MANAGEMENT OF WORKING AT HEIGHT

2026-04

mace

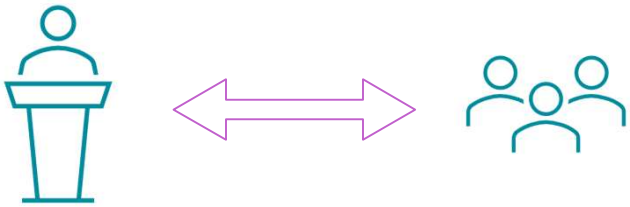
2

ADMIN & INTRO

3

ZOOMING

- Mace require your camera to be on
- Microphones muted if noisy
- Temporary un-mute: <CTRL> & <SPACE BAR>
- Gallery view to see everyone
- Same link for each day



4

SLIDE DECK

Link shared at end
to download
a copy of slides

5

COURSE STRUCTURE

Day 1	Admin & Intro
	Level 1 – 80% of Programme
Day 2	Level 1 – 20% of Programme
	Level 1 – Assessment
	Level 2 – Programme
	Level 2 – Assessment

6

ADMIN (F F F F)

Phones

Fags

7

REFRESHMENTS

Tea & coffee will be provided only at the start of the day.

The coffee machine in reception is for use by for external visitors only.

Please use the canteen on the 1st floor for your beverages, or external shops.

8

YOUR TRAINER

John Hynes
BEng(Hons) MSc(Eng)

30 years in Construction:
Design, Site Management, Fixing Technology, Remedials, Nuclear & Petrochem

25 years Work at Height:
Design & Installation, Trade Bodies & Standards

Family, Sports & Socialising

9

HIGHER SAFETY

AUTUMNAL

Independent & Impartial Height Safety Consultancy

Previously Higher Safety - established by Barney Green - now retired

10

WHAT DO WE DO?

- **Consultancy Service**
  - Project Advice, Design support, Planning, WAH review
- **Business Development**
  - Planning, Processes, Solution Development Support
- **Education & Training**
  - Awareness, Regulations, Best Practice
- **Expert Witness**
  - Advising the court ….

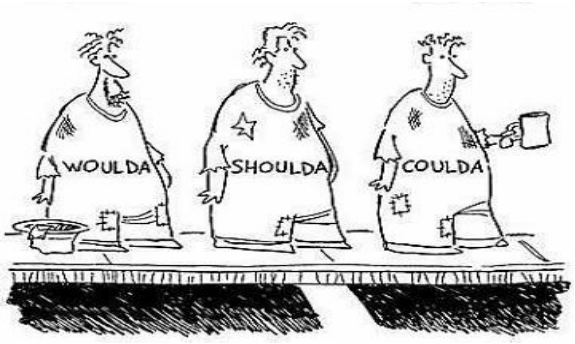
AUTUMNAL

www.autumnalservices.com

11

EXPERT WITNESS

- Ensure competence
- Justify decisions
- Keep good records



12

WHAT ABOUT YOU?

What are your…

- roles?
- current / recent projects?
- experiences?
- interests outside of work?

13

MACE
WORKING AT HEIGHT STANDARD

- **Overview**
- **Hazards**
- **MACE Hierarchy**
- **MACE Risk Rating**
- **Tool Tethering Standard**
- **Exclusion Zones & PPE**
- **Edge Protection**
- **Overhead Protection**
- **Access Equipment**
- **MEWPs & Low-Level Access Equip't**
- **Access Towers, Steps & Ladders**
- **Personal Fall Protection Equp't (PFPE)**
- **Riser Management**
- **Floor Horizontal Protection**
- **Edge Vertical Protection**
- **Vertical Access Space Protection**
- **Work at Height Plan**

Current version: Construct CN-HSW-SD-0007 v1.1 (2024?)

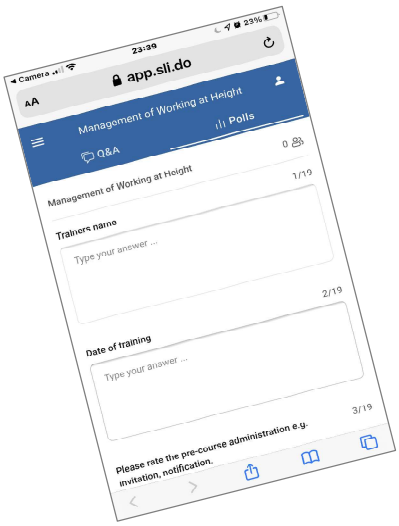
revision due by Q3-2026?!

14

FEEDBACK

www.sli.do

Requirement for Mace HSW Team



15

AGENDA

Day 1 (Level 1)	
09:00	Introduction
09:30	WaH Regulations & MACE
10:15	MACE WaH Standard
10:45	BREAK
11:00	Tethering, Exclusion Zones, Secondary Systems & Signage
11:30	Edge Protection Standards
12:15	Edge Protection Levels
12:45	LUNCH
13:15	Access Equip Common Management Controls
13:30	Access Scaffold
14:30	BREAK
14:45	MEWPs, PAVs & Peco
15:45	Towers & Podiums
16:30	FINISH

16

AGENDA

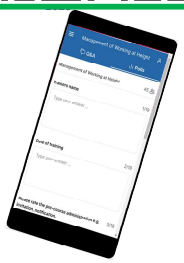
Day 2 (Level 1)	
09:00	PFPE – Work Restraint & Fall Arrest
10:30	Assessment (Level 1)
11:00	BREAK

Questions:
- 5 admin
- 28 tech

17

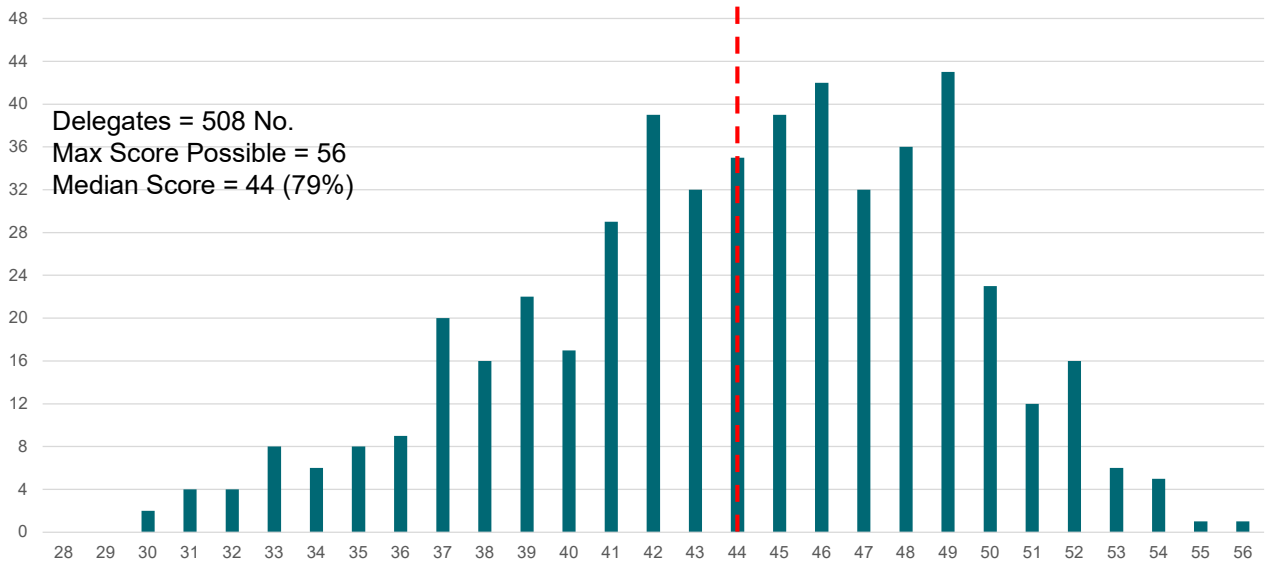
AGENDA

Day 2 (Level 2)	
11:15	Overhead Protection
12:00	Void Protection
12:15	Mast Climbers (MCWP) & Cradles (TSAE)
13:00	LUNCH
13:30	Delta Decks, Ladders, Steps, Hop-Ups
14:00	Rope Access (Abseiling)
15:00	BREAK
15:15	Riser Management
15:45	MACE WaH Plan
16:15	Feedback & Assessment (Level 2)
16:45	FINISH



18

ASSESSMENT SCORES



19

THE END

Thank you
for your
attention & participation…

20

REGULATIONS & HIERARCHY

21

GENERAL H&S LAW

HSWA (Health & Safety at Work Act)

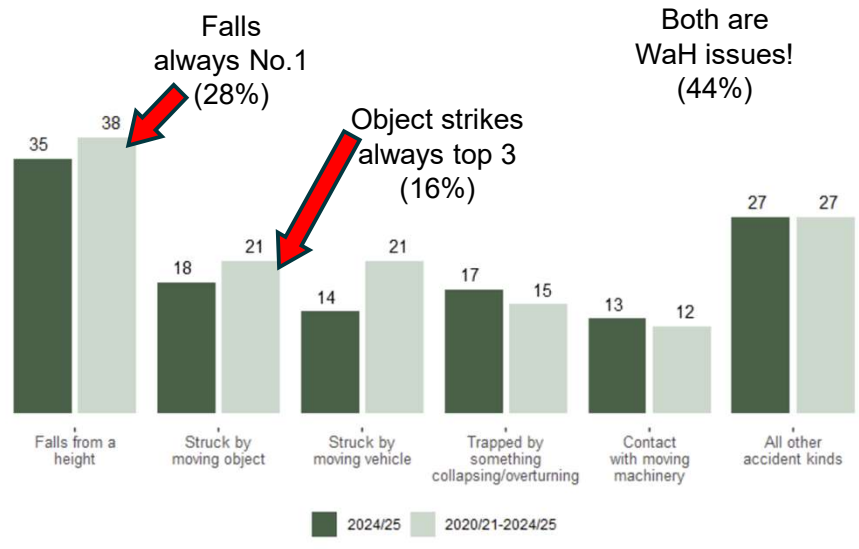
- **Duties on all employers & employees**
- **Protect SFARP** (So Far As Reasonably Practicable)
- **Enforcement**

RIDDOR (Reporting of Injuries, Diseases & Dangerous Occurrences Regulations)

- **Report 'hospital treated' injuries without delay**
- **Source of data**

22

RIDDOR STATISTICS



In construction, falls account for **52%** of all fatalities

UK HSE RIDDOR Data – November 2025

23

WAHR (WORKING AT HEIGHT REGULATIONS)

- Implemented in 2005
- Nearly lost in Brexit 'sunset' (2023)
- Applies to all work (not just construction)
- Definition of WAH

  "*Any place from which, if no action were taken, a person could fall a distance likely to cause injury*"
- Hierarchy of controls
- Unifies previous regulations on WAH

24

MAIN SECTIONS OF WAHR

- Organization & planning (~60% of WAHR convictions)
- Competency & training
- Avoidance of risks (~30% of WAHR convictions)
- Risks assessment & equipment selection
- Identifying fragile surfaces
- Controlling falling objects
- Identifying danger areas
- Maintenance & Inspection

25

TERMS

Hazard
(potential cause of harm)

x

Likelihood
(chance of encountering Hazard)

=

Risk
(product of Hazard & Likelihood)

Control Measure
(means of reducing Risk)

26

HIERARCHY OF CONTROLS

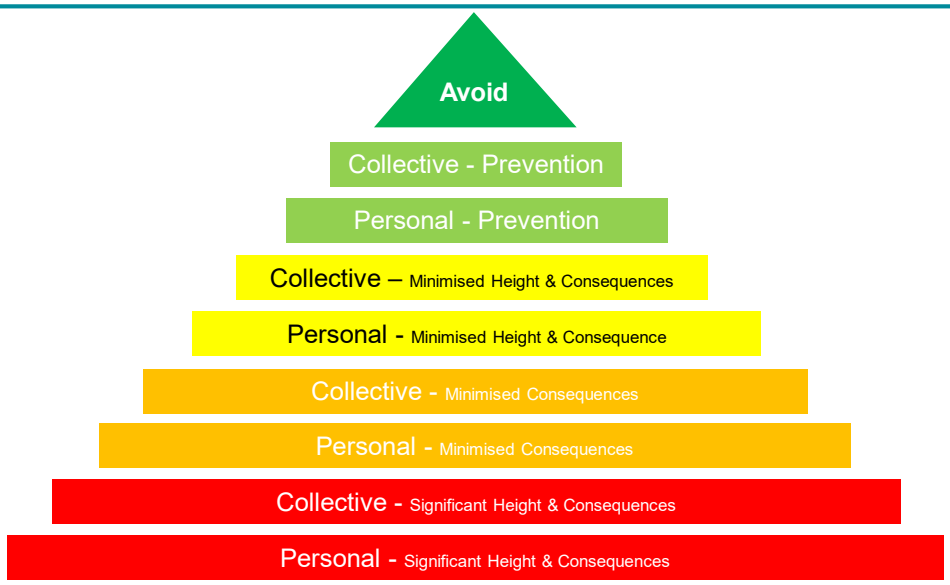
SFARP

Consider

Collective over **Personal**
Passive over **Active**
Permanent over **Temporary**

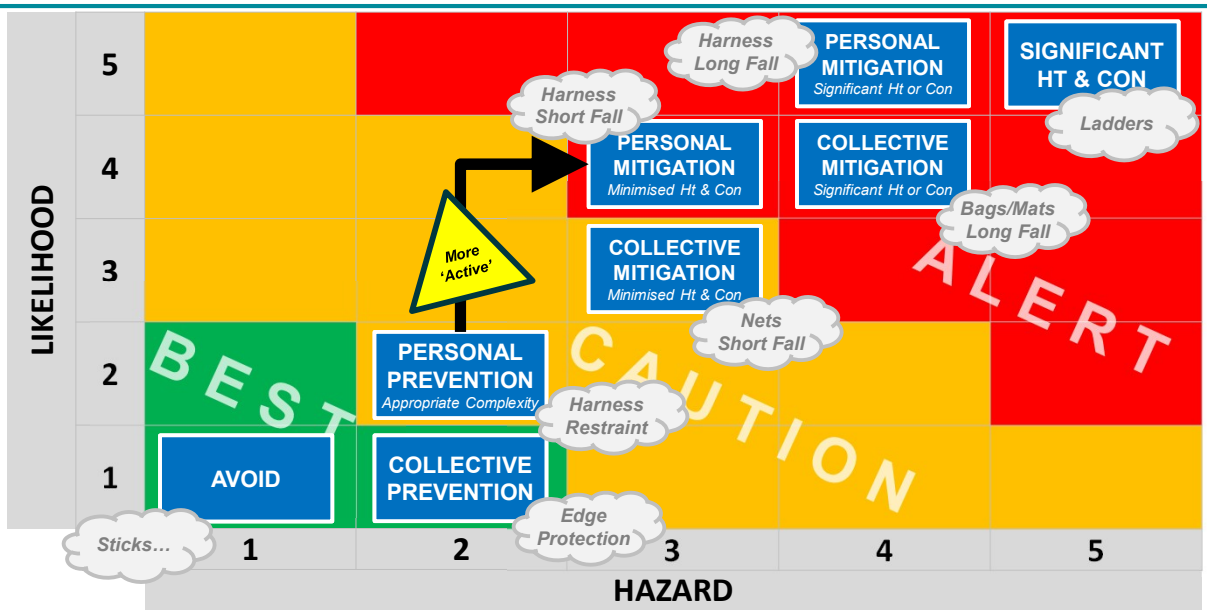
27

COMBINED HIERARCHY



28

RISK MATRIX

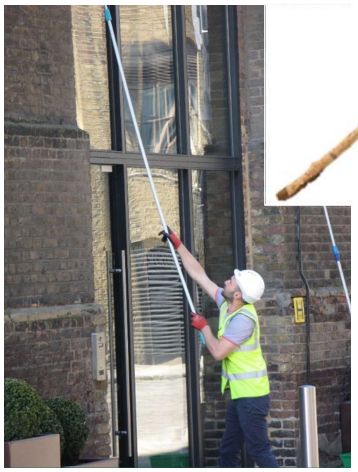


29

AVOID

30

AVOID

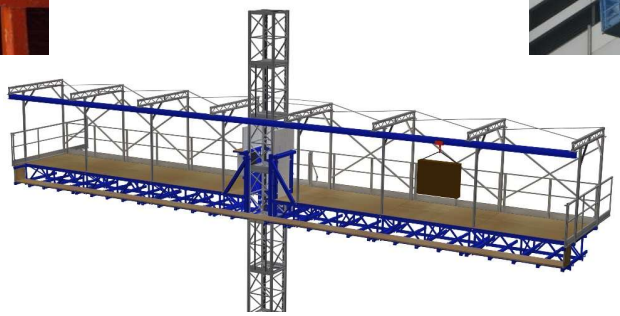


31

COLLECTIVE PREVENTION

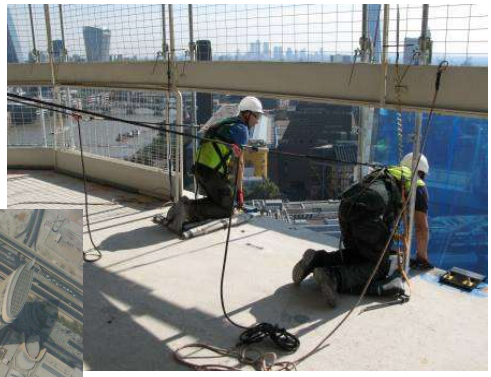
32

COLLECTIVE PREVENTION



33

PERSONAL PREVENTION

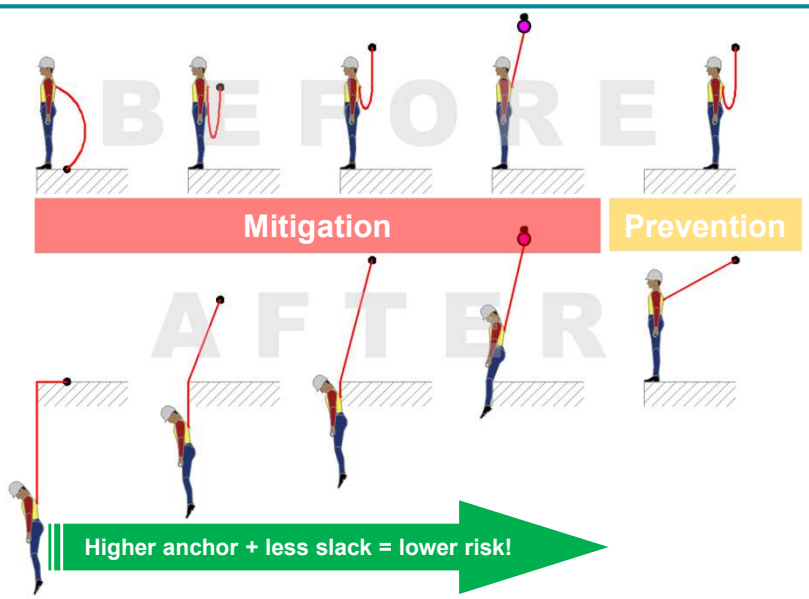


34

COLLECTIVE MINIMISE HEIGHT & CONSEQUENCE

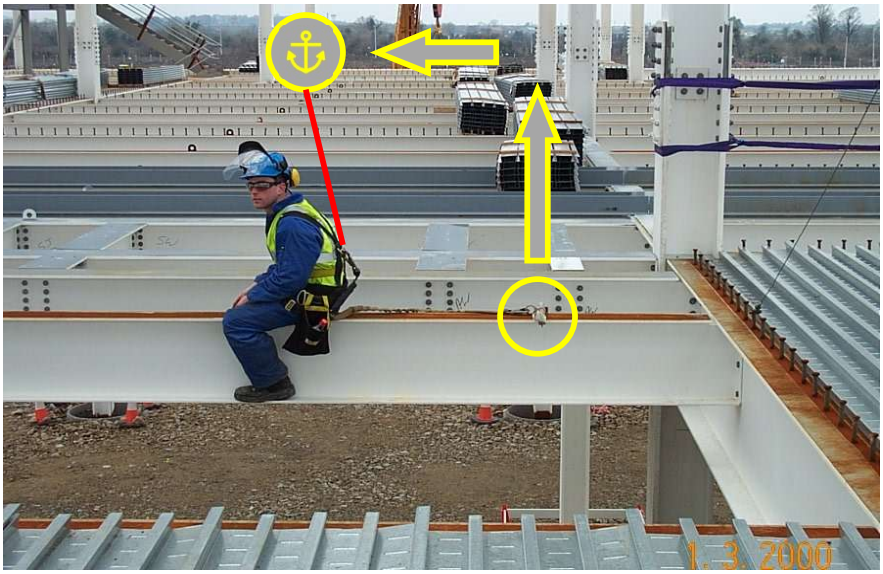
35

PFPE – MITIGATION & PREVENTION



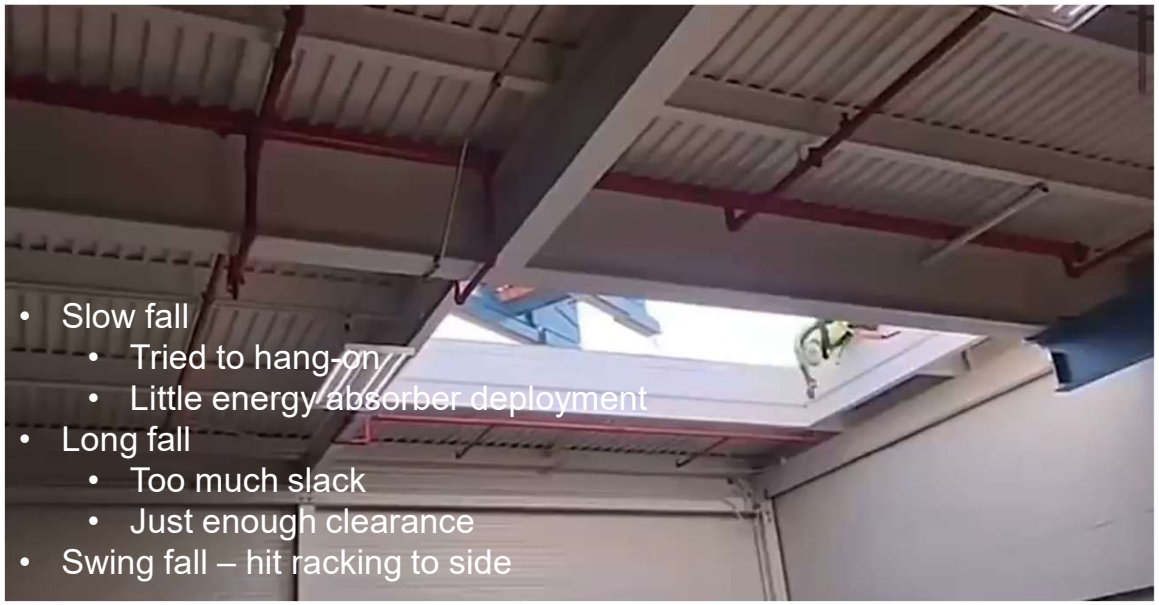
36

PERSONAL MINIMISE CONSEQUENCE



37

PERSONAL FALL ARREST EXAMPLE



38

RECOMMENDED ORDER FOR OPTIONS

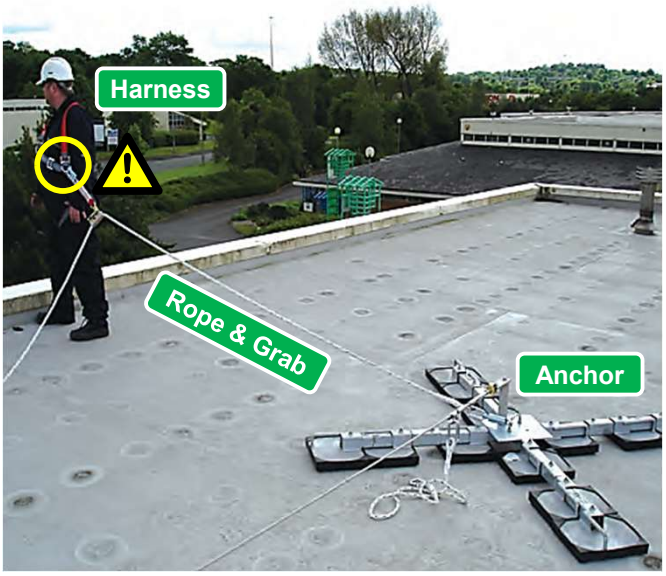
Work Equipment	Collective	Personal
Prevents a fall	Edge protection systems Advanced guard rails Work platforms	PFPE (Fall Factor 0 to 1) Pulpit steps Single user MEWPs
Minimise height and consequence	Nets (close) Material nets Soft landing systems	PFPE (Fall Factor 1 to 2)
Minimises Consequence	Net (Low level <6m) Remote soft landing systems	Lifejackets Inflating air suits Injury reduction
Does neither	Hop-ups Trestles Platforms	Ladders Stilts

39

PASSIVE VS ACTIVE

40

PASSIVE VS ACTIVE



41

OTHER WAH HAZARDS

Responsibility?

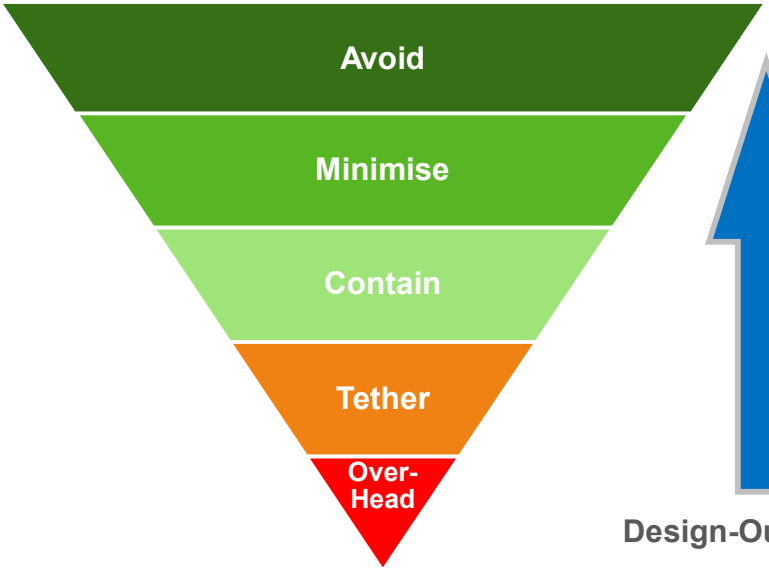
Falling Equipment

Falling Materials

Falling Debris

42

CONTROL OF MATERIALS AT HEIGHT



Design-Out Risk!!!

43

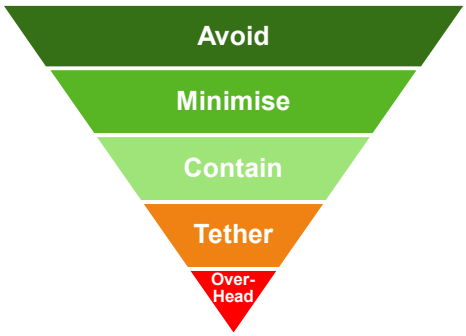
WHAT IS IT REALLY ALL ABOUT?

44

60 DROPPED ITEM REVIEW

- Lifting & Transport
- Shafts & Risers
- Demolition
- Cladding
- Others

Ask more of the package contractor!



45

MAJOR PROJECT WAH REVIEW

Early consideration ....

- CDM
- Asking questions
- Tease-out details
- How? (e.g. minimise repeat cladding visits)

Ask More!

Set expectations ....

- Demand more of the package contractor.
- Check their RAMS and Plan.
- Ensure they delivers.

46

SUGGESTED ACTION SUMMARY

1. Specialist advice early
2. Project/activity specific RAMS
3. Tough stand on competence
4. Vertical segregation
5. Revised sequence consequences
6. MACE tethering standard
7. Early cladding details. Min bits/visits.
8. Specify containment standard.
9. Consistent EP. MACE shafts & risers.
10. Demand more from scaffolder.
11. MACE public protection standard.
12. MACE temp cradles (SAEMA).
13. Housekeeping.
14. Chin straps.
15. MACE ramps and levels.
16. MACE off loading.

MACE Working at Height Standard

47

COMPETENCE

- Scaffolders
- MEWPs
- PASMA
- Slinger
- Banksmen
- Cladders
- Rope Access
- Edge Protection
- Etc.

Ask for More !

48

METHOD STATEMENTS

49

VERTICAL SEGREGATION

Briefing....
Be vertically alert!

50

QUESTIONS?

51

WORKING AT HEIGHT STANDARD

52

WORK AT HEIGHT OVERVIEW

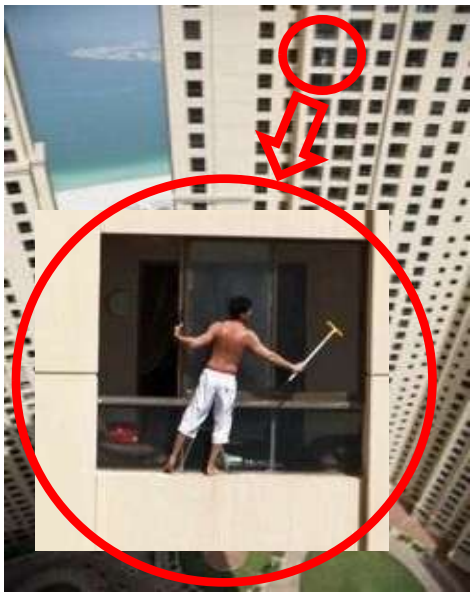
- **Largest single cause of significant incident (including within MACE)**
- **WatH Regulations 2005 require "all that is reasonably practicable"**
- **Falling and falling materials review**
- **MACE hierarchy (similar to WAHR)**
- **MACE "risk rating" system**
- **Follow the MACE standards:**
  - **Work at Height Guidelines & Standards**
  - **Riser Standards & Guidance**
  - **Tool Tethering Policy**

Working at Height Standard
CN-HSW-SD-0007 v1.1

53

MACE WORK AT HEIGHT STANDARD

- Applies to ALL work at height
- Does NOT specify “min height”
- Does NOT specify “time”
- Requires task-specific RAMS



54

MACE RISK RATINGS

Best Practice

- First consideration
- Preferred Option

Caution

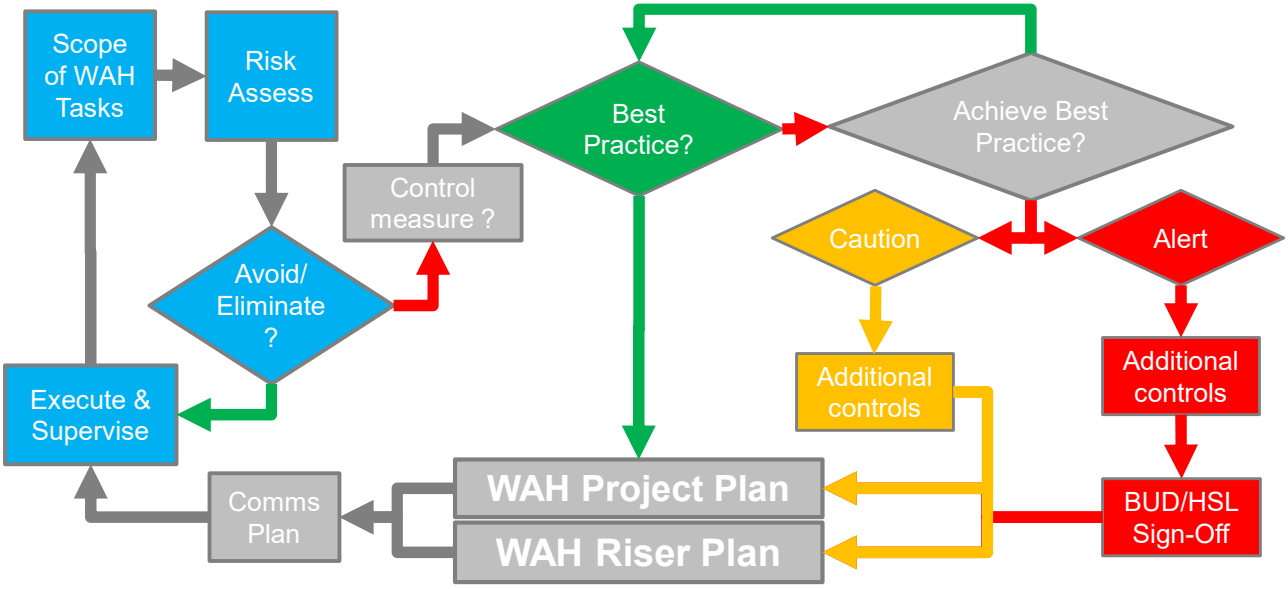
- Additional Management controls
- In task RAMS
- Justification required (WAH plan)

Alert

- Exceptional Use ONLY
- Justification required
- Approval required (BUD/HSL)

55

WORK AT HEIGHT PLANNING PROCESS



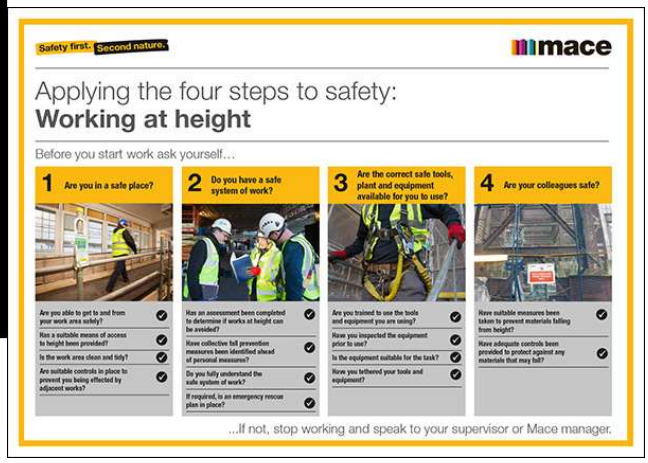
56

ROLES AND RESPONSIBILITIES

Roles	Responsibilities
Designers	• Design work to prevent or minimise WAH activities. • Review the risk ratings of this document and design work in-line with best practice rating, wherever possible.
Mace project team	• Develop project WAH and Riser Strategy and delivery plan. • Plan, organise and coordinate WAH activities and work relating to risers. • Review and sign off on Safe System of Work (SSOW), including risk assessment and method statement (RAMS). • Review work and report on any issues or opportunities for improvement.
Supply chain	• Develop and work to approved SSOW. • Provide adequate resources. • Supervise and report on any issues or opportunities for improvement.
WAH coordinator	• Co-ordinate the development of the WAH plan with the Mace Project team. • Confirm compliance with the WAH plan and requirements of this standard. • Review the WAH plan and arrange for appropriate sign off. • Additional responsibilities are outlined in the Mace safety coordinators.
Scaffold coordinator	• See Mace approved safety coordinators
Riser coordinator	• Co-ordinate the development of the Riser Strategy and Delivery plan with the Mace project team. • Confirm compliance with the Riser standard and requirements of this standard. • Lead the Riser coordination meetings. • Review the Riser Strategy and arrange for appropriate sign off. • Additional responsibilities are outlined in the Mace safety coordinators.

57

MACE FOUR STEPS...



58

FOUR STEPS AT HEIGHT

Safe Workplace?
- Access & egress
- Clean & tidy
- Plans communicated & understood

Safe Systems?
- Avoid > Prevent > Mitigate
- Collective v Personal - Passive v Active – Perm v Temp
- Emergency/ Rescue plan needed & sorted

Safe Equipment?
- Suitable for task
- Competent users
- Inspected & fit for use

Safe Behaviours?
- Prevent materials falling (contain/ tether)
- Protect from falling materials (overhead/ exclusion)
- Consider others above & below

59

MACE WORKING AT HEIGHT HIERARCHY

Avoid WaH — If persons do not have to work at height, DON'T. Your first considerations should be design, pre-fabrication, working from the ground.

Minimise WaH — If working at height cannot be totally avoided, take steps to minimise its need and level of risk.

Collectively Prevent Falls — Select suitable work platforms that prevent all in the area from falling, e.g. suitable edge protection, MEWPs and void covers.

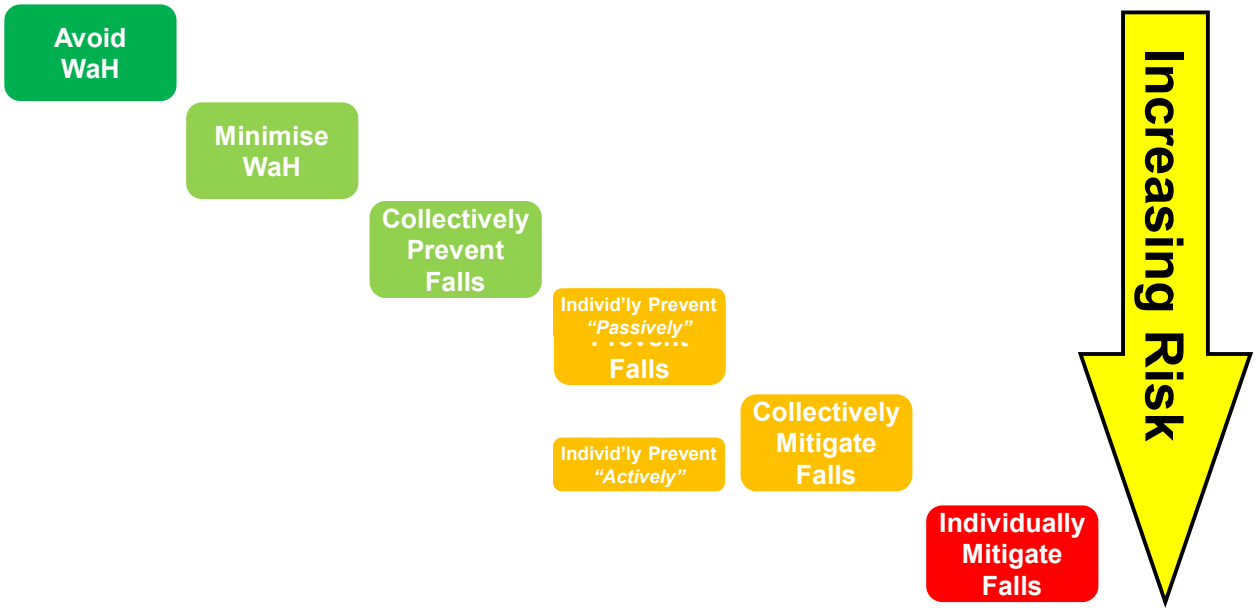
Individually Prevent Falls — Select individual fall prevention/ restraint systems, e.g. PFPE, podiums, Pecos.

Collectively Mitigate Falls — Minimise the height of the fall, e.g. safety nets.

Individually Mitigate Falls — Use PFPE that minimises the fall potential fall height.

60

DETAILS CAN AFFECT RISK HIERARCHY



61

WORK AT HEIGHT PLAN... MINIMUM REQUIREMENTS

Tender Stage	• A high level review should be undertaken. • Involve specialists (steel/MEP/decking). Note: Include all relevant trades e.g. substructure, RC frame, cladding etc. • Allocate correct costs/package splits. • Carry out a design review incorporating CDM/PD obligations are met (use Design Review checklist for this task).
Pre-construction phase	• Produce WAH Plan, at the same time as the project 'Riser Strategy and Delivery Plan'.
Construction phase	• Hold a workshop to communicate the WAH standard and plan to [illegible] employees and contractors. (Reference the WAH Training [illegible] • Review every four (4) weeks as part of the Proj[illegible] • [illegible] working drawings and have a 'refresh' s[illegible] • The H&S Manager and [illegible] practical implementation of the WAH Plan at regular [illegible] toolbox.

All members of delivery team … DABs and NABs

62

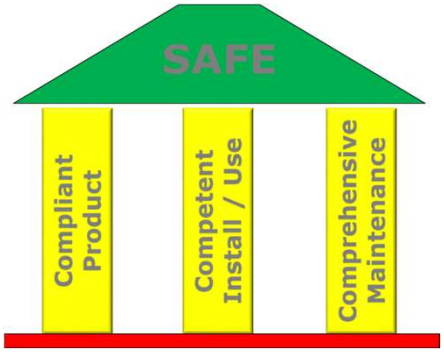
REMOVE/REDUCE HAZARD AT DESIGN

- **Build at ground-level & hoist into place**
- **Consider Temporary EP vs cladding fixings**
- **Consider changing floor levels (risers, lifts)**
- **Plan lighting; perm / temp / emergency (incl shafts & risers)**
- **Fabricate steel for pre-fitting of EP**
- **Cast-in fittings to minimise site drilling**
- **Sequence tasks to reduce temporary works**
- **Specify workable parapet heights**
- **Use double-height edge trim on metal decking**

63

SYSTEM DETAILS

- Edge Protection (6 levels)
- Ground & Void Protection – fans/ decks/ tunnels/ covers
- Access Methods – scaffolds to ladders (11 methods)
- PFPE – harness-based (3 methods)
- Risers – Horizontal (4 types)
- Risers – Vertical (2 types)
- Access Vertical space (1 type)



64

CCC EXAMPLES

Compliance	Standards Trade Associations (Methods) Specific Limits
Competence	Designer / Selector Installer / Inspector User
Comprehensive Maintenance	Inspection (Frequency / Scope) Servicing Demarcation/ Exclusion Zones

65

QUESTIONS?

66

TETHERING, SIGNAGE & EXCLUSION ZONES

67

MACE TETHERING

Required:-

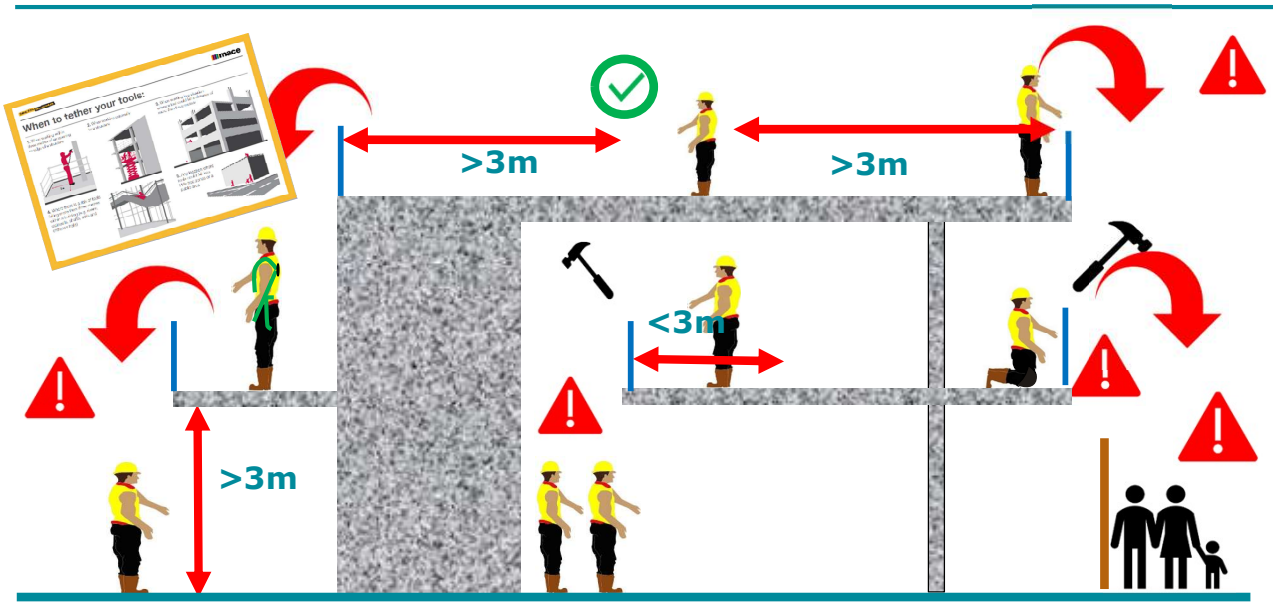
- **Within 3m of the edge**
- **When "external"**
- **Could fall > 3m**
- **Above PPE free/Public zone**

Tethers must be:-

- **Specifically for tethering**
- **Suitable for the item weight**
- **Lock at the connection points**

68

MACE TETHERING



69

TETHERING PRODUCTS

70

DROPPED OBJECTS

What is the worst?

Who is worst?

71

TETHERING AND OTHER CONTROLS

Tethers (Straps)





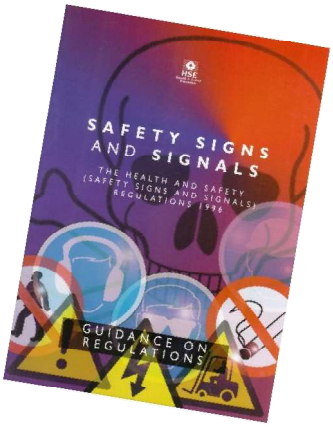
Zip-Up Pockets Tool Bags


Sterile Zone **Stay > 3m from edge !**

72

SIGNAGE

Risers, Edge Protection, Access Points, Hazards, Falling Objects, add Controls



Must be managed !

73

EXCLUSION ZONES

Hierarchically inferior… always required
"Last line of defence"… for when other controls have failed
Size?... Spotters!... Barriers?... Signage?...

74

OVERHEAD PROTECTION (SECONDARY MEASURES)

- **Public interface & risk of falling materials**
- **Required:**
  - **when risk of fatal injury**
  - **for all structural works**
- **Consider trajectory - object shape & weight**
- **RAMS must include removal/ retrieval**

Risk Assess for size of area…
… no agreed ratio yet!
(NFDC guidance 25% of height)

75

QUESTIONS?

76

TEMPORARY EP STANDARDS

77

TEMPORARY EP SCOPE

Scaffolding & Edge Protection

78

MACE- "TRIPLE LOCK PROTECTION"

3 independent controls:

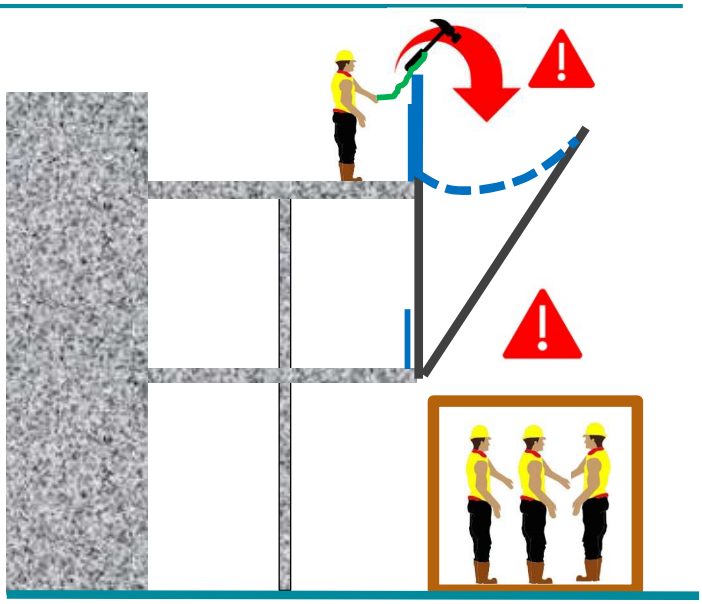
- **Required when edge >3m**
- **Excludes scaffolds**

Example:

1. **Tether**
2. **Containment**
3. **Catch Fan**

Example:

1. **Tether**
2. **Containment**
3. **Tunnel**



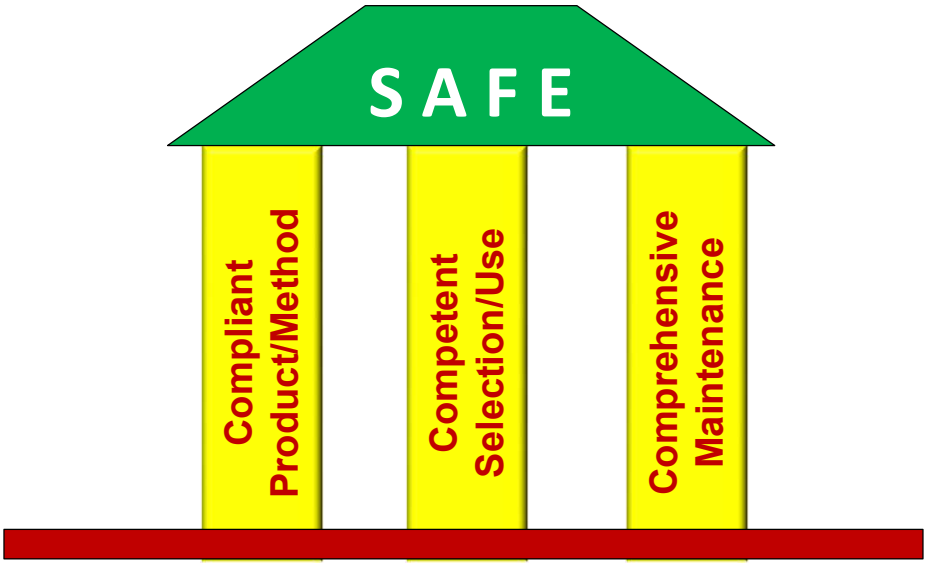
79

EARLY ENGAGEMENT & DETAILING CONSIDERATIONS

- Steel frame … pre-fitted to perimeter beams ?
- RC frame … in place and fixing considered ?
- Cladding collaboration at design stage / interface ?
- Wind loading (allow for containment / debris netting) ?
- Containment … gaps ?
- Screed allowance … changing levels ?
- Vertical and Horizontal segregation …
- Sterile Zone (3m from edge) ?
- Access controls ?
- Don't compromise products (no mixing ?)
- Tethered components ? (loose fixings ?)
- Plant stop blocks ?

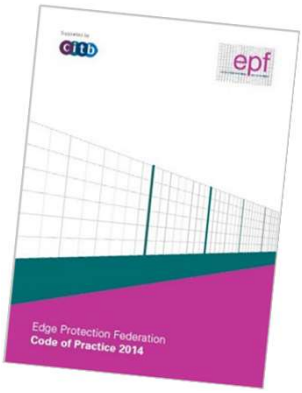
80

CCC



81

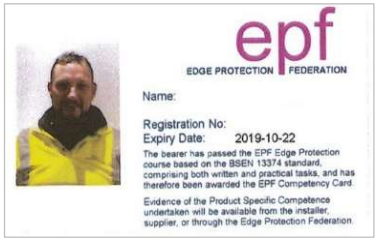
CCC- COMPLIANCE



- Regional Standard - BS EN 13374
- EPF Guidance (2 documents):
  - Code Of Practice (for BS EN 13374)
  - Containment Standard (gaps & porosities)
- Safe System Work (RAMS) (up & down)
- Manufacturer User Instructions
- Sterile Zone Permit ?
- TWC re loading

82

CCC- COMPETENCE

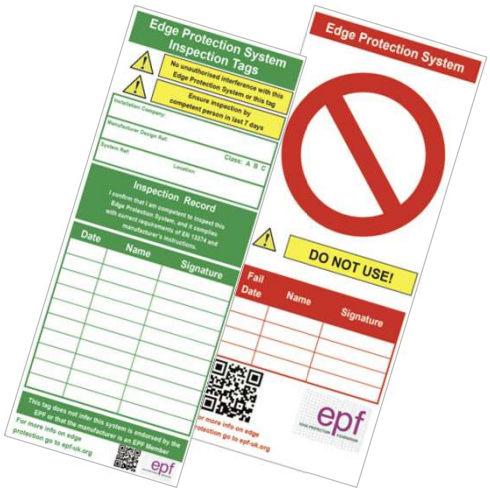


- Operative training (Generic/EPF)
- Management - EPF Code of Practice
- Tethered components
- Pre-fitted if possible
- Wind loading – for containment ?
- Maximise captive fittings
- Cladding collaboration
- Vertically alert

83

CCC-COMPREHENSIVE MAINTENANCE

- Inspection
  - Weekly
  - Following adverse weather, adjustment or impact
- Tagged
  - EP not scaffold
  - Temp Works drawing to show tag location & extent covered (Mace std)
- Minimal gaps underneath



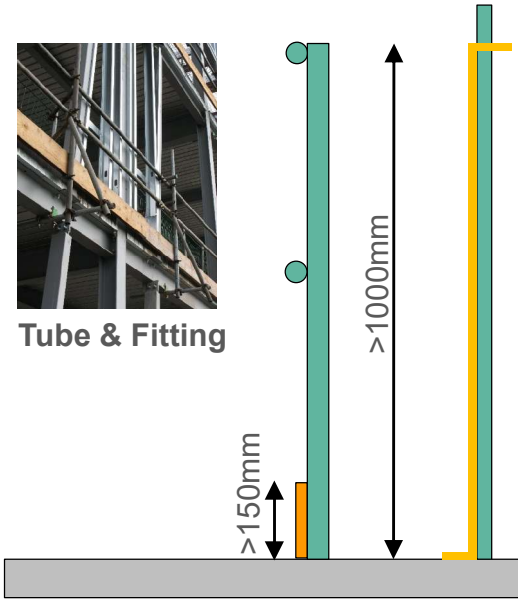
84

DESIGN REQUIREMENTS

- BS EN 13374
- Principle Guardrail
- Vertical gaps < 470mm
- Horizontal gaps < 120mm
- No unintentional removal

Mace standards:
>1500mm (otherwise **Alert**)

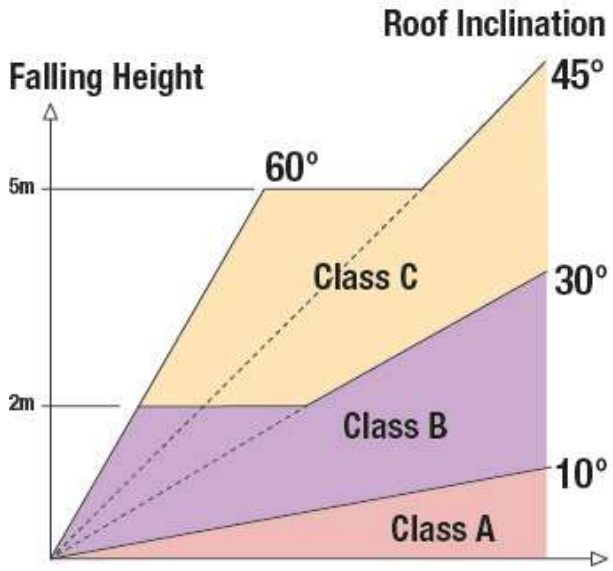
Tube & Fitting



Mesh Panel

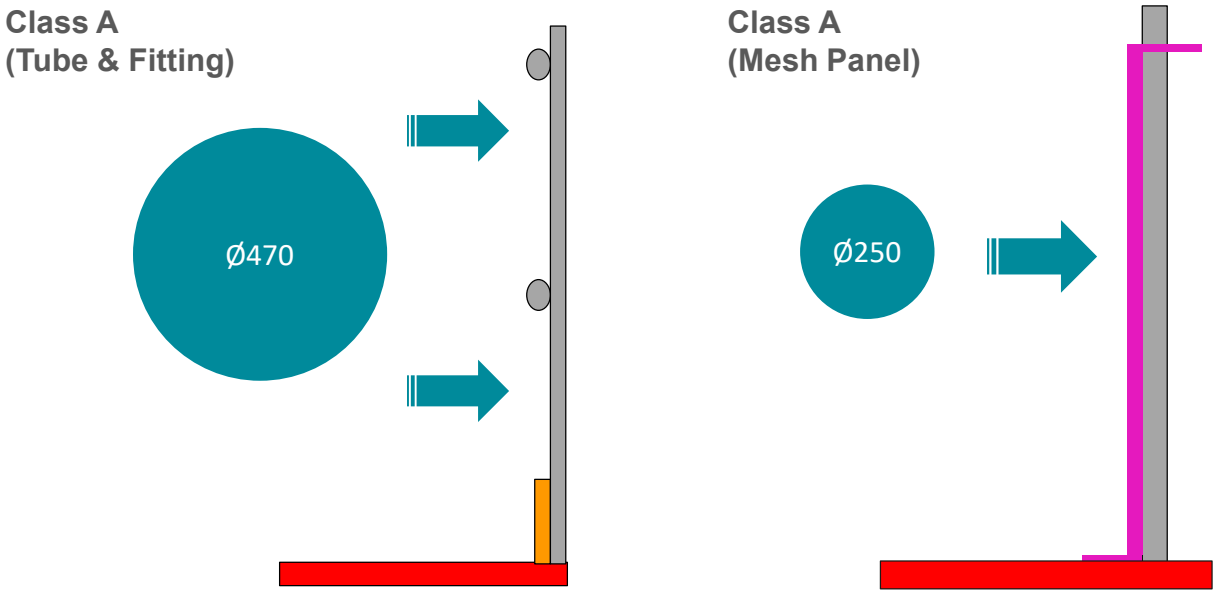
85

APPLICATION CLASSES



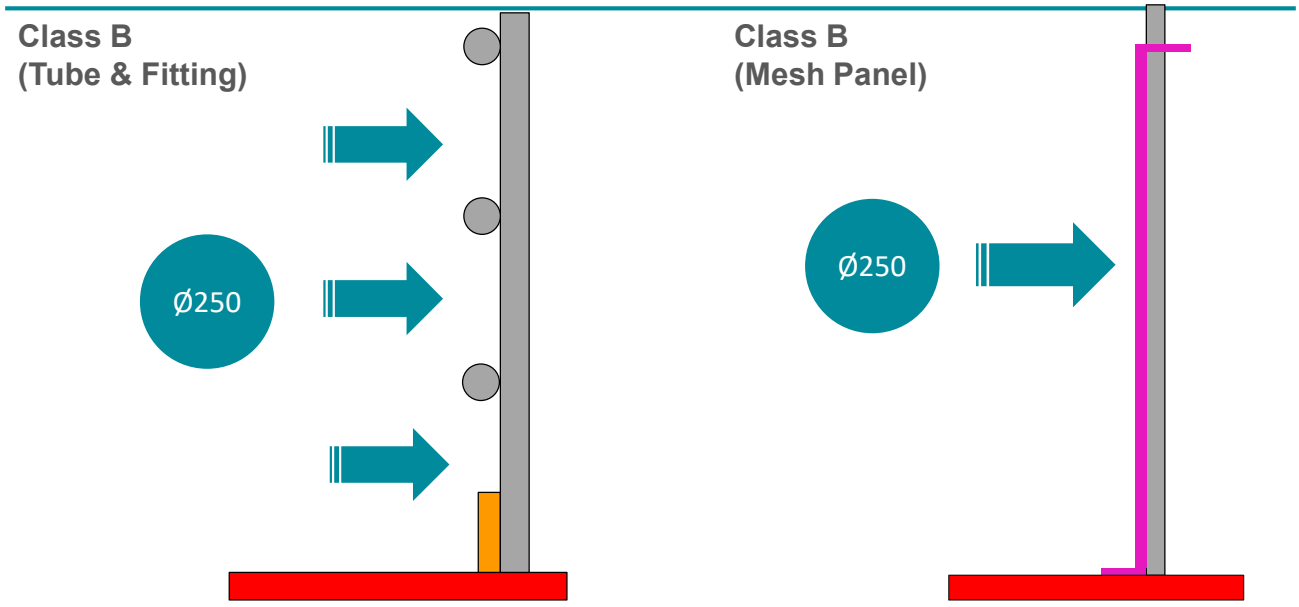
86

CONTAINMENT-CLASS A



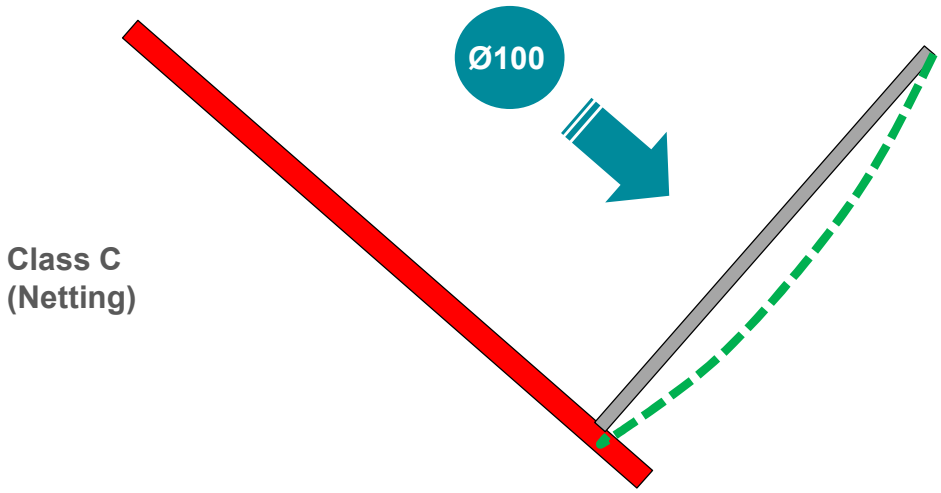
87

CONTAINMENT-CLASS B



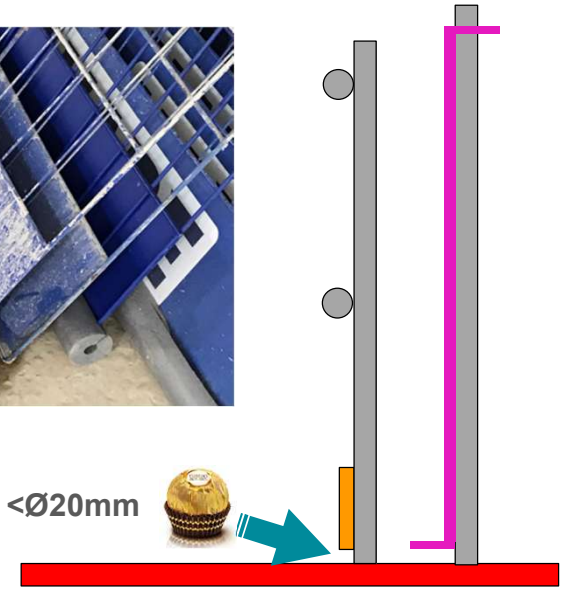
88

CONTAINMENT-CLASS C



89

GAPS AT BASE

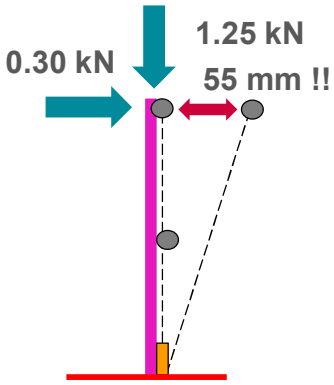


90

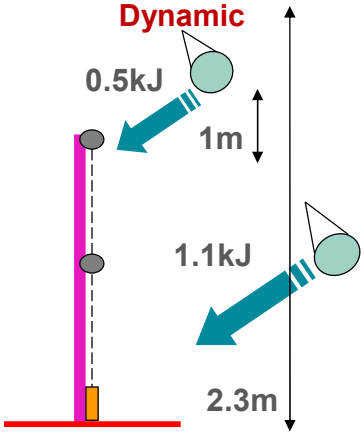
CLASS TEST PERFORMANCE

Wind Load Performance
Static (calc) & Dynamic (test)
Max Height 40m – Pressure 600N/m^2

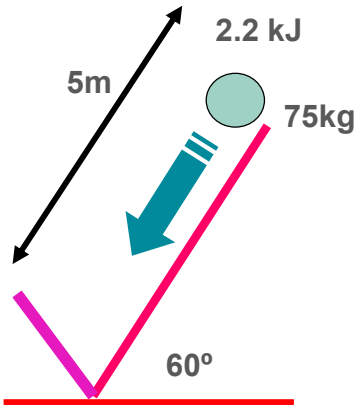
Class A
Static only



Class B
Static and Low Dynamic

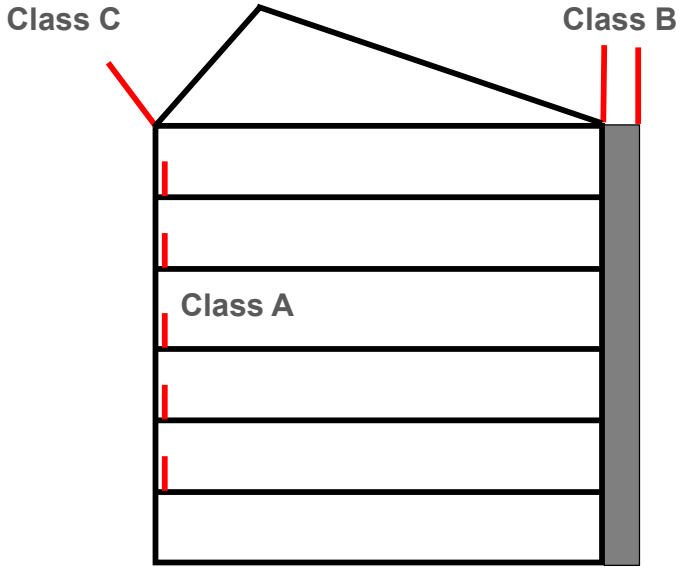


Class C
High Dynamic



91

EN 13374 - SUMMARY



All Classes:
1.0m min height

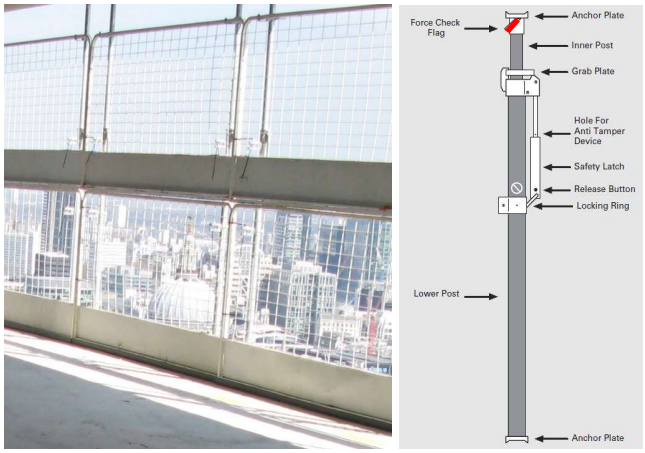
Class	Containment	
	Tube & Fitting	Mesh Panel
A	Ø 470	Ø 250
B	Ø 250	
	Netting	
C	Ø 100	

Gaps beneath < Ø20mm

92

ADDITIONAL FEATURES

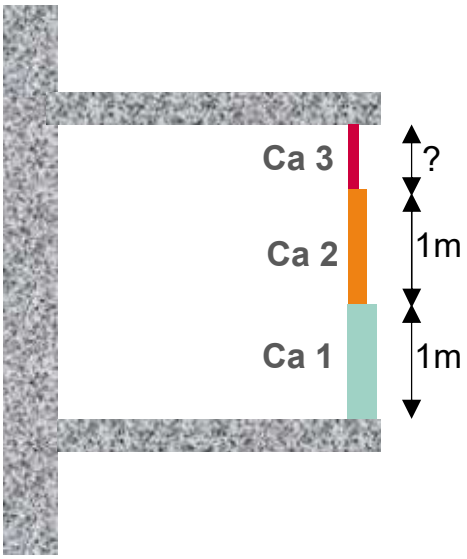
Extended or Full Height systems



Compression Posts

93

CONTAINMENT: EPF STANDARD EXAMPLE



Containment Area (Ca)	Height	Example Containment Porosity (Cp)
3	2m - Soffit	100mm
2	1m – 2m	60mm
1	Floor – 1m	5mm

~~20mm~~ → 6mm

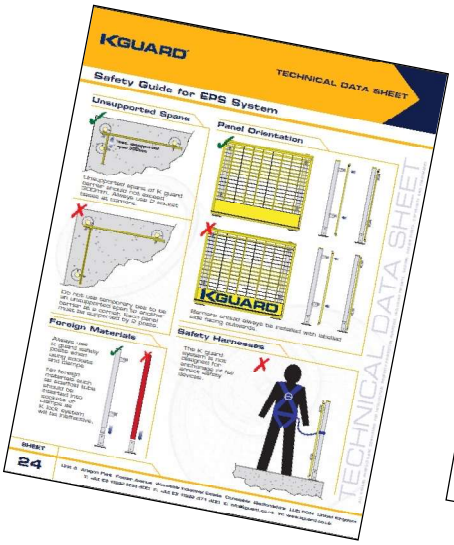
95

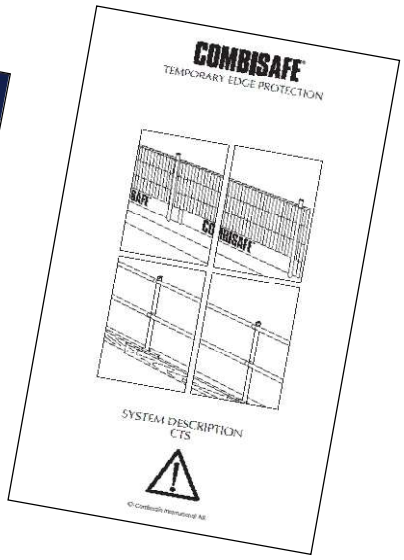
CONTAINMENT: CLIMBING SCREEN EXAMPLE

Containment Area (Ca)	Height	Example Containment Porosity (Cp)
3	2m - Soffit	6mm
2	1m – 2m	6mm
1	Floor – 1m	6mm

96

EN 13374: COMPLIANT PRODUCT





97

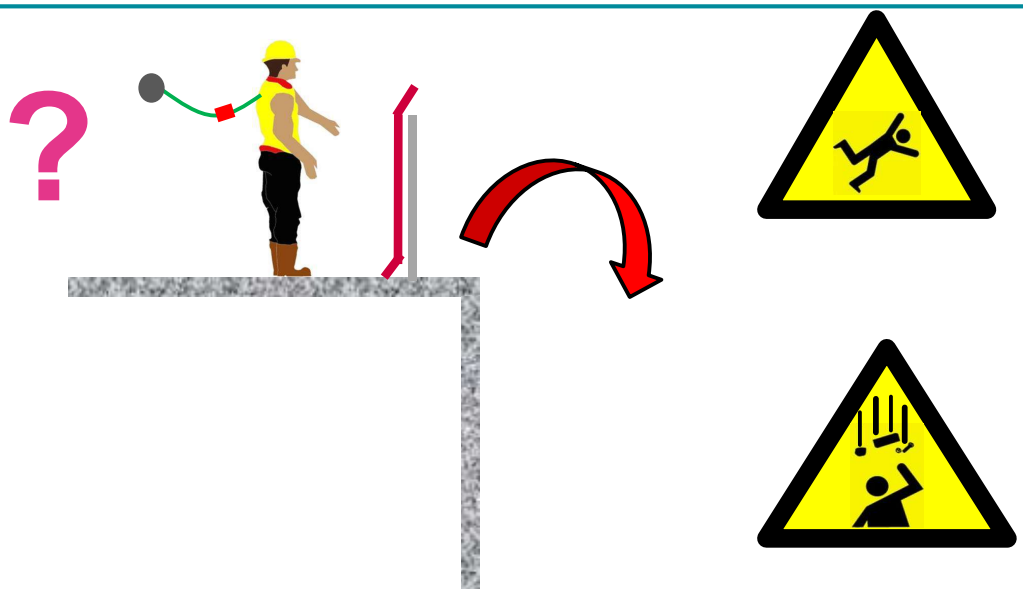
COMPETENT INSTALLATION

- Trained installers ? (EPF)
- Method Statement ? (UI)
  - Access Method ?
  - Work sequence ?
  - Erection and Dismantle ?
  - Interface with other trades ?
- Common errors .....

EDGE PROTECTION FEDERATION

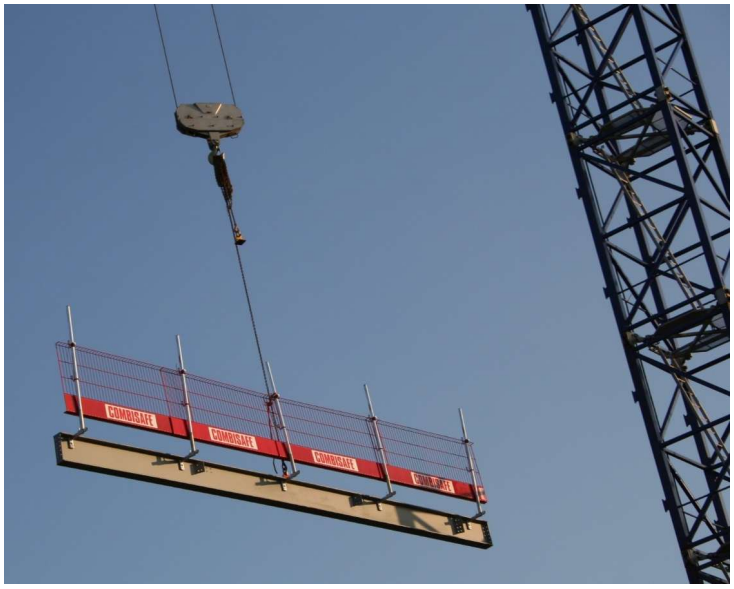
98

COMPETENT INSTALLATION



99

AVOID!



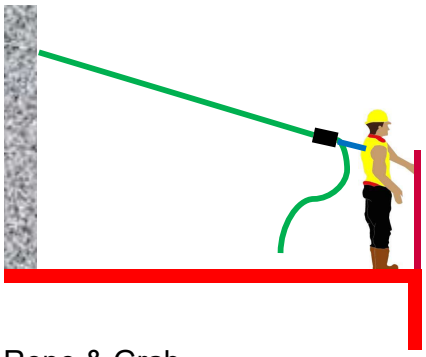
100

COLLECTIVE PREVENTION

101

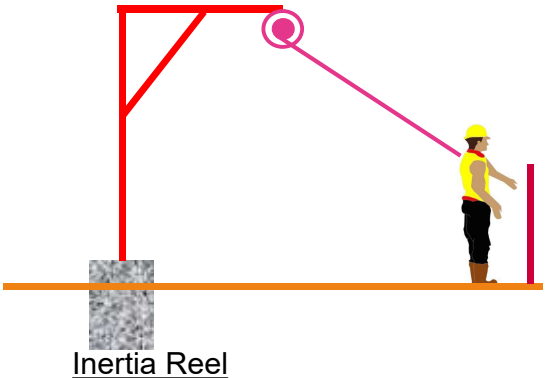
PREVENTION VS MITIGATION

Prevent	Collective	Passive	Permanent
Mitigate	Personal	Active	Temporary



Rope & Grab
- Can be adjusted to Prevent
- May require Active adjustment

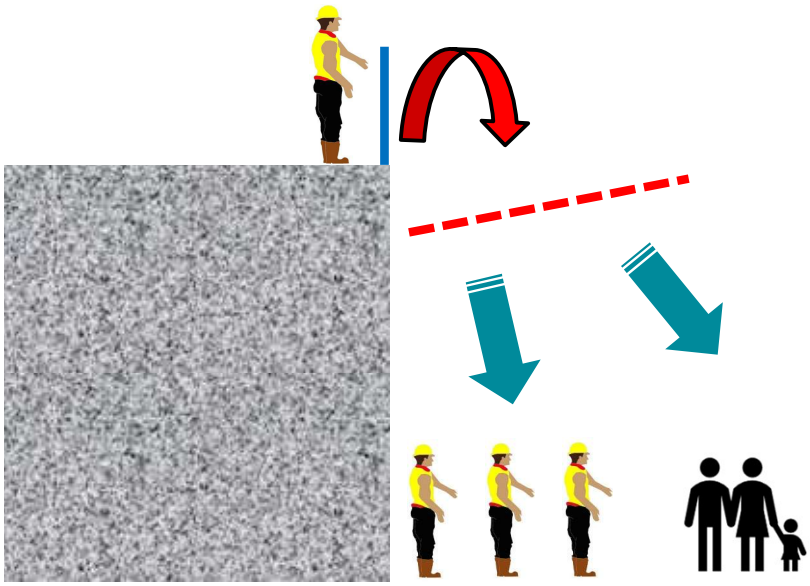
Prevent	Collective	Passive	Permanent
Mitigate	Personal	Active	Temporary



Inertia Reel
- Will not Prevent, can only Mitigate
- Adjusts Passively

102

FALLING MATERIALS AND EQUIPMENT



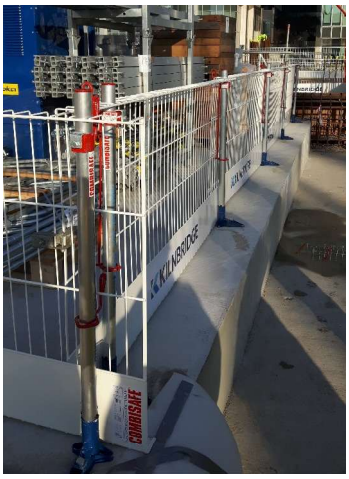
Containment?
Tethering?
Catch Fan?
Crash Deck?

103

CONCRETE FRAME

104

CONCRETE FRAME



On form work – then move on to slab.

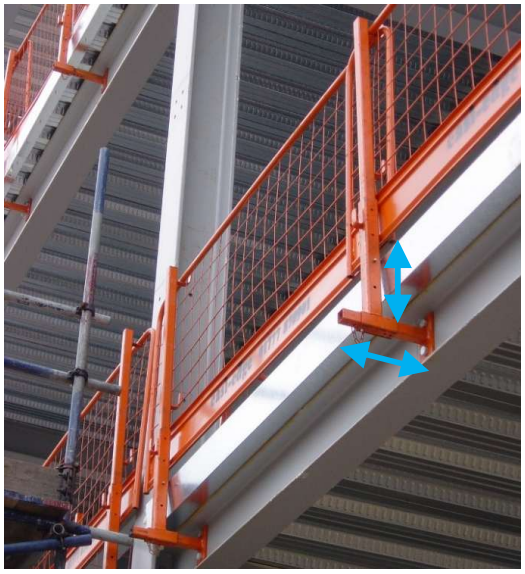
105

STEEL FRAME

106

STEEL FRAME

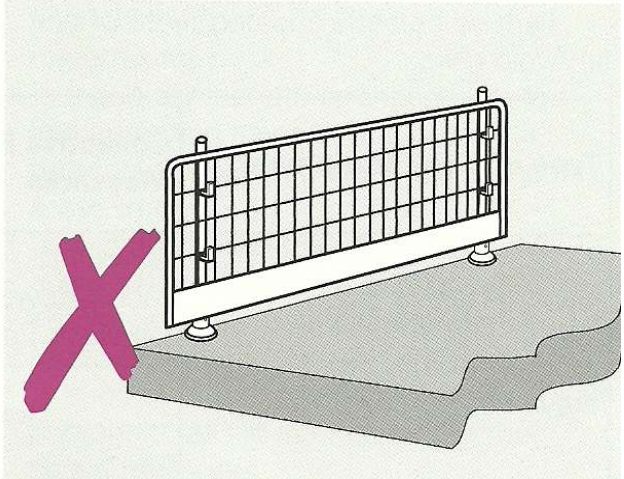
- **Bracket Adjustment**
- **Vertical & Horizontal**
- **Do it on ground – Avoid!**



107

COMMON PROBLEMS

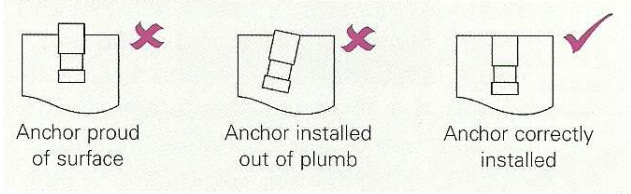
Too close to the edge



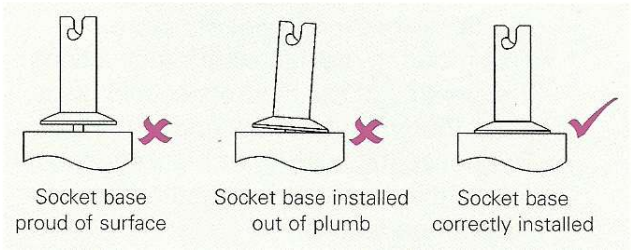
108

POOR ANCHOR SETTING

Anchor installation



Socket base installation

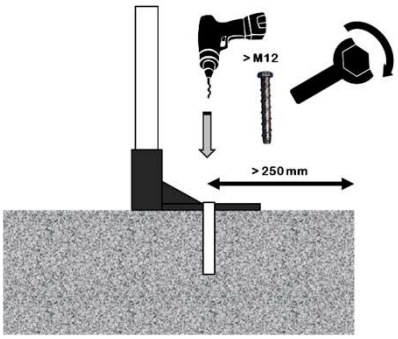


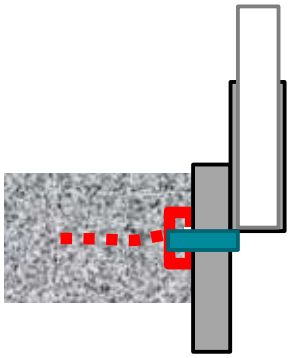
109

UNSAFE INSTALLATIONS

110

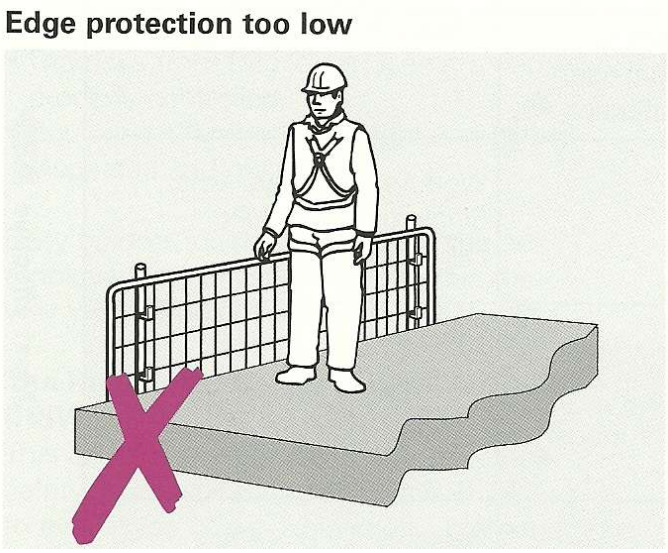
FIXING OPTIONS





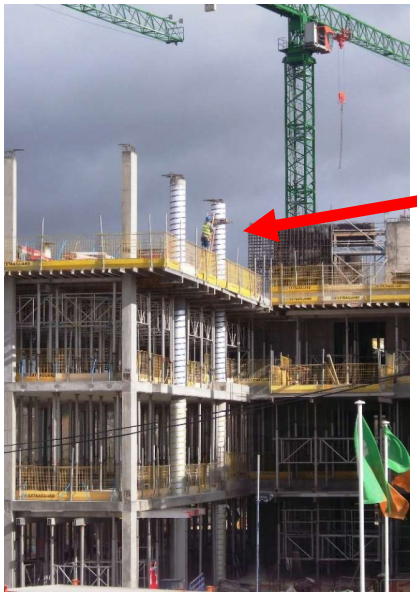
111

COMMON PROBLEMS:



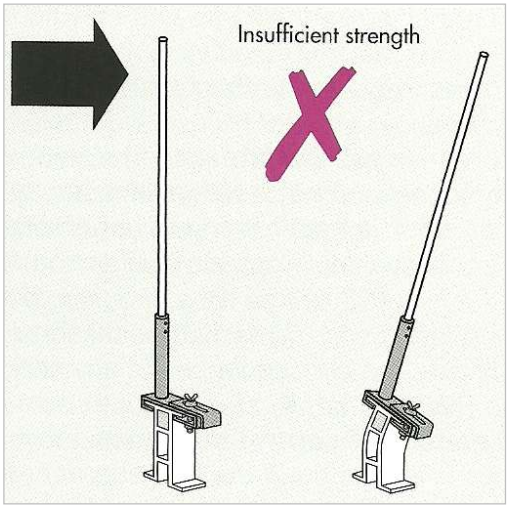
112

RELATIVE HEIGHT:



113

MOUNTING BEAM ORIENTATION



114

WRONG MOUNTING BEAM

115

WRONG MOUNTING BEAM

116

CLIMBING SCREENS

117

COMPREHENSIVE MAINTENANCE:

Handover?
Inspection Frequency?
Recording?

118

MACE INITIATIVES-SHARD

119

MACE INITIATIVES – STERILE ZONES

120

QUESTIONS?

121

TEMPORARY EP MACE LEVELS

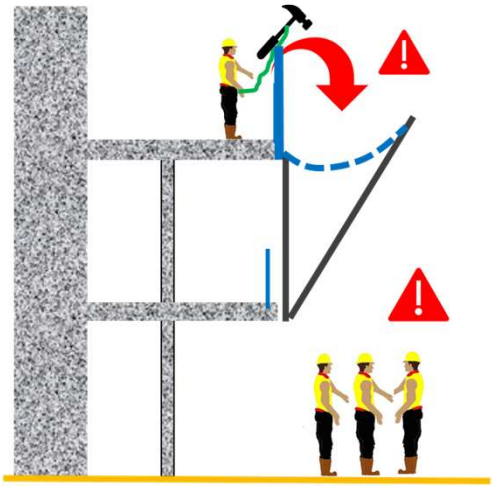
122

TRIPLE LOCK ?

Three Independent Layers .. of Protection.

Common Control Measures ?

Ask More !



123

EDGE PROTECTION- MACE LEVELS

EP Description	Panel Height	Guard Rail Height	Screen / Net Height	Risk Rating
Climbing Screen	Full	x	x	Best Practice
Full Panels & Screen	1.5m - Full	> 1.0m	Full	Best Practice
Panels with Guard Rails	> 1.5m	> 1.0m	x	Caution
Scaffolding with Panels	as per Guard Rail	> 1.5m	x	Caution
Panels Only	> 1.0m	x	x	Alert
Scaffolding Only	x	> 1.0m	as per Guard Rail	Alert

124

CLIMBING SCREEN

SAFE		
Compliance	**Competence**	**Comprehensive Maintenance**
BS5975 - Temporary Works CoP Containment - Usually 6mm for 3/4 levels Off-site fabrication & crane-in Crane or Jack to raise Install EP before raising	Design & Install - **Specialist** & TWC Lifting Plan - Appointed Person Inter-trade coordination - Site Manager Housekeeping; skirts, flaps, gaskets - Supervisor Platform SWL - Supervisor / Banksman	Inspections: - As per LOLER - Formal & Logged Weekly Keep clean and clear (especially before raising) Good Lighting

Best Practice

Risk Assessment Method Statement

125

CLIMBING SCREEN EXAMPLES

126

POST & PANEL + GUARDRAILS + FULL-HT NETTING

SAFE

Compliance	Competence	Comprehensive Maintenance
EN13374 >1.5m + full-height netting Layout as per Manufacturer's Instructions Containment Porosity Specified at Design Maximise captive / pre-fitted components Pre-fitted for steelwork / Cast-In for Concrete Guardrail vertical gaps < 470mm TWC if non-standard	System Design - Manufacturer Wind & Fixing Design - TWC Install/Adjust - **Certified** by Manufacturer / EPF Inter-trade coordination - Site Manager Tethering of tools & materials - Supervisor	Inspections: - Formal, Tagged & Logged Weekly - Following adjustment / adverse events Sterile zone & Materials tied-down Plant stop-blocks

Best Practice

Risk Assessment Method Statement

127

POST & PANEL + GUARDRAILS + FULL-HT NETTING EXAMPLES

128

POST & PANEL + GUARDRAILS MIN HT 1.5M

SAFE

Compliance	Competence	Comprehensive Maintenance
EN13374 >1.5m & Rails Layout as per Manufacturer's Instructions Containment Porosity Specified at Design Maximise captive / pre-fitted components Pre-fitted for steelwork / Cast-In for Concrete Guardrail vertical gaps < 470mm TWC if non-standard	System Design - Manufacturer Wind & Fixing Design - TWC Install/Adjust - **Certified** by Manufacturer / EPF Inter-trade coordination - Site Manager Tethering of tools & materials - Supervisor	Inspections: - Formal, Tagged & Logged Weekly - Following adjustment / adverse events Sterile zone & Materials tied-down Plant stop-blocks

Caution

Risk Assessment Method Statement

129

TUBE & FITTING TRIPLE-RAIL + PANEL MIN HT 1.5M

SAFE

Compliance	Competence	Comprehensive Maintenance
EN13374 >1.5m & Panels Layout as per Manufacturer's Instructions Containment Porosity Specified at Design Maximise captive / pre-fitted components Guardrail vertical gaps < 470mm TWC if non-standard	System Design - Manufacturer Wind & Fixing Design - TWC Install/Adjust - **CISRS** Scaffolder Inter-trade coordination - Site Manager Tethering of tools & materials - Supervisor	Inspections: - Formal, Tagged & Logged Weekly - Following adjustment / adverse events Sterile zone & Materials tied-down Plant stop-blocks

Caution

Risk Assessment Method Statement

130

MIN HT 1.5M EXAMPLES



131

POST & PANEL ONLY MIN HT 1.0M

SAFE

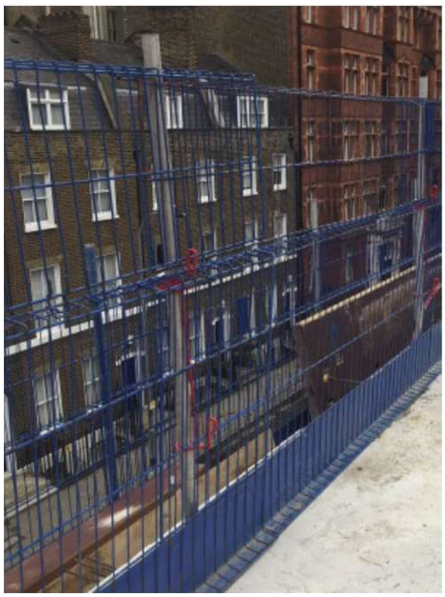
Compliance	Competence	Comprehensive Maintenance
EN13374 Layout as per Manufacturer's Instructions Containment Porosity Specified at Design Maximise captive / pre-fitted components	System Design - Manufacturer Wind & Fixing Design - TWC Install/Adjust - **Certified** by Manufacturer / EPF Inter-trade coordination - Site Manager Tethering of tools & materials - Supervisor	Inspections: - Formal, Tagged & Logged Weekly - Following adjustment / adverse events Sterile zone & Materials tied-down Plant stop-blocks

Alert

Risk Assessment Method Statement

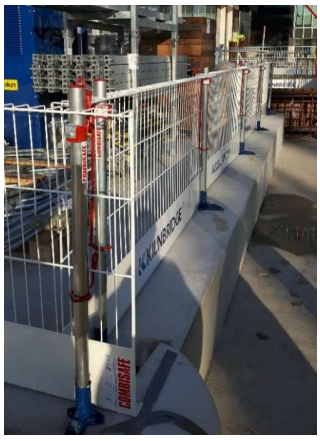
132

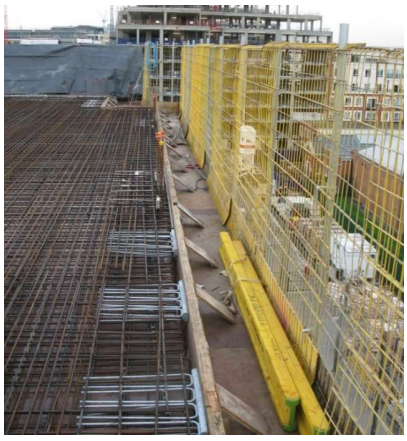
POST & PANEL ONLY MIN HT 1.0M EXAMPLES



133

POST & PANEL ONLY MIN HT 1.0M EXAMPLES





135

TUBE & FITTING ONLY MIN HT 1.0M

SAFE

Compliance	Competence	Comprehensive Maintenance
EN13374 Guardrail vertical gaps < 470mm	System Design - Manufacturer Wind & Fixing Design - TWC Install/Adjust - **CISRS** Scaffolder Inter-trade coordination - Site Manager Tethering of tools & materials - Supervisor	Inspections: - Formal, Tagged & Logged Weekly - Following adjustment / adverse events Sterile zone & Materials tied-down Plant stop-blocks

Alert

Risk Assessment Method Statement

136

TUBE & FITTING ONLY MIN HT 1.0M EXAMPLES

137

QUESTIONS?

138

ACCESS EQUIPMENT
COMMON MANAGEMENT CONTROLS

139

OVERVIEW

Access Equipment Mgt Ctrls

Access Scaffold

High Level Access MCWP

High Level Access TSAE

MEWPs & Low Level Mgt Ctrls

MEWPs

Power Tower / PAVs

Peco / Nano

Tower, Step, Ladders Mgt Ctls

Towers

Podiums

Delta Decks

Ladders & Step Ladders

Hop Ups

140

COMMON MANAGEMENT CONTROLS

Preparation

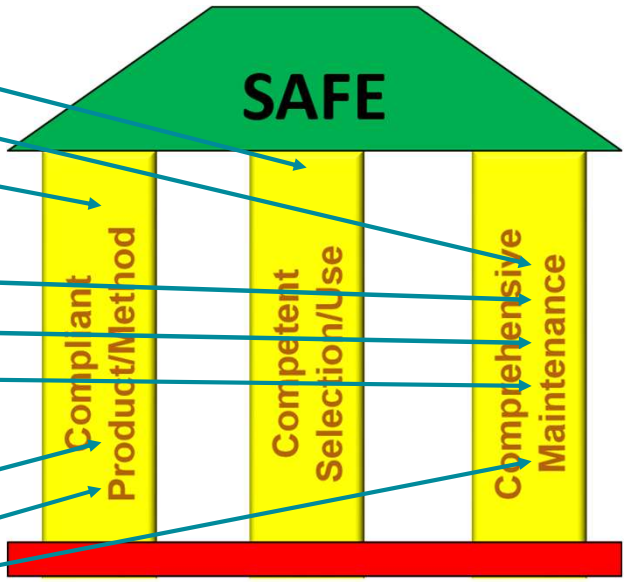
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection

- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction

- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



141

COMMON CONTROL MEASURES

Compliant

- SSOW (trade) for each application.
- Equipment/Method meet relevant local Standard.
- Safe Loads clearly signed (not exd).
- LOLER indicators.
- Exclusion Zone (above/below).

IPAF.org
PASMA
CPA CONSTRUCTION PLANT HIRE ASSOCIATION
CONSTRUCT CONCRETE STRUCTURES GROUP
BSi British Standards

142

COMMON CONTROL MEASURES

Competent

SQEP ?

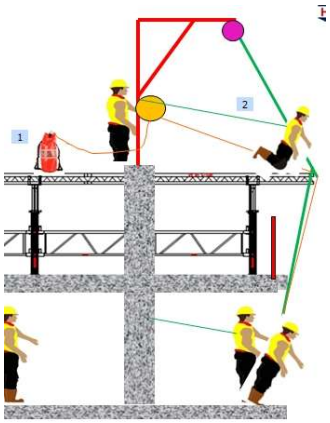
- Competent Selection (Mgt train).
- Competent Operation (cards).
- Competent Install, Inspection ?
- Competent Rescue

NASC NATIONAL ACCESS & SCAFFOLDING CONFEDERATION
irata International Industrial Rope Access Trade Association
epf EDGE PROTECTION FEDERATION
FASET Fall Arrest Safety Equipment Training
IPAF.org

143

COMMON CONTROL MEASURES

Comp Maint



- Emergency rescue plan.
- Daily checks (recorded?).
- Periodic TE (as required).
- Tagging.
- Operational limitations.
- Weather limitations.

144

145

COMMON MANAGEMENT CONTROLS

Preparation

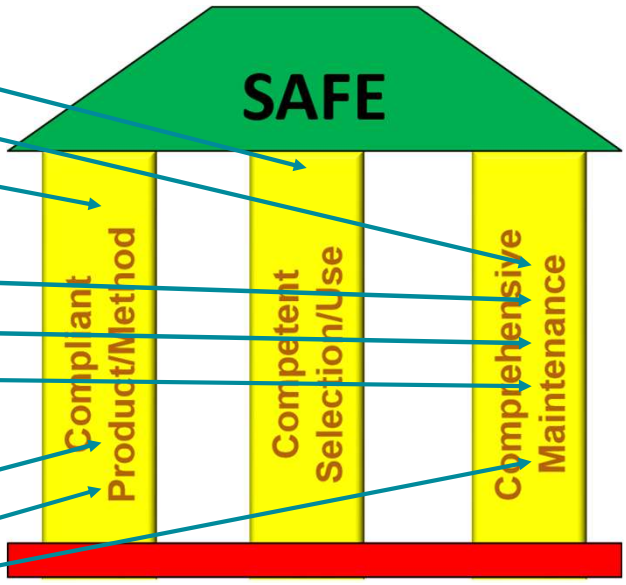
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection

- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction

- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



146

QUESTIONS?

147

ACCESS EQUIPMENT SCAFFOLDING

148

COMMON MANAGEMENT CONTROLS

Preparation

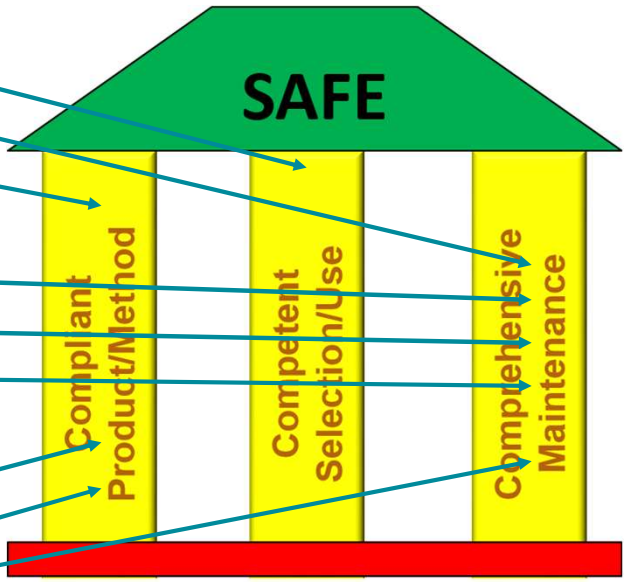
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection

- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction

- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



149

ACCESS SCAFFOLD (T&F OR SYSTEM)

Compliant

T&F – EN 12811
System – EN 12810
Components – EN 74, EN 30, etc
Load class on tags

Competent

CISRS (& System)
NASC TG20 (:yy)
NASC SG4 (:yy)
Tethering / Fans (discussed later)
AGR / PFPE / Rescue

Comp Maint

Inspection frequency / competence
Footings & ties
Exclusion zones
Clean & clear

150

ACCESS SCAFFOLD STANDARDS

- BS EN 12810 – Façade Scaffolds – Prefabricated Components:
  1. Product specification
  2. Methods of structural design

- BS EN 12811 – Temporary Works Equipment:
  1. Performance & general design
  2. Materials
  3. Load testing
  4. Protection fans for scaffolds

151

ACCESS SCAFFOLD
NASC PUBLISHED GUIDANCE

Health & Safety

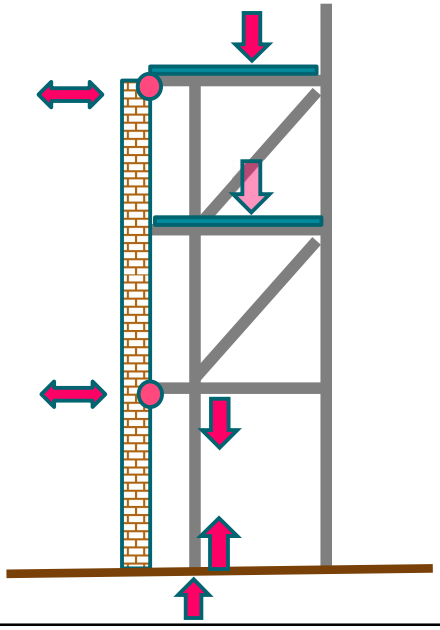
- Guide to Appointing a Scaffolding Contractor (Management Guide)
- SG01:14 Control of Substance Hazardous to Health in Scaffolding
- SG02:22 Asbestos Licences & Ancillary Work Involving Scaffolding Contractor
- SG03:21 Asbestos Awareness for the Scaffolding Contractor
- SG04:22 Preventing Falls in Scaffolding Operations
- SG05:18 Overhead Power Sources and Earthing of Scaffold Structures
- SG06:22 Management of manual handling in the scaffolding industry
- SG07:19 Risk Assessments & Method Statements RAMS

Technical

- TG01:22 Temporary Edge Protection
- TG03:25 Rubbish Chutes
- TG04:25 Anchorage Systems for Scaffolding
- TG05:24 Timber scaffold boards – BS 2482:2009
- TG06:22 Care and Maintenance of Scaffold Boards
- TG07:21 Scaffold Board Nailplates
- TG08:21 Fire Damage
- TG09:18 Design & Constr'n of Temp Roofs & Buildings
- TG10:21 Fire Retardant Treatments Timber Boards & Battens
- TG11:20 Stress Corrosion Cracks High Tensile & Alloy Steels
- TG12:22 Tying Down of Scaffold Boards
- TG13:23 Non-Standard Boarded Platforms
- TG14:20 Supplementary Couplers and Check Couplers
- TG16:21 Anchoring to the Ground
- TG17:22 Identification of EN74 – 1 Couplers
- TG20:21 Good Practice for Tube & Fitting Scaffolding
- TG21:20 A Guide to Commissioning Scaffold Design
- TG23:22 Prefabricated Beams
- TG25:21 Scaffold Tube Storage Racks
- TG26:22 Galvanic Corrosion Alumin'm Tubes & Prefab Beams
- TG27:25 Cladding of Scaffolding - Digital Download

152

COMPLIANT
GENERAL DESIGN



Load Class

Bracing

Ties

Leg Load

Bearing ?

Butted boards
Clipped
< 225 gaps
Tethered
RAMS (up/down)
Handover
Clean/Clear

153

COMPLIANT
STANDARDISED DESIGN

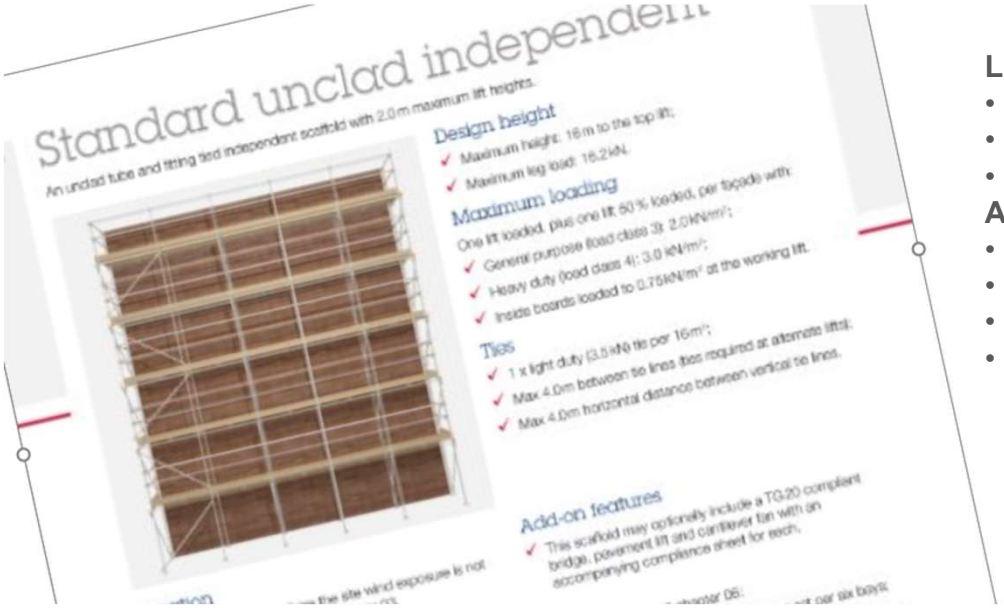
When should a Scaffold be Designed?

NASC TG20:~~13~~ 21

ALL should be designed...
A Compliance Sheet is evidence of design

154

COMPLIANT
COMPLIANCE SHEET



Lists maximum:
- **Height**
- **Loading**
- **Tie Spacing**

And:
- **Location**
- **Other Criteria**
- **Additions**
- **Etc....**

155

COMPLIANT
DESIGN LOAD CLASSES

Four main load classes :-

- **Class 1** **0.75 kN/m²** **Very Light Duty (or 'inspection')**
- **Class 2** **1.5 kN/m²** **Light Duty**
- **Class 3** **2.0 kN/m²** **General Purpose**
- **Class 4** **3.0 kN/m²** **Heavy Duty**

All should take point load of 1.5kN

© Scafftag

156

COMPLIANT
OTHER DESIGN DETAILS

- **Width**
  - **Number of boards (+ inside boards)**
  - **No minimum in Regulations (usually 600mm)**
- **Max Bay length**
  - **Depends on loading and width …**
- **Bracing**
  - **Usually every other bay… detail options**
- **Ties**
  - **Usually every other bay**
  - **NOTE Duty of ties**

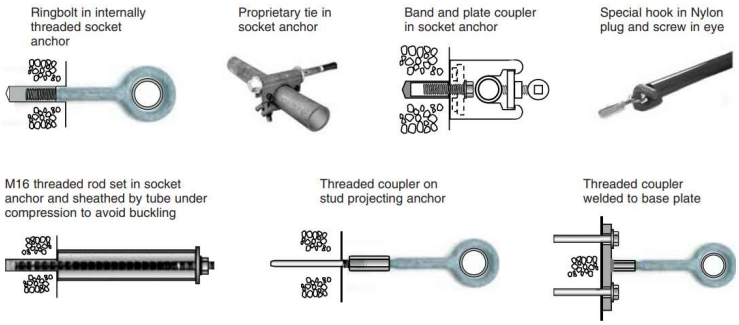
157

COMPLIANT SCAFFOLD TIES

Three classes of tie (working load pure tension)

- **Light duty 3.5kN**
- **Standard duty 6.1kN**
- **Heavy duty 12.2kN**

Examples of ties



158

COMPLIANT SCAFFOLDING TYPES

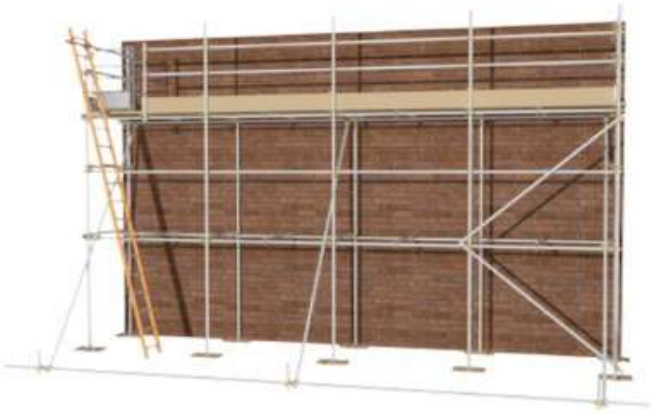
- Tied Independent Scaffolding

NASC

159

COMPLIANT SCAFFOLDING TYPES

- Free-standing Independent Scaffolding



160

COMPLIANT SCAFFOLDING TYPES

- Bridging with Beams

161

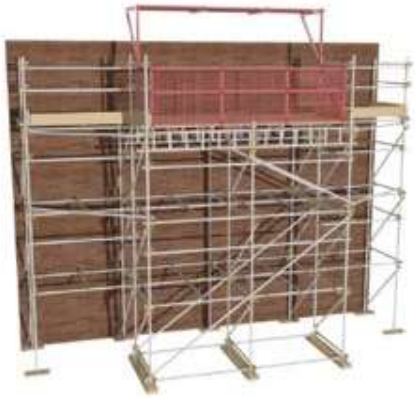
COMPLIANT
LIFT LOADING & HEIGHTS

Lifts to 3m !!

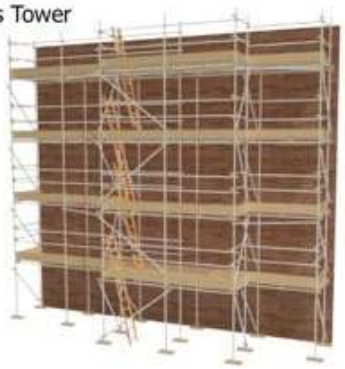
162

COMPLIANT
SCAFFOLDING TYPES

- Loading Bay

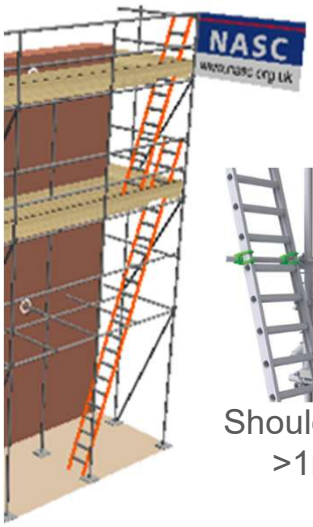


- Ladder Access Tower



163

COMPLIANT ACCESS & EGRESS

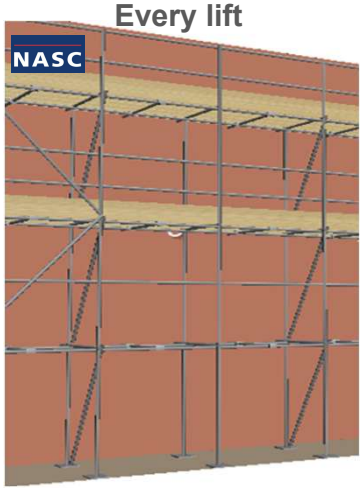


Should extend >1m above platform

164

COMPLIANT LEDGER BRACES

Every other bay & Every lift



- or -

Structural Transoms (e.g. "Readylock") Max 30m high

165

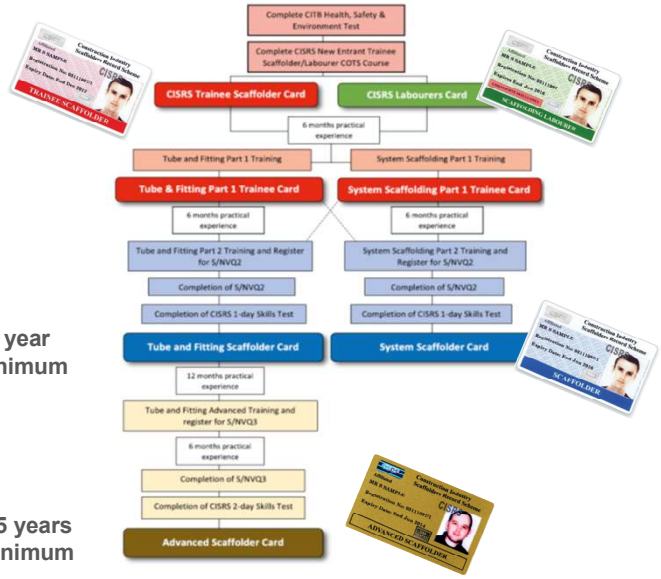
COMPETENT
UNACCEPTABLE TRADITIONS

166

COMPETENT
PLANNING ERECTION & STRIKING

167

COMPETENT CISRS SCHEME



Note NASC Safety Guidance.

- **Working From Vehicles**
- **Manual Handling**
- **Preventing Falls**

Considered as Trainee until CISRS & NVQ

Refresher training (5 years)

Labourers .. Work on the floor, or on completed scaffold

Competent… Confident… Complacent?

168

COMPETENT INSPECTOR

CISRS
CONSTRUCTION INDUSTRY SCAFFOLDERS RECORD SCHEME

Ask More…

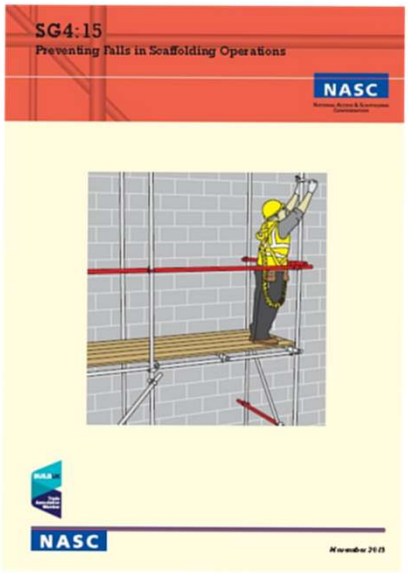
169

COMPETENT FORMAL GUIDANCE

~~SG4:15~~ SG4:22

Preventing Falls in Scaffolding Operations

NASC



170

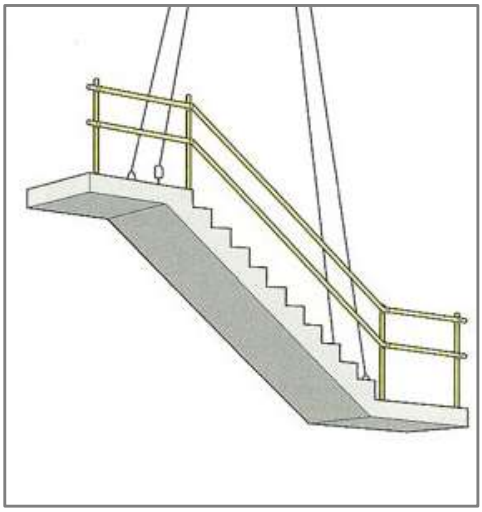
COMPETENT GUIDANCE STRUCTURE

SG4:15 Preventing Falls in Scaffolding Operations

- **Section 1** Planning for Work at Height
- **Section 2** Scaffolders' Safe Zone
- **Section 3** Other Applications
- **Section 4** Access and Egress
- **Section 5** PFPE
- **Section 6** Rescue

171

COMPETENT
AVOID

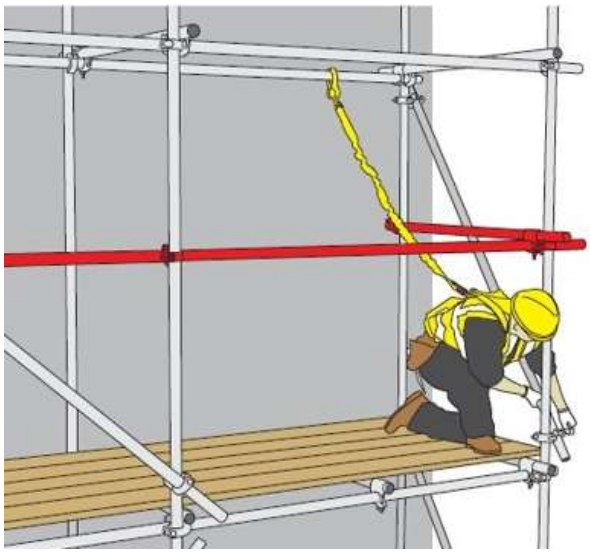


172

COMPETENT
COLLECTIVE PREVENTION (SAFE ZONE)

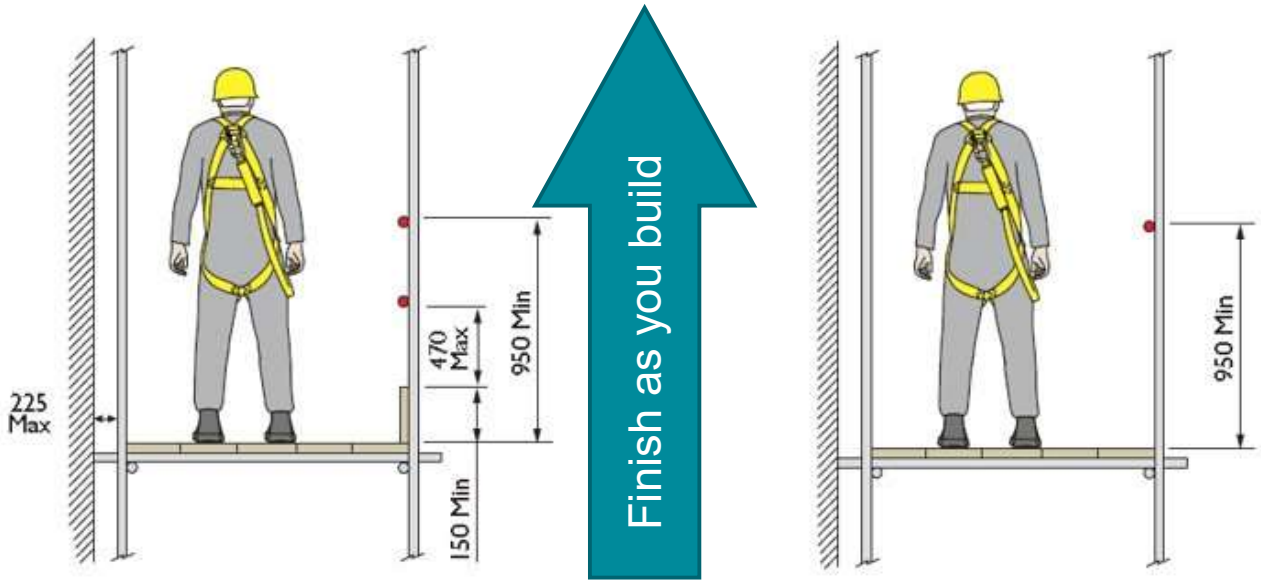
173

COMPETENT
MITIGATE (PFPE)



174

COMPETENT
SCAFFOLDER'S SAFE ZONE



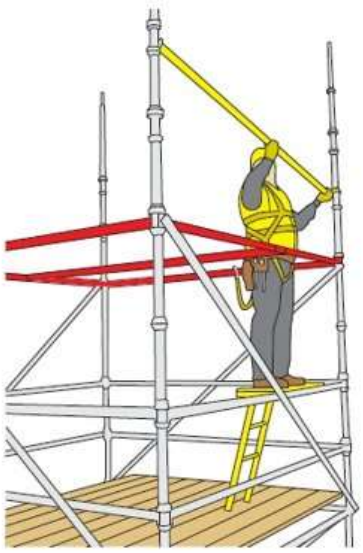
175

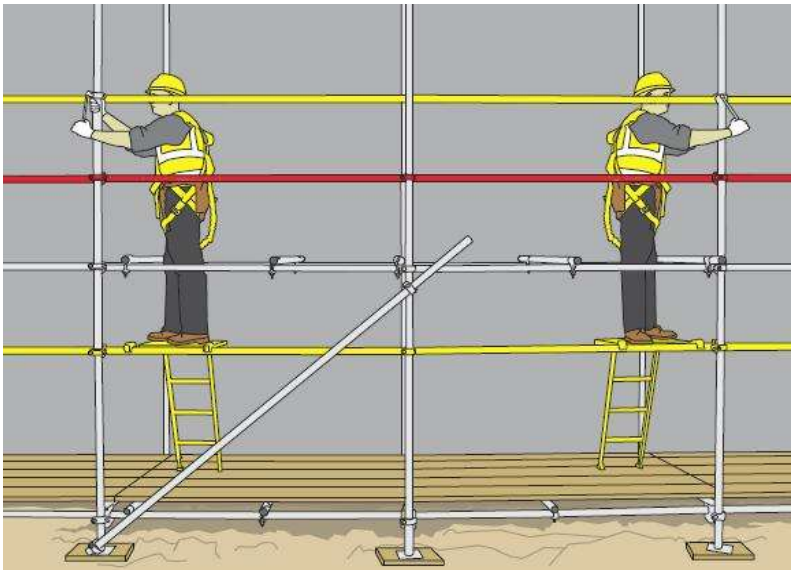
COMPETENT AGR PRINCIPLE

Advanced
Guard
Rail

176

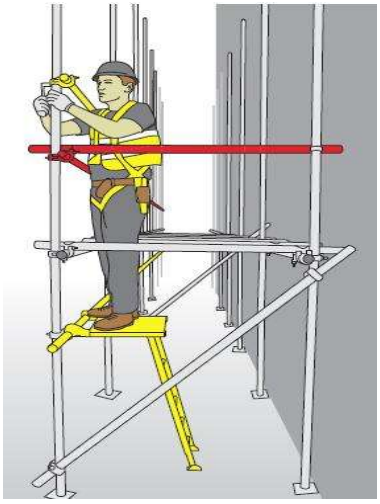
COMPETENT AGR PROCESS

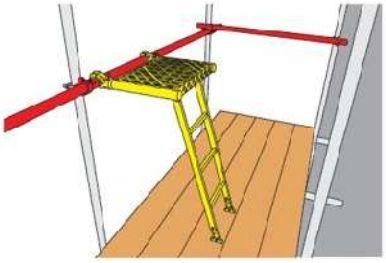




177

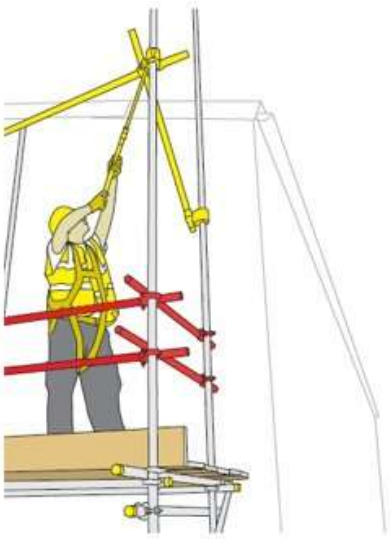
COMPETENT
"SCAFF STEP"

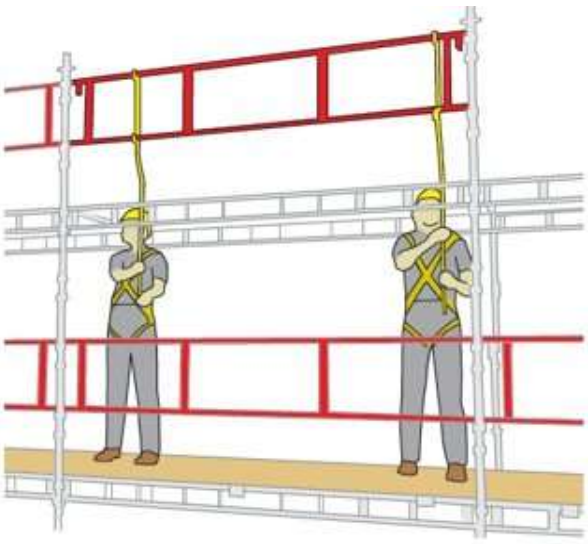




178

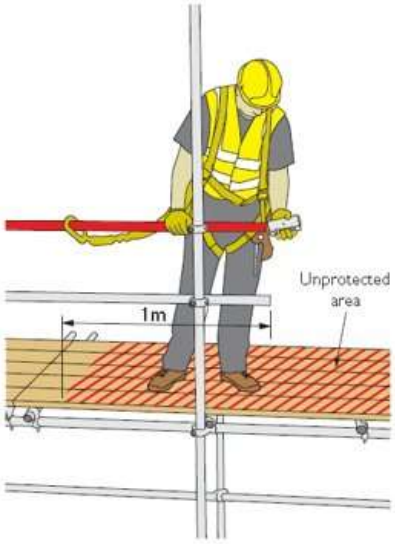
COMPETENT
AGR ALTERNATIVE OPTIONS





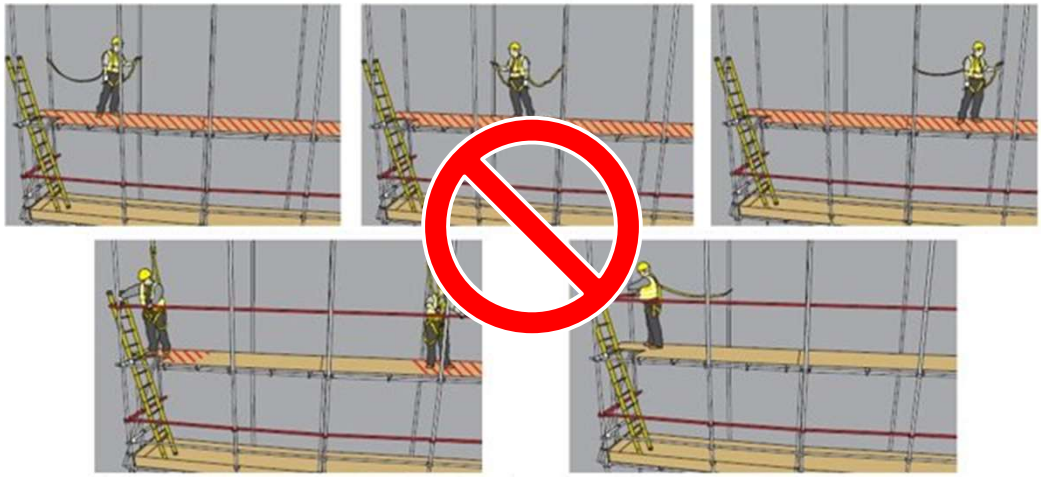
179

COMPETENT
AGR HORIZONTALLY



180

COMPETENT
PASSIVE NOT ACTIVE

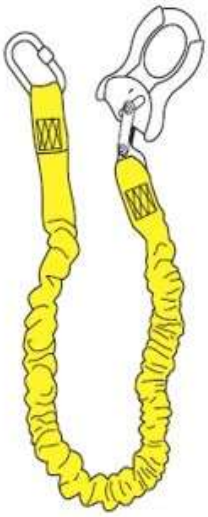


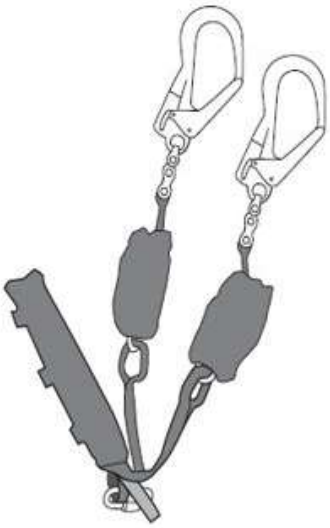
"Protected Traverse"
Too ACTIVE to be reliable

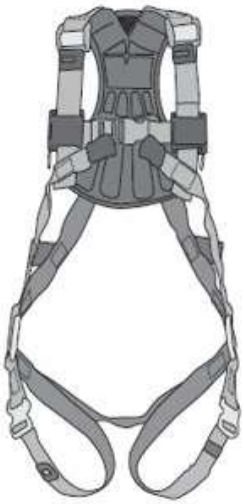
181

COMPETENT SCAFFOLDER'S PFPE

Basic "Construction" kit, with added features…







182

COMPETENT POOR ANCHOR SELECTION

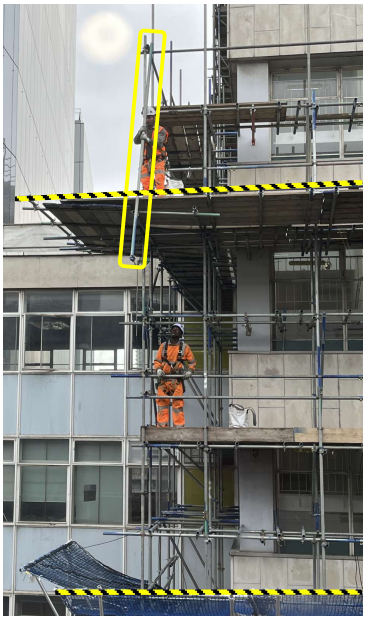
183

COMPETENT TETHERING

Can everything be tethered?

Elimin8
(from GKR)

Tethering Tubes?
Especially for fans…



184

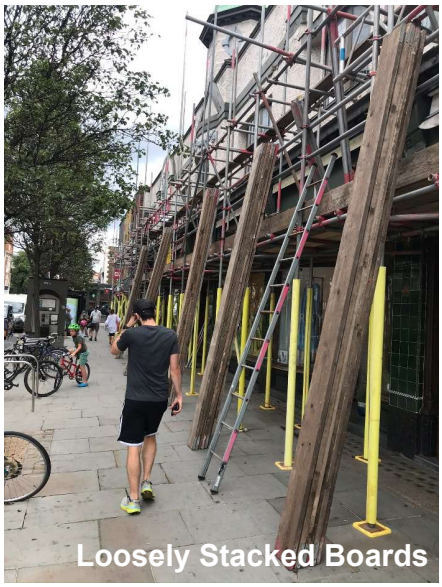
COMPETENT OPERATIONS

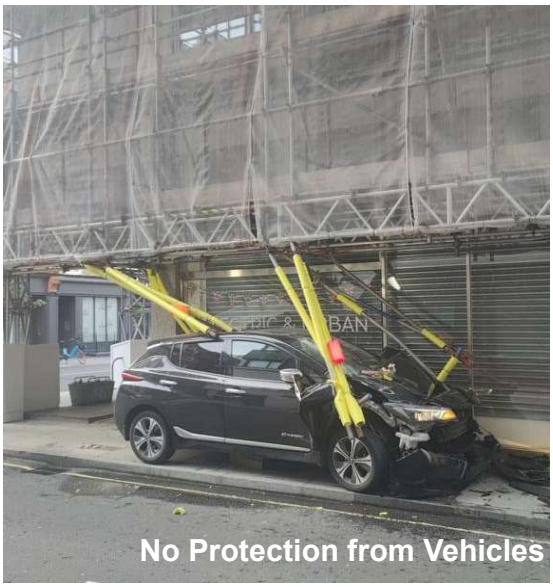
Safe Storage

Vulnerable Sheeting

185

COMPETENT FAILURES


Loosely Stacked Boards


No Protection from Vehicles

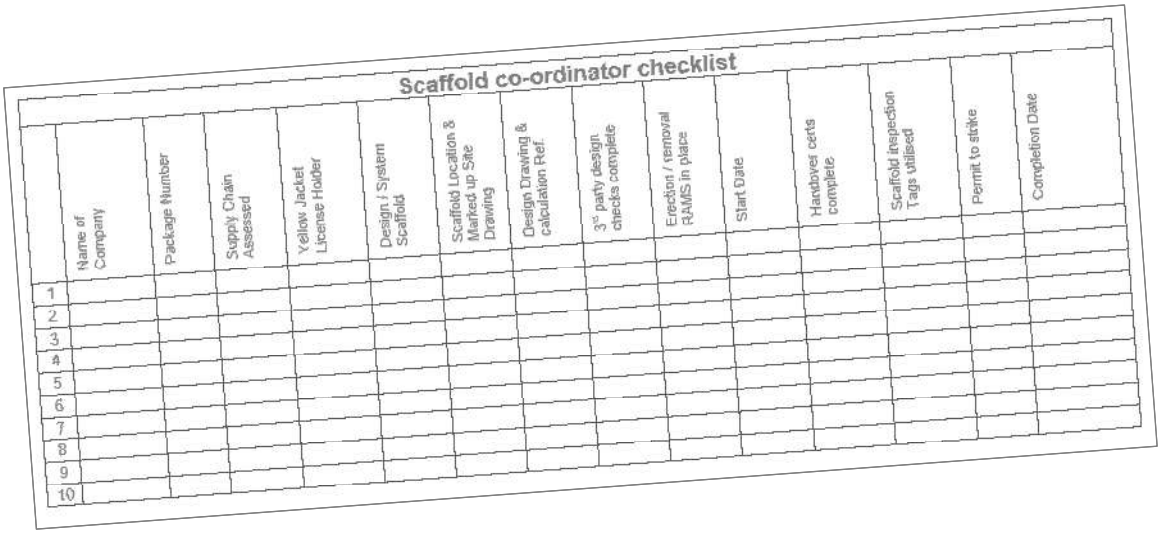
186

COMPREHENSIVE MAINTENANCE INSPECTION & TAGGING

Handover ?
Inspection Frequency ?
Recording ?
Ties ?

187

COMPREHENSIVE MAINTENANCE MACE CHECKLIST



Scaffold co-ordinator checklist

	Name of Company	Package Number	Supply Chain Assessed	Yellow Jacket License Holder	Design / System Scaffold	Scaffold Location & Marked up Site Drawing	Design Drawing & calculation Ref.	3rd party design checks complete	Erection / removal RAMS in place	Start Date	Handover certs complete	Scaffold inspection Tags utilised	Permit to strike	Completion Date
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

188

QUESTIONS?

189

ACCESS EQUIPMENT

MEWP
(MOBILE ELEVATED WORK PLATFORM)

PAV
(PUSH AROUND VERTICAL)

190

MEWP
EXAMPLES

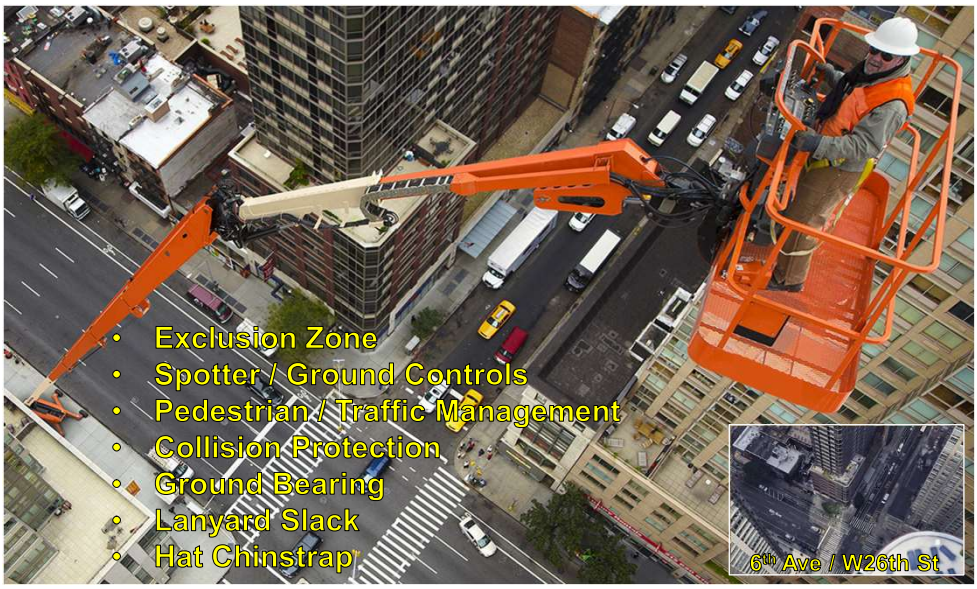







191

MEWP OBSERVATIONS



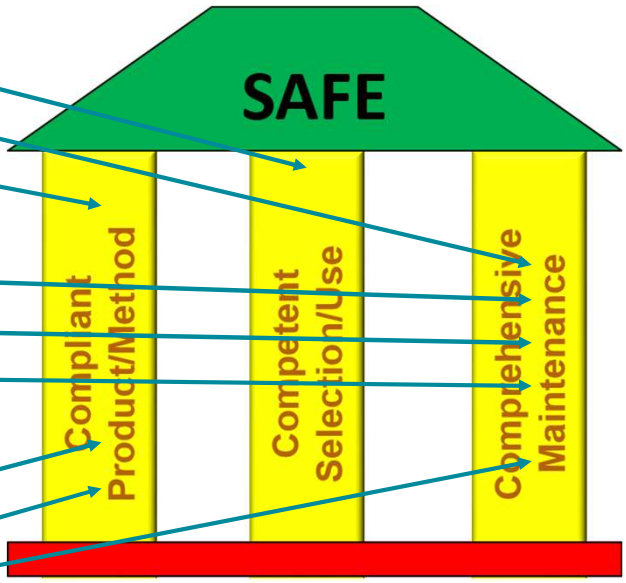
192

COMMON MANAGEMENT CONTROLS

Preparation
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

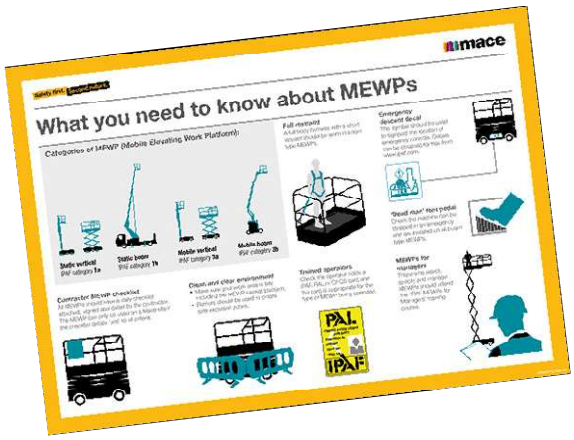
Inspection
- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction
- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



193

MEWP



194

PAV (PUSH AROUND VERTICAL)

Less than 5m Reach height?

195

CCC-MEWPS & PAVS

Compliant

Capacity marked.
Lifting plan (task).
Rescue plan.

Best Practice

Competent

Competent Selection.
IPAF MEWPs for Mgrs.
Competent rescue.
Zones / Stop blocks.

Risk Assessment Method Statement

Comp Maint

Regular inspection (daily).
LOLER
Displayed on machine.

196

CCC-MEWPS

Compliant

EN 280 / BS 8460 : 2025
Capacity indicated
CE marked anti entrapment (Boom)
MEWPs for Mgt

Best Practice

Competent

Lifting plan
IPAF/PAL (PAL +)
Specific operative/task only
Rescue plan
Exclusion / Wheel stops
Tethering.

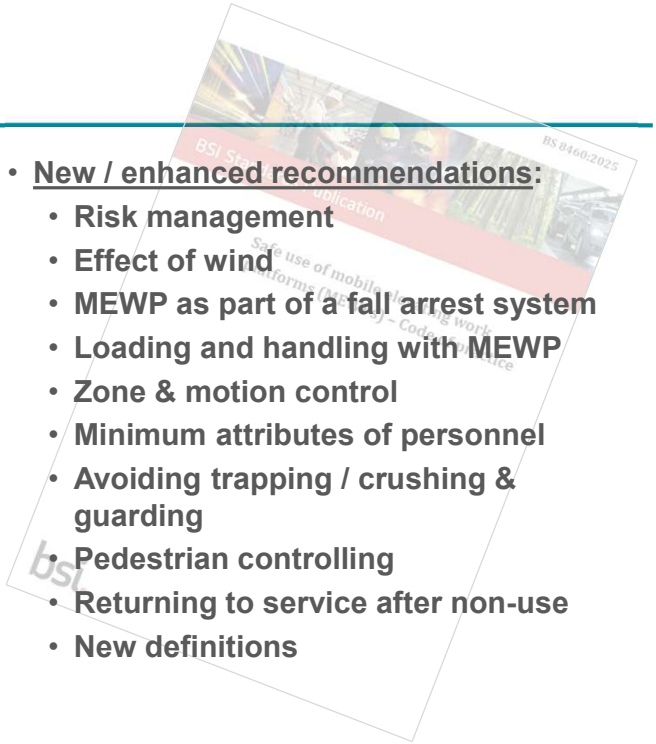
Risk Assessment Method Statement

Comp Maint

Daily Inspt (tag)
Bearing
LOLER

197

COMPLIANCE
BS8460:2025 CHANGES



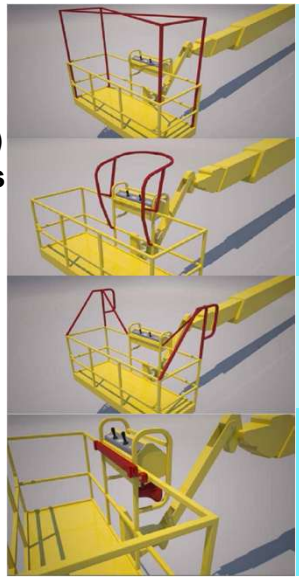
- Principal changes:
  - Compliance with EN280 changes
  - Process map for safe use of MEWPs & content restructured to suit
- Clarifications:
  - Confined work-spaces
  - PFPS use over water
  - Segregation from pedestrians
- Informative annexes:
  - Hoist lift height limits
  - Wind speed vs height
- New / enhanced recommendations:
  - Risk management
  - Effect of wind
  - MEWP as part of a fall arrest system
  - Loading and handling with MEWP
  - Zone & motion control
  - Minimum attributes of personnel
  - Avoiding trapping / crushing & guarding
  - Pedestrian controlling
  - Returning to service after non-use
  - New definitions

198

COMPLIANCE
ANTI-ENTRAPMENT

Mace requirement:
- **Cherry Pickers – for many years**
- **Scissor Lifts – since Jan-2026**
  (as per People Plant Interface Standard)

Included in BS8460:2025 for cherry pickers



Physical Barrier
Fixed Full Cage Structure

Physical Barrier
Operator Protective Structure

Physical Barrier
Side Protection Barriers

Pressure Sensing Device
Pressure sensing bar – stops further movement & audible & visual alarm

199

MANAGER COMPETENCY

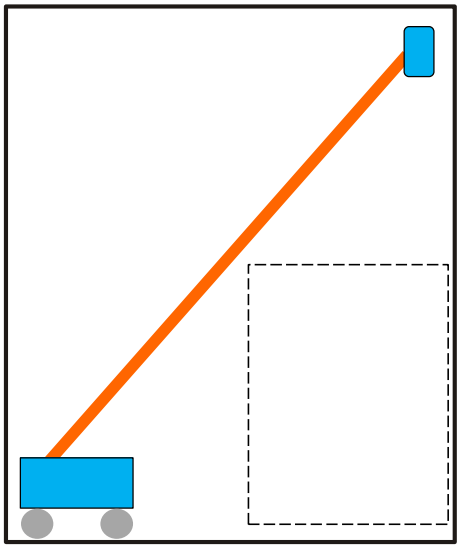
MEWPs for Managers?

HSE

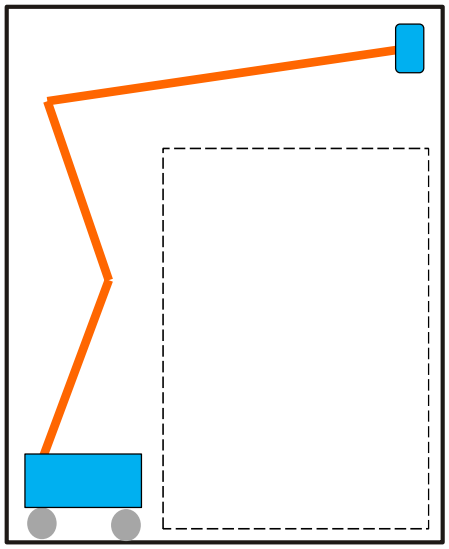
200

CHERRY PICKER:

Straight Boom

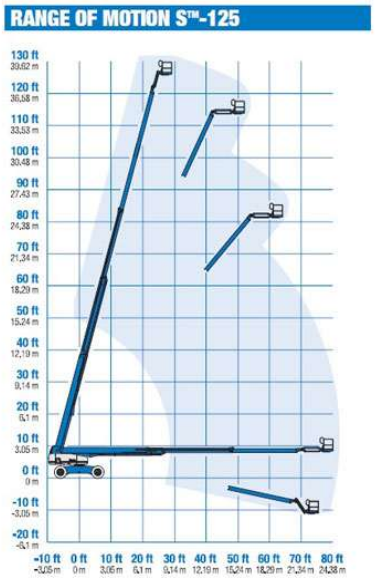


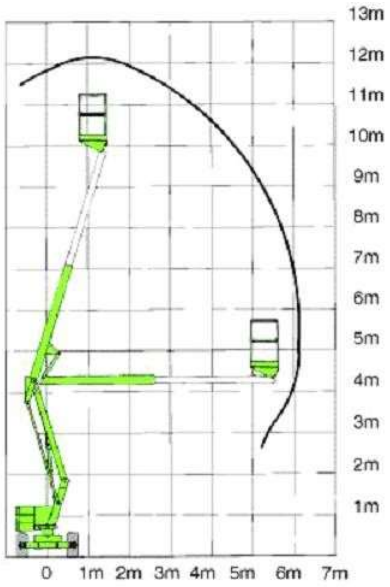
Articulated Boom



201

CHERRY PICKER:





202

CHERRY PICKER:

203

CHERRY PICKER:

204

CHERRY PICKER:

205

CHERRY PICKER:

206

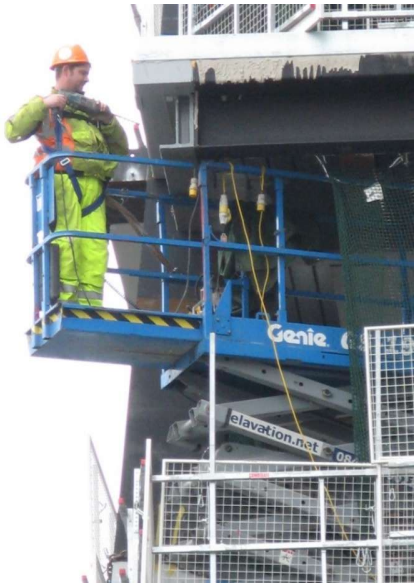
SCISSOR LIFT:

207

SCISSOR LIFT:

208

WHAT DO YOU THINK?



Design issues with corner brackets…

Emergency lowering

Wind load

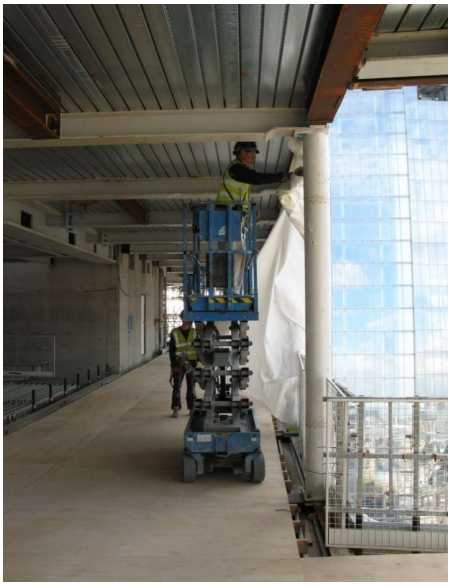
Slab capacity

Wheel stops

No tethering

209

OBSERVATIONS?

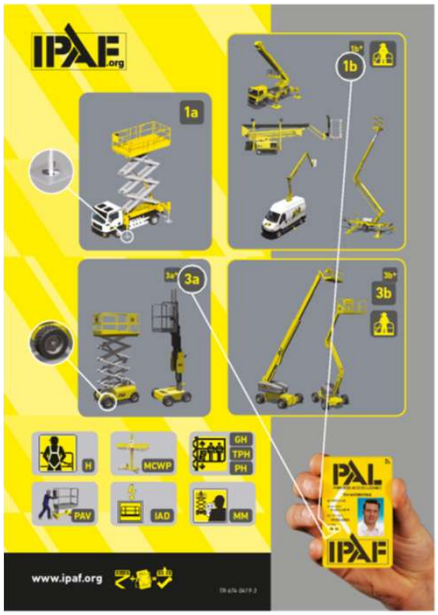


210

OBSERVATIONS?

211

COMPETENT:



Specifics listed on the back
1a, 1b (Static) + ?
3a, 3b (mobile) + ?
PAV
Special (Mgt, Mast Climbers …)
Etc …..

PAL+

HSE Health and Safety Executive

The selection, management and use of mobile elevating work platforms

HSE information sheet | General Information Sheet No 6

212

MEWPS - FALL PROTECTION

Layers of Protection

- Generally – guard rail (**collective prevention**)
- Occasionally – restrained by PFPE (**personal prevention**)
- Rarely – fall arrested by PFPE (**personal mitigation**)

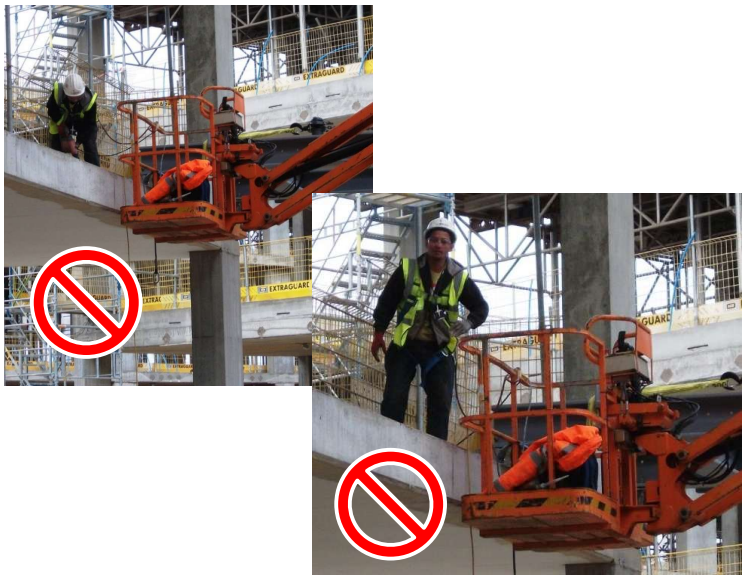
IPAF *IPAF Guidance (2025)*

- *PFPE in boom type MEWPs essential due to risk of falling or catapulting/ ejecting (not a risk in verticals)*
- *Lanyard should be short enough to restrain within platform (adjustable) & may contain an energy-absorber*
- *Over water risk assess to determine PFPE or life-jacket*

213

CHERRY PICKER- CLIMBING-OUT?

- Generally equipment not designed for this
- IPAF require additional controls including:
  - No fall risks – platform to be at least 2m from roof edge
  - Operator to remain in platform – extra person required

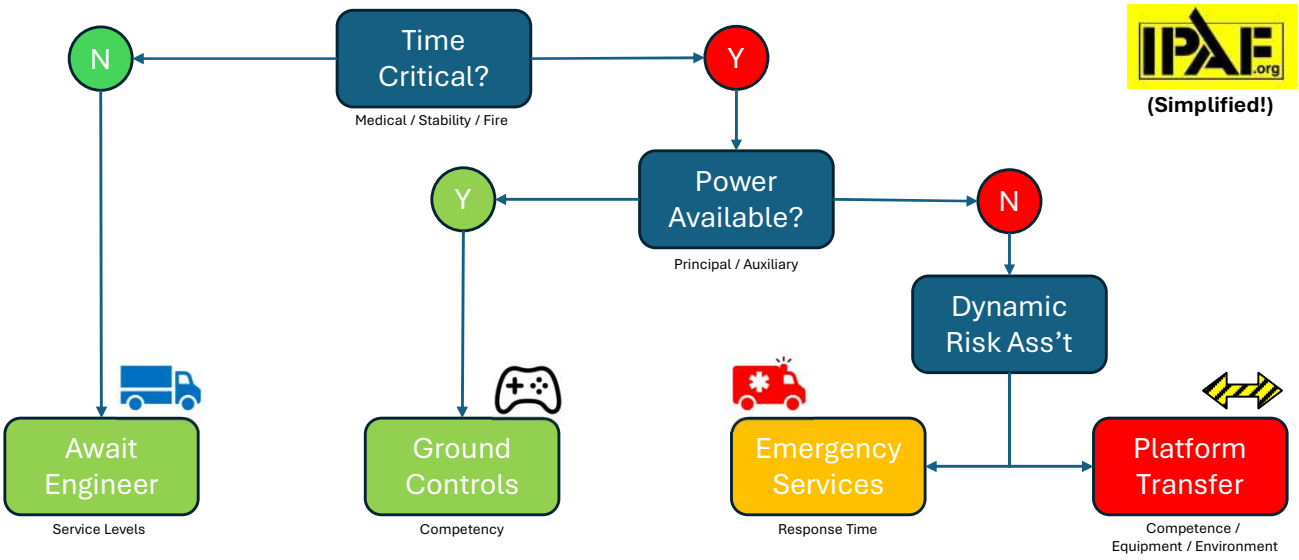


214

CHERRY PICKER- OVER-REACHING?

215

COMPREHENSIVE MAINTENANCE - RESCUE



216

COMPREHENSIVE MAINTENANCE

Exclusion Zones
Tethering,
Wheel stops
Wind Resistance

217

COMPREHENSIVE MAINTENANCE

Daily Inspection
6 month LOLER

218

PAVS: (INCLUDING PECO)

Compliant

EN 280 (power tower)
MEWPs for Mgt
Capacity clear
Bearing (raised floor)
< 5m working height
Internal flat only (unless rated)

Best Practice

Competent

Lifting plan (competent person)
IPAF PAV (or 1a/3a with familiarisation)
Rescue/Lower plan
Exclusion / Wheel stops
Tethering.

Risk Assessment Method Statement

Comp Maint

Daily Op insp (tag)
LOLER.

219

PAV - COMPLIANCE

No specific Standard as yet but they meet "others" (EN 280)

220

PAV - COMPLIANCE

Internal Use Only!

High bearing pressure?

221

PAV - COMPETENCE

- Used Preferred
  - IPAF PAV
- User Adequate (with familiarisation)
  - IPAF 1a / 1b / 3a / 3b
- Managers / Supervisors
  - IPAF MEWPs for Managers

222

COMPETENT:

- Wheel stops
- Wind
- Over-reaching
- Access to work area
- Bearing pressure
- Exclusion
- Etc..

223

COMPREHENSIVE MAINTENANCE:

Capacity signs
Emergency “lower”
Daily Op inspect
6 month LOLER

224

OBSERVATIONS?

225

QUESTIONS?

226

ACCESS EQUIPMENT
TOWERS & PODIUMS

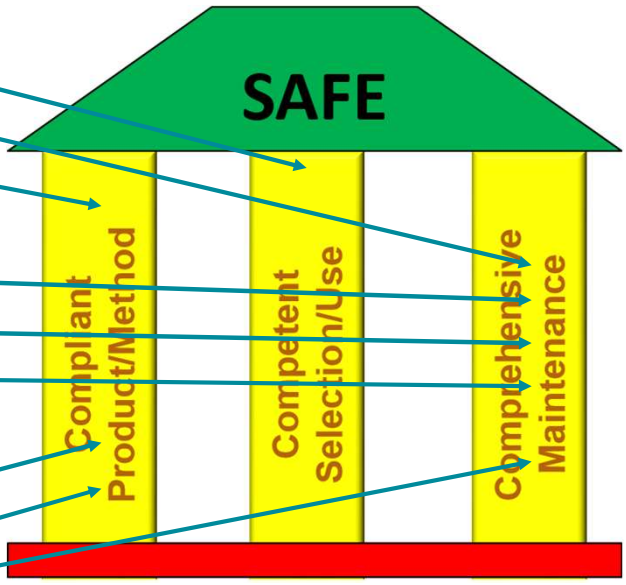
227

COMMON MANAGEMENT CONTROLS

Preparation
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection
- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction
- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations

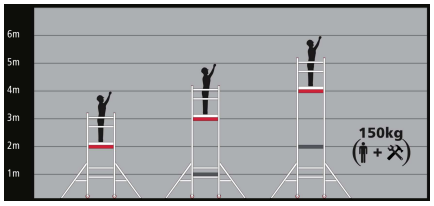


228

LOW-LEVEL WORK PLATFORMS

"PASMA" Tower
EN 1004

Max platform heights:
Indoor: 12m
Outdoor: 8m



"Working Height"
usually includes
2m of human reach

Podium Step
BS 8620 (or PAS 250)

2.5m max

229

TOWER CCC

Compliant

- EN 1004
- AGR preferred to 3T
- Legs/Riggers as per manufacturer
- Platform capacity marked (SWL)
- Add stability in wind (<2m edge)

Competent

- PASMA (erect/adjust/inspect)
- Users?
- Always leave SAFE (up/down) locked
- Toe Boards
- Tethering
- Don't overload

Comp Maint

- Daily pre-use PASMA
- Weekly PASMA (tagged)

230

TOWER STANDARDS

BS EN 1004-1:2020

Mobile access and working towers made of prefabricated elements - Materials, dimensions, design loads, safety and performance requirements

BS EN 1004-2:2021

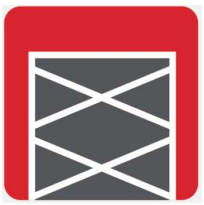
Mobile access and working towers made of prefabricated elements – Rules and guidelines for the preparation of an instruction manual

231

TOWER TRAINING

PASMA
Prefabricated Access Suppliers and Manufact Association

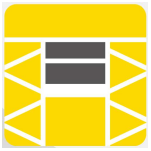
(Category on Cards)



Basic Tower (T)

On Stairs (A5)

Cantilever (A6)



Bridges (A7)

Linked (A8)

Large Deck (A9)

232

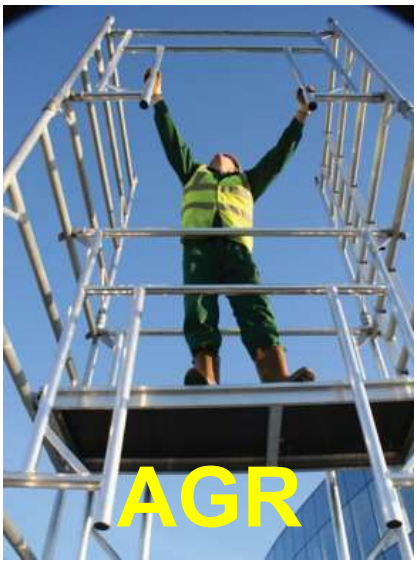
COMPETENT USE

- **PASMA Ticket (to erect, strike, significant adjustment, or inspection)**
- **Always leave SAFE**
- **Toe Boards (Risk Assess)**
- **Tethering (Risk Assess)**
- **SWL**
- **Locked**

Risk Assessment Method Statement

233

TOWER ASSEMBLY TECHNIQUES



AGR
Advanced Guard Rail
Preferred

Technique depends on tower design

Choice at procurement!

3T
Through The Trapdoor
Prone to mis-use & abuse

234

TOWER ASSEMBLY DETAILS

235

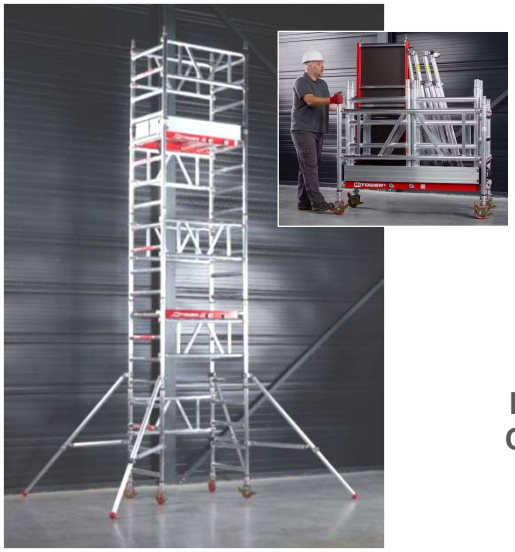
TOWER WIDTH & STABILITY

Choose widest for task space

Use Outriggers whenever tower is tall enough to fit

236

SINGLE PERSON TOWERS

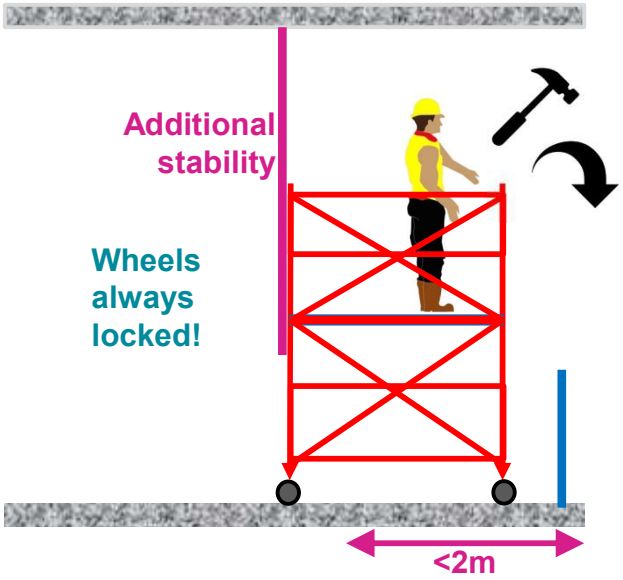


Easier to handle
Fold-away options

Reduced Stability
Narrower Platforms
Challenging Rescue

237

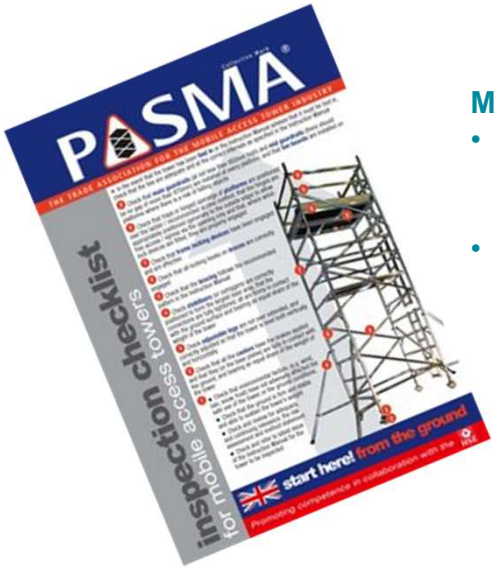
CLOSE TO THE EDGE?



Containment?
Triple Lock?!

238

COMPREHENSIVE MAINTENANCE



Must be inspected:

- Every time
  - Assembled, or
  - Altered (significantly)
- Every 7 days

239

OBSERVATIONS ?

- Outriggers
- Deck spacing
- Toe boards
- Bracing positions
- Proximity to glass
- Ladder alignment (outside tower)

240

PODIUM STEPS

Compliant

BS 8620 (PAS 250)
Max 2 wheel
Podiums that do not require outriggers.
Fold out preferred
Erected to Manuf Inst.

Caution

Competent

PASMA (<2.5m)
Clear and Level
Folding preferred
Legs trip hazard ?
Leave SAFE (up /down) Locked

Risk Assessment Method Statement

Comp Maint

Use PASMA check list
Daily pre-use
Weekly (tag)

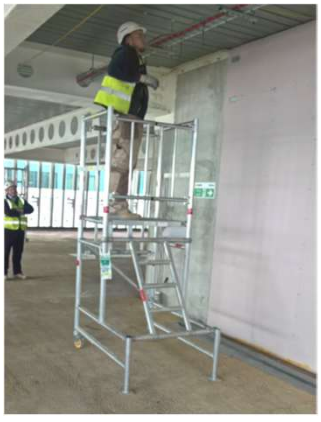
241

COMPLIANT

Opportunity ?

242

COMPLIANT



BS 8620 (PAS 250)

Max 2 wheels
Max 2.5m high
Prefer Fold-Out

243

BASIC REQUIREMENTS

BS8620 Stability Check

- 0.75kN on platform
- Legs attached
- 0.30kN push at platform

Toe board required?

WaH Regs - Suitable and sufficient steps to prevent falling objects liable to cause injury

Depends on task, tools & environment

244

COMPETENT

Specific < 2.5m course

Card remains the property of PASMA

Report any dangerous or inappropriate activity by the cardholder

245

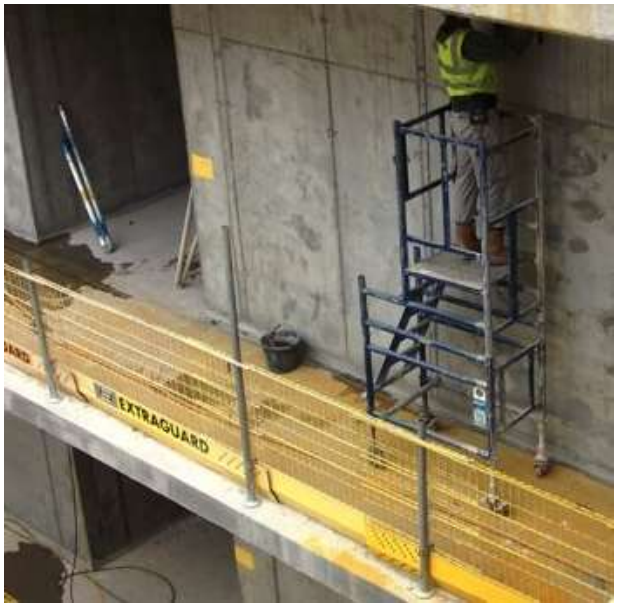
COMPREHENSIVE MAINTENANCE

Must be inspected:

- **BEOOU**
- **Every 7 days & tagged**

246

OBSERVATIONS?



- **Outriggers**
  (in view!)
- **Other means of stabilising**
  (tied or soffit pole)
- **4 x wheels**
- **Wheel jacks over-extended**
  (one should always be minimum)
- **Bottom step height**
- **Edge Protection**
- **Containment**
  (Triple Lock)

247

OBSERVATIONS?

Protecting finishes
but can't inspect

Platform too high
No Outriggers
Top step reach
Bracing
Proximity to Riser

248

QUESTIONS?

249

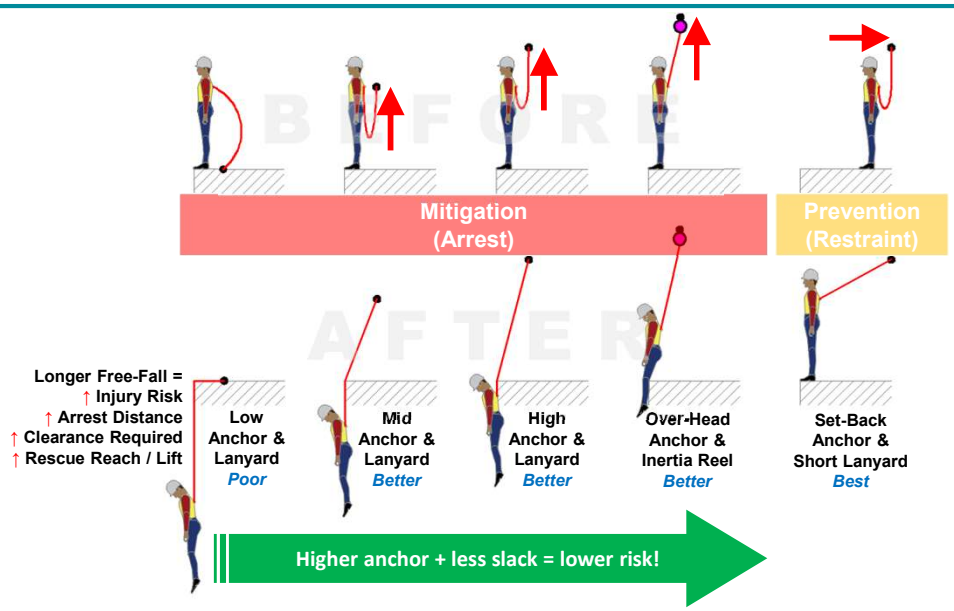
PFPE

(PERSONAL FALL PROTECTION EQUIPMENT)

250

PFPE-
PREVENTION & MITIGATION

AUTUMNAL



251

PFPE – CCC

Compliant	CE-Marked Certified anchor installation	Prevention • Prevents Falls Mitigation • Overhead inertia preferred
Competent	PFPE Selection & Use Anchor Design & Install Passive preferred to Active Exclusion Zones & Tethering Controlled Zones & Signage	Mitigation • Clearance (vertical & swing) • Rescue
Comp Maint	User daily inspection (visual & tactile) Formal inspection (<=6 monthly & logged) Tagged Clean dry storage	

252

PFPE – COMPLIANCE STANDARDS (PREVENTION & MITIGATION)

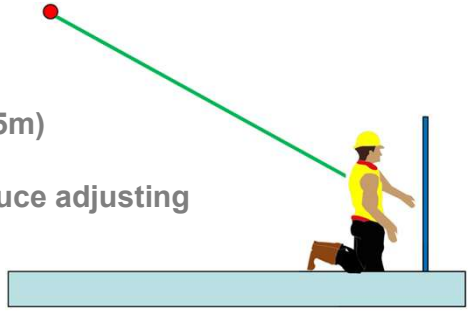
EN 353-1 - Rigid Line Arresters
EN 353-2 - Flexible Line Arresters
EN 354 - Lanyards
EN 355 - Energy Absorbers
EN 358 - Work Positioning Lanyards
EN 360 - Retractable Fall Arresters
EN 361 - Full Body Harnesses
EN 362 - Connectors
EN 795 - Anchor Devices
BS 8513 - Twin-Legged Lanyards

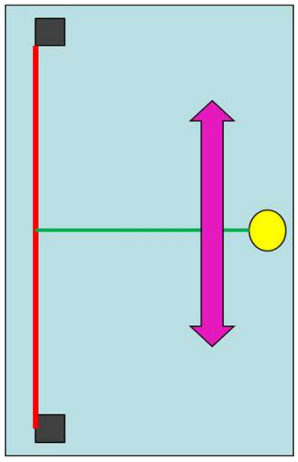
EN 363 - Fall Protection Systems
EN 364 - Test Methods
EN 365 - Instructions, Examination, Marking
BS 7883 - Design, Installation, Inspection
BS 8437 - Selection, Use, Maintenance
BS 8454 - WAH Training Delivery
BS 8610 - Anchor Systems Specification

253

PFPE-COMPETENCE
ANCHOR POSITIONING

Anchor Position:
- **Set-back from edge (>2.5m)**
- **High – but reachable**
- **Parallel to Edge – to reduce adjusting**



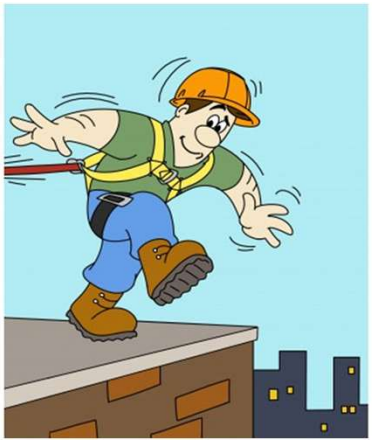


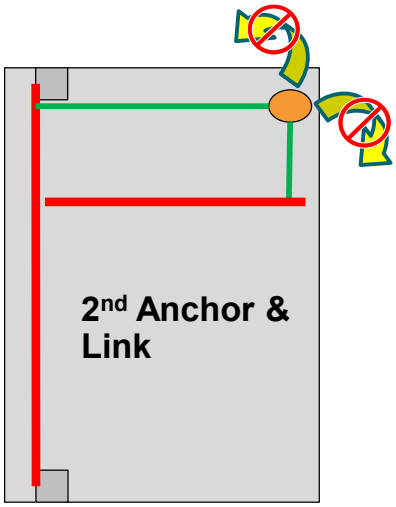
254

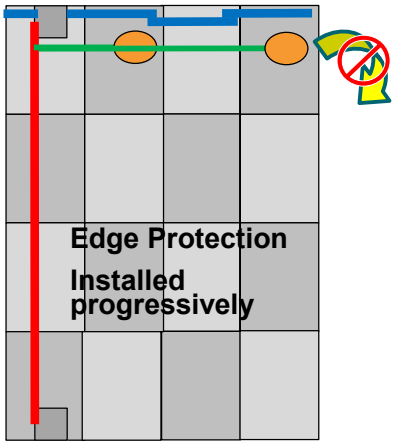
PFPE-COMPETENCE
GOOD PRACTICE

255

PFPE-COMPETENCE
WORK RESTRAINT IN CORNERS



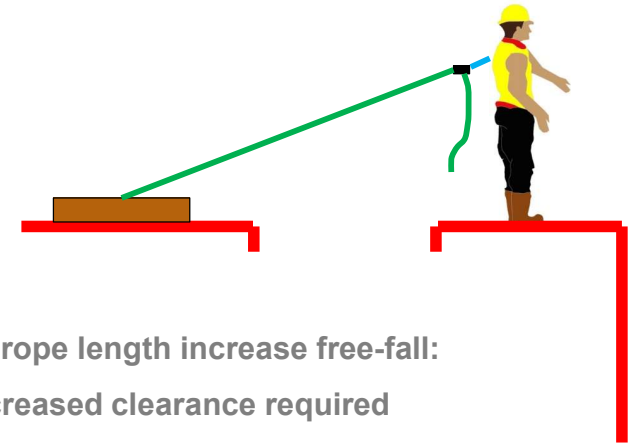




256

PFPE –COMPETENCE
VOIDS

Is this effective fall prevention?

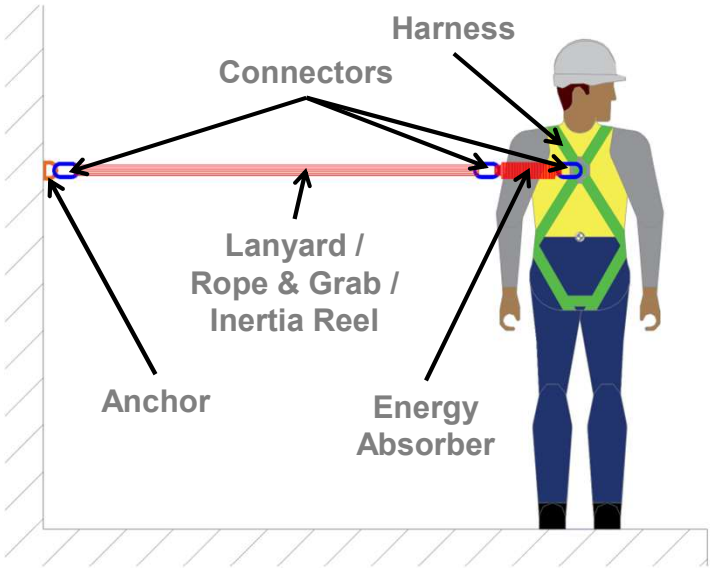


Extra rope length increase free-fall:

- **Increased clearance required**
- **Arrest loads above design specification**

257

PFPE-COMPLIANCE
SYSTEM ELEMENTS



Comprehensive specification required…
from worker to anchor

BS 8437:2022
Code of Practice
Selection, use & maintenance of PFPE

258

PFPE-COMPETENCE
HARNESS SELECTION

- Many types available
- All suitable for Arrest & Restraint
- All need to be fitted correctly
- General categories:
  - Construction – flexible / light / simple / low cost
  - Utilities – stiffer / heavier / more options / mid cost
  - Rope Access – supportive / heavy / complex / expensive
- All have rear (Dorsal) points – generally recommended
- Some also have front (Sternal) points


"Construction"


"Utilities"


"Rope Access"

259

PFPE-COMPETENCE
DORSAL EXTENDERS

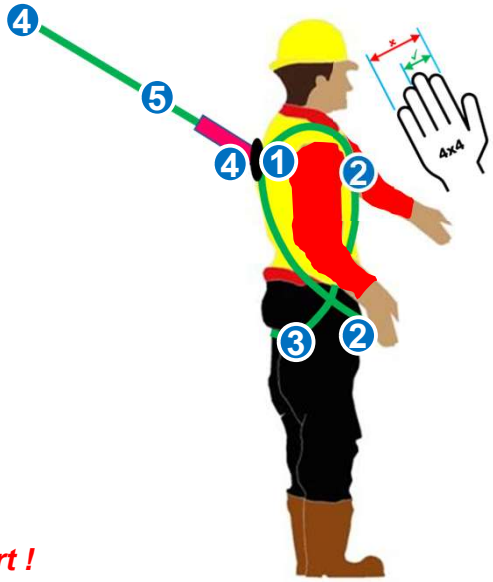
- **Reaching rear ("Dorsal") point of correctly-fitted harness is difficult**
- **Extender allows easier, safe self-attachment**
- **Fitted to Dorsal Point (factory or retro-fit)**
- **Length 300mm to 500mm (to minimise slack)**

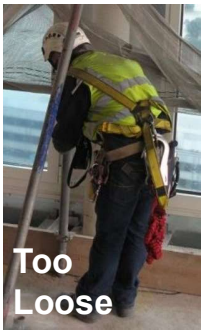
260

PFPE-COMPETENCE
HARNESS CHECKS

1. **Rear Attachment Point**
   Condition & Position
2. **Chest & Thigh Straps**
   Tight (2 to 4 fingers)
   Cannot pull off shoulders
   Comfortable at groin
3. **Rear Strap**
   Beneath back-side
4. **Connectors**
   All Locked
5. **Link to Anchor**
   Short with minimal slack

1 + 2 + 3 requires time & effort !

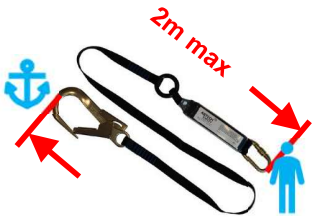




261

PFPE-COMPETENCE
LANYARD SELECTION

- Maximum length 2m (including energy absorber)
- Energy absorber always justified
- Always have energy absorber at user end (not anchor)
- Choice of connectors at both ends
- Usually webbing (can be rope)
- Twin tail (single energy absorber)
- Check if rated for edges (tested to CNB-RFU-11.074)



262

PFPE-COMPLIANCE
ENERGY ABSORBERS

- Many types depending on system
- "Plastic" deformation, not elastic, so no "bounce"
- High initiation force (2kN = 200kg)
- Limited peak force (6kN = 600kg)
- Will not deploy accidentally, can be used in Restraint systems…

"Its better to have one & not need it, than to need one & not have it!"

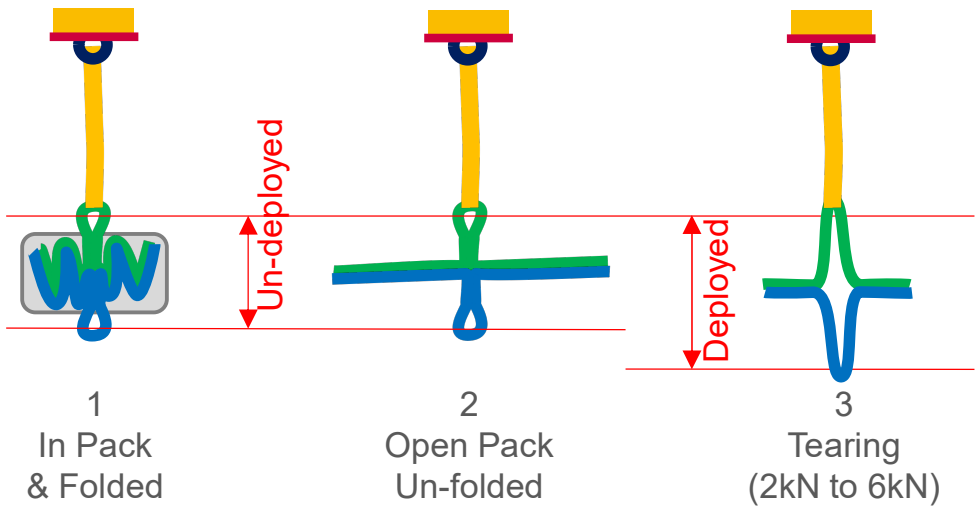
263

PFPE-COMPLIANCE DEMONSTRATION

- **Demo from 3M**

264

PFPE-COMPLIANCE LANYARD ENERGY ABSORBERS



265

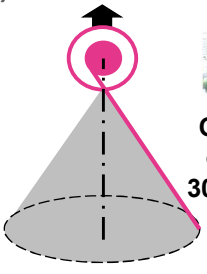
PFPE-COMPLIANCE
ROPE & GRAB SYSTEMS

- Manually adjusted to set length
- No energy absorber…
  No fall arrest!
- Good for WORK RESTRAINT
- Most designed only for vertical use
- Ensure rated for horizontal use & over edges
  (tested to CNB-RFU-11.075)

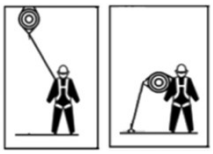
266

PFPE COMPLIANCE
RETRACTABLE FALL ARRESTERS

- AKA… Inertia Reel / Fall Arrest Block / SRL (Self-Retracting Lifeline)
- Range of lengths & line materials
- Most models have limited safe use range:
  - Angle – lock may fail closer to horizontal (marked)
  - Edge – lines can be cut
- Most older models only rated for overhead use
  - Use higher spec (more expensive) models
    (tested to CNB-RFU-11.060)
  - Plan all anchors to be overhead
- Latest standard BSEN360:2023
  - Option to test for horizontal use
  - Will be marked

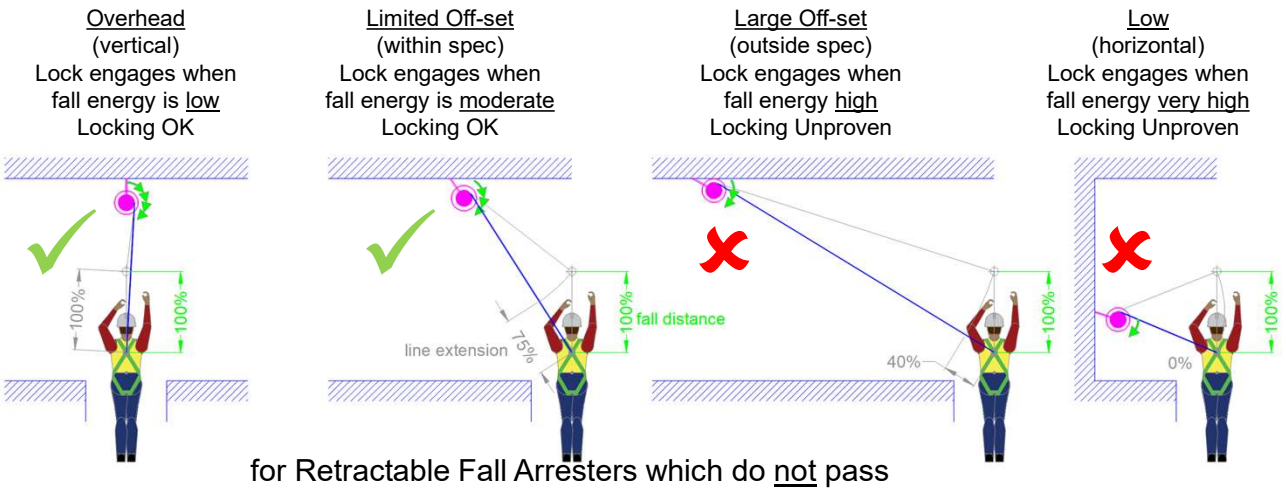


Often only 30° - 40°



267

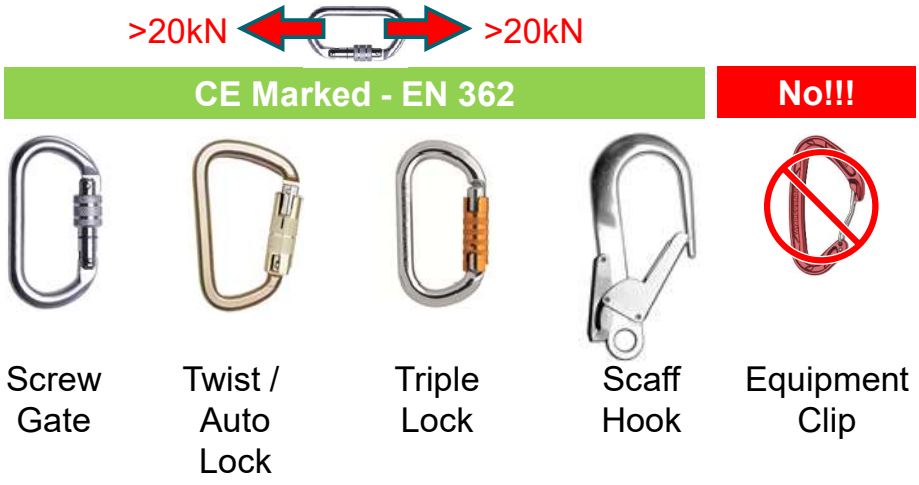
PFPE COMPLIANCE
COMMON RETRACTABLE ISSUE



for Retractable Fall Arresters which do not pass
CNB-RFU-11.060
BS EN 360:2023 (Horizontal)

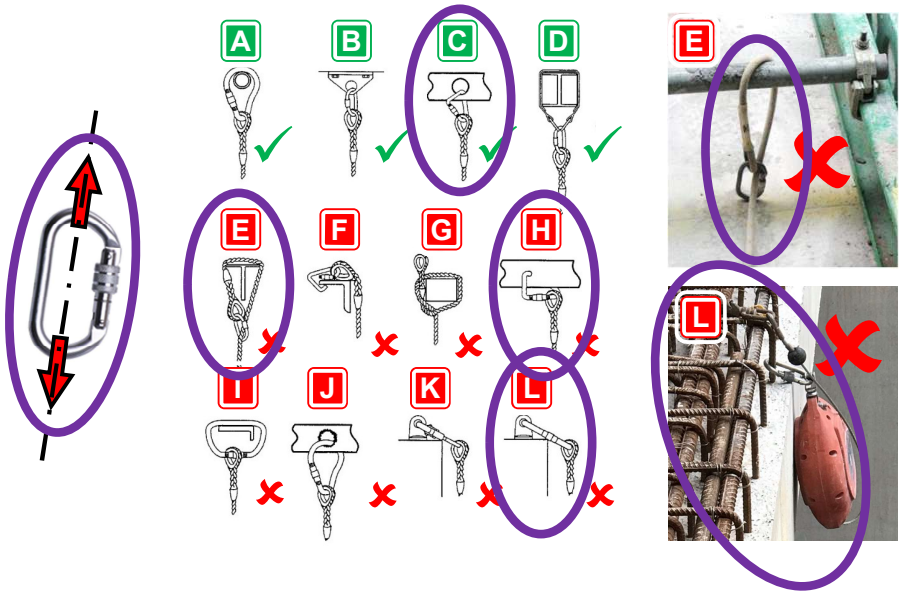
268

PFPE-COMPETENCE
CONNECTORS



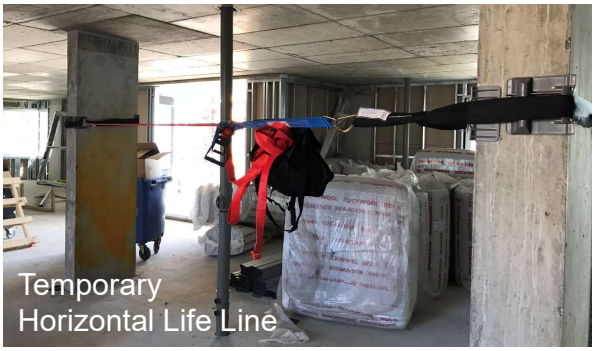
269

PFPE-COMPETENCE
ANCHOR SELECTION



270

PFPE-COMPETENCE
TEMPORARY ANCHORS



271

PFPE-COMPETENCE
ANCHOR STRENGTH

- **Arrest Force = 6kN**
  (limited by Energy Absorber)
- **Safety Factors**
  = 2.0 (EN) Temporary, or
  = 2.5 (BS) Permanent
- **Required Strength**
  = 2.0 x 6 = **12kN** (1200kg) for EN
  = 2.5 x 6 = 15kN (1500kg) for BS
- **Typical car weight = 12kN**
  (Ford Focus)

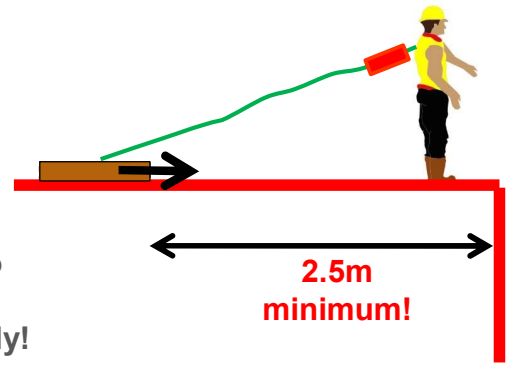
272

PFPE-COMPETENCE
DEADWEIGHT ANCHORS

Comply with EN 795 – Type E

Platform surface must be:

- **Tested with anchor (wet & dry)**
- **Max 5° pitch**
- **Clean**
- **Not frozen**



Allowed to slide 1m & still comply!

273

PFPE-COMPREHENSIVE MAINTENANCE
FALL INDICATORS?

274

PFPE-COMPREHENSIVE MAINTENANCE
USER INSPECTIONS

275

HARNESS SUSPENSION

Time critical

- Medical issues can develop for 20% within 10 minutes
- Lack of muscle movement affects circulation (orthostatic intolerance)
- Blood collects in feet & legs (Venus pooling)
- Lack of oxygen to brain leads to dizziness (Pre-syncope)

Emergency services too slow
(& medical attention probably not required after prompt rescue)

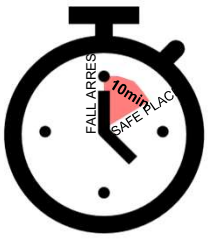
Site-based plan required

276

RESCUE PLANNING

FIRE RISK

FALL RISK



Keep the emergency kit VERY close!

Practice → Experience → Competence

Fully Planned:
Location & Task Specific
Detailed in Task RAMS
DOWNWARDS to 'safe place'
Aim for 10mins

Rescue Ready:
Rescue kit close by
Always >1 person in harnesses

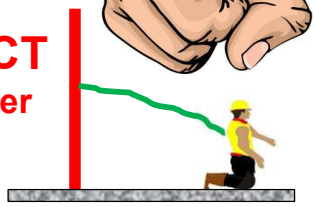
Practice:
Regular toolbox talks
(on the ground – low risk only!)
Spare kit for training
(if main kit 'sealed')

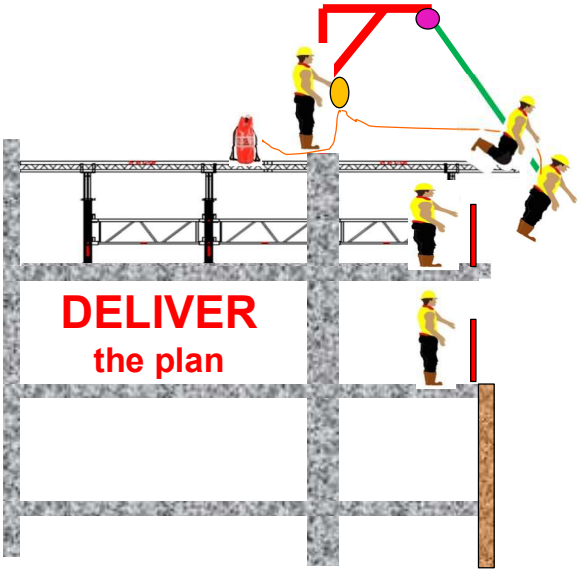
277

RESCUE
RPD (RAISE-PROTECT-DELIVER)

RAISE
the alarm

PROTECT
the rescuer



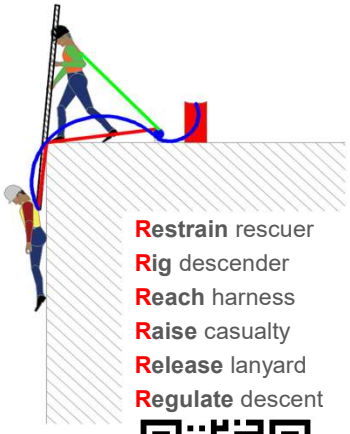


DELIVER
the plan

278

RESCUE
EXAMPLE KIT & PLAN

- Example Kit
- Constant Rate Descender (CRD)
- Rope (long enough???)
- Sling
- Reach Pole (Telescopic)
- Corner Protector



Restrain rescuer
Rig descender
Reach harness
Raise casualty
Release lanyard
Regulate descent

279

PFPE MANAGEMENT CONTROLS:

Risk
Assessment
Method
Statement

- Signage – "Use PFPE"
- Anchor – Compliant Design & Specification (EN795)
  Anchor – Competent & Certified Installation (BS7883)
- Exclusion Zones
- Tethering
- Competency – Use & Rescue
- Rescue Planning
- Rescue Practice – Low risk

Caution

Restraint
Fall Prevention

Alert

Fall Arrest
Min Ht & Consq

280

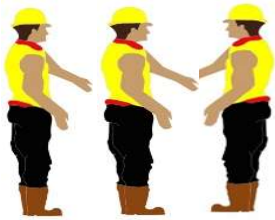
QUESTIONS?

281

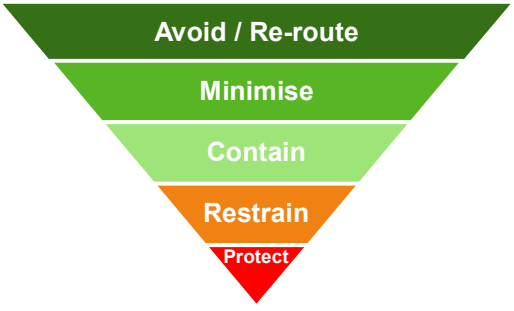
OVERHEAD PROTECTION

282

OVERHEAD PROTECTION



Whom from What & How ?

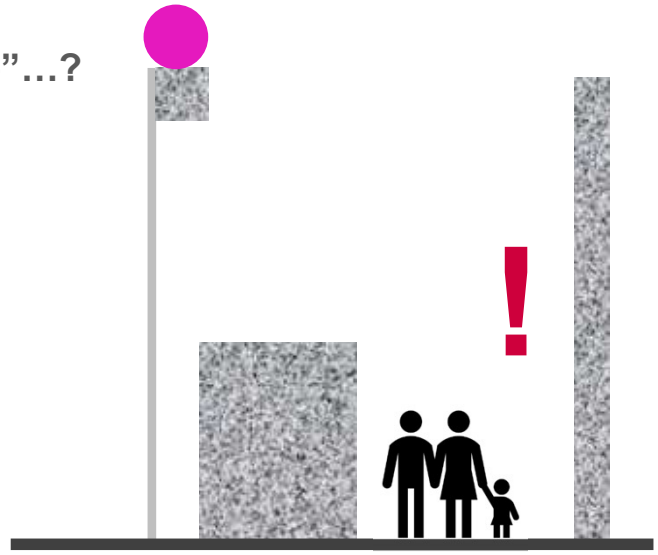


283

KINETIC ENERGY

- What is the “major” concern?
- What are we trying to “capture”…?

Kinetic Energy!



284

SCAFFOLD FAN

285

SAFETY NET

286

FANS-CCC
NETS & SCAFFOLD

Compliant

BS EN 1263 (Nets)
SG34:17 (new)
Local authority requirements
EP must be in place

Best Practice

Competent

FASET/Manufacturer Training
CISRS / SG4:15.
Design load / Scaffold capacity..
TWC involvement

Risk Assessment Method Statement

Comp Maint

Free of Debris.
7 day inspection.
Recorded.
Lighting etc (tunnels).

287

NETS-COMPLIANT

EN 1263 – Safety Nets

- Part 1 - Product Performance, (test, and maintenance)
- Part 2 - Positioning Limits (rigging)

FASET Fall Arrest Safety Equipment Training

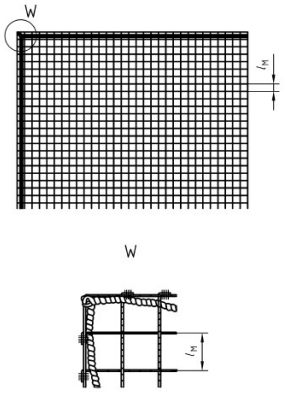
FASET Best Practice Guidance

BS 8411 : 2007

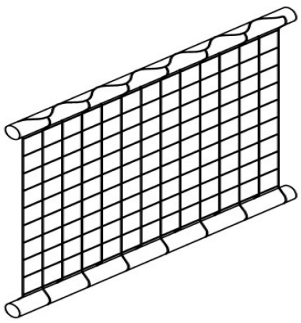
Code of Practice for Safety Nets on Construction Sites

288

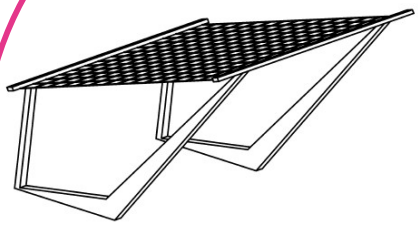
NETS-SYSTEMS



System S
Safety Net with border rope to be fitted to suitable structure



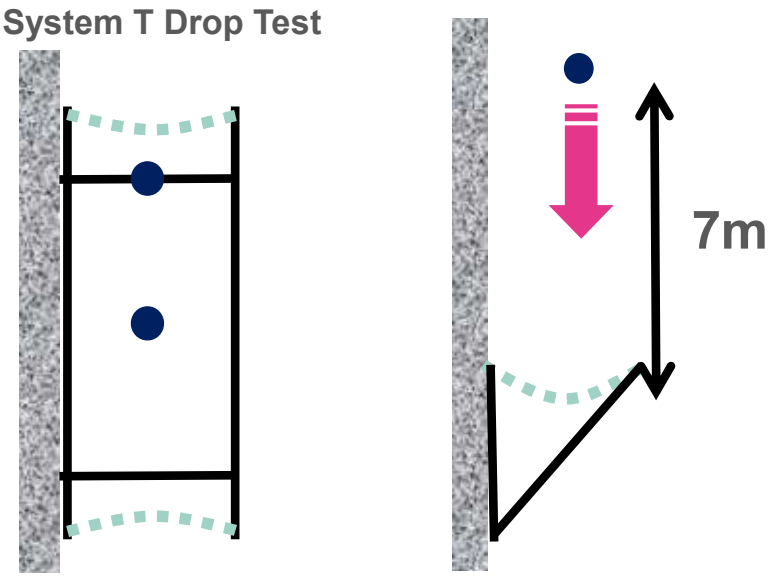
System U
Safety Net attached to supporting frame for vertical use



System T
Safety Net attached to brackets for horizontal use

289

NETS-DROP TESTS



290

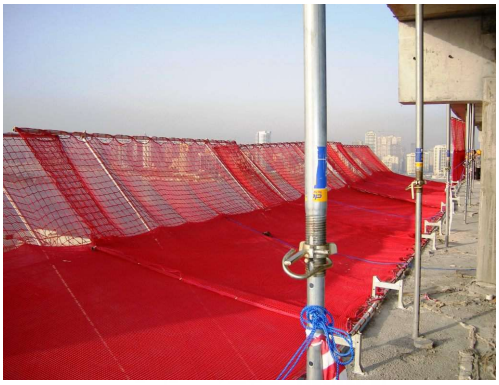
NETS-
LABELS & TEST CORDS

Label:
EN 1263-1 – S – A2 _ Q100 – 18 x 15

- Year/month (first in service)
- Test Cord Min
- Manufacturers Identification
- Serial Number (also on test meshes)

291

NETS-LAYERED



Mesh density :-

- 100 x 100
- 60 x 60
- 20 x 20
- Debris

292

NETS-COMPETENCY

FASET
Fall Arrest Safety Equipment Training

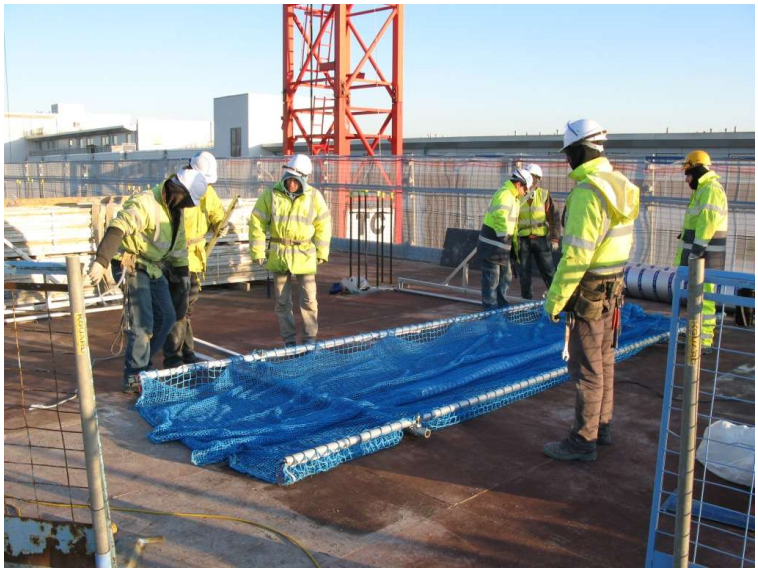
NVQ L2

- **Work unsupervised**
- **Handover**
- **Supervise**

- **Work under supervision**

293

NETS - INSTALLATION TRAINING



294

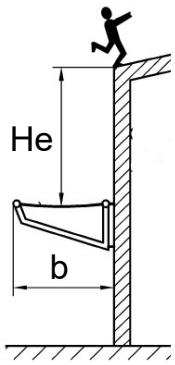
NETS - INSTALLATION ISSUES

- Access? • **Working on the edge?**
- Below? • **Exclusion Zones** (how high does that work?)
- Tethers? • **Tools plus components & fixings Scaffold tubes?**
- Interfaces? • **Edge Protection, Cladding, etc …**
- Loading? • **Temporary Works / Scaffold**

Risk
Assessment
Method
Statement

295

NETS - FALL ARREST REQUIREMENTS



maximum fall height

He	≤ 1.0m	≤ 3.0m	≤ 6.0m
b	≥ 2.0m	≥ 2.5m	≥ 3.0m

minimum width

296

NETS - INSTALLATION ERRORS

297

NETS - CAPABILITY EXAMPLE

- Mr Rahman fell from 8th floor
- Into Safety Net Fan on 4th floor
- Fall of 15m
- Unknown weight

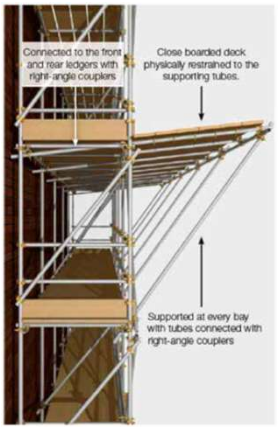
298

NETS - COMPREHENSIVE MAINTENANCE

- Inspection > 7 days? (recorded)
- Keep clear (hats, ply, concrete)
- Check fittings (loosen in wind)
- Tie up in high wind
- (>25MPH, crane down)

299

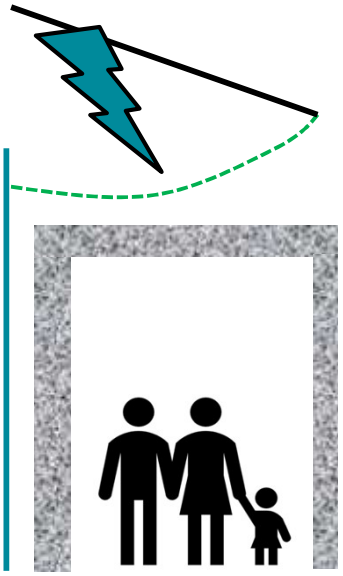
SCAFFOLD FANS



300

FANS, DECKS & TUNNELS

Kinetic Energy ?



301

OBSERVATIONS?

302

FANS - PERFORMANCE

Guidance on Protecting the Public:
HSE - HSG 151
NASC - SG 34

Mostly relates to actual "scaffold" .. But has some use.

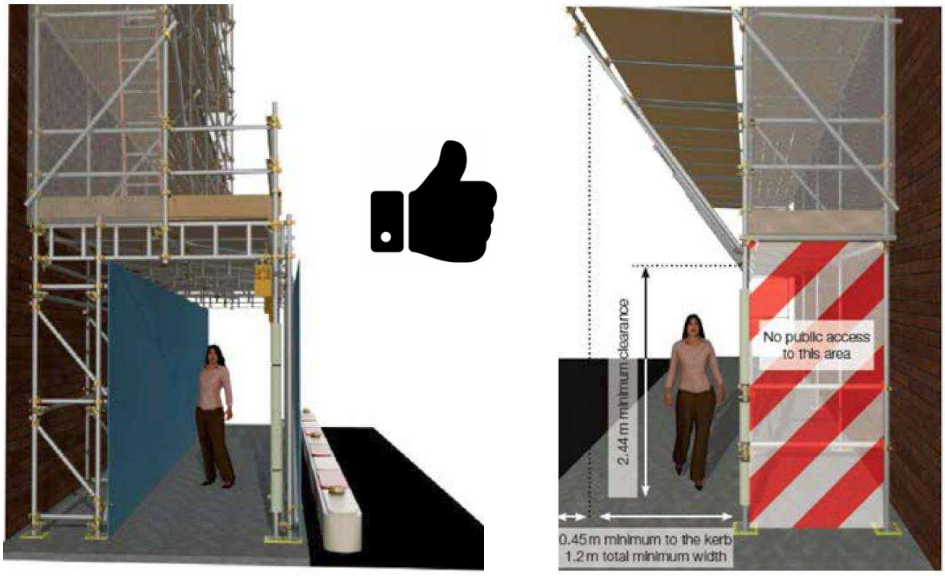
Local Authority requirements

303

LACK OF HAZARD AWARENESS

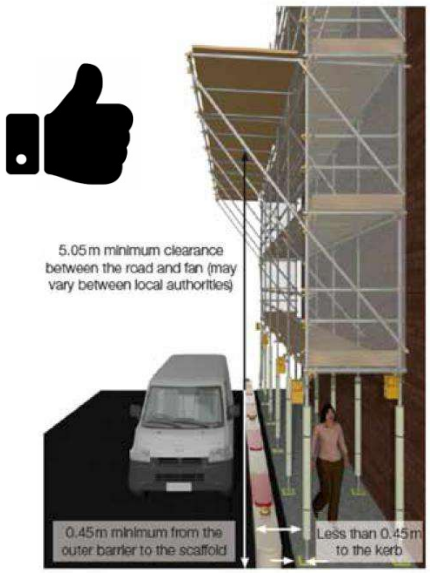
304

PEDESTRIAN PROTECTION



305

VEHICLE CLEARANCE & PAVEMENT ISSSUES



Consider the following:

- **Disabled & Buggies / Prams**
- **Children-Proof**
- **Lighting** (incl. emergency)
- **Snagging on sharps**
- **Earthing**
- **Mugging**
- **Escape**
- **Underground services**
- **Drainage**

etc…

LA
Pavement Licence

306

PUBLIC PROTECTION

307

PUBLIC PROTECTION

HSE Guidance on "protecting the public".
Local authority standards?

308

OBSERVATIONS?

- Gaps Overhead
- No lighting
- Snagging
- Climbable
- Trip hazards
- No collision barrier
- Escape routes

309

QUESTIONS?

310

VOID PROTECTION

311

VOID PROTECTION

Compliant

No specific Standard
Load bearing !!
TW Eng / Tworks BS 5975
New designs .. Proper covers
Max load needed (pics/kgs).
MACE Tech Note E16

Best Practice

Competent

Temp Wks Designer
Warning signs (capacity)
Nom Person (mgt)
Riser Coordination meetings
Installation equipment needed

Risk Assessment Method Statement

Comp Maint

Formal Weekly.
Recorded
Signs (pics/numbers)

312

COMPLIANT

- TWC Approval
- HSE Guidance (withdrawn?)

- Significant Loads:
  - Distributed (persons, materials etc)
  - Point (wheels such as MEWPs, pods)
  - Factors
- Span Orientation (timber)
- Bearing (all sides ?)
- Secured !!
- Access hatches
- Signage

313

COMPLIANT

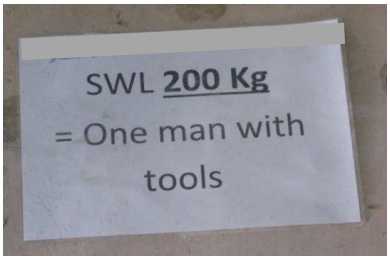
Proprietary load-bearing deck system ?
(provision made in support surface ?)
(designed/selected for the load?)
(fire stopped?)

Best Practice

Inspection tag system

314

COMPLIANT



315

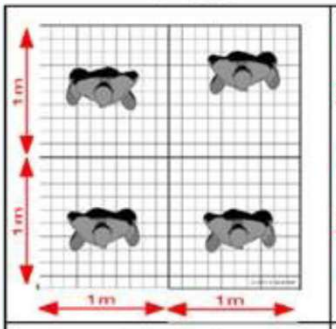
TECH NOTE E 16

Loading intensity:

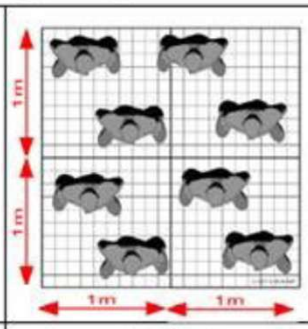
Imagine a room with a grid of 1m² drawn on the floor, and if we had one operative stood in each 1m square – then you'd have a floor load of 100kg per square metre or 1.0 kN/m².

Similarly, if you then had two operatives stood in each square metre, then it would be 200kg per square metre or 2.0 kN/m². (as shown on central image below).

Noting that people and items move within a space, these loads are looked at as an average, thus in the image (right), the average loading is 1.0 kN/m².



1.0 kN/m²



2.0 kN/m²

1.0 kN/m²

316

WITH VEHICLES .. DIFFICULT TO SIGN ?

317

OBSERVATION ?

318

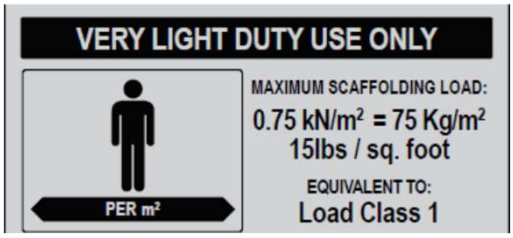
OBSERVATION ?

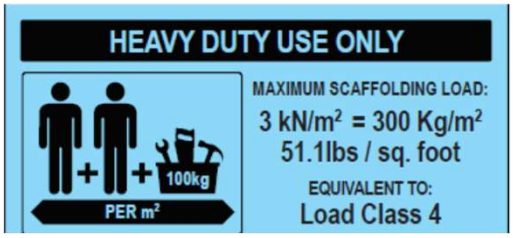
319

OBSERVATION ?

320

WHY NOT LEARN FROM SCAFFOLDING?...





321

QUESTIONS?

322

ACCESS EQUIPMENT

MCWP

(MAST CLIMBING WORK PLATFORMS)

TSAE

(TEMPORARY SUSPENDED ACCESS EQUIPMENT)

323

COMMON MANAGEMENT CONTROLS

Preparation

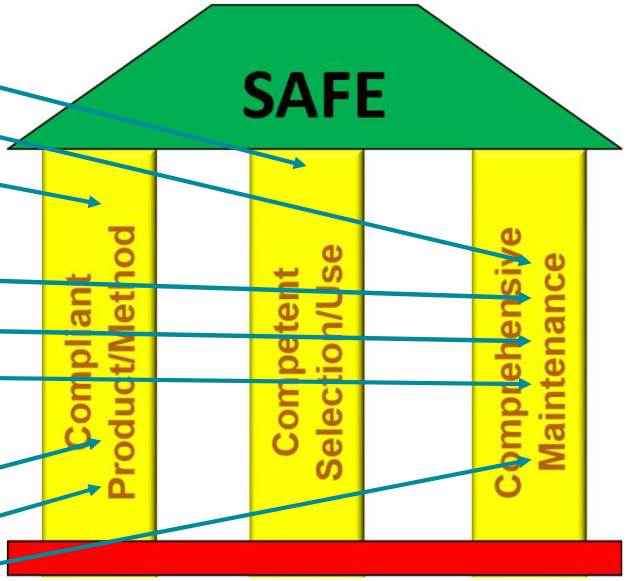
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection

- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction

- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



324

MCWP

A Work Platform
NOT a hoist

325

TSAE

A cradle or work platform.

326

AE : MCWP

Compliant

BS 7981 (install, maint, TE)
BS EN 1495
Rescue RAMS
Exclusion

Competent

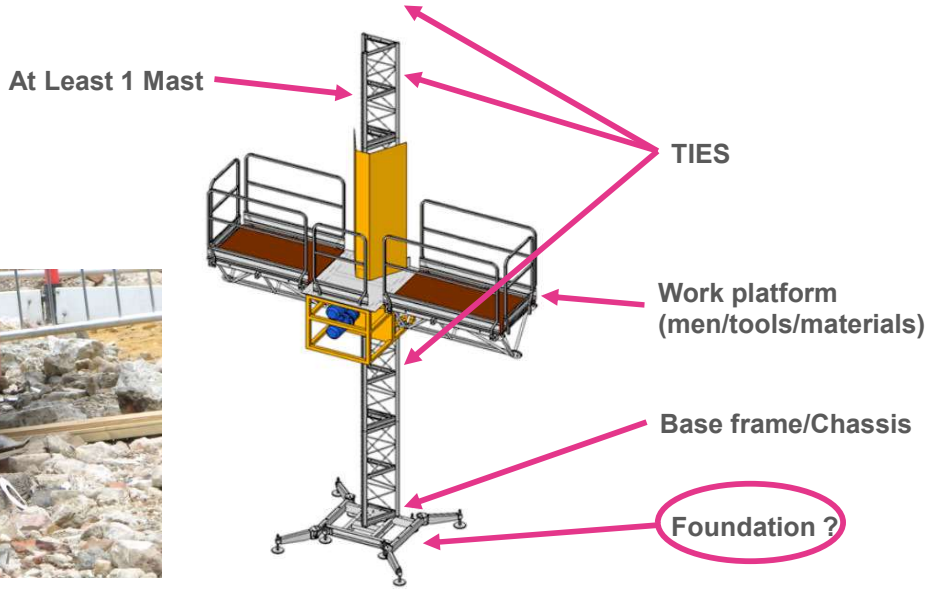
Operator train (IPAF)
Supplier/Manuf (demo)
Inspector (daily)
Temp Wks (Wind)
Debris
PFPE (RAMS)

Comp Maint

Daily pre-use
Specific maint
LOLER
Left clean clear

327

COMPLIANT: MCWP ELEMENTS



328

MCWP - COMPLIANCE

BS7981:2017 - Code of practice
installation, maintenance, thorough examination & safe use of MCWPs

- **Hazards**
- Specification, installation planning, erection and dismantling
- **Management and control**
- Personnel and training
- **Planning of the installation**
- Siting
- **Installation**
- Operation, use, maintenance and inspection
- **Thorough examination and testing**
- Safety at the work site

329

MCWP - COMPLIANCE

BS EN 1495:1997+A2:2009
Lifting platforms. Mast climbing work platforms

- List of hazards
- **Safety requirements and/or measures**
- Verification of the safety requirements and/or measures
- **Information for use**

330

OBSERVATIONS?

331

OBSERVATIONS?

332

COMPLIANT:

- Position
- Foundation (design)
- Ties (design, install & removal)
- Capacity (tasks / activities)
- Access to Platforms (higher levels)
- Interlocks (platforms sharing mast / overlapping)
- Ground Protection (exclusion zones / deck)
- Prevention of Unauthorised Use
- Power Supply (fixed with switch)
- Weather / Wind (monitoring & actions)
- Inspection (LOLER)

333

COMPLIANT : MACE REQUIREMENTS

- Limit switches
- Levelling system
- PFPE & Rescue (RAMS)
- Stop Button
- Direction controls (?)
- Gate interlock
- Manual descent & Overspeed brake
- Max load sign (icons ?)
- Tethering

334

OBSERVATIONS?

335

OBSERVATIONS?

336

COMPETENT: BS 7981

"Suitably" Qualified Person (knowledge/experience/training)

- Supplier Competent Person
- User Competent Person
- Installer
- Demonstrator
- User/Operator

IPAF
INTERNATIONAL POWERED ACCESS FEDERATION

IPAF Guidelines for the Safe Use of Mast Climbing Work Platforms

BS 7981:2017

BSI Standards Publication

Code of practice for the installation, maintenance, thorough examination and safe use of mast climbing work platforms (MCWPs)

337

COMPETENT:

Risk Assessment Method Statement

Installers/Operators/Demonstrators/Inspectors

338

COMPETENCE :

339

COMPREHENSIVE MAINTENANCE:

- TE prior to 1st use after install
  Frequent Inspection / Testing
- Daily Pre-Use Inspection
  User Appointed Person
- LOLER (MACE) / 3 Month (BS)
- Inspection following In-Service Maintenance
  As required by Manufacturer / Installer

Handover ?

Check Sheet ?

340

TSAE

A cradle or work platform.

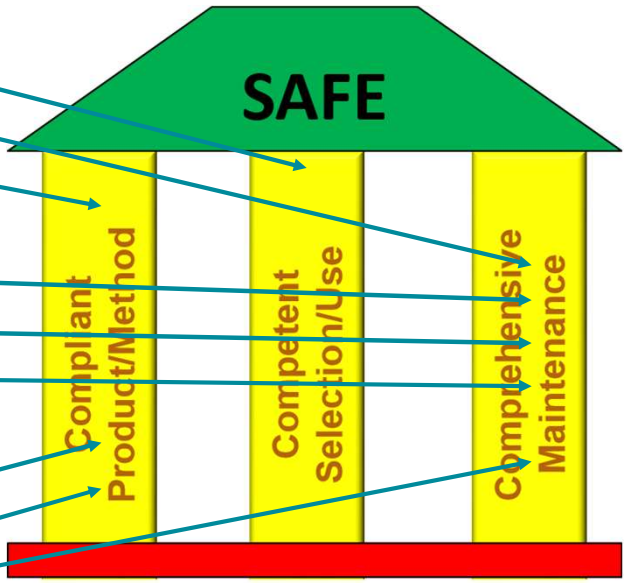
341

COMMON MANAGEMENT CONTROLS

Preparation
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection
- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction
- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



342

AE : TSAE

Compliant
- BS 5974
- LOLER / TE
- Task RAMS
- Exclusion / access deck / locked anchors wts

Competent
- User Appt Person
- Familiarity training for all
- Supplier/ Manufacturer (demo)
- Rated load
- TWC Design (Wind / Debris)
- PFPE (RAMS) Rescue
- Anemometer

Comp Maint
- Inspector (daily)
- Daily pre-use
- Specific maint
- LOLER
- Left free clear

Risk Assessment Method Statement

343

COMPLIANT:

TSAE

344

TSAE - COMPLIANCE

BS 5974:2017 - Planning, design, setting up and use of temporary suspended access equipment. Code of practice

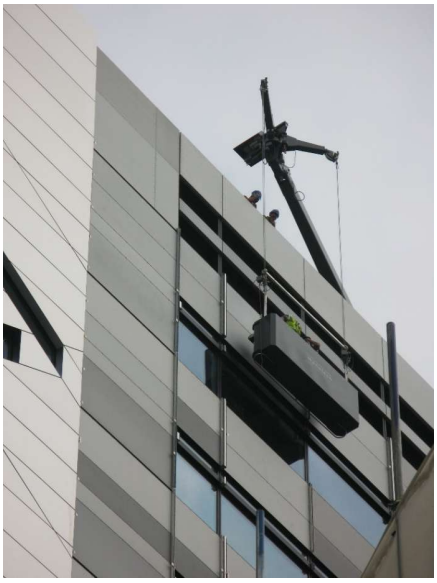
- Identifying hazards
- Planning & info exchange
- Responsibilities
- Health and safety
- Types of TSAE
- Materials & components
- Overturning & righting
- Design criteria
- Components & WLL
- Electrical requirements
- Protection against lightning
- Installation, commissioning, handover & dismantling
- Maintenance, thorough examination and testing
- Using TSAE
- Care in storage
- Personnel and training

345

OBSERVATIONS?

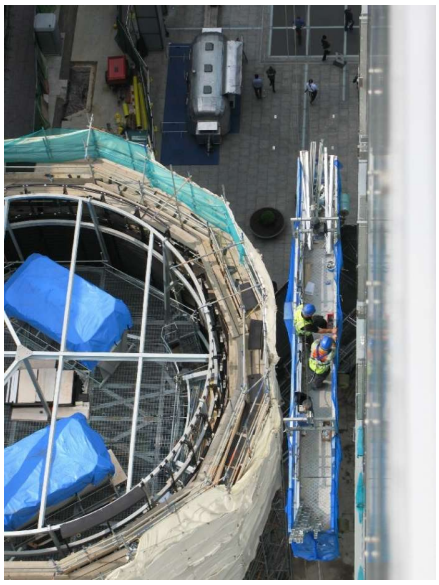
346

OBSERVATIONS?



347

OBSERVATIONS?



348

COMPLIANT:

Risk
Assessment
Method
Statement

- Position
- Fixings (mechanical / locked ballast)
- Supports
- Façade Ties
- Capacity (tasks / activities)
- Access (higher levels)
- Secondary Support & Braking
- Ground Protection (exclusion zones / deck)
- Prevention of Unauthorised Use
- Power Supply (fixed with switch)
- Weather / Wind (monitoring & actions)
- Inspection (LOLER)

349

MACE REQUIREMENTS

- TWC for supports / fixings / ballast
- Rated Load
- Overspeed brake /2nd ry support
- PFPE & Rescue (RAMS)
- User Appointed person

350

OBSERVATIONS?

351

SECURITY OF RIGGING

- Requiring hand-tools is sufficient level of security
- Steel cables & grips

or

- Lockable enclosure
- Use signage

352

COMPETENT: BS 5974

User Appointed Person

Supplier Appointed Person

Installer

Demonstrator

User/Operator

353

COMPETENT

Previously no "accredited" courses...

SAEMA now offer Operator Course:
- **Part 1: On-line**
- **Part 2: On Site**

Risk Assessment Method Statement

Installers/ Operators / Demonstrators / Inspectors

354

COMPREHENSIVE MAINTENANCE:

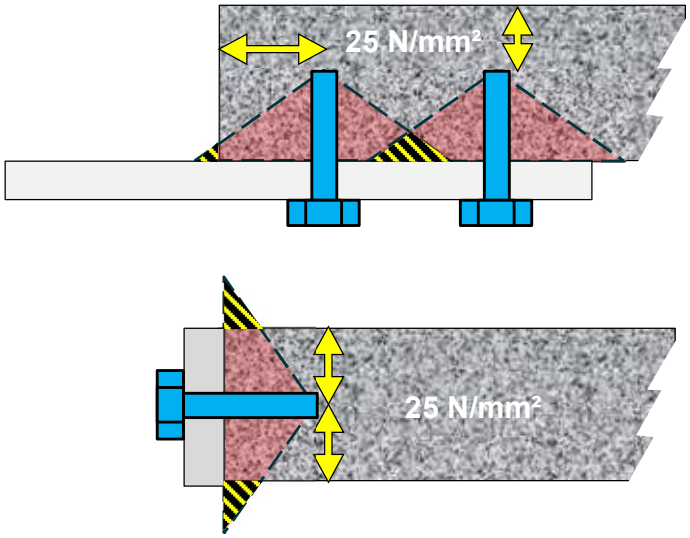
- **TE prior to 1st use after install**
  Frequent Inspection / Testing
- **Daily Pre-Use Inspection**
  User Appointed Person
- **LOLER (MACE) / 3 Month (BS)**
- **Inspection following In-Service Maintenance**
  As required by Manufacturer / Installer

Handover ?

Check Sheet ?

355

MCWP & TSAE FIXINGS IN CONCRETE



Affects on Fixing Capacity:

- Fixing Type
- Edge Distance
- Proximity to Each Other
- Slab / Wall Thickness
- Concrete Age (maturity)

356

QUESTIONS?

357

ACCESS EQUIPMENT

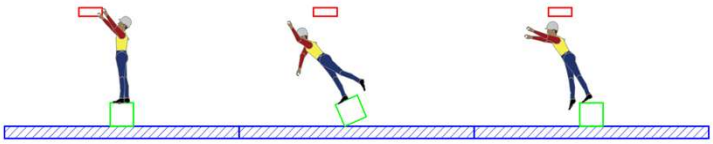
DELTA DECKS, LADDERS, STEPS & HOP-UPS

358

DELTA DECKS, LADDERS, STEPS & HOP-UPS







Can it fall over?
Can I fall off it?

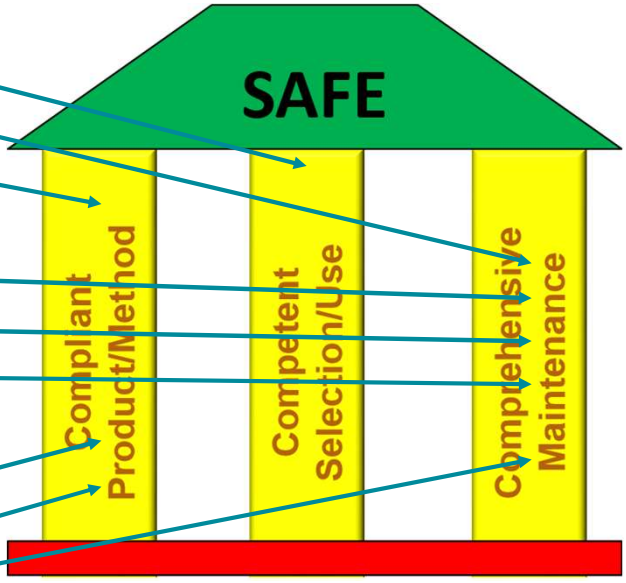
359

COMMON MANAGEMENT CONTROLS

Preparation
- Competent Selection / Use
- Emergency rescue plan
- SSOW for each application

Inspection
- Daily Pre-use checks
- Formal Inspection / Tagging
- Criteria for additional inspection

Restriction
- Exclusion zone (base/below)
- Safe Working Loads
- Weather limitations



360

DELTA DECKS

- **Low & wide**
  good stability
- **Guardrails**
  high & robust – but compliant?!
- **Fold-Away**
  Fewer assembly errors
- **Portable**
  25kg to 30kg

Fall over? Good
Fall off? Good




361

DELTA DECKS-CCC

Compliant

EN 1004-1 tested/rated
EN 1004-2 instructions (formerly EN 1298)
SWL 200kgs
Max work height 2.6m

Caution

Competent

Prod Training / Familiarisation
Clear and Level
Leave SAFE

Risk Assessment Method Statement

Comp Maint

Daily pre-use
Weekly (tag).

362

LADDERS & STEPS

Fall over? Poor
Fall off? Poor

363

LADDERS & STEPS-CCC

Compliant

EN 131 (Professional)
Composite or metal
Wooden - with RA (BS1129 C1)

Alert

Competent

LA offer training
Use justified (permit)
Incline Sticker/Rating
Secured (tied braced)
Locked against use

Risk Assessment Method Statement

Comp Maint

Daily pre-use
Tags/Reg.

364

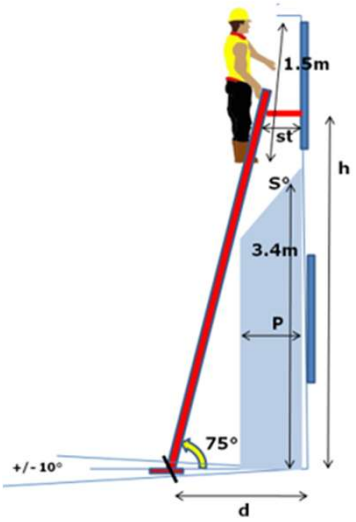
LADDERS & STEPS-COMPLIANT

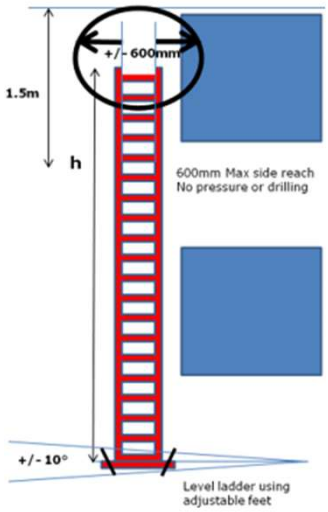
- BS EN 131
- No 'domestic' ladders – now termed 'non-professional'
- Only 'professional'
- No wooden ladders (unless risk assessed)
- Do not use as "work platform" without additional controls:
  - 3 points of contact?
  - Fall Protection?
  - Not telescopic ladders

Remove top three steps/rungs?

365

LADDERS - COMPLIANT



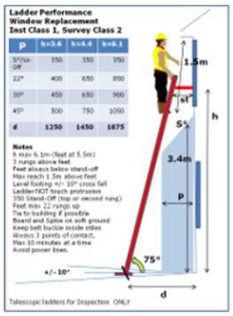


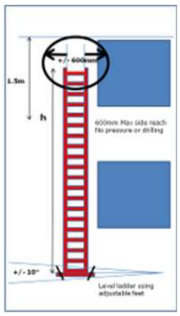
Safe Use Specification

- **Competency: Ladder Assoc**
- **Max height: 6m?**
- **Marked SWL: 150kg**
- **Marked Angle: 1H:4V (75°)**
- **Level Ground: <10°**
- **Tied / Secured from ground**
- **Reach: <600mm**
- **Storage: Locked**

366

LADDERS - COMPETENCE





- **Tied.**
- **1in4 / fully open.**
- **Locked up**
- **Loading marked**
- **Incline marked**

367

LADDERS - COMPREHENSIVE MAINTENANCE

- Daily
- Weekly
- Inspection records
- Tags

368

OBSERVATIONS ?

369

OBSERVATIONS ?

370

OBSERVATIONS ?

371

HOP-UPS-COMPLIANT

Length x width: 600 x 600 (minimum)
Height: 500 (maximum)

Permit to use

Fall over? Good
Fall off? Poor

372

HOP-UPS-CCC

Compliant

600 x 600 min
< 500 ht
SWL 150kg (EN 131)

Competent

Permit to use
Justified (RAMS)
Light work
Tool Box Talk

Comp Maint

Daily pre-use
Weekly Competent
Tag / Locked

373

HOP-UPS-
COMPETENT

150 kgs

Short Duration ??
Light duty ??

Tool Box Talk
Evidence ?

Where no alternative possible...

… “constricted space.”

374

HOP-UPS-
COMPREHENSIVE MAINTENANCE

Daily
Weekly
Tags
Register
maintained

Inspectors
Course

Secured when not in use

375

OBSERVATIONS ?

376

QUESTIONS?

377

ROPE ACCESS

378

ROPE ACCESS.. PERSONAL FALL PREVENTION

379

JUSTIFY DECISION ?

Alternatives from hierarchy?...
MACE rating?.....

Consider :-

- Ease of task when in suspension
- Risks to those below
- Handling of tools
- Reaction forces (drilling etc)
- Pace of task
- Exposure of Technician
- Rescue options (down & away)
- Other task-specific hazards

380

ROPE ACCESS

Compliant

IRATA CoP / BS 7985
Many equipment Standards
2No Anch 15kN (Annex F)
"unquestionably reliable"

Competent

IRATA Level 1-3
Rescue Plan
TWC for Anchor Designs
Exclusion / Tether / Catch Net
Watcher

Comp Maint

Anchor Protection
Rope Protection
TE 6 monthly

381

GUIDANCE

IRATA CoP / BS 7985

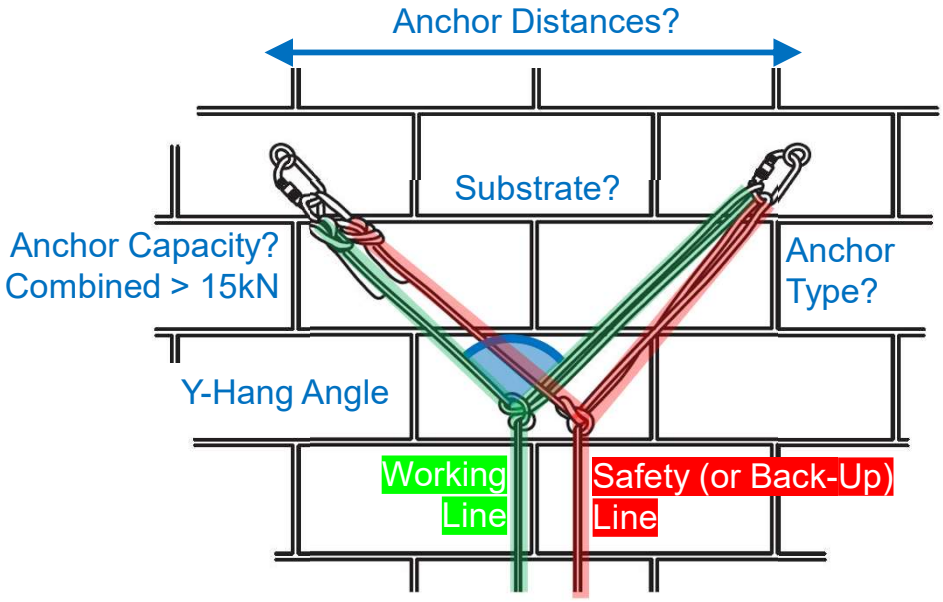
- Generally minimum is team of 3
  Team of 2 permitted for simplest rescue
- 2 independent anchors
- Rescue provision
- All watched by another abseiler
- Exclusion zone with spotter

382

EQUIPMENT & STANDARDS

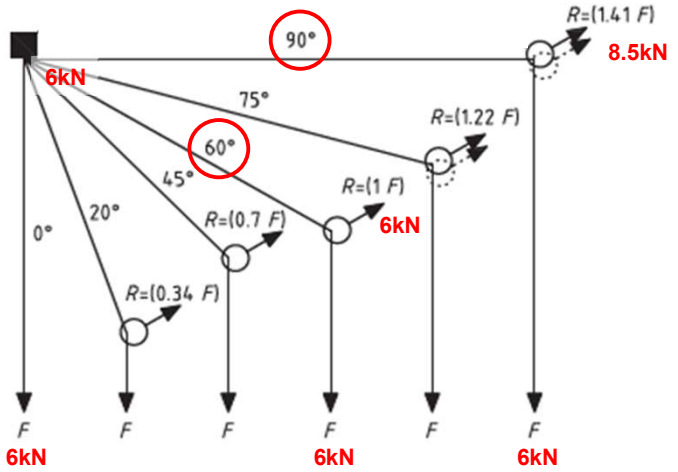
383

RIGGING



384

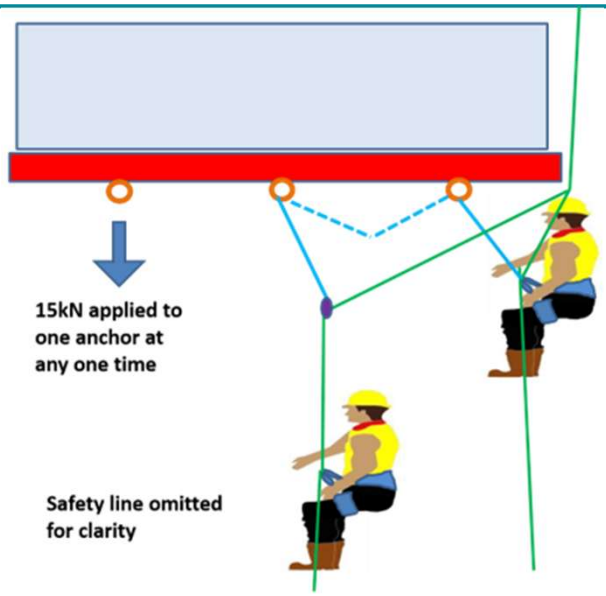
DEVIATIONS



Fall Arrest Load
(without Safety Factors)

385

"AID CLIMBING"

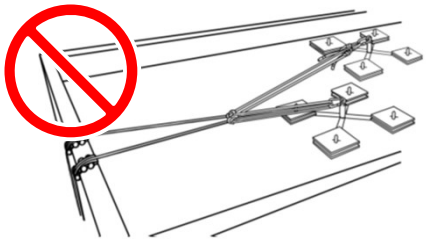


386

OBSERVATIONS ?

387

TEMPORARY ANCHORS



388

COMPETENCY SCHEME

Level 1 (entry)

- 4 days training
- 1 day assessment
- Log book

Level 2

- +12 months @ L1
- +1000 hours @ L1
- Rescue

Level 3 (Supervisor)

- +12 months @ L2
- +1000 hours @ L2
- First Aid
- Advanced Rescue

irata International
Industrial Rope Access
Trade Association

389

OBSERVATIONS ?

390

OBSERVATIONS ?

391

COMPETENCY

Query:

- **Team size**
- **Qualifications & experience** (logbook)
- **Anchors** (15kN x 2No)
- **Rope length** (down to access level)
- **Rope protection** (physical / thermal / chemical)
- **Monitoring & Communication**
- **Rescue**
- **Material feeding**
- **Tethering**
- **Ground concerns**
- **Timing** (rests / access)
- **Limits** (wind / weather / cold)

392

COMPREHENSIVE MAINTENANCE

- **User Inspection**

  ***B**efore **E**ach **O**ccasion **O**f **U**se*
- **Formal Inspection** (LOLER)

  Every **6** months
- **Anchors**

  Unquestionably reliable
- **Secure**

  Anti-tamper & restricted access

393

CONTROLS BELOW

- Spotter (radio)
- Exclusion Zone
- Activity/Materials

394

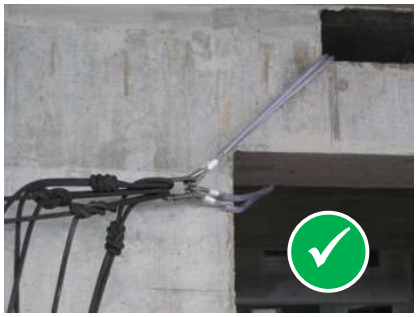
POOR ANCHOR SELECTION & POSITIONING

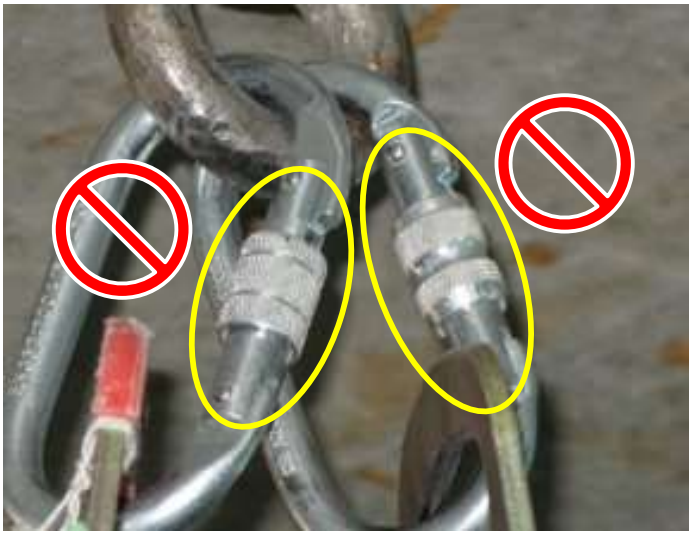
395

ROPE STORAGE

396

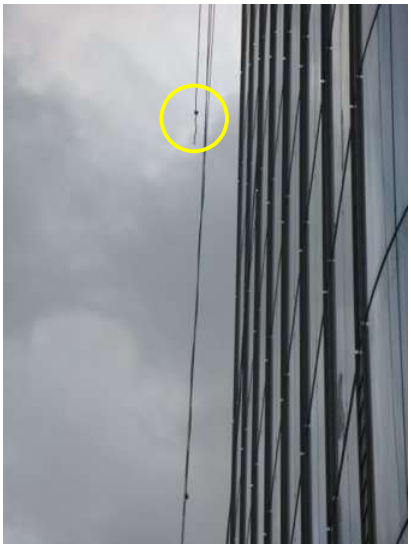
UNQUESTIONABLE?...





397

RIGGED TO RESCUE

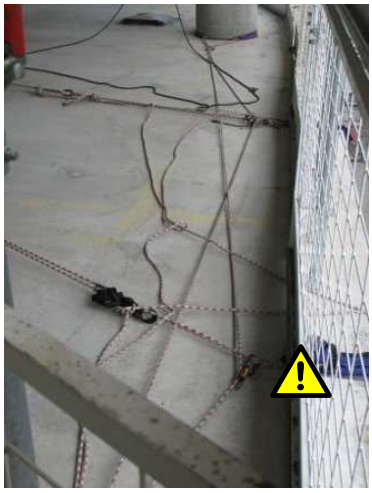


398

HIGHLY COMPETENT?!...

399

ROPE RIGGING & PROTECTION



400

EXCLUSION ZONES

401

OBSERVATIONS

402

OVER-LOADED?!...

403

QUESTIONS?

404

RISERS
STRATEGY & MANAGEMENT

405

RISER MANAGEMENT : WHY THE FOCUS?

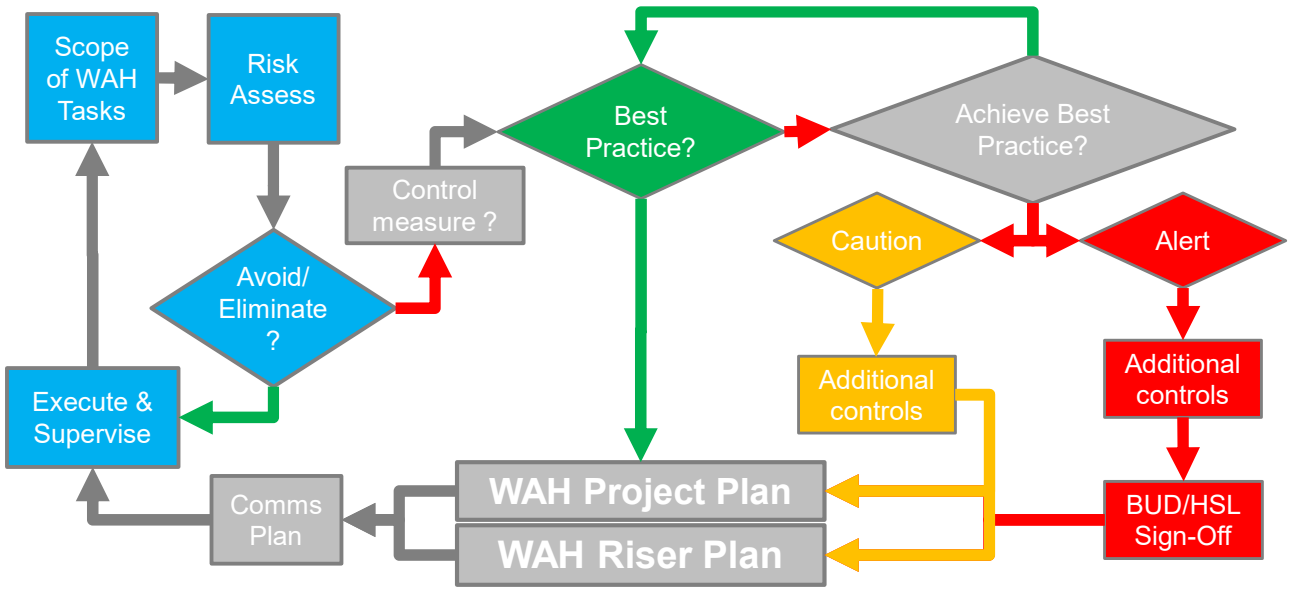
- **Start early and run throughout project**
- **Change daily**
- **Involve many trades**
- **Divide responsibilities (horizontal/vertical)**
- **Varied methods and equipment**
- **Involve "live" services**
- **Varied shapes and sizes**

Riser Strategy

- Required for every project
- Requires both floor (horizontal) & vertical protection
- No deviation without approval (BUD/HSL)

406

WORK AT HEIGHT PLANNING PROCESS



407

RISER STRATEGY

- **Developed at Tender / Pre-Construction**
  - Signed-off before frame design finalised - Utilise pre-fabrication & permanent works
  - “Real intent to use Best Practice” - Minimise activity & risk

- **Specify control measures**
  - Vertical & Horizontal - planning & positioning to reduce movement & drilling
  - Clear SWL on floors
  - Wheel stops / upstands to prevent wheeled access

408

RISER STRATEGY

Task-specific RAMS

- Minimise material falling risks
- For simultaneous activity
  - High Risk (e.g. intrusive works, use of tools equipment, materials)
    Requires; floor protection, tethering, no access below
  - Low Risk (e.g. inspections, witness tests, labelling)
- Control cutting of decks.

Riser Co-Ordinator

- Single point of control
- Daily meetings & Co-ordination Board
- Permits / Access / Trade-to-trade hand-overs

409

RISER MANAGEMENT STRATEGY

6 Strategic Plan

Using the table below, list out every riser and explain the build strategy. Refer to the guidance notes on the following page and working examples for clarity.
Please remember to drag formulas down in columns F,G,H,I to allow correct population of cells.

A	B	C	D	E	F	G	H	I
Riser Reference	Location	Riser wall / shaft Construction, incl headline construction strategy	Services to be installed	Headline Services installation strategy	Floor horizontal protection type	Edge vertical protection type (incl headline installation strategy)	Riser types	Risk Summary
2	Level 2 south building Grid x - y	Core concrete (back) Dry lining sides and front	Heating Chilled Drainage Condensate	Prefab modules lifted in by crane/bottom up (start ground floor)	F1 - a) Full modular prefabricated solution b) Modular prefabricated riser deck unit installed as the frame progresses	G2 - Scaffold based system 1.5m high with toe-board and netting	R2 - Individual or part prefab services with separately installed platform	Caution
3	Level 1 south building Grid x - y	Core concrete (back) Dry lining sides and front	Busbar Containment Gas	Services installed floor by floor	F2 - Floor deck installation installed after the frame prior to the MEP commencing	G3 - 1.5m high post and panel system ie. no rails	R1 - Fully modular prefabricated cassette with integral platform	Alert

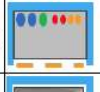
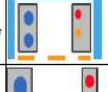
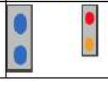
410

RISER MANAGEMENT STRATEGY

6 Strategic Plan

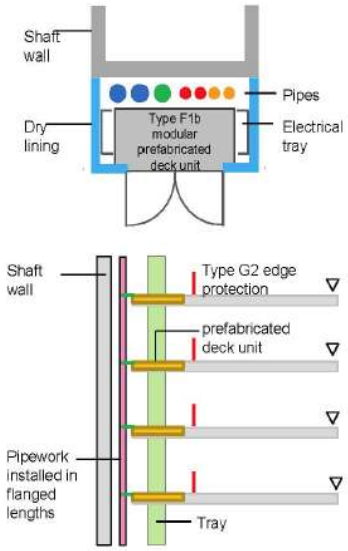
Guidance Notes:

A.	List out the same reference for each riser from the GA plans
B.	Location references as per the project specific plans
C.	Concrete, shaft wall, standard stud partition existing
D.	Exact services in the riser
E.	High Level Services Installation Strategy

F. Floor horizontal protection type	G. Edge vertical protection type	H. Riser types Key - vertical edge protection riser / shaft wall construction				I. Risk Summary
Select from the choices below	Select from the choices below	Select a type of riser from the following and insert into the table. *(If none of the below apply, select the blank cell and introduce a new reference)*				Based on the selected methods give overall status as below - If two different warning categories are shown, choose the "lesser" of the two
F1 - a) Full modular prefabricated solution b) Modular prefabricated riser deck unit installed as the frame progresses	G1 - 1.5m high triple rail system with toe-board and demountable panels	R1 - Fully modular prefabricated cassette with integral platform		R4 - Existing riser condition with platform		Best Practice
F2 - Floor deck installation installed after the frame prior to the MEP commencing	G2 - Scaffold based system 1.5m high with toe-board and netting	R2 - Individual or part prefab services with separately installed platform		R5 - Existing riser condition without platform		Caution
F3 - a) Timber based solution b) Scaffold based solution	G3 - 1.5m high post and panel system ie. no rails	R3 - Ductwork		R6 - Slots and holes formed in the riser		Alert
				R7 - Slots and holes formed in slab - individual		

411

RISER MANAGEMENT STRATEGY



412

RISER MANAGEMENT STRATEGY

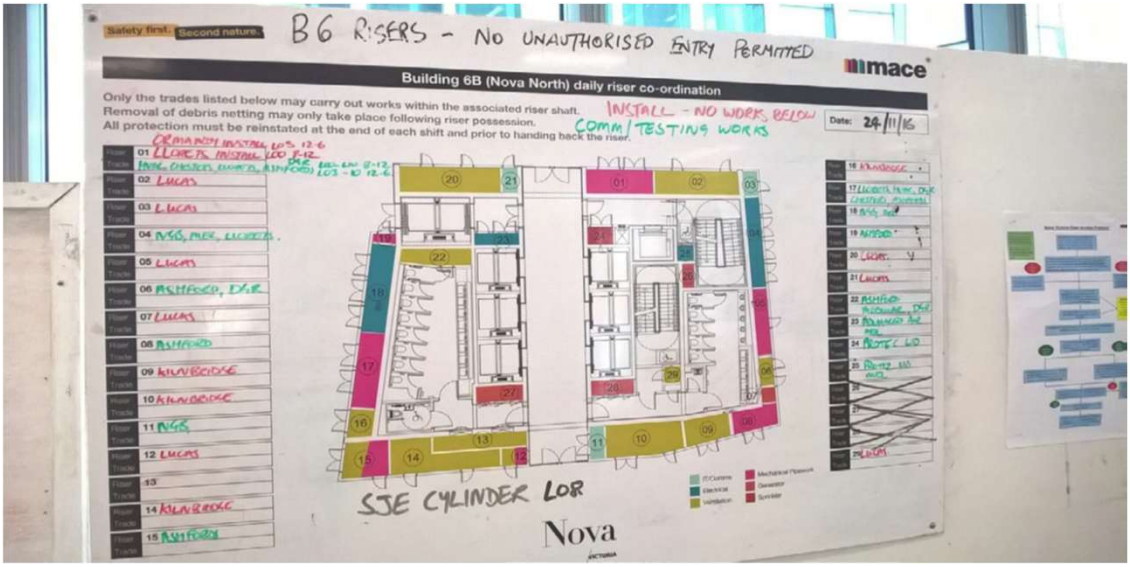
10 Sign Off

Guidance Note
Strategy document to be produced and signed off by the Senior Leadership Team and communicated to "all staff" on the project
This document must be completed during the tender stage if relevant
A full review should be carried out immediately following appointment

	Name	Sign	Date
The Team			
Project Director			
Construction Lead			
MEP Lead			
Structural Lead			
Commercial Lead			
Design Lead			
Planning Lead			
Senior Team			
Construction Director			
H&S Lead			
Business Unit Director			

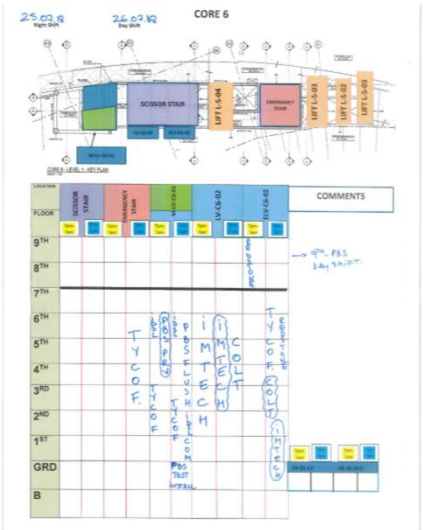
413

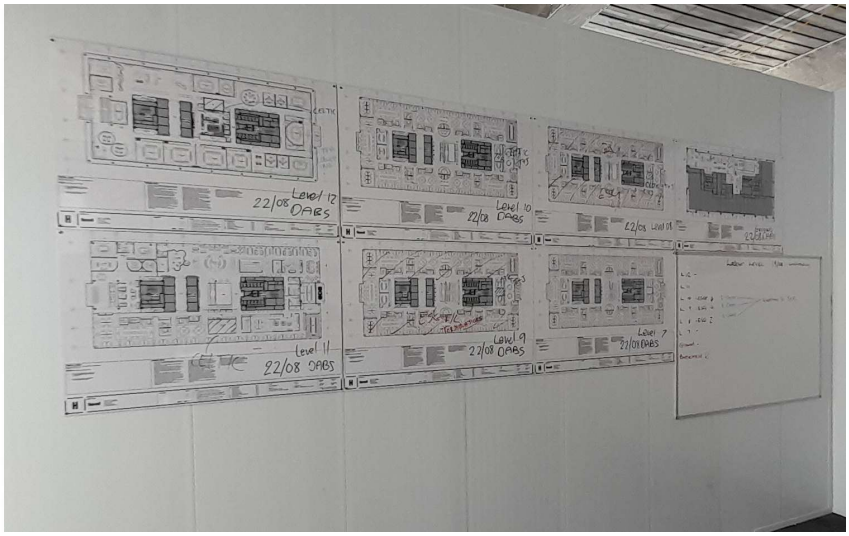
DAILY RISER COORDINATION BOARD



414

EXAMPLES OF 4D PLANS





415

RISER SIGNAGE

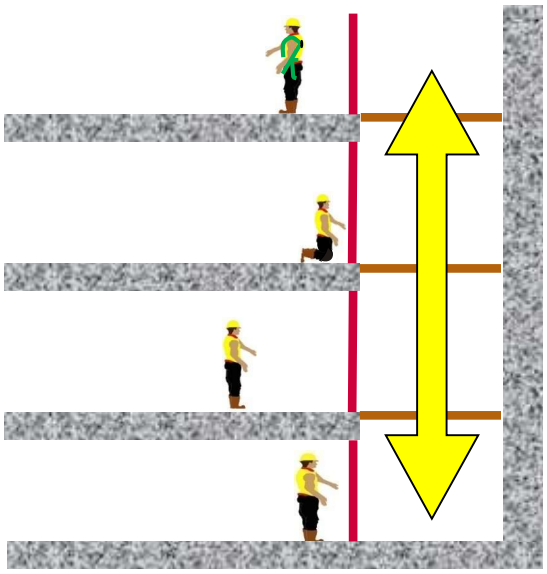
416

BEARING SURFACES

What does this mean ?

417

PROTECTION DIVIDED :



Horizontal Protection
4 Types

Vertical Protection
2 Types

Access Space Protection
1 Type

418

RISERS - COMMON MANAGEMENT CONTROLS

Horizontal & Vertical
- SSOW & competent to install/ adapt/ modify
- Authorisation for access
- Vertically alert (coordinated activities)
- Daily visual inspection (logged)
- Weekly formal inspection (tagged & logged)
- Permit to Work (MEP for charged services)
- Lighting (standard/ task/ emergency)
- Signage (large, robust, clear, pictograms)
- Change/Defect Mgt process (TWC)

Horizontal (additional)
- Load-bearing
- Physical control of access
- Tethering or containment
- Fire-rated (as required)

Vertical (additional)
- Compliant (BS EN 13374 / EPF / Mace)
- Other controls for Access (last resort)
- Changes in floor levels accommodated
- Gaps: Vert < 470, Hor < 100, TB < 6
- Can withstand plant impact or stop blocks
- No protrusions that could harm/ snag

419

HORIZONTAL FLOOR PROTECTION:

F1a - Pre-Fab Modules — Best Practice

F1b - Pre-Fab Deck — Best Practice

F2 - Deck Following Frame — Caution

F3 – Temporary / Scaffolding — Alert

420

F1A - PRE-FAB MODULES

- Self supporting with Integrated services
- Specialist team installation
- Permanent deck (load bearing) and EP
- Voids < 225mm (max)
- All EP designed to permit additional install
- Kick plates
- Fire rated
- Suitably load rating for works within

Best Practice

421

F1B - PRE-FAB DECK

Note Vertical EP must be in place for installation

- Solid Load bearing Deck or Grillage
- Installed as frame progresses
- Covers whole opening (wall to wall)
- Pre-cut & temp covers
- Support designed (no adapt needed)
- Eng support to frame
- Mesh as small as poss (< 225 or EP)
- Suitable bearing for works
- Kick plates
- Deck fire stopped as required

Best Practice

422

F2 DECK FOLLOWING FRAME

- Deck or grillage (whole area) load bearing
- Installed with building frame (from below?)
- Full cover and Cut on site
- Support designed to permit services
- Bearing suitable for works
- Small as possible mesh
- Fire stopped as required
- Kick plates
- EP etc if holes > 225
- Consider EP incorporated

Caution

423

F3 – TEMPORARY / SCAFFOLDING

- Designed for load and bearing
- Covers full opening
- Installed with frame (from below)
- Barriers to prevent overloading
- EP etc if holes > 225
- Toe boards, kick plates
- NOT fire “compartmentable” … use alternative

Alert

424

RISER … EDGE VERTICAL PROTECTION

425

VERTICAL EDGE PROTECTION

~~Post & Panel with Rail 1.5m~~

G1 - Tube & Fitting (Scaffold) 1.5m

Caution

G3 – Panel Only (No rails!) 1.5m
(no rail … no access)

Alert

426

G1 - TUBE & FITTING (SCAFFOLDING)

1.5m above slab plus debris
Triple rail
Full debris, mesh, or net cover (containment)
Eng connections
Installed with building frame
Competent installers (CISRS)
Tubes capped, No protrusions.

Caution

427

G3 – PANEL ONLY (NO RAILS!)

1.5m above slab
Only when no access needed
Approved design/fixing
No protrusions.

Alert

428

VERTICAL ACCESS SPACE PROTECTION

Controlled access process (permit to work/keys)
Installed by competent persons
Install ASAP
Signage as before in good condition
Robust defects/change process

Best Practice

Single Specialist Contractor

429

SINGLE SPECIALIST CONTRACTOR ACCESS:

- Proprietary system, covers full opening
- Fitted ASAP .. Designed fixings (NOT friction)
- EP in place before fitted
- Lockable (inside turn/escape)
- 2nd Fall prevention as required
- Mesh unless fire rated
- Vision panels or CCTV when active
- Illuminated when occupied
- Inspected and tagged < 7days

Best Practice

430

QUESTIONS?

431

WORK AT HEIGHT PLAN

432

WORKING AT HEIGHT PLAN

What?

Management process to help Project Teams:-

- **Select most appropriate WaH method for task**
- **Justify, Record, and Track the decision making**

When?

- **All projects**

Who?

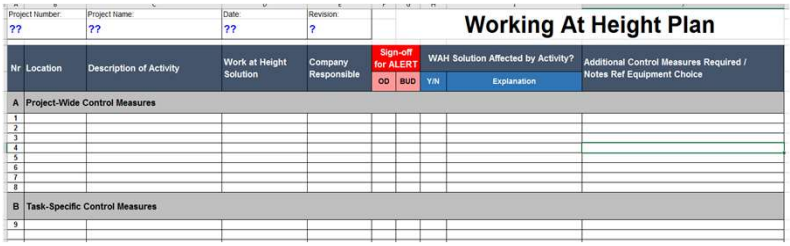
- **All MACE Construction Teams**

Where?

- **InfoMACE (MG-H&S-PR 2800-V?)**

433

WORKING AT HEIGHT PLAN



Project Number:	Project Name:	Date:	Revision:	Working At Height Plan					
??	??	??	?						

Nr	Location	Description of Activity	Work at Height Solution	Company Responsible	Sign-off for ALERT		WAH Solution Affected by Activity?		Additional Control Measures Required / Notes Ref Equipment Choice
					OD	BUD	Y/N	Explanation	
A	Project-Wide Control Measures								
1									
2									
3									
4									
5									
6									
7									
8									
B	Task-Specific Control Measures								
9									

- All WaH tasks
- Each Location & Activity (Project/ Task Specific)
- Chosen method & Risk-Rating
- **ALERT** sign-off (link to email?)
- Solution affected by activity
- Tracks changes & implications
- Note references to Guidance

434

WORKING AT HEIGHT PLAN – OPTIONS

Climbing Screens (2.6.1) - Best Practice
Proprietary post and panel, with horizontal handrail and full height screen/netting (2.6.2) - Best Practice
Proprietary post and panel, with horizontal handrail (1.5 metre height) (2.6.3) - Caution
Triple rail tube and fitting edge protection with mesh panels (minimum 1.5 metre height) (2.6.4) - Caution
Proprietary post and panel minimum 1 metre, no rails (2.6.5) - Alert
Tube and fitting edge protection (scaffolding equipment) (2.6.6) - Alert
Fans/crash decks/tunnels (2.7.1) - Best Practice
Load bearing void protection (2.7.2) - Best Practice
Access scaffold (tube and fitting or system scaffold) (2.8.1) - Best Practice
Mast climbing working platforms (MCWP) (2.8.2) - Caution
Temporary suspended access equipment (TSAE) – temporary cradles (2.8.3) - Caution
Mobile elevated work platforms (MEWPS) (2.9.1) - Best Practice
Low level powered access equipment (up to five metres) (PAV) (2.9.2) - Best Practice
Low level manual access equipment - Peco/eco/nano type units (2.9.3) - Best Practice
Mobile Aluminium Towers (2.10.1) - Caution
Aluminium podium towers/podium steps (2.10.2) - Caution
Delta Decks (2.10.3) - Caution
Ladders and step-ladders (2.10.4) - Alert
Extra wide hop-ups (2.10.5) - Alert
Work restraint systems (2.11.1) - Caution
Fall arrest systems (2.11.2) - Alert
Rope access equipment (2.11.3) - Alert

- Drop down (restrictive).
- Discuss with ESH Mgt if not available.
- Company responsible for implementation

435

WORKING AT HEIGHT PLAN

Project Number:	Project Name:	Date:	Revision:
123	Test Build	01/01/2023	A

Working At Height Plan

Nr	Location	Description of Activity	Work at Height Solution	Company Responsible	Sign-off for ALERT		WAH Solution Affected by Activity?		Additional Control Measures Required / Notes Ref Equipment Choice
					OD	BUD	Y/N	Explanation	
A	Project-Wide Control Measures								
1	RC Frame	Construction of in-situ frame	Climbing Screens (2.6.1) Best Practice	GCL	x	x	No	x	All as per Mace standards
2									
3									
4									
5									
6									
7									
8									
B	Task-Specific Control Measures								
9	Cladding Façade	Application of mastic sealant	Rope access equipment (2.11.3) - Alert	RA Abseil Ltd	1/11/22 - confirm email	2/11/22 - confirm email	Yes	Missed design opportunity to specify cladding system which did not require sealant post-install	All as per Mace standards

436

WORKING AT HEIGHT MANAGEMENT PROCESS

437

MANAGEMENT PROCESS FOR WORKING AT HEIGHT

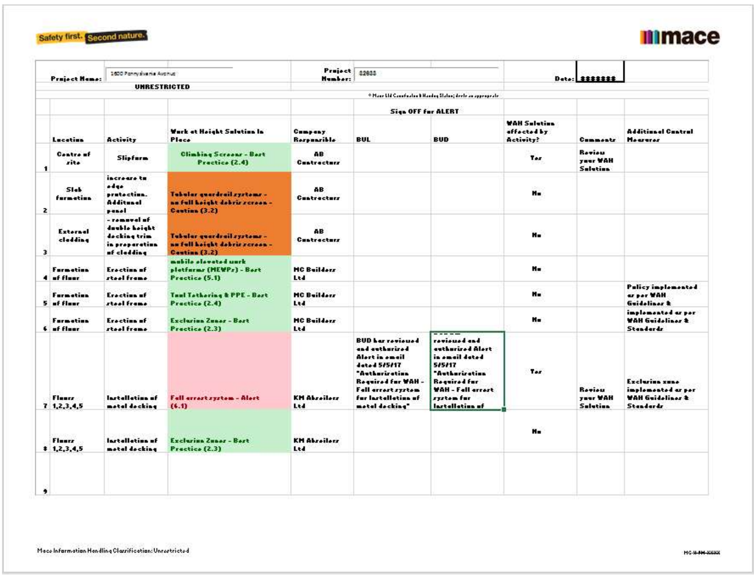
- **Live document - reviewed at least every 4 weeks**
- **Must be reflective of on site activities**
- **Within Construction Phase Plan of the PDP**
- **Communicated to all Operatives during DABs/ NABs (evidence required)**

438

WORKING AT HEIGHT AUDIT / REVIEW

439

AUDIT PROCESS/REVIEW



Safety first. Second nature. mace

Project Name:	1600 Pennsylvania Avenue		Project Number:	02603		Date:	########	
	UNRESTRICTED							

	Location	Activity	Work at Height Solution In Place	Company Responsible	Sign OFF for ALERT: BUL	Sign OFF for ALERT: BUD	WAH Solution affected by Activity?	Comments	Additional Control Measures
1	Centre of site	Slipform	Climbing Screens - Best Practice (2.4)	AB Contractors			Yes	Review your WAH Solution	
2	Slab formation	increase to edge protection. Additional panel	Tubular guardrail systems - no full height debris screen - Caution (3.2)	AB Contractors			No		
3	External cladding	- removal of double height decking trim in preparation of cladding	Tubular guardrail systems - no full height debris screen - Caution (3.2)	AB Contractors			No		
4	Formation of floor	Erection of steel frame	mobile elevated work platforms (MEWPs) - Best Practice (5.1)	MC Builders Ltd			No		
5	Formation of floor	Erection of steel frame	Tool Tethering & PPE - Best Practice (2.4)	MC Builders Ltd			No		Policy implemented as per WAH Guidelines &
6	Formation of floor	Erection of steel frame	Exclusion Zones - Best Practice (2.3)	MC Builders Ltd			No		implemented as per WAH Guidelines & Standards
7	Floors 1,2,3,4,5	Installation of metal decking	Fall arrest system - Alert (6.1)	KM Abseilers Ltd	BUD has reviewed and authorised Alert in email dated 5/5/17 "Authorisation Required for WAH - Fall arrest system for Installation of metal decking"	reviewed and authorised Alert in email dated 5/5/17 "Authorisation Required for WAH - Fall arrest system for Installation of	Yes	Review your WAH Solution	Exclusion zone implemented as per WAH Guidelines & Standards
8	Floors 1,2,3,4,5	Installation of metal decking	Exclusion Zones - Best Practice (2.3)	KM Abseilers Ltd			No		
9									

Mace Information Handling Classification: Unrestricted

Note:-
- Dated (4 weeks)
- **ALERT** sign-off
- Additional measures

440

AUDIT QUESTIONS:-

- Has the Mace Project Team received the WAH training?
- Does the Project Team know where to find the latest WAH Guidelines & Standards (MG-H&S-PR-2800-V#)?
- Has the WaH Plan been completed for the project?
- Where the WAH Plan identifies risk at '**Alert**' level, – has
  - this been communicated and
  - specific approval been granted by the BUD and HSL?
- Has the latest WAH Plan been briefed to Mace employees/ contractors?

441

AUDIT QUESTIONS:-

- Has the latest WAH Plan been briefed to supply chain managers and supervisors?
- Has the WAH Plan been reviewed on a monthly basis?
- At the time of inspection, have all WAH tasks been captured within the WAH Plan?
- Is a permit to work procedure in place for all relevant WAH tasks (e.g. ladder use/ riser access etc)?
- Is safe WAH behaviour observed on site at all times during inspection?

442

QUESTIONS?

443