. The primary function of these units is to unload materials from the delivery vehicle on which they are mounted. If used for this purpose to unload standard materials such as bricks or pipes, the supplier of the goods is responsible for the detailed planning and appointment of the Appointed Person. If however a lorry loader is to be used for general site lifting or particularly large, complex or potentially high risk lifts, then the same principles for planning, testing, supervising and executing the lift are required as for a conventional crane lifts. In both cases the following points must be observed:

- Lorry loaders must be operated on firm level ground with the outriggers properly deployed and the vehicles tyres correctly inflated
- Spreader plates may be required under the outrigger feet
- Machines may only be used with outriggers partially retracted if this duty is permitted by the manufacturer
- Lorry loaders should always be positioned so that there is no risk of the operator being trapped between the lorry and the load or loader arm
- Operating controls should be clearly marked. Where more than one operating position is provided the operator should ensure that no person is in a position to interfere with the second set of controls. Operators should have a clear view of the whole lifting operation
- Lorry loaders with a SWL in excess of 1,000kg (or an overturning moment in excess of 40,000Nm) must be fitted with suitable overload cut out devices. These must enable the boom to return to a safe position in the event of an overload
- Where the SWL is dependent upon the operating radius or boom configuration, a load radius diagram must be provided at each operating position
- Operators of lorry loaders are required to hold a CPCS or ALLMI card (Association Lorry Loader Manufactures and Importers) covering the operation of lorry loaders.

## 7.0 Lift Categories

To enable lifts to be planned, supervised and carried out effectively, three categories of lift undertaken within BCE are detailed below. The category into which a particular lift will fall depends on the assessment of the hazards associated with both the environment in which the lift is to be carried out and those associated with the load and lifting equipment. As part of the planning process for the lifting operation, the environmental and load/lifting equipment complexities (the "Complexity Index") should be evaluated and categorised as either 1 (low), 2 (medium) or 3 (high). This will then enable the complexity of the lift to be established as shown in tables overleaf.

Environmental Complexity	Hazards imposed by the environment in which the lift takes place, gradient, ground conditions wet / dry, wind force and direction, steady or gusting. Available space at pick up, whilst traveling and at drop down point. Overhead services.
Load complexity	hazards imposed by the load and operation: load stability, centre of gravity of load, weight of load, size of load, lifting equipment required to lift load, anchor/lifting points, excavator required to carry out the lift, driver competencies, other persons in vicinity, travel route etc.

Remember the complexity and size of the job will determine the exact team structure but all roles must be allocated and the duties discharged.

### 7.1 Basic Lift

Lifting operation where the load characteristics are considered straightforward and there are no significant hazards within the working area or on the access route for the crane to the working area.

A Crane/Lift Supervisor: Attendance is not required on site at all times, but must ensure all plans and competencies are in place and be immediately available

In many instances, a generic lift plan is suitable for basic lifts, provided that no additional hazards are identified on site.

### 7.2 Intermediate Lift

If there are hazards, either within the working area of the crane or on the access route to the working area, but no multiple crane lifting is required

A Crane/Lift Supervisor may be required for the duration of the lifting operation.

## 7.3 Complex Lift

If the lifting operation requires more than one crane to lift the load, or cranes using load enhancement attachments, or if the lift is at a location with exceptional hazards (e.g. at a chemical plant), then the appointed person should ensure that the lift plan/SSOW is suitable and sufficient to carry out the task safely.

Where a lift is designated as complex the Appointed Person shall in addition to all other duties:

 Identify all exceptional hazards in the operating area, including any areas required for access or setting up of the excavator, this will require the AP

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to attend the location of the planned lifting operation as part of the planning process.

- Liaise with any other person or authority, as required to overcome any hazard, by including any necessary corrective action or special measures in the safe system of work.
- Ensure that the lifting plan includes the exact sequence of detailed actions to carry out the lift
- Preparing a sufficiently detailed and dimensioned drawing of the site, excavator and the load, identifying the load path, pick up and set down areas, together with the position of exceptional hazards in the area. The information provided

should be sufficient to enable the operator to position the excavator accurately.

Be present on site during a complex lift, unless they select a competent deputy to attend in their place.

### Note: excavators are not generally suitable for complex lifts

Complex lifts involving cranes will not be undertaken by BCE, these will be undertaken as a contract lift.

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ental ty (E)	2	Intermediate	Interm	Intermediate		Complex
onm olexi	1	Basic	Interm	ediate		Complex
Envi		1		2		3
		Load	d/lifting	equipment com	plexity (L)	
Key:	1: Low			2: Medium		3:High
L1	Simple load with known centre of gravity and obvious slinging points.		E1	Clear sight of the load path with the load placed directly on the ground or double stacked. Stable ground conditions, bearing capacities known.		
L2	Load may become unstable during loading or off-loading. Load is to be lifted into position. Load without clear centre of gravity without lifting points. Load operation involves assembly or disassembly.		E2	Operator does not have a clear view of the load path or landing area due to obstructions or placing at height Load being placed in or removed from water. Stable ground conditions, bearing capacities require verification.		
L3	Load weight not accurately known and centre of gravity may shift with no integral lifting points.		E3	Removal of pot live carriageway close to proxir overhead powe engineered solu loads	entially unstable loads adjacent to a or members of the public. Load path nity hazards such as scaffold or r lines. Difficult ground conditions, ution required to support outrigger	

The Table above is a guide to assessing the complexity of a lift. When assessing the category of lift the Appointed Person should refer to BS 7121.

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The Table below shows examples of where the same basic lifting task will fall into different lift categories depending on differing environmental or load complexities.

Complexity variables and	Lift category						
constants	Basic	Intermediate	Complex				
Increasing environmental complexity	The excavator operator has clear sight of the load path and the load is to be placed on the ground.	The load is to be placed over an obstruction such that the excavator operator might not have clear sight of the landing area from the control position	The load is to be placed in a trench behind a bund, without line of sight, and with proximity hazards, such as scaffolding or overhead power lines.				
Constant low load/lifting equipment complexity	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed.				
Increasing load/lifting equipment complexity	A load of known weight with designated top lifting points and central centre of gravity. The load does not contain fluids, is not fragile and is inherently stable when landed	A load of estimated weight with an estimated centre of gravity and without designated lifting points. The load does not contain fluids, is not fragile and is inherently stable when landed.	A load of estimated weight and centre of gravity and without designated lifting points. The load contains fluids, is fragile and is not stable when landed				
Constant low environmental complexity	The excavator operator has clear sight of the load path and the load is lifted to and from the ground	The excavator operator has clear sight of the load path and the load is lifted to and from the ground	The excavator operator has clear sight of the load path and the load is lifted to and from the ground				
	Complexity Index E1:L1	Complexity Index E1:L2	Complexity Index E1:L3				

Activity	Role	Basic	Intermediate	Complex
Planning	Appointed person	Required	Required	Required
Site visit	Appointed person	Not essential	May be required	Required
	Appointed person	Not essential	May be required	Required
Lifting	Lift Supervisor	Not essential	May be required	Required
Operation	Slinger/Signaler Required		Required	Required
	Operator	Required	Required	Required

The above table details personnel required for category of lift

Activity	Role	Basic	Intermediate	Complex
Lifting Operation	Appointed person	Not essential, role may be combined with Lift Supervisor	May be required	Required
	Lift Supervisor		Roles may be combined	Required
	Slinger/Signaler	Roles may be combined	Roles may be combined	Required
	Operator		Required	Required

The above table details where roles may be combined.

**NOTE:** This table is for guidance. It is the appointed person's responsibility to determine the combination of roles for each *lifting operation.* 

## 7.4 Hired crane

When hiring a crane via a CPA agreement where it is only a legal crane and a trained operator is supplied, the appointed person must ensure that there is a lift plan/SSOW in place. This plan outlines how the lifting operation is to be carried out. This plan must include:

- Type of crane used and operating details i.e. radius, jib length, ballast and outriggers used
- Weight of loads to be lifted

- Type of accessories to be used
- Sequence of operations (detailed method of how the task is be carried out)
- Risk Assessment
- Detailed drawings of the lift
- Ground loading calculations
- Requirements for working at height

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## 7.5 Contract lift

When hiring a crane via a contract lift where the crane company produces the lift plan/SSOW then an appointed person from BCE must review the plan. The BCE appointed person signing off the lift plan/SSOW must ensure that the documents produced are suitable and sufficient for the lifting operation to be carried out safely.

## 8.0 Company Scheme of Thorough Examination for Lifting Equipment and Accessories

Description	Examination Period	Inspection Type	Comment	
Equipment & Before e accessories use		User visual inspection	-	
Equipment & Weekly accessories		Recorded visual inspection	Entered into register	
Lifting accessories	6 Monthly	Thorough examination by competent person	Chains, Slings, Ropes, tow straps, jacks, axle stands	
Lifting equipment	12 Monthly	Thorough examination by competent person	Mobile Cranes, hoists, HIABs, excavators jibs	
Lifting equipment and accessories used for lifting persons	6 Monthly	Thorough examination by competent person	Cranes, slings, man baskets, MEWP, shackles etc.	

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