

# Aztex

# Equipment

## Liftwell Screen Risk Assessment

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# 1. Introduction

Liftwell enclosures are used to safeguard persons working in or around liftwell openings.

Aztex Equipment Pty Ltd has designed, engineered and fabricated a lightweight, portable liftwell enclosure of improved design. Principle improvements stem from the new structural design elements which have eliminated manual handling hazards and other identified hazards typical of steel liftwell enclosures already in the market.

A risk assessment has been undertaken by Aztex Equipment Pty Ltd as the designer, fabricator and supplier of the new proprietary liftwell enclosure. This document outlines:

- the potential hazards associated with liftwell enclosures
- the nature of risk associated with the identified hazards
- control mechanisms employed in the new liftwell enclosure by way of improved design, engineering and fabrication.

## 2. Compliance References

As the designer, fabricator and supplier of a liftwell enclosure, Aztex Equipment Pty Ltd has referenced and complied with the following:

- *the National Standard for Plant [NOHSC:1010 (1994)]*
- *AS/NZS 4431:1996 Guidelines for safe working on new lift installations in new constructions*

and has undertaken design, fabrication and supply activities cognisant of the duty of care obligations outlined therein.

For purposes of this risk assessment, plant is defined as including: *“any machinery, equipment (including scaffolding), appliance, implement or tool and any component or fitting thereof or accessory thereto.”*

### 2.1 National Standard for Plant [NOHSC:1010 (1994)]

The OHS Acts in each jurisdiction place duties on a range of persons. In accordance with NOHSC:1010 1994,

<sup>2</sup> *“A person in applying a duty under this national standard must apply the principle that risks to health and safety arising from plant and systems of work associated with plant are, as far as practicable, eliminated, or where this is not practicable, minimised.”*

Aztex Equipment Pty Ltd has identified their duty obligations as those relevant to:

- Designer
- Supplier.

Where the duties are identical, however, Aztex Equipment Pty Ltd need only carry them out once.

#### 2.1.1 Duties of Designers

<sup>3</sup> *A designer must ensure that hazards are identified in accordance with Clause 65 during the design process, for plant intended for use at a workplace.*

<sup>4</sup> *Where an assessment under Clause 10, identifies a risk to health or safety, the designer must control the risk by eliminating, or where this is not practicable, minimising the risk, in accordance with this clause and Clause 67.*

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<sup>1</sup> National Standard for Plant [NOHSC:1010 (1994)]

<sup>2</sup> Ibid - Part 2-Duties 7(1)

<sup>3</sup> Ibid – Part 2, Clause 8

<sup>4</sup> Ibid – Part 2, Clause 10

### **2.1.2 Duties of Suppliers**

Aztex equipment has assumed information provision duties as the supplier of the new liftwell enclosure.

<sup>5</sup> *“A supplier must ensure that: in respect of new plant, the purchaser or owner is provided with health and safety information.....”*

### **2.1.3 Information Provisions**

As the supplier of liftwell enclosures, Aztex Equipment Pty Ltd, has prepared a set of instructions for end users covering the following key areas:

- transport, handling and storage
- installation
- general safety instructions
- liftwell enclosure inspection and maintenance.

Where requested, a copy of this risk assessment will be provided.

## **2.2 AS/NZS 4431:1996 Guidelines for safe working on new lift installations in new constructions**

At the time of developing the liftwell enclosure, (the subject of this risk assessment), no Australian or International Standard had been approved specifically for the design, manufacture or supply of liftwell enclosures. However, section 3.4 of AS/NZS 4431 requires that persons installing new lift installations in new constructions, provide entrance protection through the use of liftwell enclosures. Section 3.4.1 Liftwell enclosures (a) – (k) specifies minimum requirements for the guarding of openings in liftwell enclosures during installation.

In accordance with the Standard, Aztex equipment Pty Ltd, has complied with the said clauses of the Standard and in many aspects exceeded requirements by improving the liftwell design to eliminate identified hazards.

## **3. Risk Assessment**

Employing the principles of hazard identification, risk assessment and control, a lightweight, portable liftwell enclosure of unique design has been developed. Potential hazards have been identified and eliminated through appropriate design and engineering controls. The potential hazards and means of control are outlined below.

### **3.1 Manual Handling Hazards**

Conventional liftwell enclosures are made from steel and weigh approximately 70kg. This coupled to the size of the enclosure poses a significant manual handling hazard.

Access to liftwell openings can often be awkward and ease of movement restricted. Space restrictions may prevent the use of mobile plant or appropriate materials handling equipment. The risk then is that personnel manually handle the liftwell enclosure and are thereby exposed to strain and sprain type injuries. The heavy weight of the steel enclosure may also cause crush injuries, severe bruising or even amputation if dropped on the body.

#### **3.1.1 Manual Handling Controls**

Aztex Equipment has addressed this hazard through suitable weight reduction controls. The new design reduces the overall weight of the liftwell enclosure by half. This has been achieved through the following design controls:

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<sup>5</sup> Ibid – Part 2, Clause 20 (a)

- conventional heavy steel mesh has been replaced by a lighter gauge and more open steel mesh.
- conventional steel form has been replaced with security grade aluminium
- the liftwell enclosure is fully collapsible to reduce bulk and awkwardness when handled.

The use of aluminium reduces the overall weight without compromising the structural integrity of the liftwell enclosure and complies with the requirements of AS/NZS 4431:96.

The larger mesh opening of the steel mesh reduces the overall amount of steel used and accordingly reduces weight.

The hinged panel design allows the enclosure to be fully collapsed into a flat regular package thereby reducing bulk. Team lifting and carrying techniques can be implemented where space confines restrict the use of materials handling equipment. The flat, uniform collapsed package reduces the likelihood of load instability when moved and handled using materials handling equipment and aids.

### **3.2 Foreseeable Abnormal Situations – Misuse, Impact, Drop from Height**

The structural integrity of the liftwell enclosure may be compromised during handling, installation, dismantling or use as a consequence of:

- misuse, abuse or vandalism
- impact from mobile plant or vehicles
- drop from height.

#### **3.2.1 Foreseeable Abnormal Situations – Controls**

The main frame of the liftwell enclosure is made from high grade, impact resistant steel to sustain wilful damage, impact from mobile plant or equipment, or, a drop from height.

### **3.3 Cut or Puncture Hazards**

The mesh of a conventional liftwell enclosure is fixed to the frame without enclosing the mesh edges. Persons working with or handling the enclosure are exposed to potential cut, puncture or tear injuries.

#### **3.3.1 Cut/Puncture Hazard Control**

A safety design mechanism comprising steel channelling has been developed to completely enclose the sharp edges of the mesh. This risk control measure eliminates the risk of cut, puncture or tear injuries.

### **3.4 Locking Mechanism**

In new constructions, an enclosure may be installed out of square, thereby rendering the locking mechanism dysfunctional. In this circumstance the protection afforded by the enclosure is negated, potentially enabling unauthorised personnel to enter the liftwell opening. The likelihood of falling into the liftwell is very high and could result in serious injury or death.

#### **3.4.1 Dysfunctional Locking Mechanism Control**

A new locking mechanism featuring an extended striking plate has been designed and engineered. In the event that an enclosure is fixed to a new liftwell opening that is not plumb, the locking mechanism with extended strike plate will still function as required.

### **3.5 Enclosure Tampering**

With conventional liftwell enclosure designs the potential for tampering is very high. The removal of enclosure lids is not uncommon, nor is it uncommon for personnel to remove enclosure fasteners to gain access to the liftwell opening.

The likelihood of falling into the liftwell opening or onto the ground structure upon which the enclosure is erected is very high. Serious injury or death is likely.

### **3.5.1 Tamper Resistant Controls**

To prevent the unauthorised removal of the enclosure lid, an interlocking lid and frame has been designed and engineered. The positioning of fasteners is such that they cannot be accessed from outside the enclosure and therefore are accessible only by key entry of authorised personnel.

## **3.6 Falling Objects**

Unless suitably designed and engineered, there is a significant risk of small objects such as nails, screws, small tools etc being kicked or pushed under the enclosure. Risk stems from the potential of the object to fall into the liftwell and strike persons working below causing injuries ranging in seriousness from minor cuts and lacerations to severe head injury and even death. The severity of injury will increase as the height from which the object falls, increases.

### **3.6.1 Falling Objects – Control**

A toe board has been installed the full width of the liftwell enclosure exceeding the specified safety requirements of AS/NZS 4431:1996.

## **3.7 Hinge Damage**

A potential to damage enclosure hinges has been identified particularly where enclosures are handled by forklift or crane and during activities such as dismantling, transport and storage. When hinges are damaged, the enclosure may not sit square or doors may fail to lock thereby creating many of the risks identified elsewhere.

### **3.7.1 Hinge Damage Control**

The Aztex liftwell enclosure has been designed so that the enclosure hinges are positioned inside the frame in the collapsed state. The external frame structure and uprights therefore provide protection to the hinge/s during operational activities such as moving, transporting and storage of the liftwell enclosure.

## **4. Summary**

This risk assessment has been undertaken at the design level by the designer (Rod Burrows, Aztex Equipment Pty Ltd) in consultation with operations personnel of the same company. The hazards associated with conventional liftwell enclosure design have been identified. Significant design improvements to eliminate the hazards have been engineered into this proprietary new liftwell enclosure.

As the designer and supplier have no control over the workplace activities or construction sites of the end user, it is recommended that a full risk assessment of the work environment and operational activities carried out at the place of end use, be undertaken prior to handling, transporting, installing, using, dismantling or storing an Aztex Equipment liftwell enclosure.