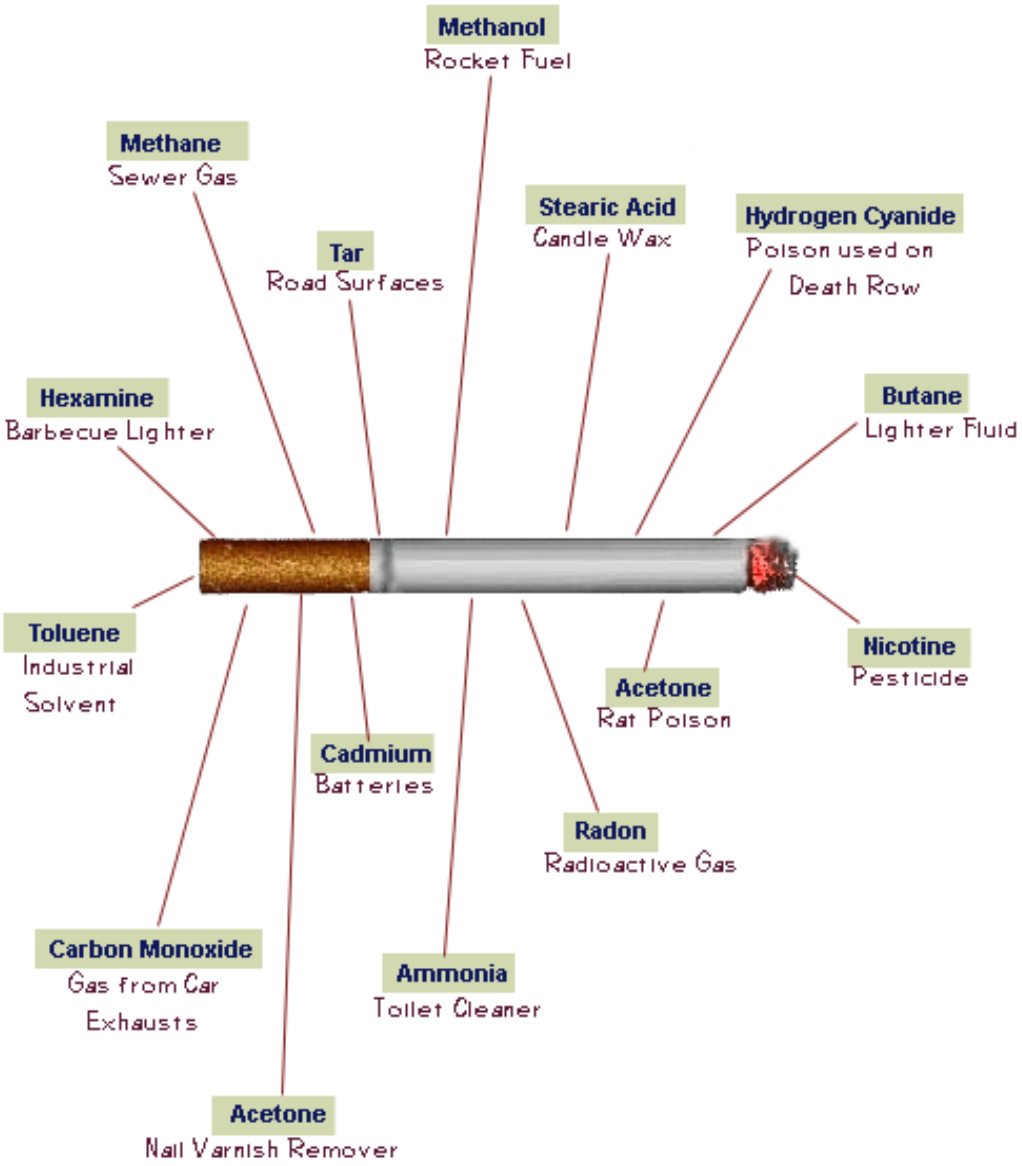
HIGHER SAFETY

CONSTRUCT
CONCRETE STRUCTURES GROUP

Work at Height Update & Workshop

Facilities

HIGHER SAFETY

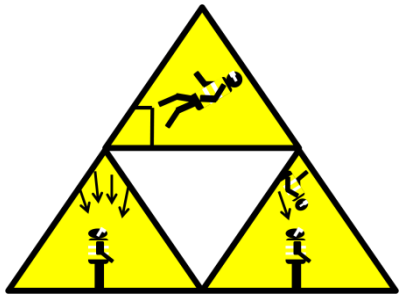


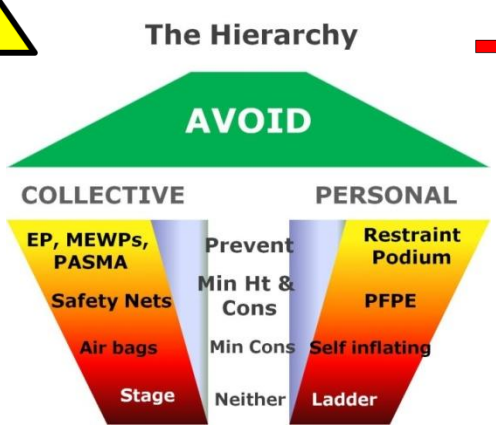
Introduction

Objective :-

- Focus on some misconceptions about Work at Height
- Look at recent changes in accepted practice.
- Review 12 key areas of concern from site.

Throughout .....





Who am I?

Barney Green
40 years in Construction, Design, Site Management
10 years Hilti Fixings technology.
30 years Work at Height
Installation of Safety Systems

Anchor systems, harness and lanyards, edge protection, safety nets, access, scaffolding, temporary roofs …….
BSI, CEN, ISO
BCSA, CONSTRUCT, HSE, NFRC, NASC, ACR, ACWAHT, ..

Safe @ Height

Impartial, Independent Height Safety consultancy

Consultancy (policy, plan, advice, inspection, investigation)
Project Support (workshops, technical advice, supervision)
Training (designers, managers, supervisors, operatives)

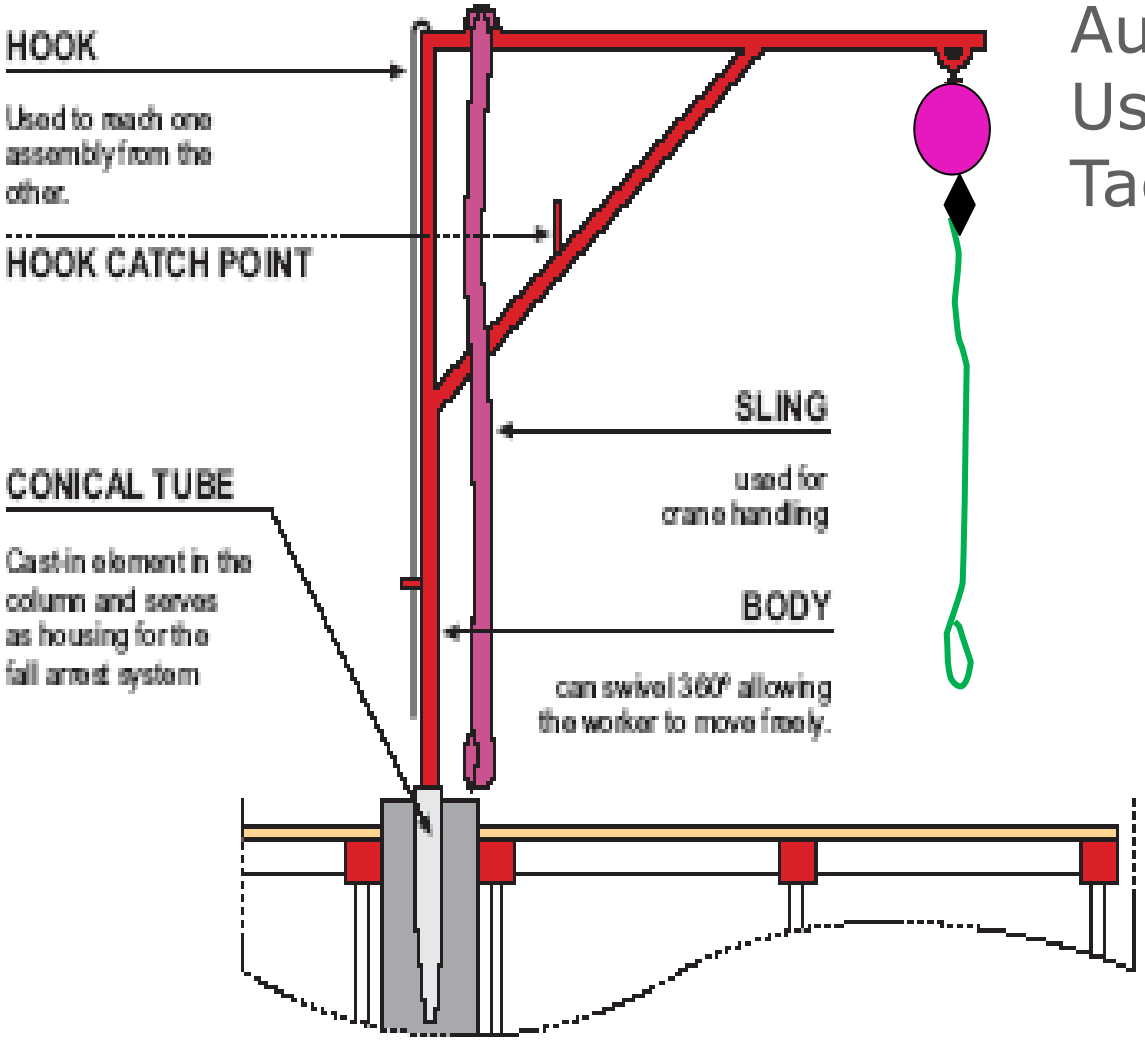
www.highersafety.org

Issues to discuss

1. Use of Alsipercha (hangman)
2. Podium Steps Standard
3. Advanced guard rails on Towers
4. Advanced guard rails on falsework
5. Edge protection installation
6. Anchor installation
7. Real RESTRAINT
8. Horizontal Inertia blocks
9. Falsework selection/edge protection
10. The Containment Standard
11. TG 20:13 Introduction
12. TG 20:13 offering

Alsipercha

Extended User Equipment

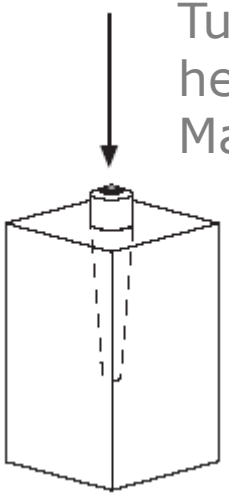


Max 6.2m ?
Autolock connection ?
Use in anger indicator ?
Tag line ?

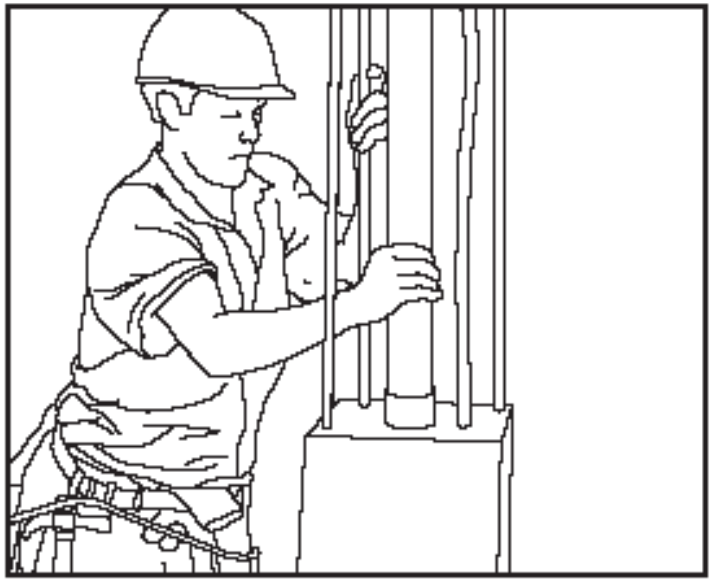
Alsipercha overhead.

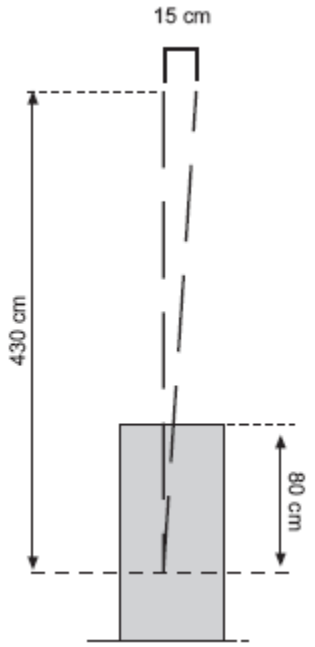
Alsipercha

Cast in Tube



Tube is cast into column heads required.
Max 50mm protrusion





Tie it down ....

Levelling "plumb" ensures that tube is vertical (2º)

Alsipercha

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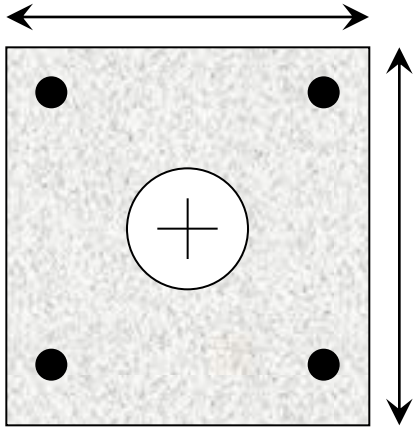
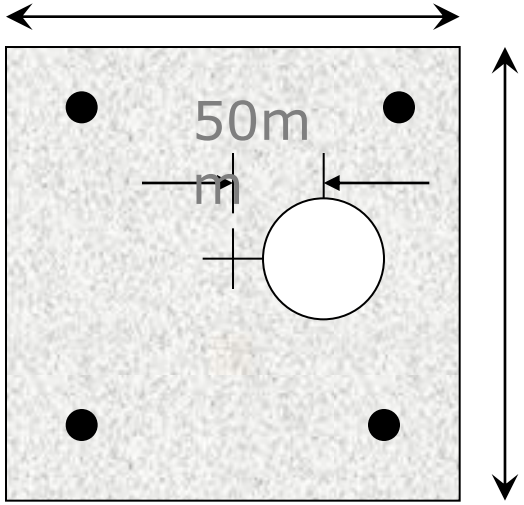
Cast in Tube - 76.1mm Ø

250 x 250 Small Column



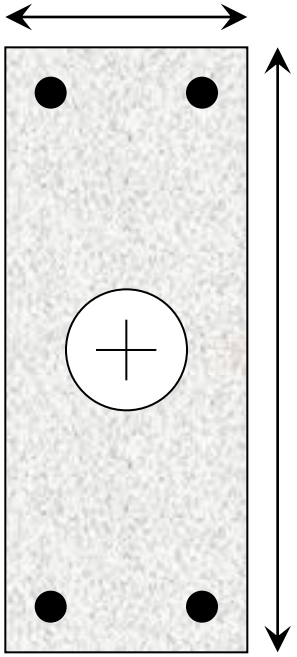
Centred +/- 10mm

300 x 300 Column



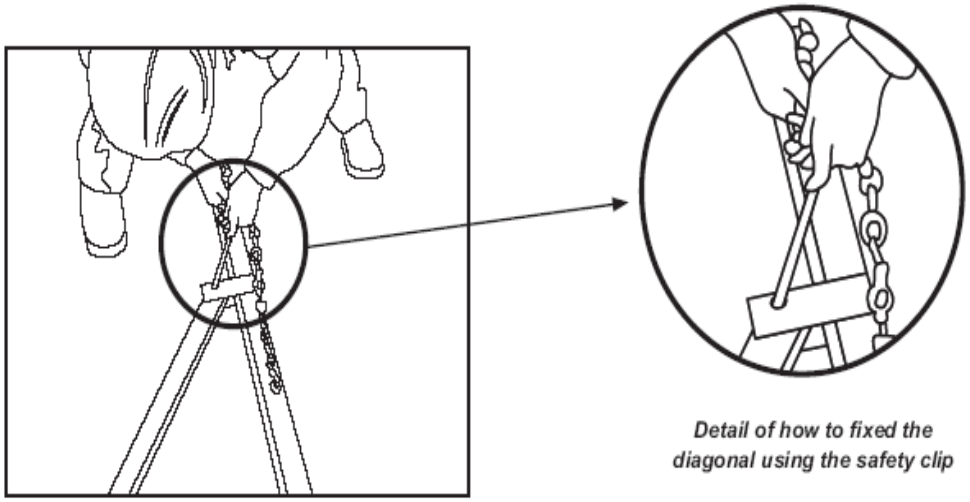
Tube can be off centre by 50mm

150 x 400 Blade Column

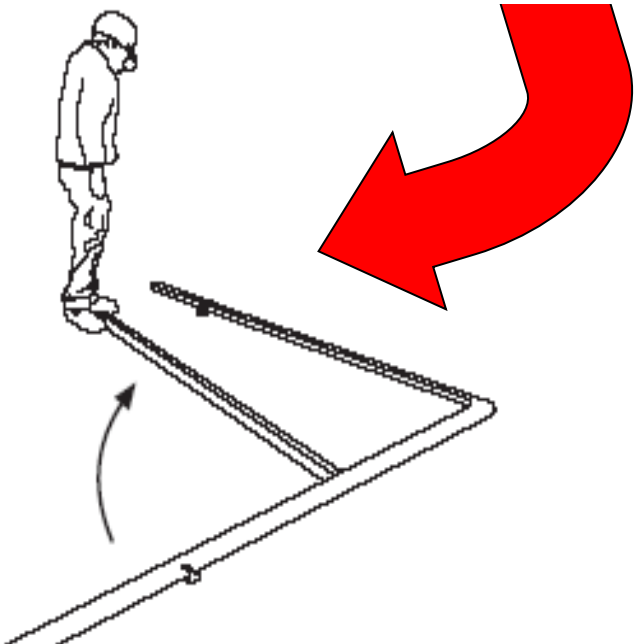


Centred +/- 10mm

Alsipercha



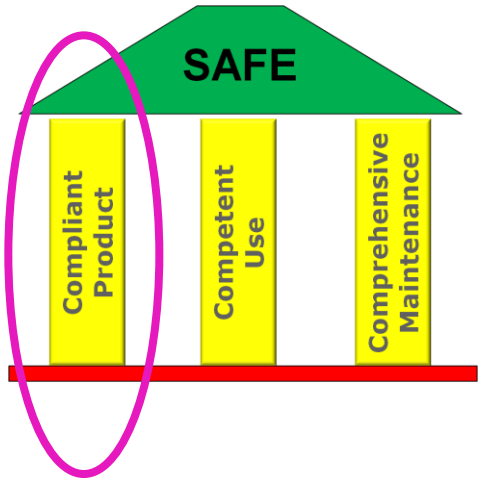
Detail of how to fixed the diagonal using the safety clip



&

ROTATE before lifting !!

Podium Steps



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Podium Steps

HIGHER SAFETY

Podium Steps

HIGHER SAFETY

Steps ?

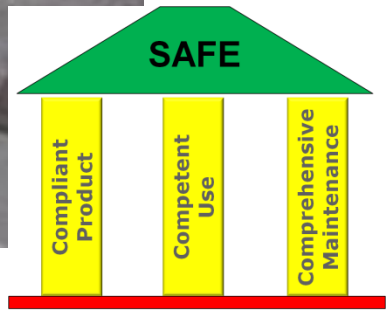
Advanced Guard Rails

Speed +
Idiot Proof +
“Spare” components +

Better Safety
all round ….

Advanced Guard Rails

HIGHER SAFETY



Advanced Guard Rails

HIGHER SAFETY

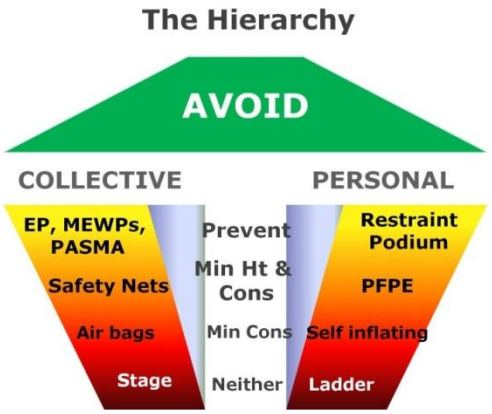
Do they work in Falsework ?

Advanced Guard Rails

HIGHER SAFETY

Skydeck (or Similar) ..... Why not always ?

Is it REALLY bottom up ?



Edge Protection Installation

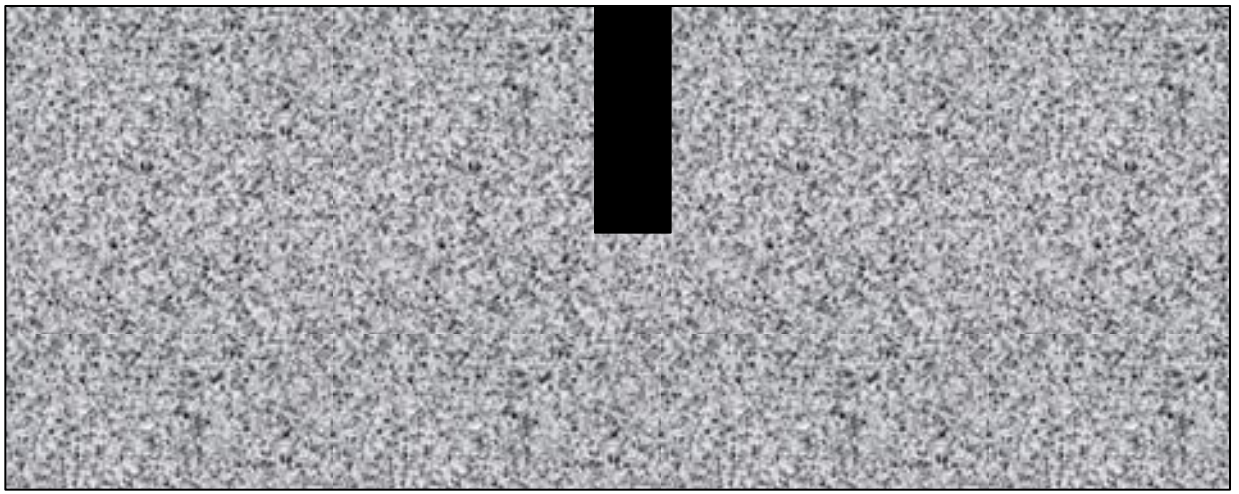
HIGHER SAFETY

Sooooo many issues ..
What real training do the guys get ?

Edge Protection Installation

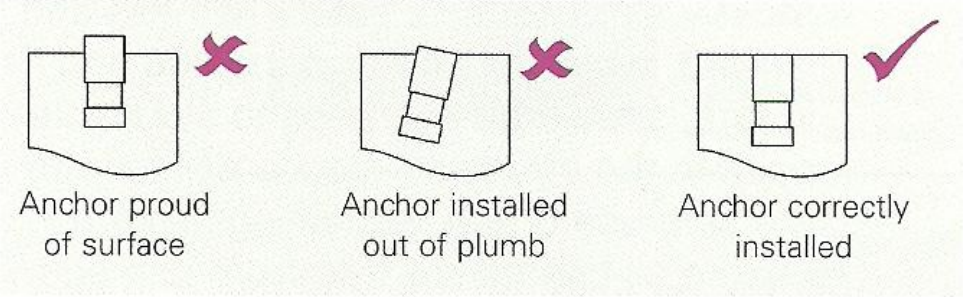
Edge Distance ?

M16 Impact set
Socket anchor
Min edge dist **225** mm

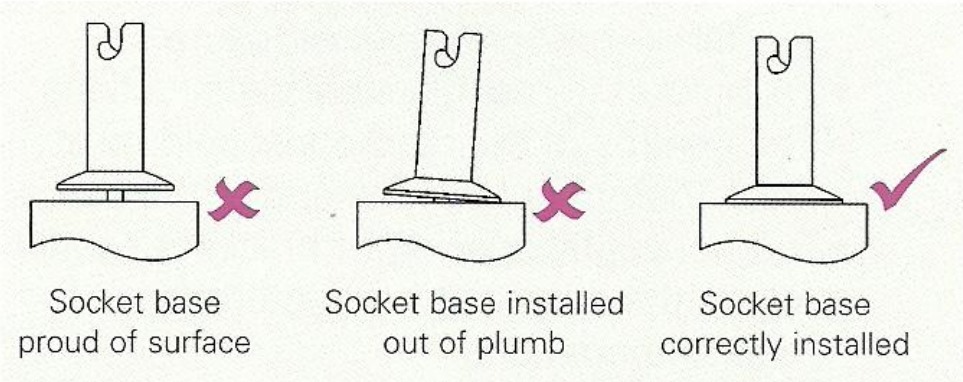


Common problems ..

Anchor installation



Socket base installation



Edge Protection Installation

HIGHER SAFETY

Edge Protection Installation

HIGHER SAFETY

Edge Protection Installation

Edge Protection Installation

Mix not Match ?

Socket
Post Height
Fit
Orientation
Etc ...

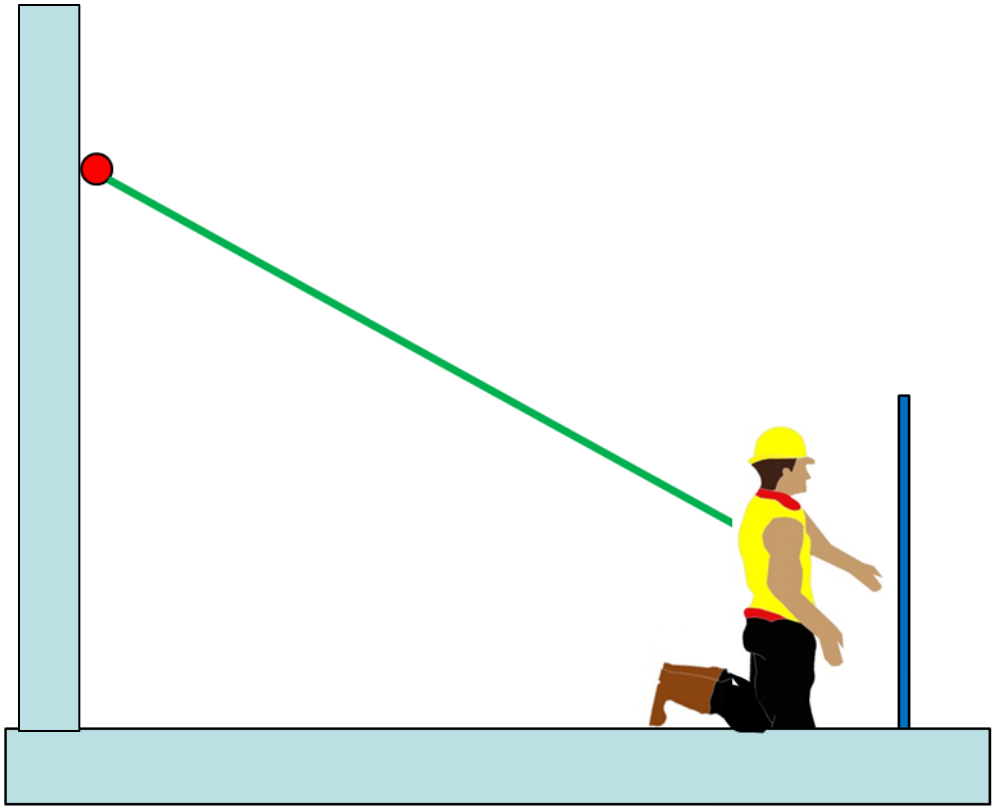
“System” Edge Protection ?

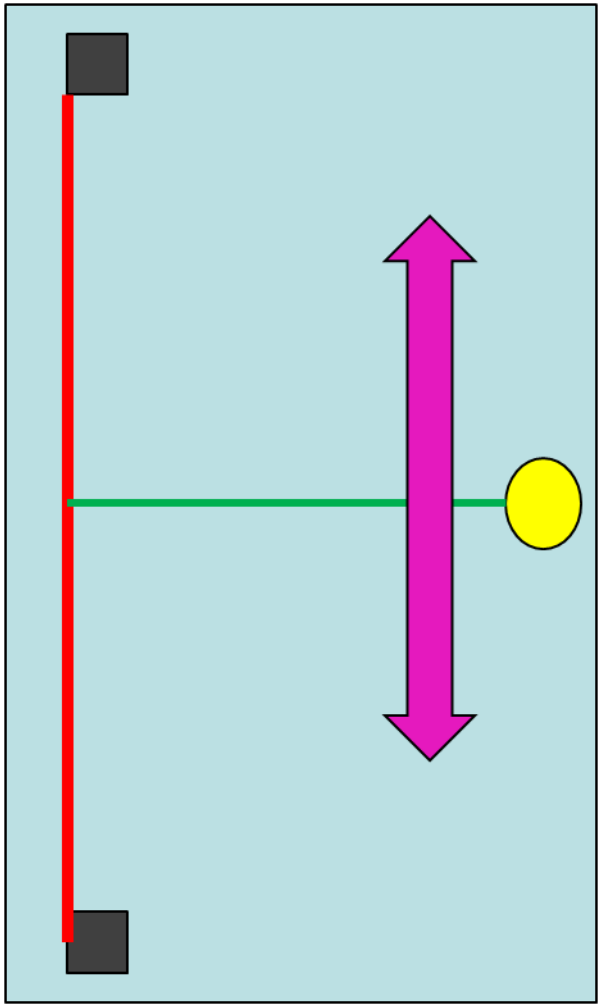
Real "Restraint"

.. cannot get into a position from which to fall ..

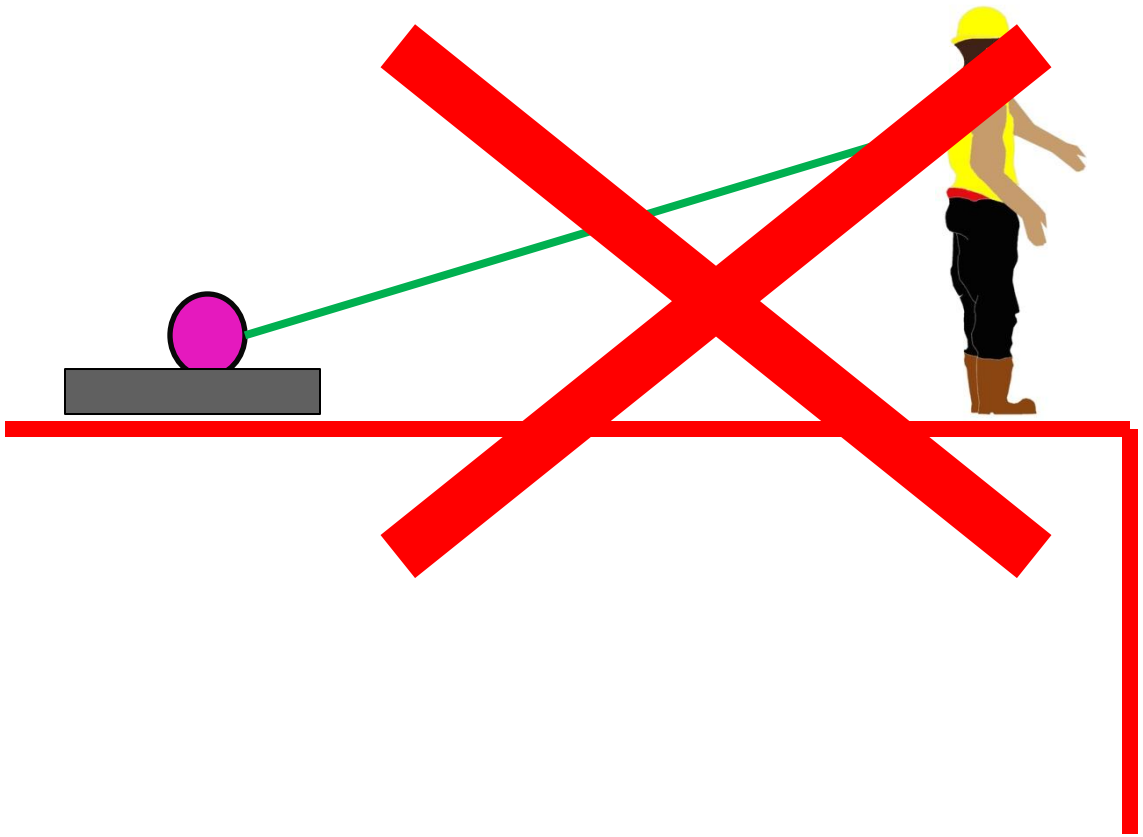
Real “Restraint” ?

Real “Restraint”



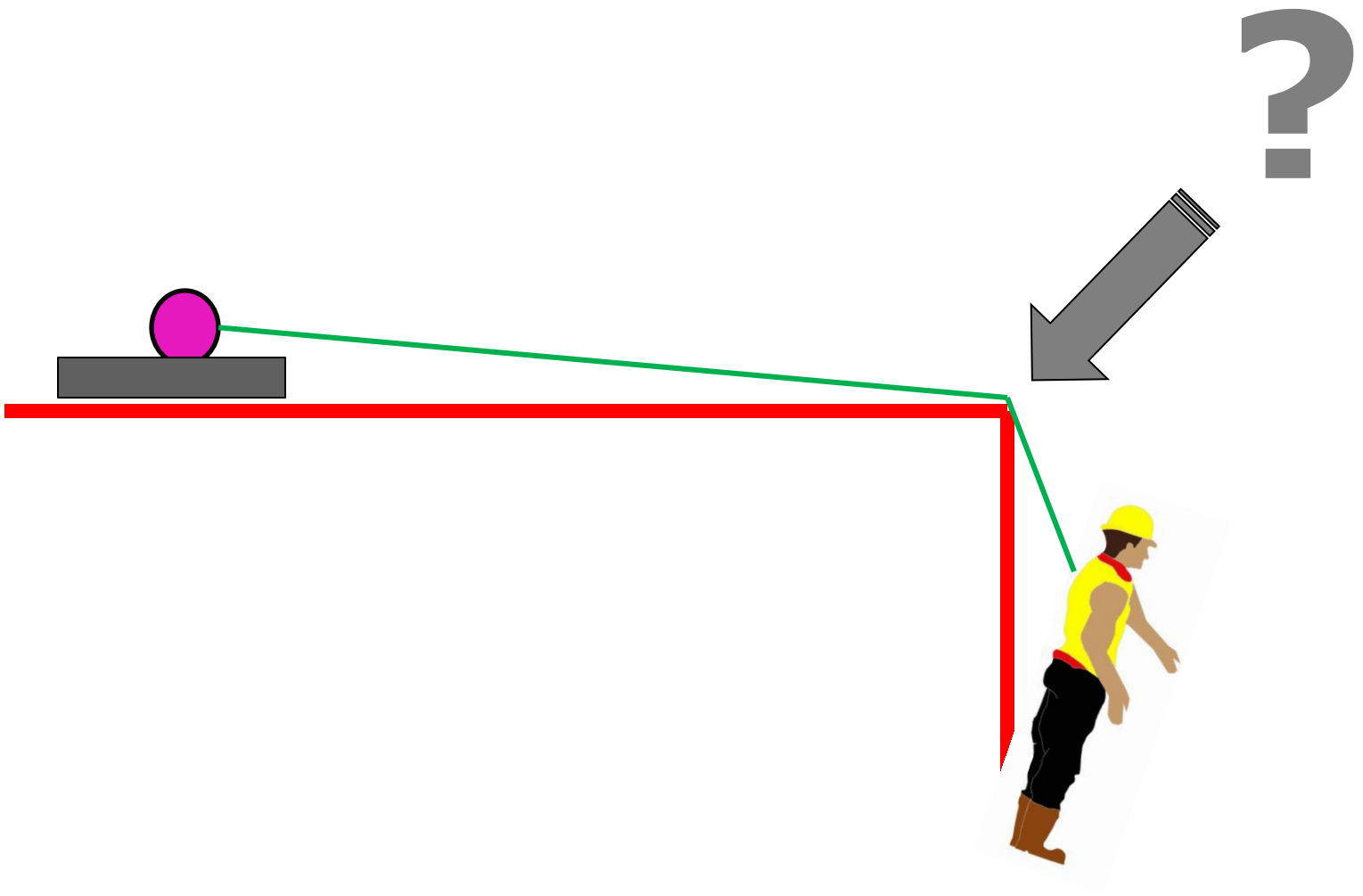


Horizontal Inertia Blocks

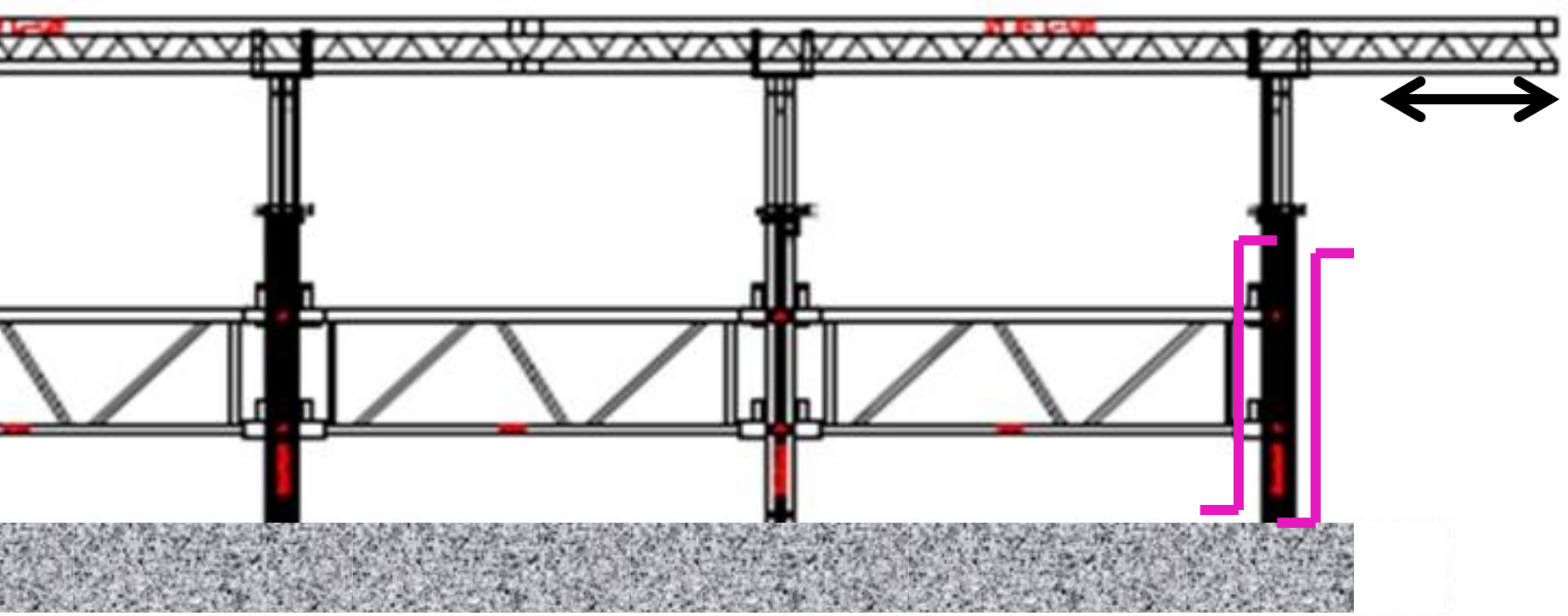


?

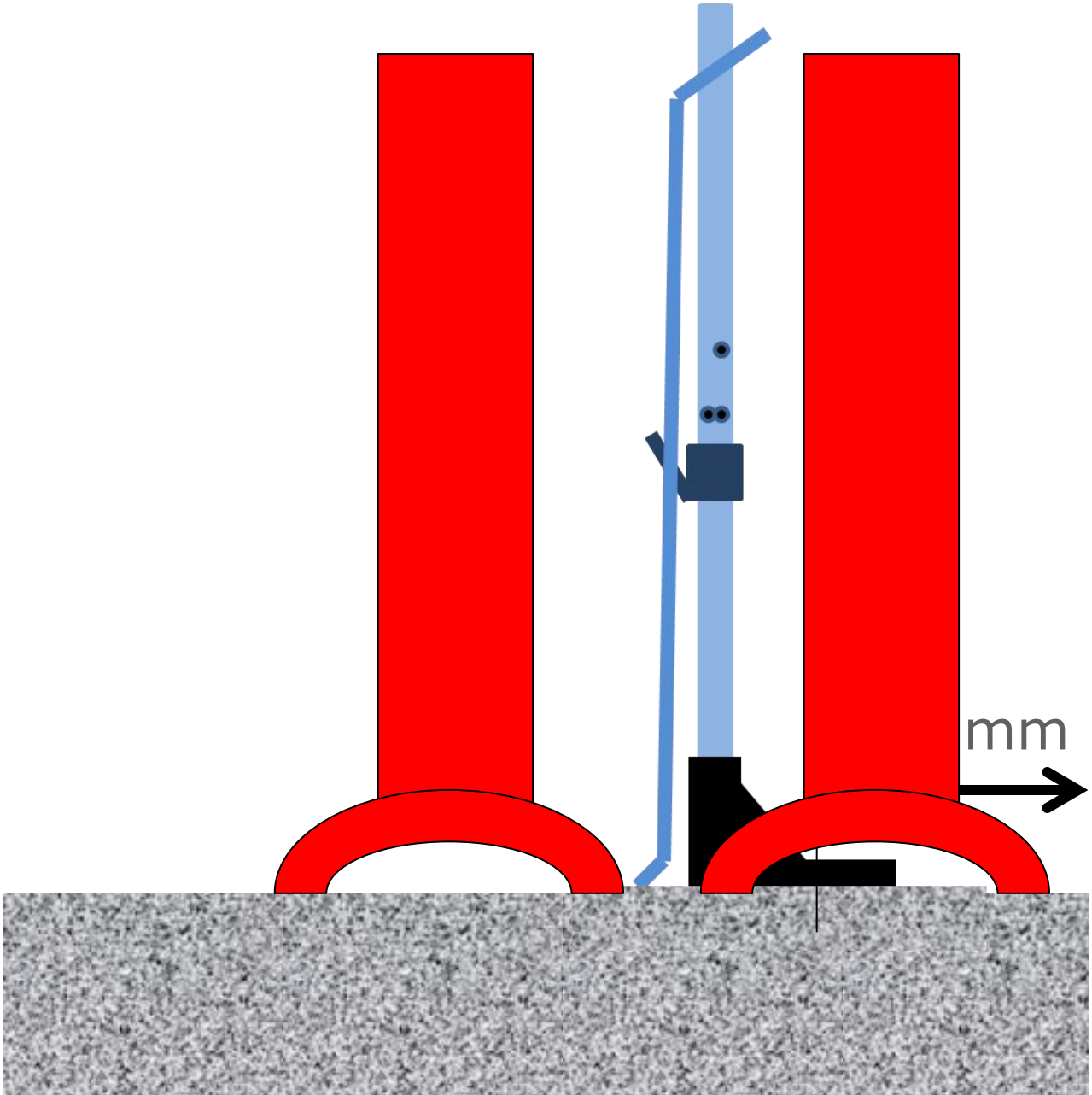
Horizontal Inertia Blocks



Falsework & Edge Protection



Falsework & Edge Protection



Containment Standard

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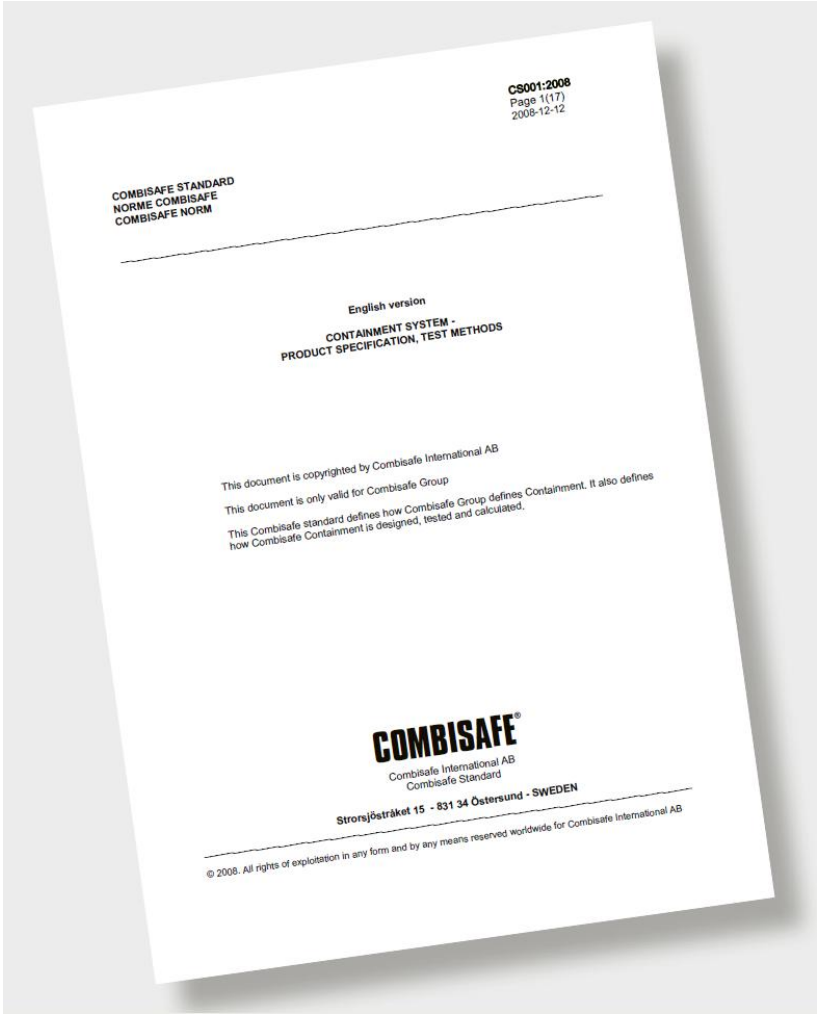
Edge Protection Standard

EN 13374 ?

(Wind loading is limited to 40m height)



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2008-12-12

COMBISAFE STANDARD
NORME COMBISAFE
COMBISAFE NORM

English version

CONTAINMENT SYSTEM -
PRODUCT SPECIFICATION, TEST METHODS

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This document is only valid for Combisafe Group

This Combisafe standard defines how Combisafe Group defines Containment. It also defines how Combisafe Containment is designed, tested and calculated.

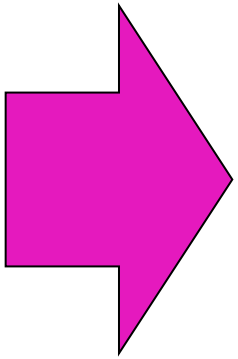
COMBISAFE®
Combisafe International AB
Combisafe Standard
Strorsjöstråket 15 - 831 34 Östersund - SWEDEN

epf
EDGE PROTECTION FEDERATION

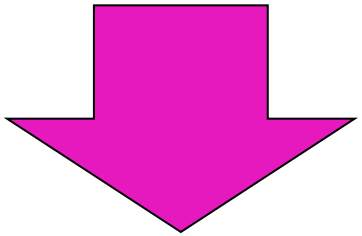
High Rise Containment

Additional Hazards

Wind/Weather
Extent of work on edge ?
Components ?
Access needs ?
Other trades (segregation) ?

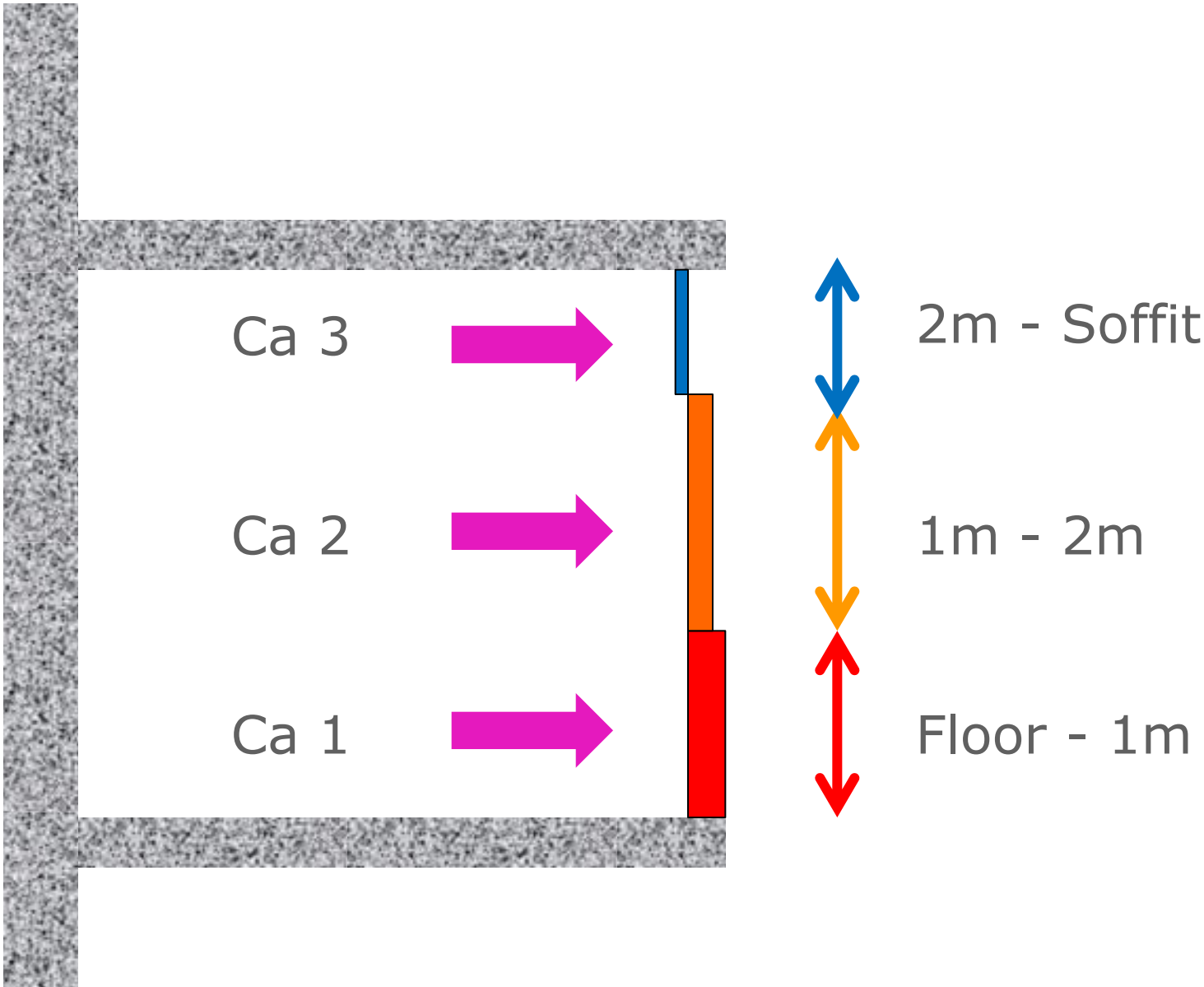


Horizontal Containment



Vertical Containment

High Rise Containment



Containment Standard

Containment Hierarchy

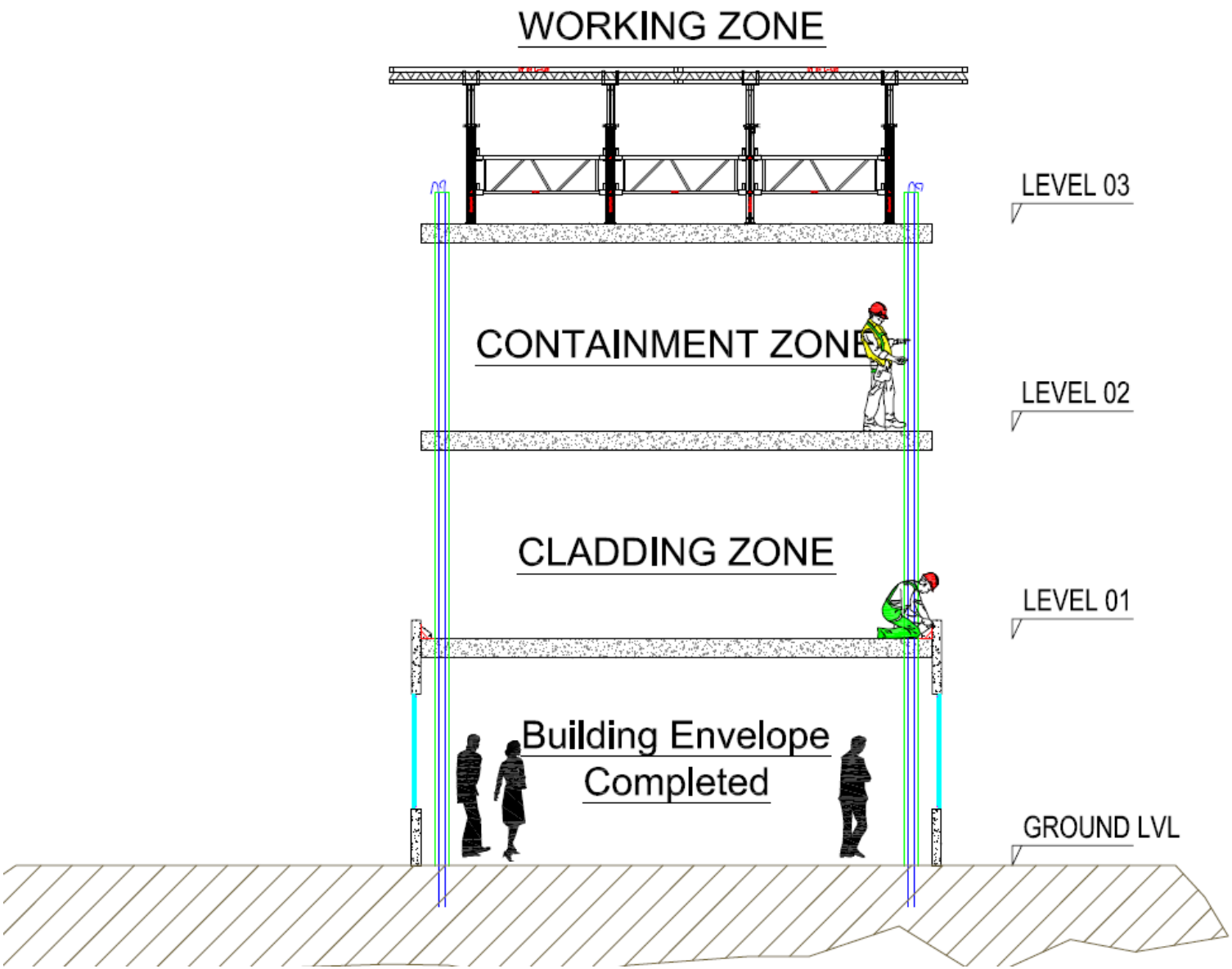
Screens

Floor to soffit containment

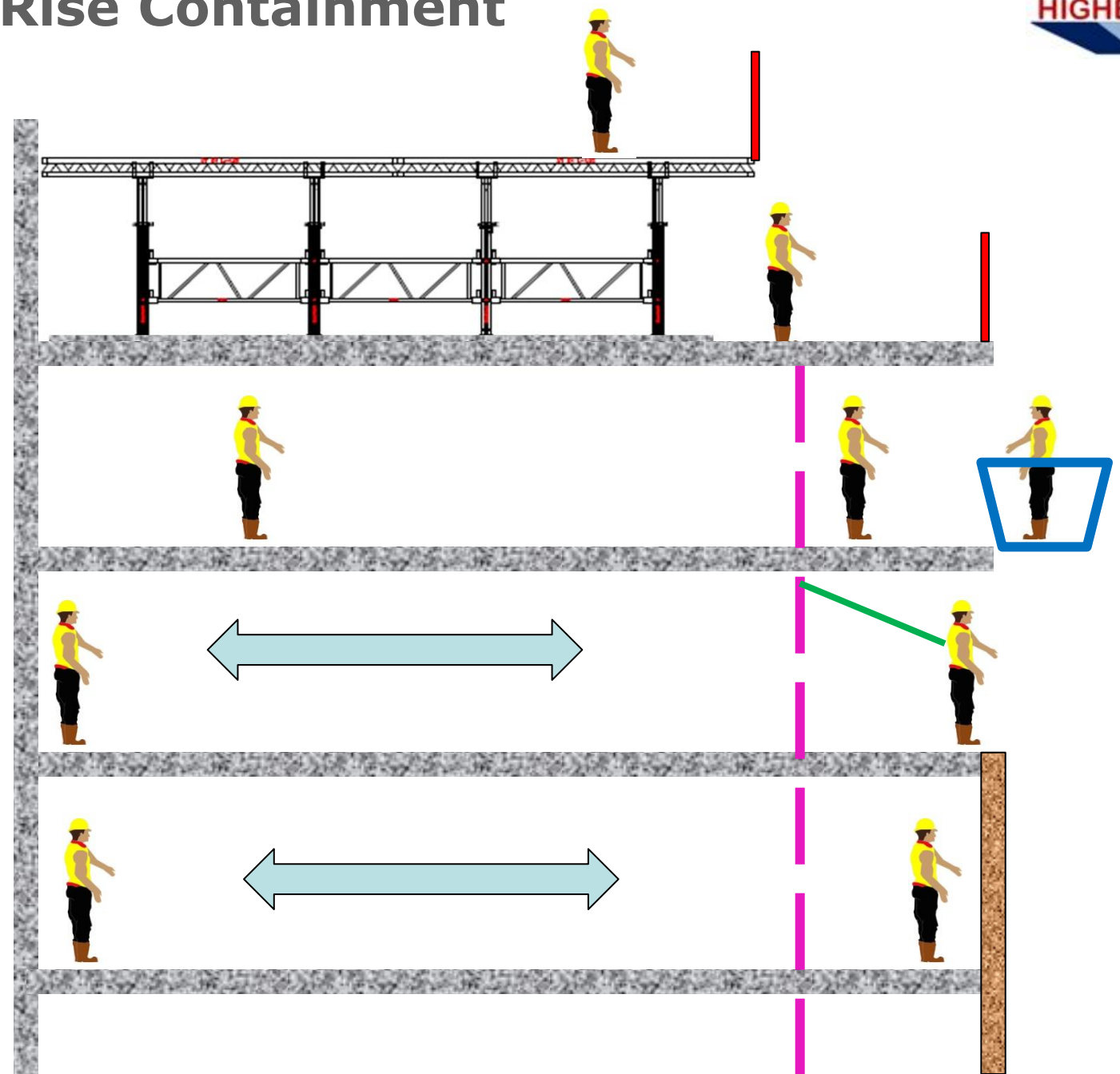
Enhanced height systems

EN13374 compliant systems (1.2m)

High Rise Containment



High Rise Containment



TG 20:13

When should a Scaffold be Designed ?

NASC

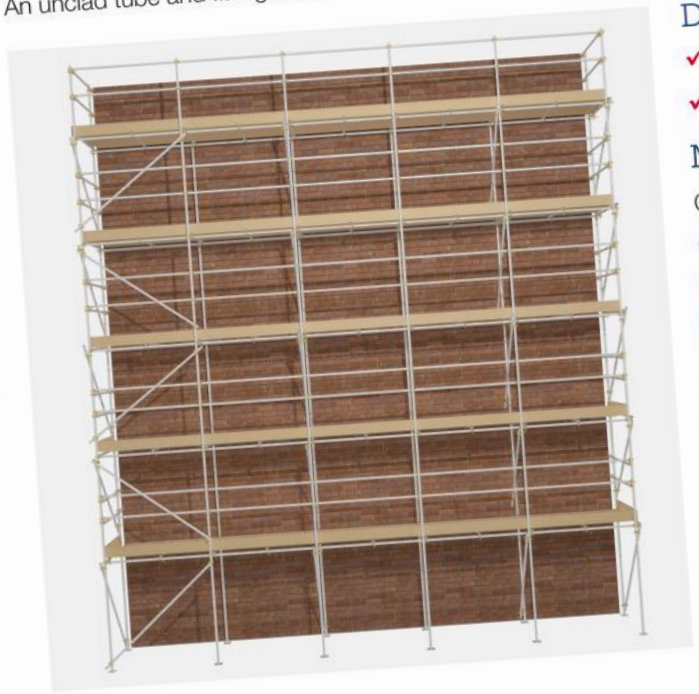
TG20:13

When it is NOT shown to be a "Compliant Scaffold"

Evidenced with a “Compliance Sheet”

Standard unclad independent

An unclad tube and fitting tied independent scaffold with 2.0 m maximum lift heights.



Design height

- ✓ Maximum height: 16 m to the top lift;
- ✓ Maximum leg load: 16.2 kN.

Maximum loading

One lift loaded, plus one lift 50 % loaded, per façade with:

- ✓ General purpose (load class 3): 2.0 kN/m²;
- ✓ Heavy duty (load class 4): 3.0 kN/m²;
- ✓ Inside boards loaded to 0.75 kN/m² at the working lift.

Ties

- ✓ 1 x light duty (3.5 kN) tie per 16 m²;
- ✓ Max 4.0 m between tie lines (ties required at alternate li
- ✓ Max 4.0 m horizontal distance between vertical tie lines

Location

Valid in the British Isles where the site wind exposure is not *extreme* as defined in TG 20:13 chapter 03.

Add-on features

- ✓ This scaffold may optionally include a TG 20 compliar bridge, pavement lift and cantilever fan with an accompanying compliance sheet for each.

Criteria

To be erected as a TG 20 compliant tied independent scaffold as described by TG 20:13 chapter 06:

- ✓ Boarded at any number of lifts, 3 – 5 main boards and up to 2 inside boards wide;
- ✓ Maximum lift height: 2.0 m;
- ✓ bay length: 2.0 m (load class 3), 1.8 m (class 4);
- ✓ Façade braced in every elevation, one set per six bays;
- ✓ Ledger braced at alternate standards and at end frames;
- ✓ Double guard rails at boarded lifts (triple guard rail permitted at the top lift);
- ✓ guard rails at unboarded lifts;

Listing :-

- Height.
- Loading
- Ties
- Location
- Other Criteria
- Additions
- Etc .....

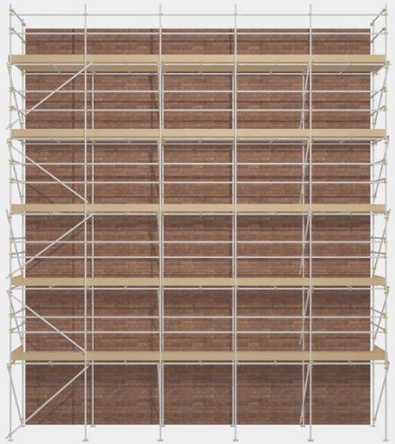
HIGHER SAFETY

NASC

TG20 DESIGN 1

Standard unclad independent

An unclad tube and fitting tied independent scaffold with 2.0 m maximum lift heights.



Design height

- ✓ Maximum height: 16 m to the top lift [1].

Maximum loading

- ✓ One lift loaded, plus one lift 50 % loaded, per façade with:

Load class	Duty	Maximum loading
3	General purpose	2.0 kN/m²
4	Heavy duty	3.0 kN/m²

- ✓ Inside boards loaded to 0.75 kN/m² at the working lift;
- ✓ Foundation design leg load (for the client): 16.0 kN (18.65 kN if a cantilever fan is included).

Ties

- ✓ 1 x light duty (3.5 kN) tie per 16 m²;
- ✓ Max 4.0 m between tie lines (ties required at alternate lifts);
- ✓ Max 4.0 m horizontal distance between vertical tie lines.

Location

Valid in the British Isles where the site wind exposure is not *extreme* as defined in TG20:13 chapter 03.

Add-on features

- ✓ This scaffold may optionally include a TG20 compliant bridge, pavement lift, cantilever fan, loading bay and ladder tower with a TG20 compliance sheet for each.

Criteria

To be erected as a TG20 compliant tied independent scaffold as described by TG20:13 chapter 06:

- ✓ 3 – 5 main boards and up to 2 inside boards wide;
- ✓ Maximum lift height: 2.0 m;
- ✓ Maximum bay length: 2.0 m (load class 3), 1.8 m (class 4);
- ✓ Maximum transom spacing: 1.2 m (load class 3), 0.9 m (load class 4);
- ✓ Unclad or with wire or plastic brick guards;
- ✓ Boarded at any number of lifts;
- ✓ Tied to an *impermeable* façade (no significant openings);
- ✓ Façade braced in every elevation, one set per six bays;
- ✓ Ledger braced at alternate standards and at end frames;
- ✓ Double guard rails at boarded lifts (triple guard rail permitted at the top lift);
- ✓ Single guard rails at unboarded lifts;
- ✓ Internal edge protection provided where required;
- ✓ Tied in accordance with TG20:13 chapter 07.

Sign-off

Scaffold reference or description: ----------

Much is unchanged .. BUT

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Loading ..Four main classes :-

- Class 1. 0.75 kN/m²
- Class 2. 1.5 kN/m²
- Class 3. 2.0 kN/m²
- Class 4. 3.0 kN/m²

Width :- Number of boards wide ?
Inside Boards ?

Max Bay length .. Depends on loading and width ...

Bracing .. Very similar, but with some detail changes ....

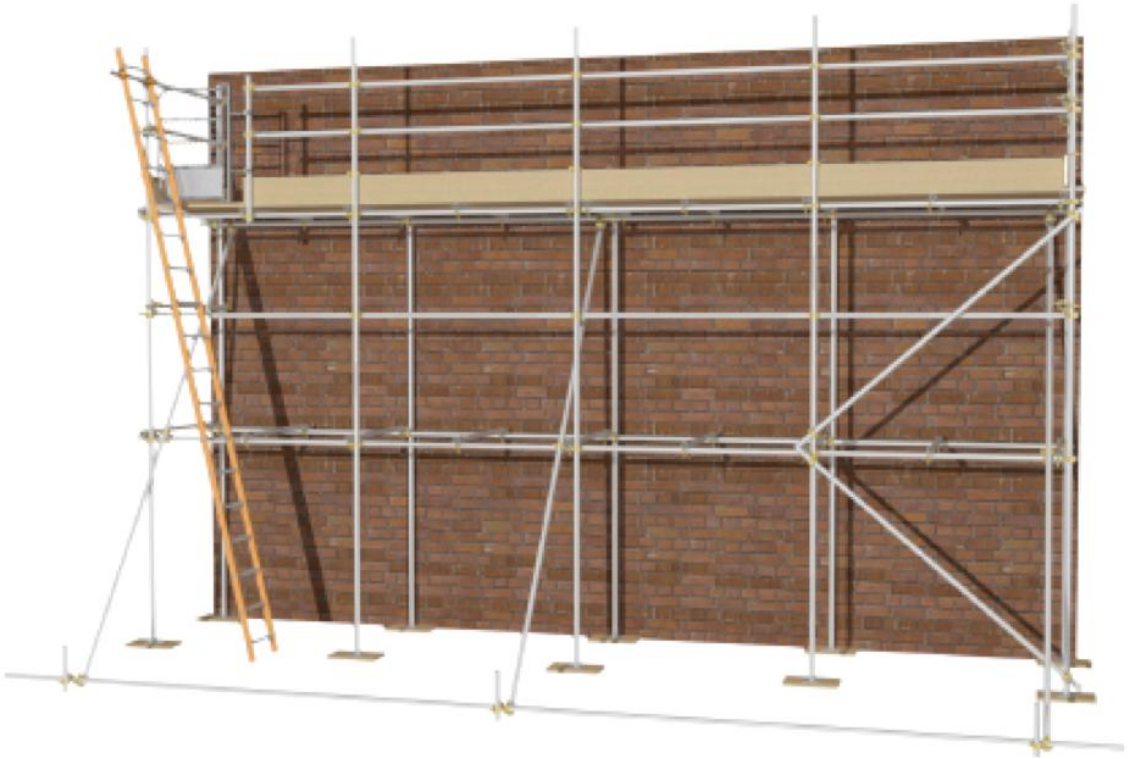
Ties... Mostly every other every other. NOTE Duty

Compliant Scaffolding Types

- Tied Independent Scaffolding

Compliant Scaffolding Types

- Free-standing Independent Scaffolding



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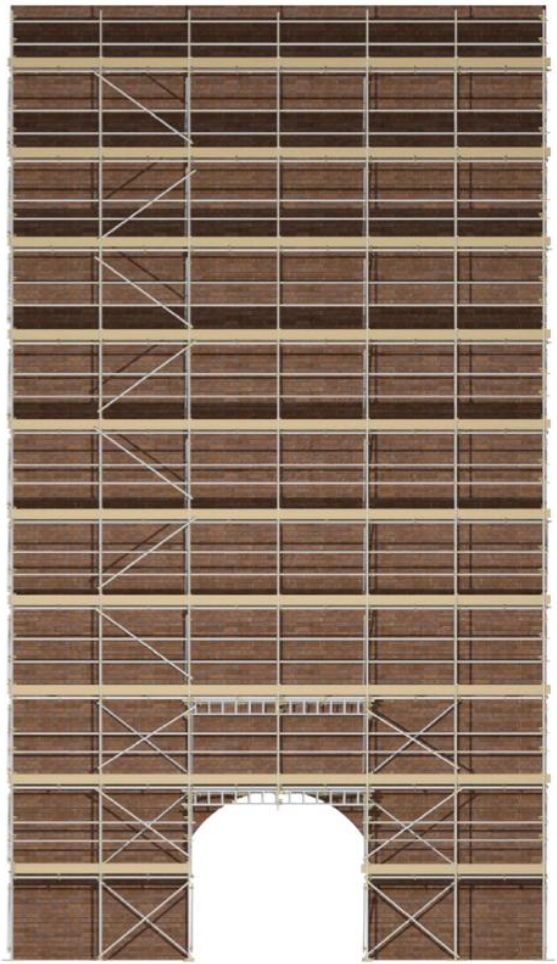
Compliant Scaffolding Features

NASC

- Bridging with Beams

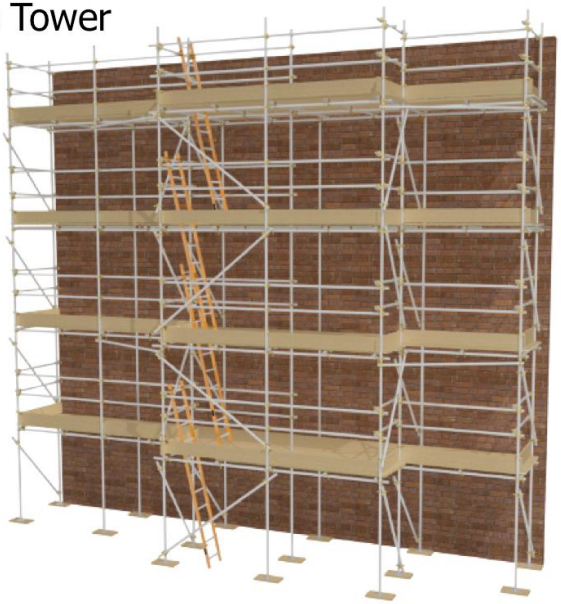


Compliant Scaffolding Types

- Loading Bay

Compliant Scaffolding Types

- Ladder Access Tower



Loaded Lifts

Lifts to 3m !!

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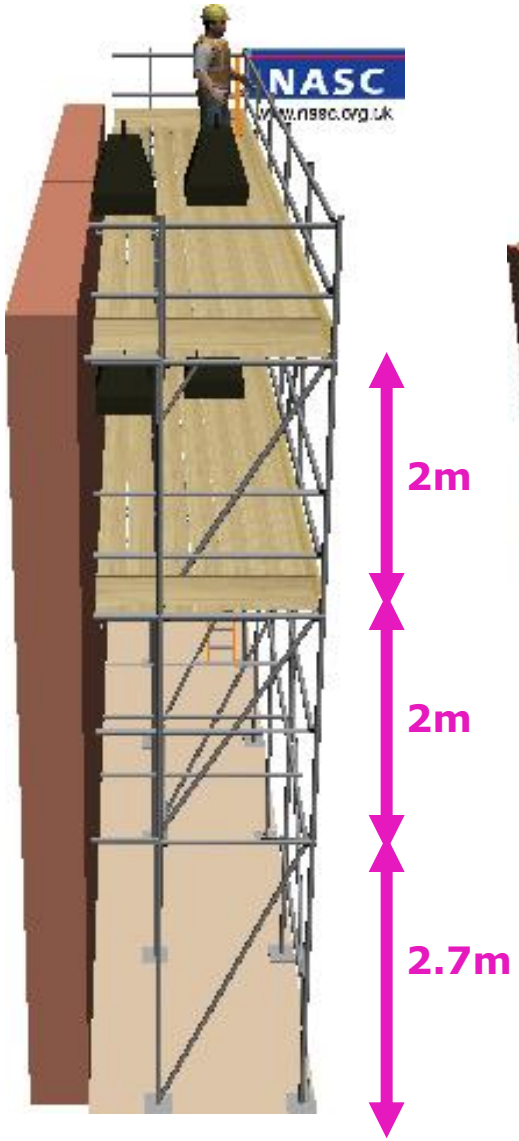
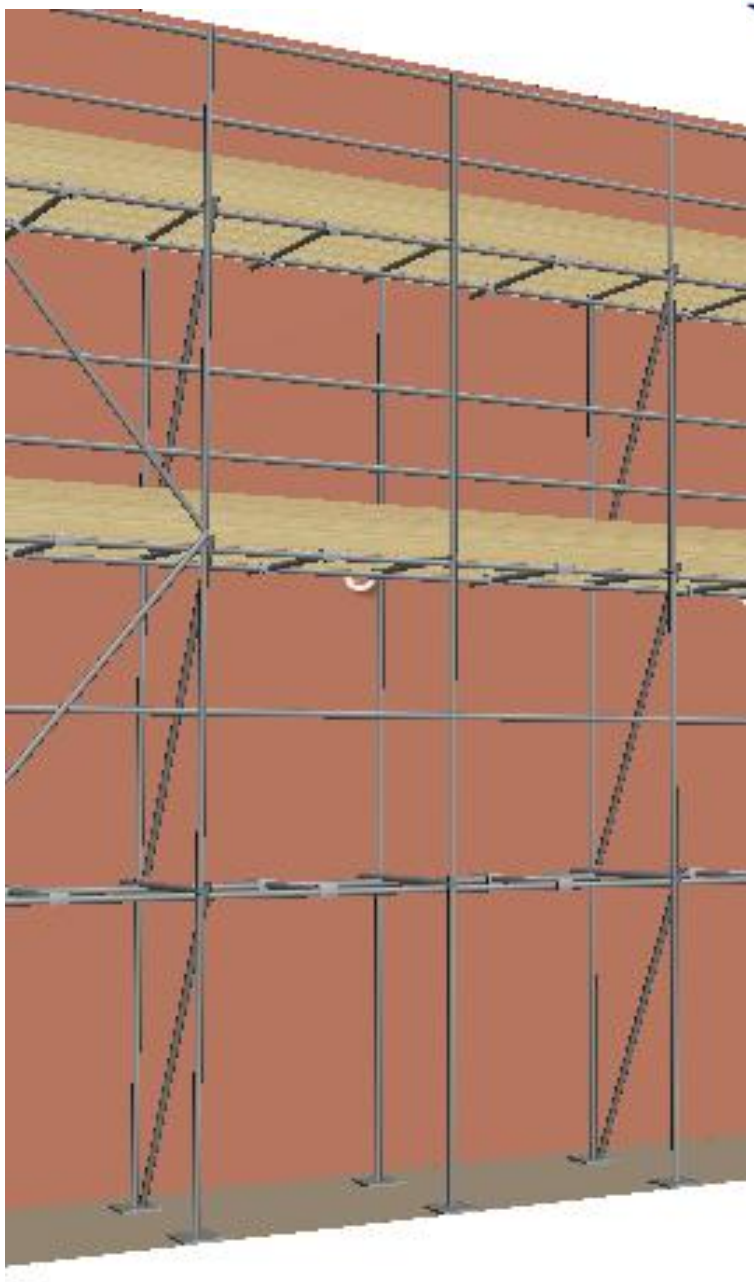


Ledger Braces

Every other bay ..

Or Readylock
(<30m)



Compliance can include .....

Some bridges.
Some cantilevers and fans
Pavement lifts
Inside board brackets
Some loading bays
Some birdcages
Etc .....

There is still the requirement/opportunity for a full design, if outside the simple Compliance method.

New Compliance service offering from

TG 20:13

Issues to discuss

HIGHER SAFETY

1. Alsipercha (hangman) Use
2. Podium Steps Standard
3. Advanced guard rails on Towers
4. Advanced guard rails on falsework
5. Edge protection installation
6. Anchor installation
7. Real RESTRAINT
8. Horizontal Inertia blocks
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Safe @ Height

Questions ?