

[illegible]

- 
- Please Exit
Before
Tweeting
About It**



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-
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-

1

Trainer Intro



John Hynes

- Originally a civil engineer
- BEng & MSc(Eng)
- 30 years (approx.) working at height
- Wide range & depth of experiences
- Involved with British Standards & various trade organisations
- Family / Running / Villa / Wine

4

Autumnal Services



Consultancy Service

Project Advice / Supervision / Inspection / Reviews

Business Development

Planning / Process / Product Development & Advice

Education & Training

Awareness / Regulations / Best Practice

Expert Witness

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5

Something about you...

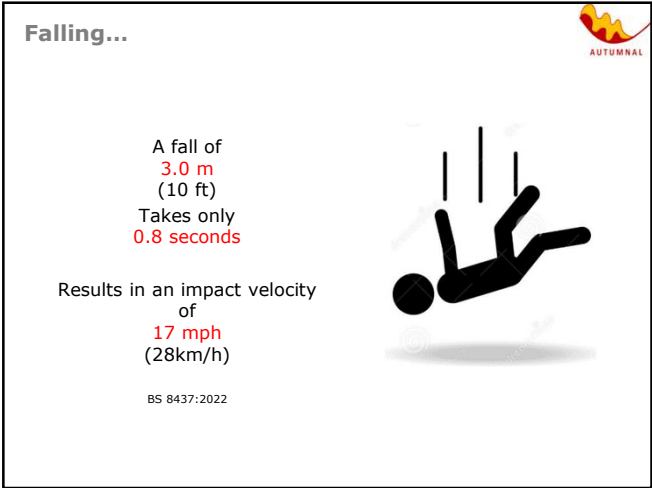


- Role & Project?
- Experience & Expectations of training?
- When you're not at work?

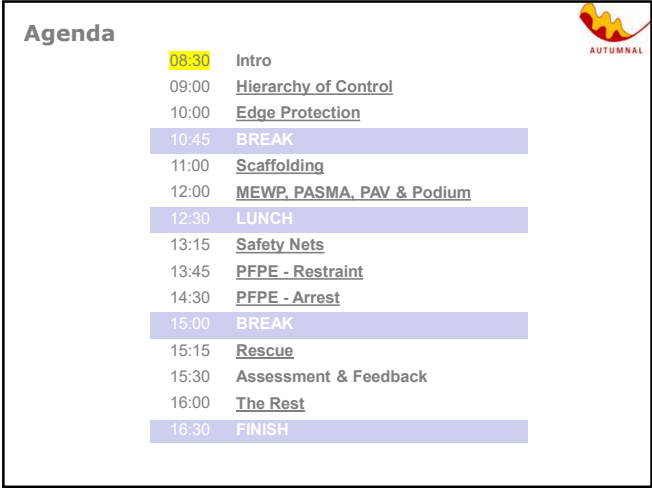
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Assessment



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Feedback



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Hierarchy of Control

Work at Height Regulations 2005

1

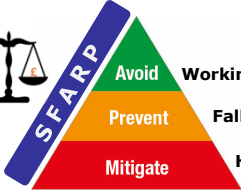
Work at Height Regulations



- European Directive (2001/45/EC)
- Enacted April 2005
- Applies to all work (not just construction)
- Definition ...
"any place from which, if no action were taken, a person could fall .. likely to cause injury"
- Hierarchy of controls
- Unifies existing

2

WAHR



Avoid Working at Height
Prevent Falls
Mitigate Height & Consequences of Falls
- Controlled Arrest
- Prompt Rescue

Consider:

Collective	before	Personal
Passive	before	Active
Permanent	before	Temporary

3

Risk



Hazard
Something with the potential to cause harm

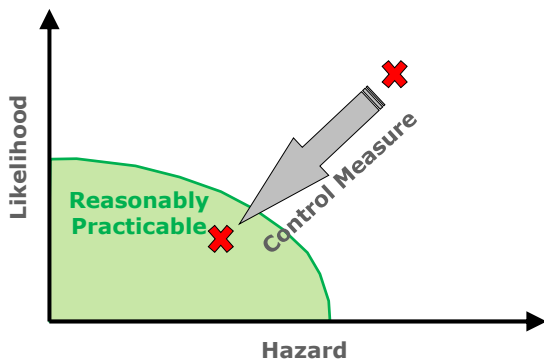
Likelihood
Chance of encountering Hazard

$\text{Risk} = \text{Hazard} \times \text{Probability}$

Control Measures
Used to manage risk

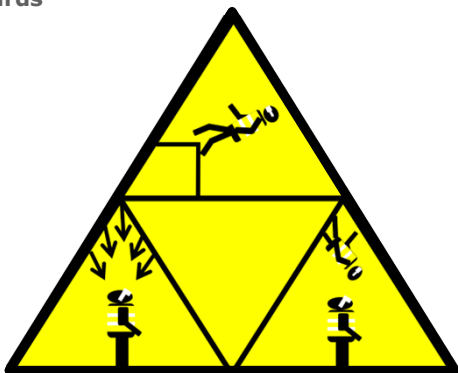
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Risk Management



5

Hazards



6

Other Hazards



Responsibility?

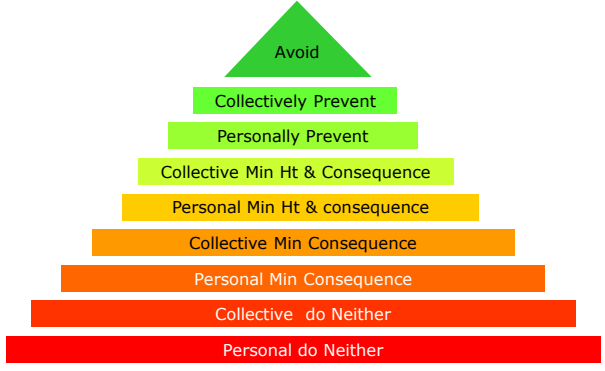
Falling:

- People
- Tools / Equipment
- Materials / Debris



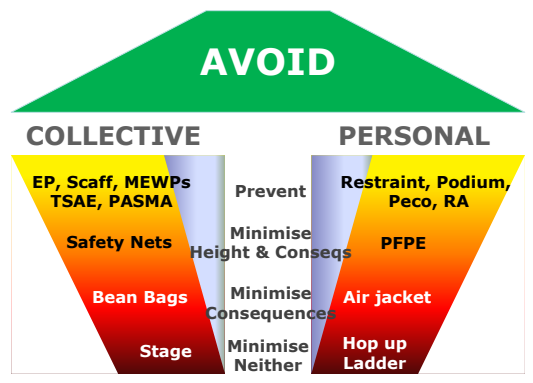
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Height Safety hierarchy



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Hierarchy Examples



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Avoid



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Avoid



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Collective Prevention



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Collective Prevention



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Collective Prevention



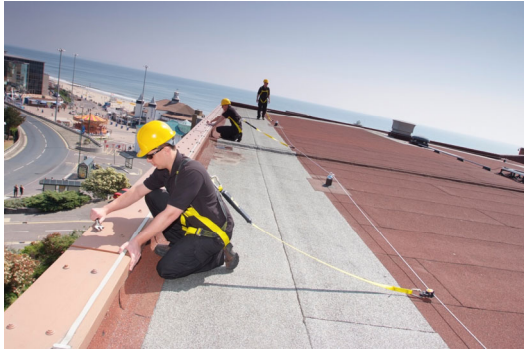
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Personal Prevention



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Personal Prevention



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Collective Minimised Height & Consequences



17

Collective Minimised Height & Consequences???



18

Personal Minimised Height & Consequences



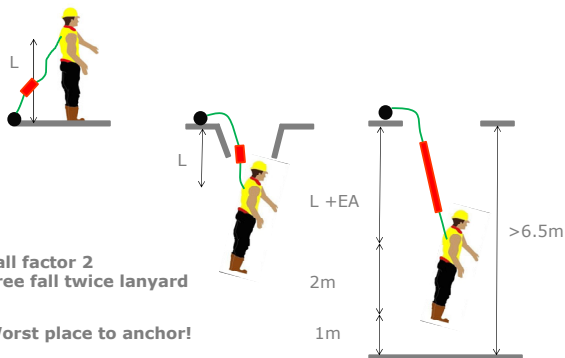
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Personal Minimised Height & Consequences



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Fall Factor 2



21

Fall Factor 1

Fall factor 1
Free fall 1 x length of lanyard

Shorter the lanyard... higher anchor point
Less the free fall, the EA extension, the clearance

22

Fall Factor 0

Often not often practical !!

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Fall Factor 0
Inertial Reel

No slack = minimum free-fall
(AKA: Arrest Block, Retractable, SRL)

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Significance of Anchor Height

25

Selection Guidance

Work Equipment	Collective	Personal
Prevents a Fall	Edge Protection Systems, Advanced Guard Rails, Working Platforms	Fall Factor 0 (PFPE) Pulpit steps, Single user MEWPs
Minimises Height and Consequence	Nets close, Material nets, Soft landing systems	Fall Factor 1 (PFPE) Fall Factor 2 (PFPE)
Minimises Consequence	Net at low level (< 6m) Remote soft landing systems	Lifejackets Inflating air suits Injury Reduction
Does neither	Hop ups, Trestles, Platforms	Ladders Stilts

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Selection Examples

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Passive v Active



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Passive v Active



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Passive v Active



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Passive v Active



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What is it all about .. really ?



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Questions?

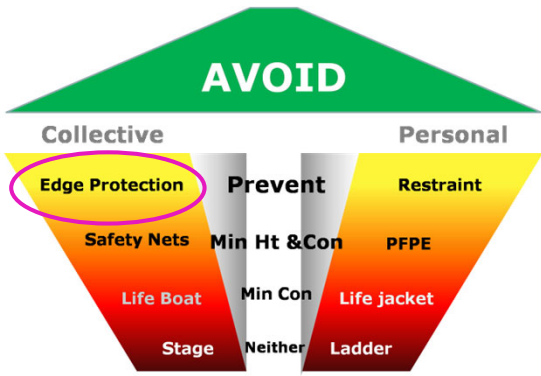
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Edge Protection Systems
(Collective Prevention)

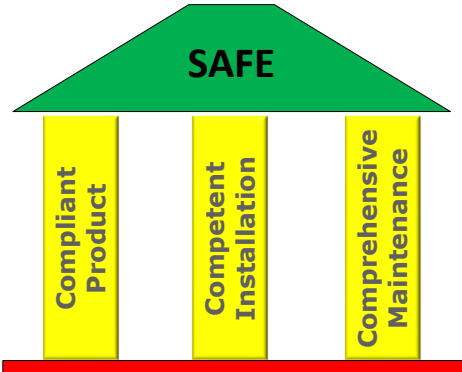
1



The diagram is a pyramid divided into three vertical sections: Collective, Prevent, and Personal. The top section is green and labeled 'AVOID'. The middle section is yellow and labeled 'Prevent'. The bottom section is red and labeled 'Ladder'. The Collective section includes 'Edge Protection' (circled in pink), 'Safety Nets', 'Life Boat', and 'Stage'. The Prevent section includes 'Min Ht & Con', 'Min Con', and 'Neither'. The Personal section includes 'Restraint', 'PFPE', 'Life jacket', and 'Ladder'.

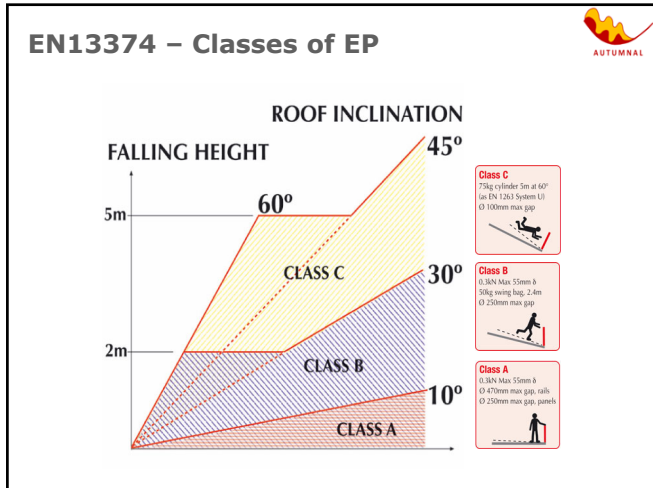
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The 3 C's of a Safe Installation

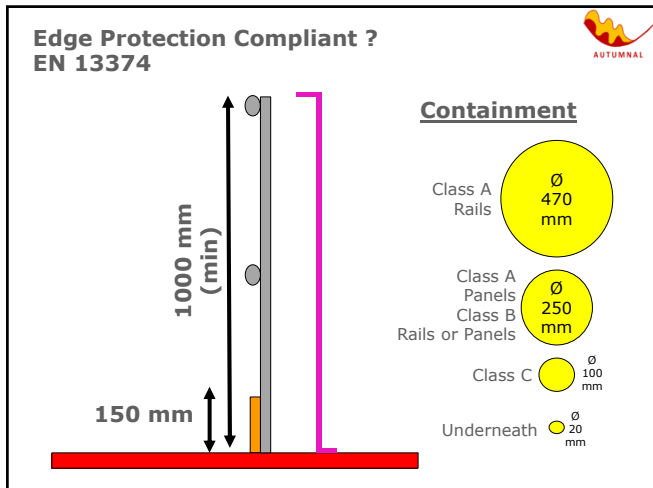


The diagram shows a green roof labeled 'SAFE' supported by three yellow pillars. The pillars are labeled 'Compliant Product', 'Competent Installation', and 'Comprehensive Maintenance'. The pillars are on a red base.

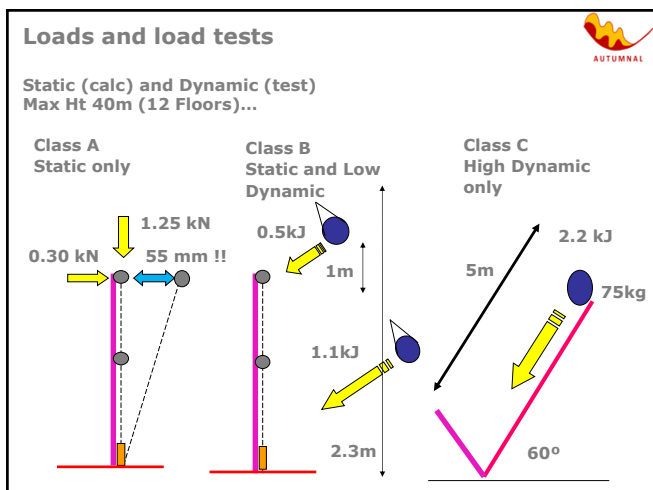
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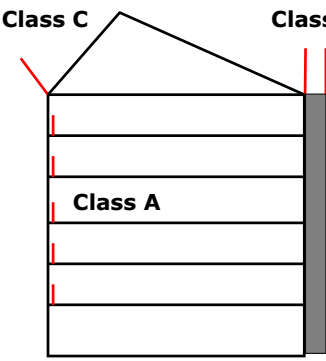


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EN 13374



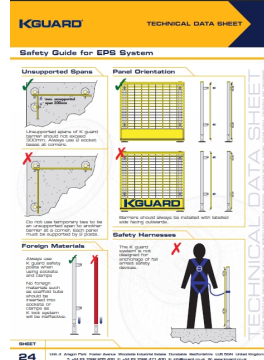
All Classes
1.0m min height

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



7

Compliant Product

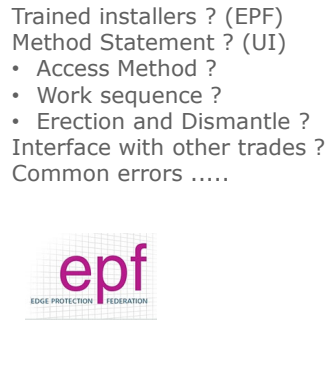


COMBISAFE
TEMPORARY EDGE PROTECTION



8

Competent Installation



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





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3

Competent Installation

Typical mesh barrier components for concrete slabs

Concrete Frame
Steel Frame
Free Standing
Screen Systems
Tube & Fitting

10

EDGE PROTECTION FEDERATION

Concrete Frame

11

EDGE PROTECTION FEDERATION

Concrete Frame

Socket base assembly.

Typical Edge Protection to Slab Surface

Safety Post

Safety Barrier

1000mm

Distance subject to manufacturer's recommendation

Slab clamp arrangement

Safety Post

Safety Barrier

1500mm

System clamped to Slab Edge

Upright Beam Slab Clamp arrangement

Safety Post

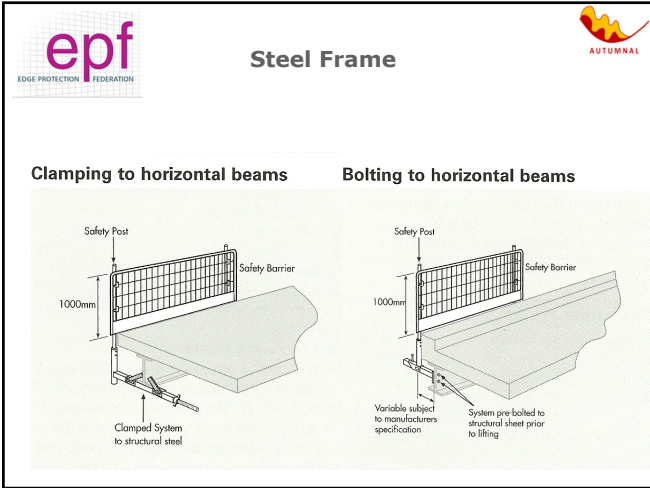
Safety Barrier

Profile of Permanent Barrier

1500mm

Clamped System to Concrete Upright

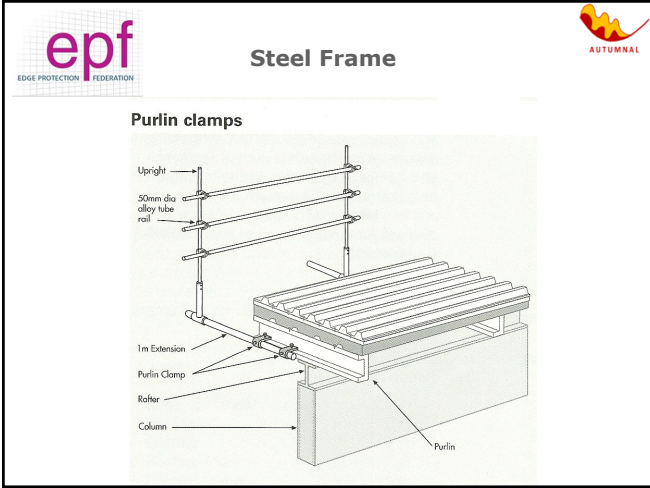
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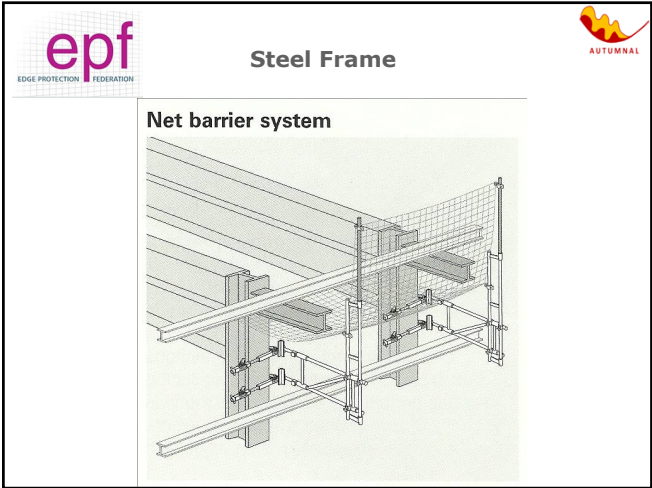
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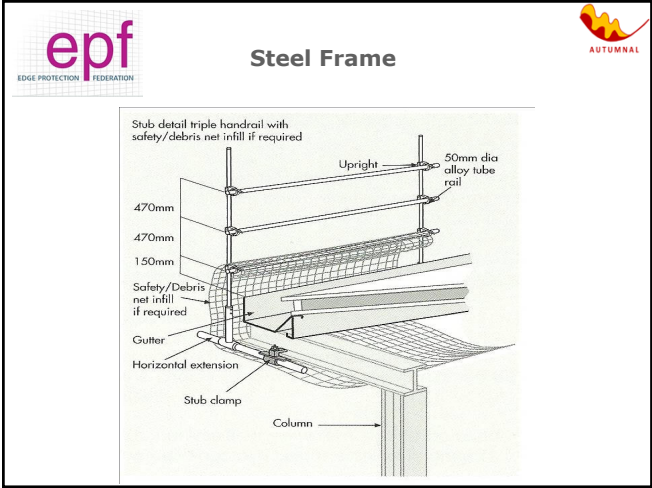
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EDGE PROTECTION FEDERATION

Free Standing





Must comply with BS13700 if permanent (wind load calc)

19

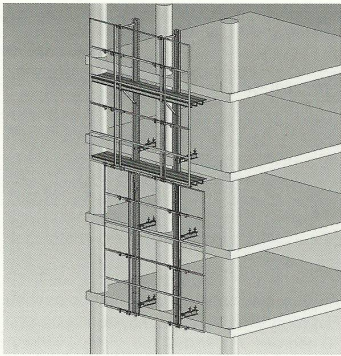


EDGE PROTECTION FEDERATION

Screen System



Climbing screen system



20



EDGE PROTECTION FEDERATION

Screen System





21



EDGE PROTECTION FEDERATION

Screen System





22



EDGE PROTECTION FEDERATION

Tube & Fitting





23



EDGE PROTECTION FEDERATION

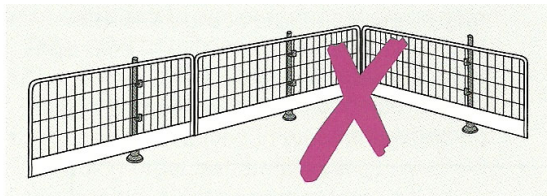
Hazard Identification



- Falls from Height
- Falling Materials
- Manual Handling
- Inadequate Space
- Inadequate Access
- Lifting & Lowering
- Competence
- Structural Integrity

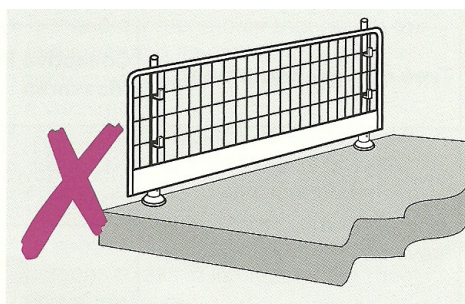
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Common problems – Inadequate supports



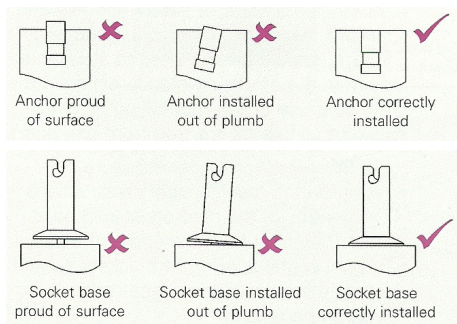
25

Common problems – Too close to slab edge



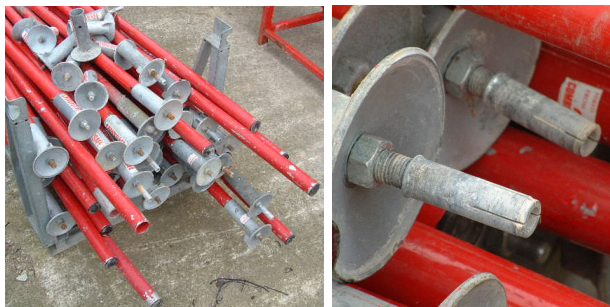
26

Common problems – Poor anchor installation



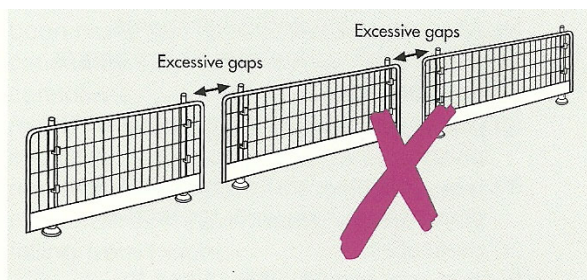
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**Common problems –
Evidence of incompetence**



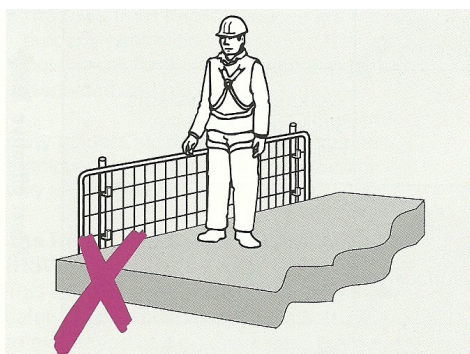
28

**Common problems –
Excessive gaps**



29

**Common problems –
Level change & too short**



30

Common problems –
Step Set-Back for Class A

1000mm Min
300mm Max
PRIMARY BEAM
Falsework Leg

3 x 'Y'
But NOT less than 1.0m
PRIMARY BEAM
Falsework Leg
'Y'

SLABS UP TO 300mm THICK
SLABS OVER 300mm THICK

The above cantilevers are required to maintain the integrity of Class A edge protection systems.
For the larger cantilevers consideration must be given to the falsework/formwork design.
If the above cantilevers cannot be maintained then the system may have to be extended in height and braced back to the formwork deck. Extensions are only a visible barrier on slabs over 500mm. Alternatively the system may have to be designed to suit the requirements of Class B/C Edge Protection.

31

Common problems –
Orientation of formwork beams

Insufficient strength

32

Common problems –
Orientation of formwork beams

Vokomatik - Tisch 2,00 x 5,00 m

33

**Common problems –
Orientation of formwork beams**



34



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Comprehensive Maintenance



- Product condition
- Handover ?
- On-going Inspection ?
- Fit for Purpose ?

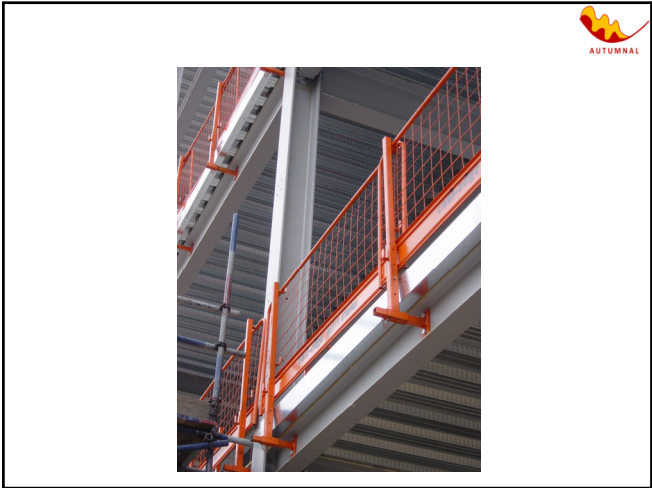
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Scaffolding

1



AVOID	
COLLECTIVE	PERSONAL
Edge Protection & Scaffold	PFPE - Restraint
Safety Nets	PFPE - Arrest
Bean Bags	Air Jacket
Stage	Ladder
Prevent	
Min Ht & Cons	
Min Cons	
Neither	

2

Scaffolding Familiarisation



SAFE		
Compliant Product	Competent Installation	Comprehensive Maintenance

3

Scaffold Standards & Guidance

Components:

- Tubes
- Fittings
- Boards

EN 39, or EN 10210
EN 74 (BS 1139)
BS 2482

System Scaffolds

EN 12810

Tube & Fitting Scaffolds

EN 12811

Design (simple)

NASC TG20:21

Safe Working

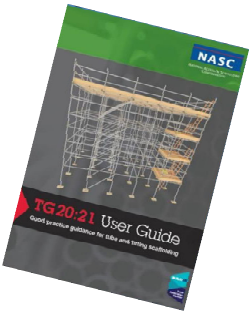
NASC SG4:22



4

NASC TG20

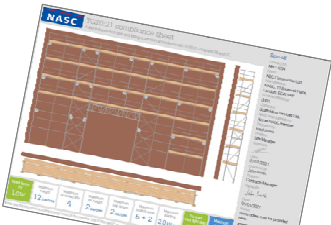
- National Access & Scaffolding Confederation
- All work platforms must be designed
- TG20 can be used for “simpler” scaffolds
- Otherwise Temporary Works design required





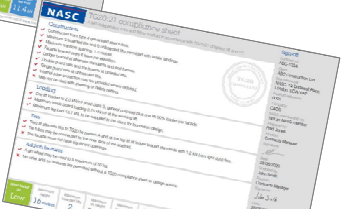
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Compliance Sheet



Maximum:

- Height
- No. Boarded Lifts
- Lift Height
- Bay Length
- Width (boards)
- Loading (kN/m²)





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2

Load Classes

1. Very Light Duty	0.75 kN/m ²
2. Light Duty	1.5 kN/m ²
3. General Purpose	2.0 kN/m ²
4. Heavy Duty	3.0 kN/m ²

Only 1 lift to 100% & 1 more to 50% of load class

VERY LIGHT DUTY USE ONLY

Maximum Uniform Load:
0.75 kN/m² = 75 Kg/m²
150kg / sq. foot
Equivalent to Load Class 1

Net Wt.

⚠️ **CAUTION:** Maximum capacity reached. Do not exceed load capacity.

LIGHT DUTY USE ONLY

Maximum Uniform Load:
1.5 kN/m² = 150 Kg/m²
300kg / sq. foot
Equivalent to Load Class 2

Net Wt.

⚠️ **CAUTION:** Maximum capacity reached. Do not exceed load capacity.

GENERAL PURPOSE USE ONLY

Maximum Uniform Load:
2.0 kN/m² = 200 Kg/m²
400kg / sq. foot
Equivalent to Load Class 3

Net Wt.

⚠️ **CAUTION:** Maximum capacity reached. Do not exceed load capacity.

HEAVY DUTY USE ONLY

Maximum Uniform Load:
3.0 kN/m² = 300 Kg/m²
600kg / sq. foot
Equivalent to Load Class 4

Net Wt.

⚠️ **CAUTION:** Maximum capacity reached. Do not exceed load capacity.



7

TG20 Designed Scaffolds

- Façade (Sway) Bracing - every 6 bays
- Ledger bracing – alternate bays
- Boarded Lifts – Double guard rail (at least!)
- Un-Boarded Lifts – Single guard rail
- Ties – Alternate Lifts – Duty Specified



8

Example – Tied Independent Scaffold



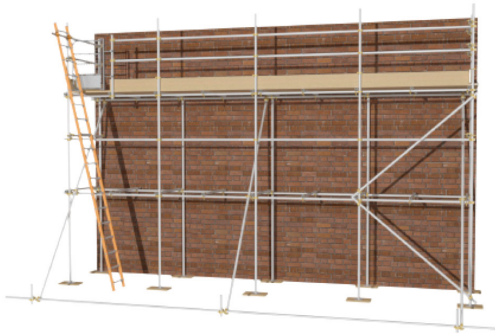


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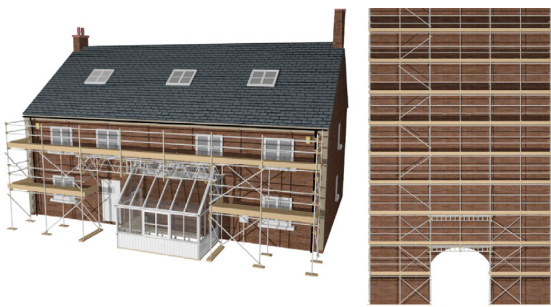
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Example –Free-Standing Independent Scaffold



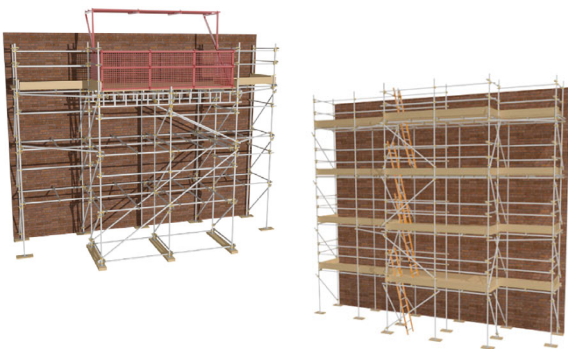
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Example – Bridging Beams



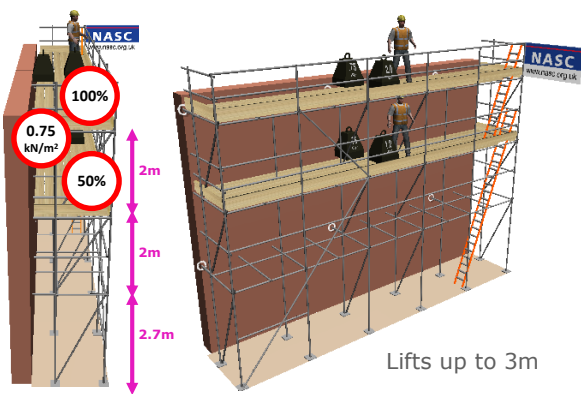
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Example – Loading Bay & Ladder Tower



12

Loaded Lifts



13

Ledger Bracing

Brace alternate bays

Or Structural Transoms (e.g. "Readylock")



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Other Compliant Features

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

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

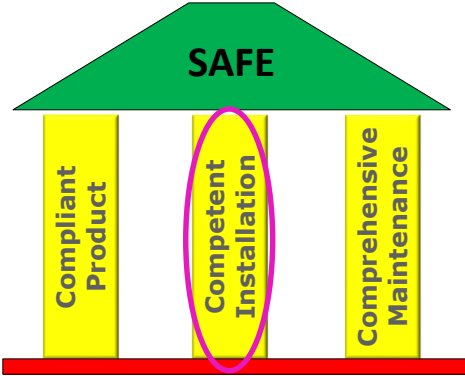
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Access & Egress
Ladders, Stairs & Hoists



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Safe Scaffolding Operations



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Competent Installation



Note NASC Safety Guidance.

- Working From Vehicles
- Manual Handling
- Preventing Falls

Considered Trainee until CISRS and NVQ

Refresher training ? Months. Recorded.

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

18

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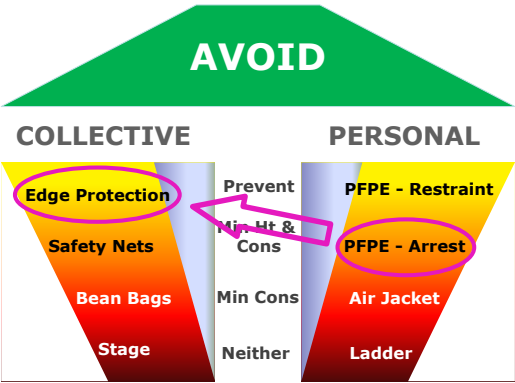
Good Old / Bad Old Practices





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Intention of SG4





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NASC SG4
Preventing Falls in Scaffolding Operations





Sections

1. Introduction

2. Planning for WAH

3. Principles of Fall Prevention & Protection

4. Collective Fall Protection

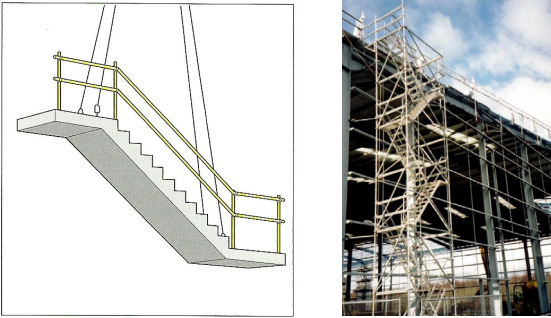
5. Personal Fall Protection

6. Methods of Access & Egress

7. Other Scaffolding Applications

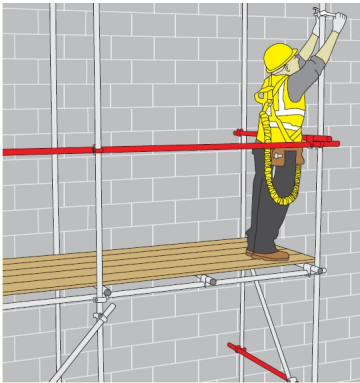
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Avoid WAH



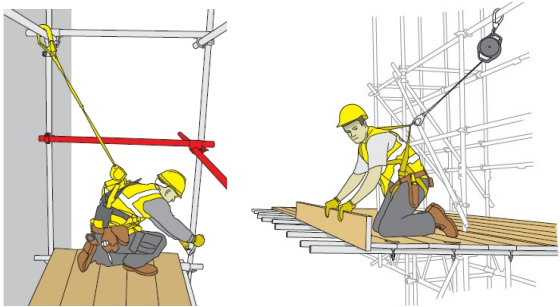
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Collective Fall Prevention

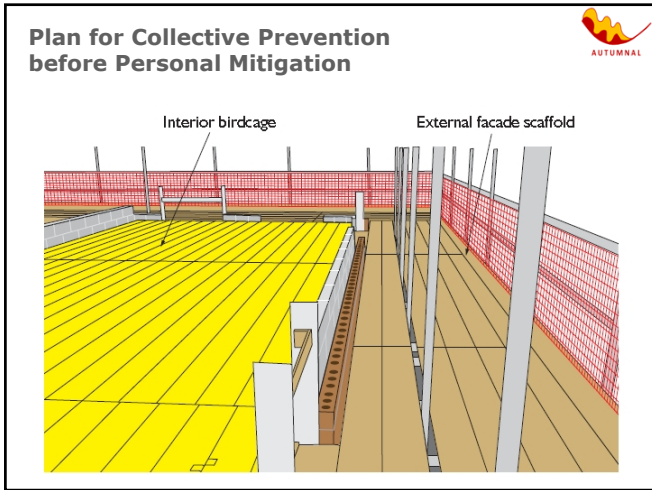


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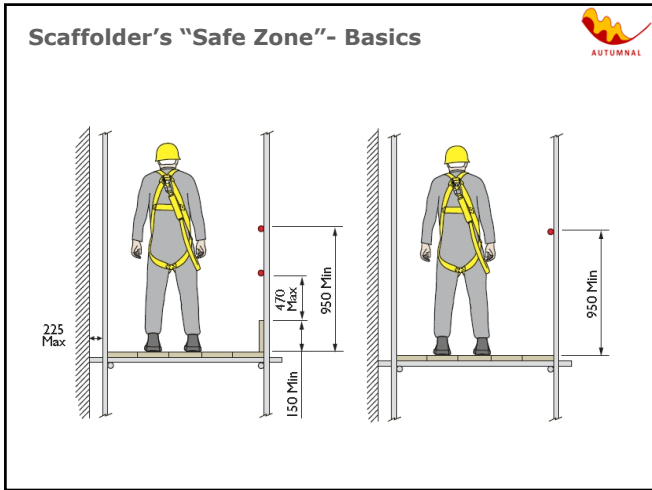
Personal Fall Mitigation



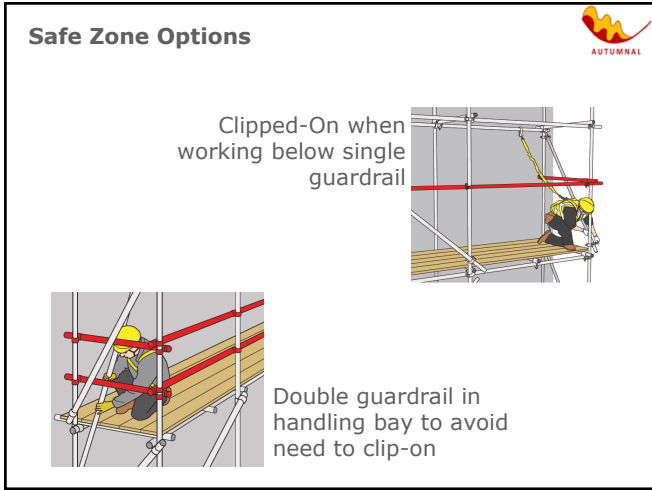
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AGR – Advanced GuardRail

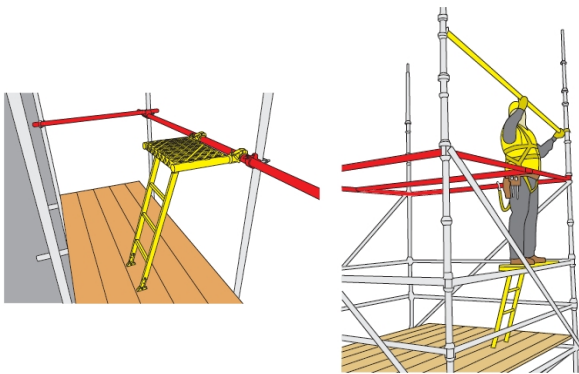


GuardRail
for next lift,
installed in advance
of it being accessed



28

Providing Safe Zone from Below



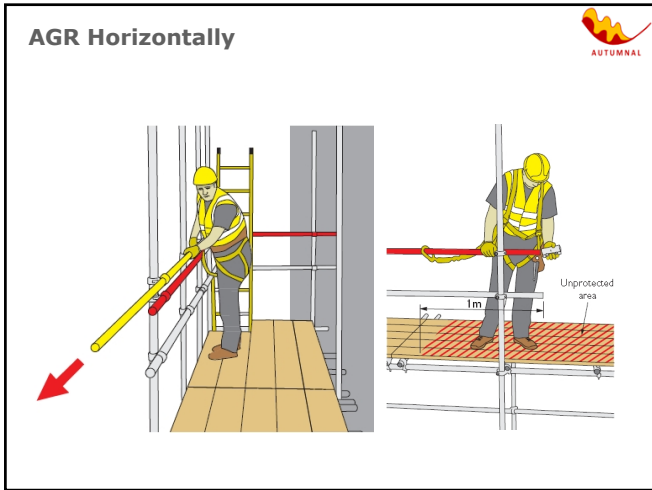
29

Personal Protection for AGR

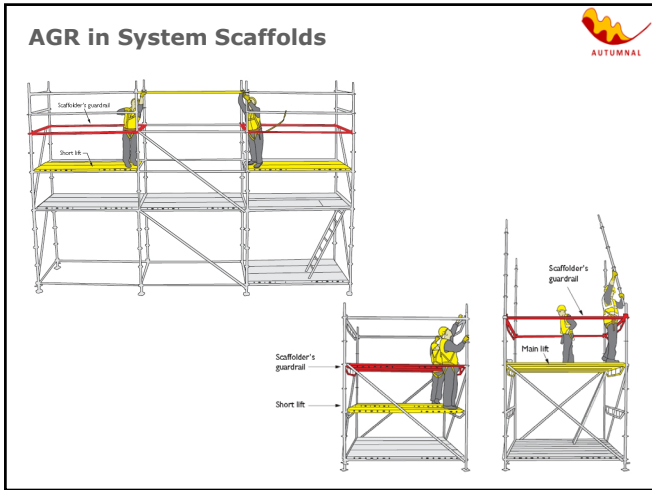


Clip-on high
&
minimise slack

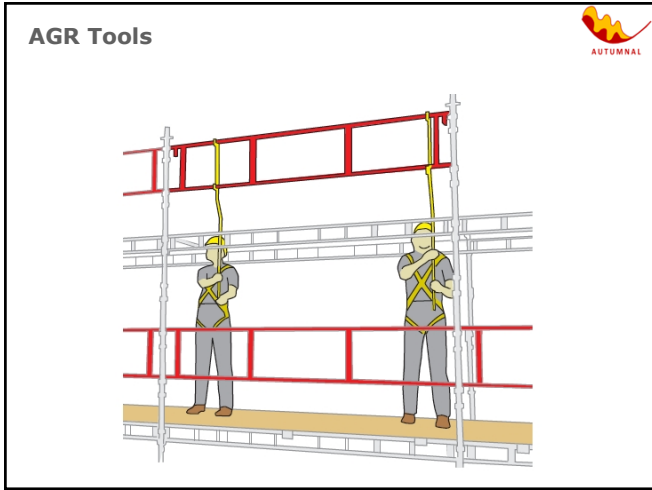
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AGR Systems

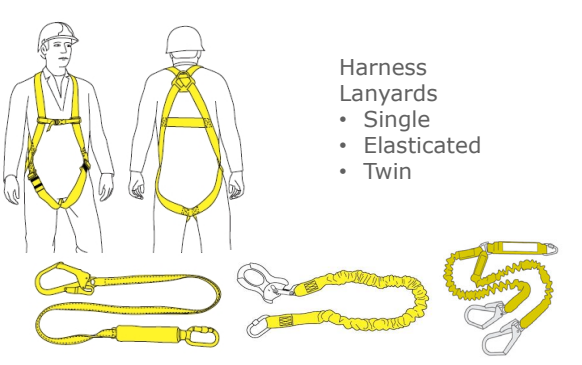


The diagram on the left shows a worker on a scaffold with a yellow AGR (Automatic Guarding Rail) system. The photo on the right shows a worker on a construction site with a similar system installed on a steel frame.

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Scaffolder's PFPE



The diagram on the left shows two types of harnesses: a single lanyard and a twin lanyard. The photo on the right shows a worker on a scaffold with a yellow lanyard system installed.

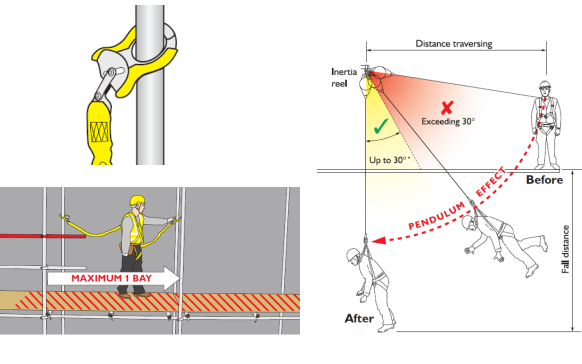
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Harness Lanyards

- Single
- Elasticated
- Twin

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Use of PFPE in Scaffolding



The diagram on the left shows a worker on a scaffold with a yellow lanyard system. The photo on the right shows a worker on a scaffold with a yellow lanyard system installed. The diagram on the right illustrates the 'Pendulum Effect' where a worker's fall distance is increased by the length of the lanyard, potentially exceeding 30 degrees. The photo on the left shows a worker on a scaffold with a yellow lanyard system installed, with a label 'MAXIMUM 1 BAY' indicating the maximum distance traversing.

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Anchor Points

Ledger on right angle couplers

Guardrail on right angle couplers

Proprietary anchor devices for standards

As per system scaffold manufacturer's instructions

Suitable Anchors

Ledger or guardrail on single couplers

No joints in ledger or guardrails

Standards without suitable anchor device

Standards with a joint above the platform

Transoms below foot level

Putting transom or bridle tube

Transoms underlaid on non load-bearing couplers

Reveal ties

Vertical bracing

Open ended tube

Unsuitable Anchors

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Rescue

- Plan must be in RAMS
- May vary by location
- All kit & competency immediately available

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Scaffolding Familiarisation

SAFE

Compliant Product

Competent Installation

Comprehensive Maintenance

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Comprehensive Maintenance

- Handover
 - From competent scaffolder
 - Certificate & Compliance Sheet
- Inspection Frequency
 - Weekly
 - Adjustment or Adverse events
- Inspection Recording
 - Logged & tagged





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Ties

- Check design
 - Duty
 - Type
 - Position
- Tagging
 - Unique refs
 - Clear & sequential
 - Inspection records





41



AUTUMNAL

Questions?

42

43

14



AUTUMNAL

MEWPs

PASMA Towers

PAVs & Podiums

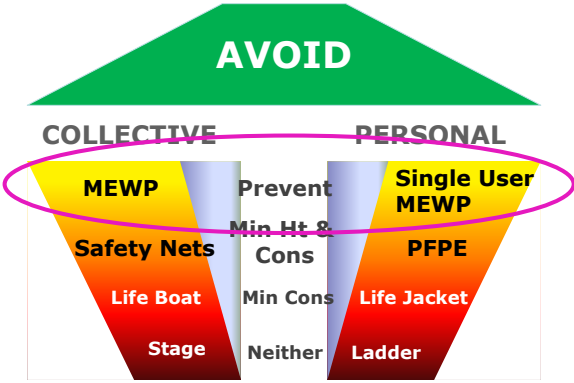
1

Collective Prevention



2

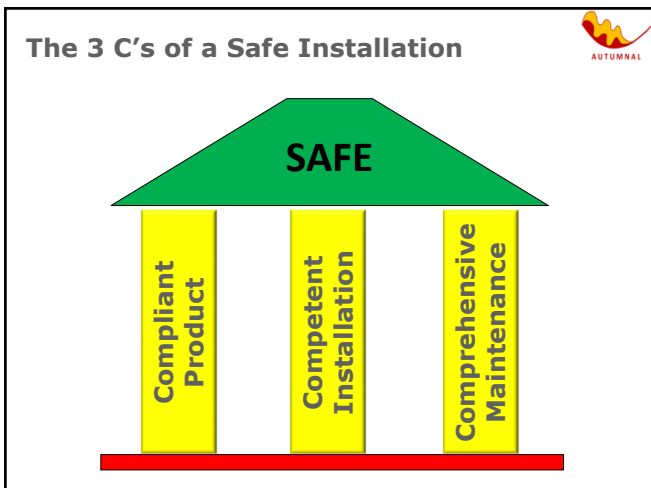
The Hierarchy



3







Compliance ?

EN 280
BS 8460
HSE Guidance .. lots

Competence ?




Maintenance ?

Handover
Familiarisation
On-going .. beoou



7

Selection Considerations

- **Type** - single, multi, vertical, up and over
- **Reach** - vertical/ horizontal, obstructions
- **Fuel** - (bio-)diesel, electric (charging), gas
- **Wheels** - inside, outside, bearing, puncture
- **Basket** - size, slewing, access
- **Boom** - straight, articulated, fly-jib, down, under
- **Deck** - extensions, off-set, lifting
- **Capacity** - people, equipment, materials
- **Footprint** - counterweight, width, length, radius
- **Access** - doorways etc
- **Delivery route** - roads, clearance, off-loading
- **Obstructions** - overhead/ underground
- **Weather**



8

Scissor





9

Competent Management



10

Risk of Trapping or Crushing



BAM – Requirement
BS8460 – Recommendation

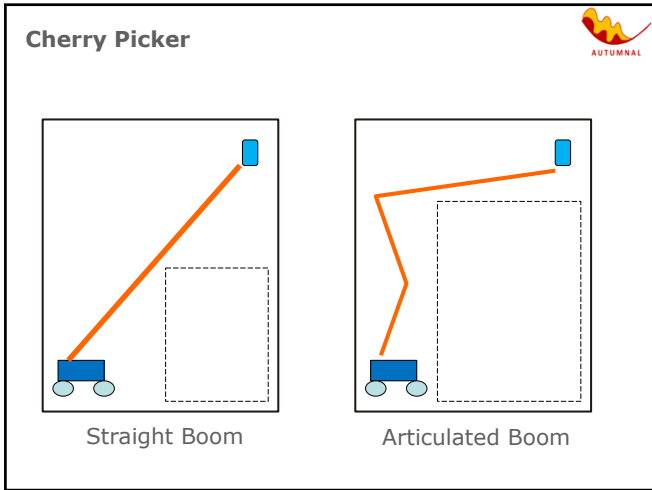


11

Trapping Injuries



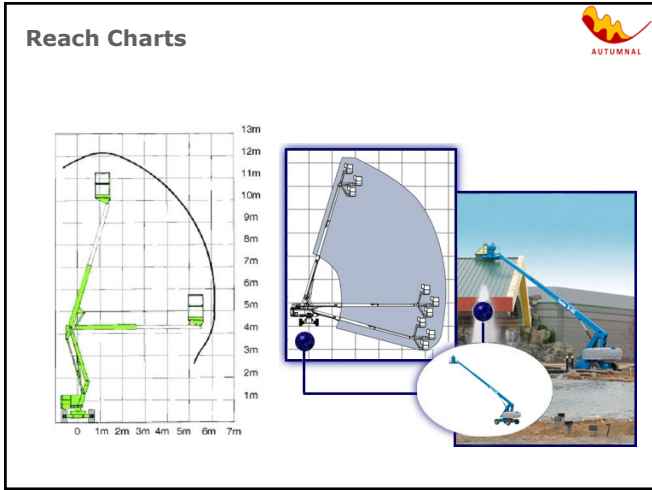
12



13



14



15

Cherry Picker - Features



16

High-Level Runways



17

Access Restrictions



18

Ground Bearing



19

Ground Bearing & Services



20

Other Vehicles & Obstructions



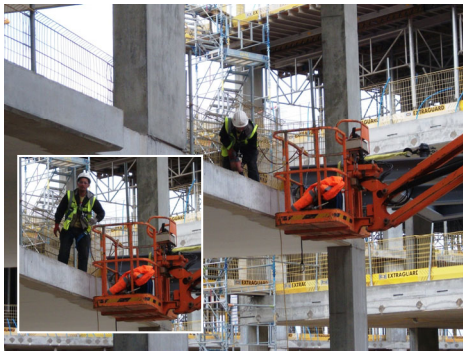
21

Pedestrian Interactions



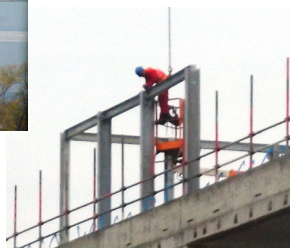
22

Issues – Climbing Out



23

Issues – Standing on Guardrails



24

IPAF on PFPE in Cherry Pickers



When working from a boom type MEWP, it is strongly recommended that a full body **harness** with an **adjustable lanyard** be used to provide work restraint.



The lanyard should be adjusted to be as short as possible and may contain an **energy absorber**.

25

Rescue ?



- Keep it simple - Boring!
- Use ground controls
Competent person
- Service agreement for
break-downs
- Practice
Experience
Competence

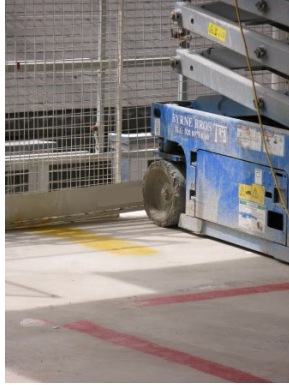
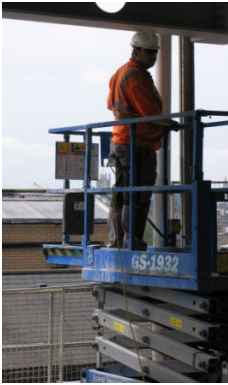
26

Observations ?



27

Observations ?



28

Observations ?



29



AUTUMNAL

MEWPs
PASMA Towers
PAVs & Podiums

30

Compliance ?

EN 1004 ?

Competence ?


Who can USE it ?

Maintenance ?

Handover
Not less often than 7 days ?
Adjustment
On-going .. Beoou
Whom



31



3T

- Through The Trapdoor





32

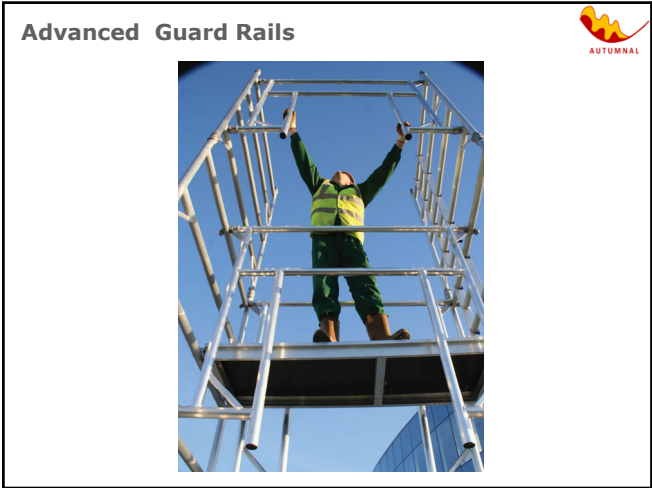




33



34



35



36

Podiums & PAVs

Compliance ?

PAS 250 / BS8620
PASMA

Competence ?



Maintenance ?

Handover
Inspection



Opportunity !?



37

Podium Steps - Compliance

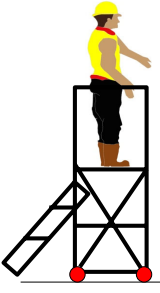




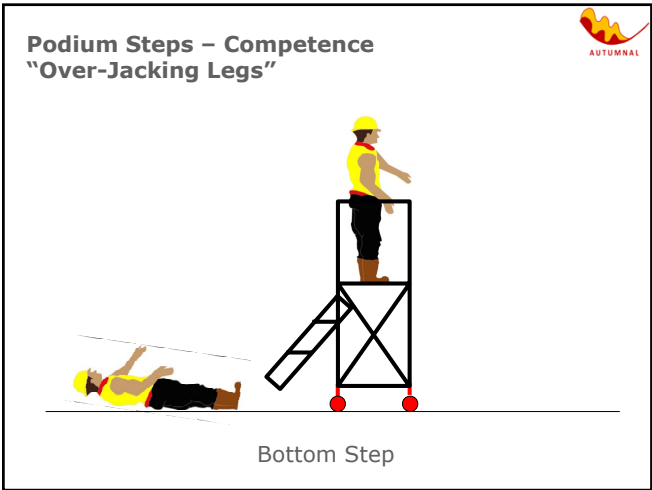
38

Podium Steps – Competence

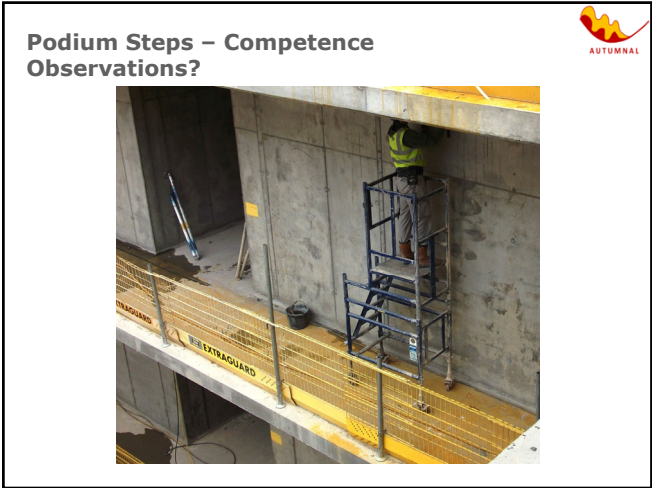
"Surfing!"



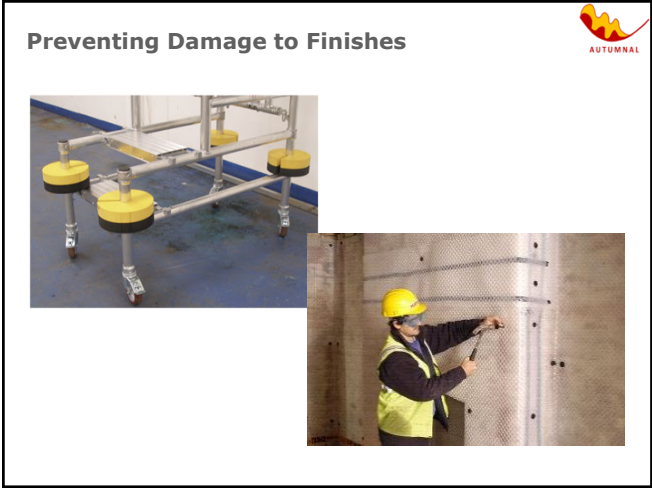

39



40



41



42

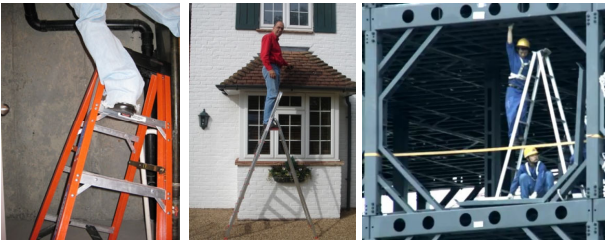
PAVs

- Push Around Verticals



43

Podiums vs Step Ladders



44

Podiums vs Step Ladders



Compliant Prevention?

45



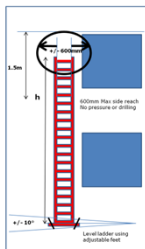
Ladder Performance
Window Replacement
Test Class 1, Survey Class 2

P	1	2	3	4
W	350	500	750	1350
L	22"	400	650	850
W	350	450	650	900
L	45"	500	750	1050
W	1250	1450	1875	

Notes
 h max 6.1m (20 ft 0 in)
 2 rungs above hand
 Board & Splice on soft ground
 max 10 minutes at a time
 Avoid power lines.

Diagram Labels:
 1.3m
 3.4m
 5%
 P
 75°
 d
 1/10°

Telescopic ladders for Inspection ONLY



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



Questions?



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Safety Nets

1



AVOID

Collective

Personal

Edge Protection

Prevent

Restraint

Safety Nets

Min Ht & Con

PFPE

Life Boat

Min Con

Life jacket

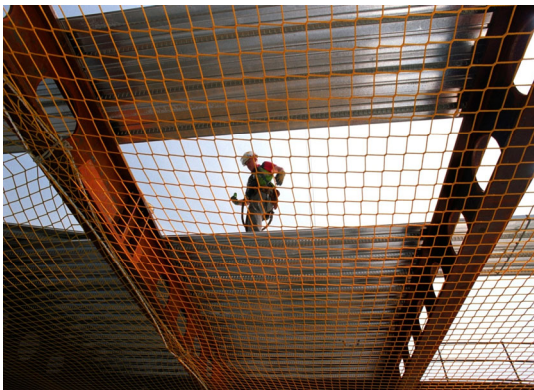
Stage

Neither

Ladder

2

Collective Minimised Height & Consequences



3

Collective Minimised Height & Consequences



4

Scaffold Fan

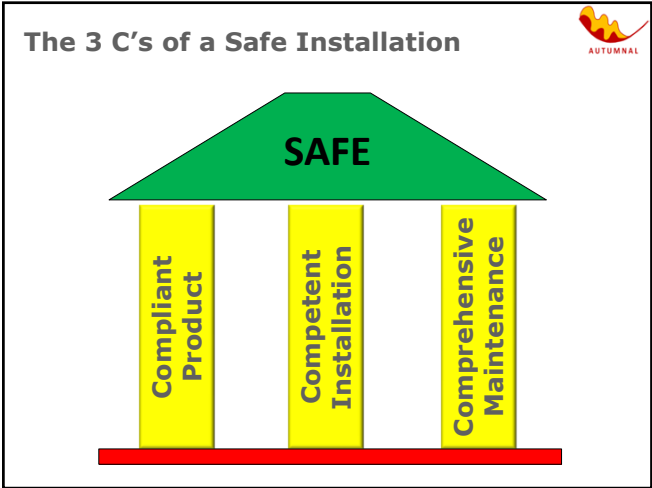


5

Safety Net Fan



6



7

Standards for Safety Nets

- BSEN 1263-1
 - Product Manufacture, Testing, Maintenance
- BSEN 1263-2
 - “Rigging” (Positioning) maximum limits
- FASET guidance and best practice
- BS 8411 : 2007
 - Code of Practice for Safety Nets on Construction Sites ..

8



9

Compliant Products



Meet All the Requirements of BSEN 1263-1

- Two basic methods of net manufacture:
 1. Knotted
 2. Knotless
- Two types of net formation:
 1. Diamond mesh (D)
 2. Square mesh (Q)
- Two standard mesh sizes:
 1. 60mm
 2. 100mm
- Four Safety Net "systems" (classes):

System S	System U
System T	System V

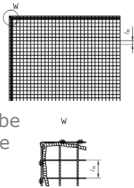
10

Compliant Products



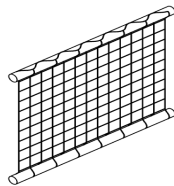
System S

Safety Net with border rope to be fitted to suitable structure



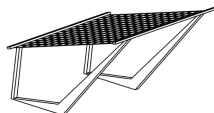
System U

Safety Net attached to supporting frame for vertical use



System T

Safety Net attached to brackets for horizontal use



11

Compliant Products



4 Classes of Net

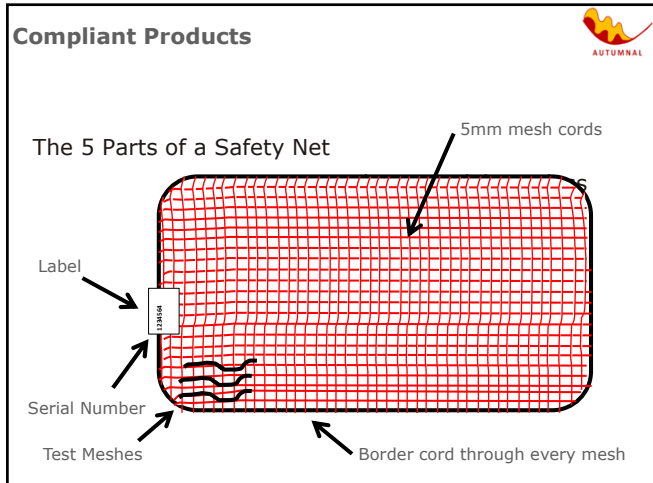
Class A1 : 2.3kJ absorption 60mm Mesh

Class A2 : 2.3kJ absorption 100mm Mesh

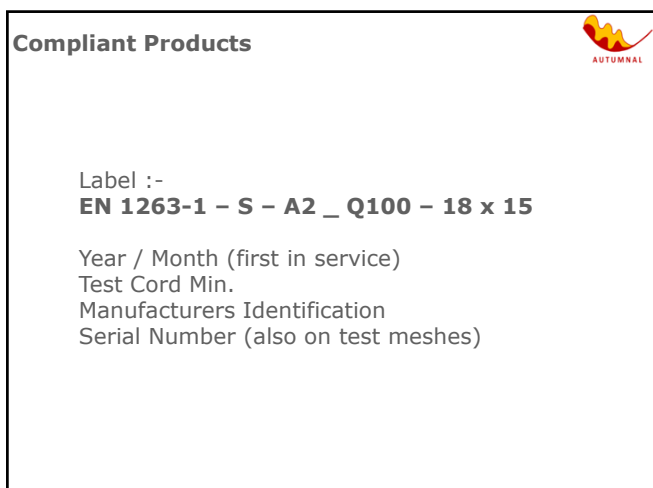
Class B1 : 4.4kJ absorption 60mm Mesh

Class B2 : 4.4kJ absorption 100mm Mesh

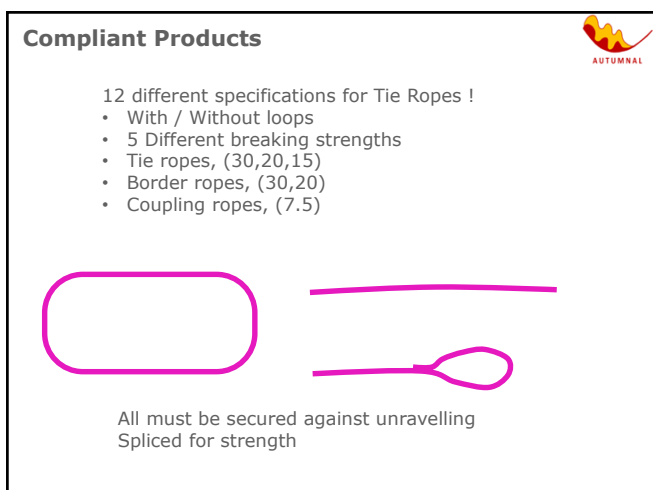
12



13



14



15

Support devices using remote attachment

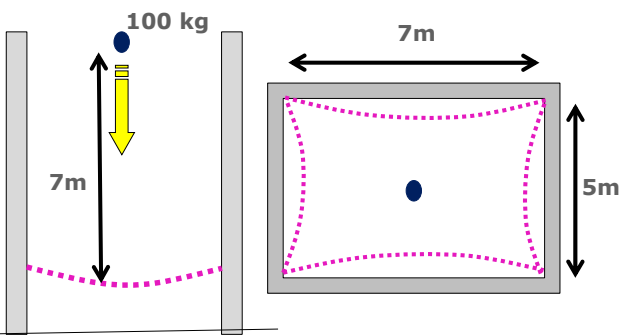


16

Compliant Products



System S Drop Test



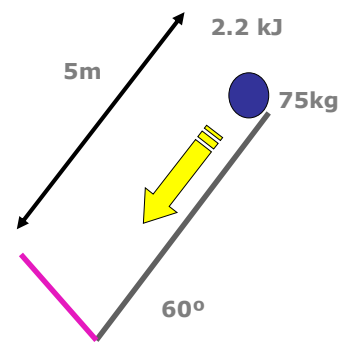
17

Compliant Products



System U Drop Test

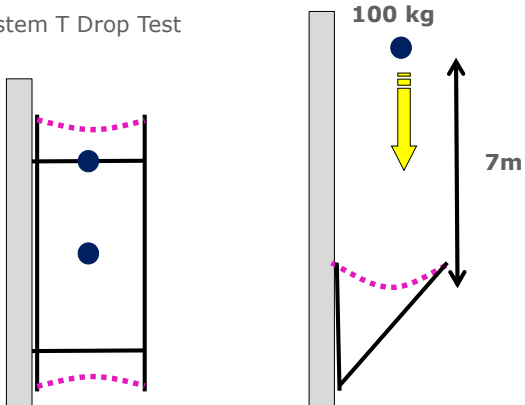
Class C
High Dynamic only



18

Compliant Products

System T Drop Test



100 kg

7m



19

Compliant Products





20

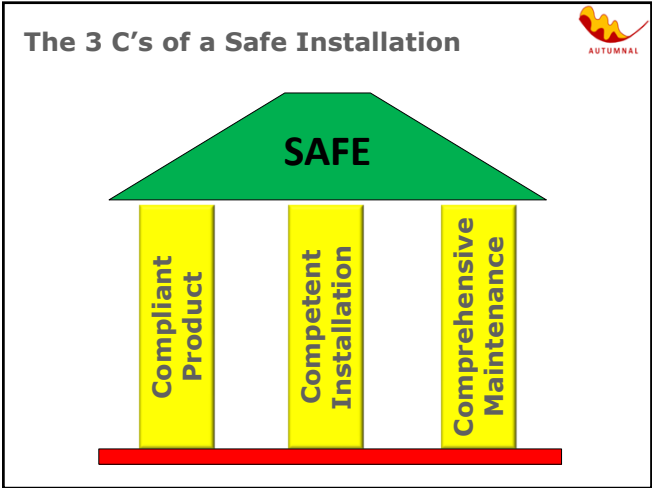
Compliant Products

Handling Instructions

- Install, Use, Dismantle
- Store, Care, Inspect
- Dates for test meshes
- Conditions for service withdrawal...
...temperature, ice, chemicals (Chlorine)
- Declaration of conformity
- Used in Anger ??



21

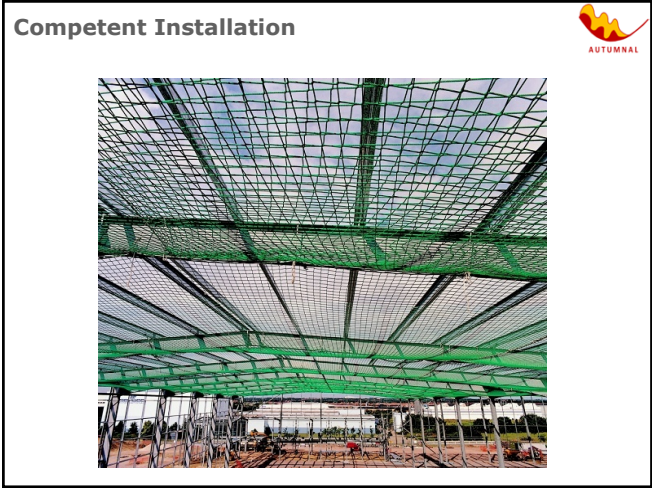


22

FASET
Fall Arrest Safety Equipment Training

The image shows three CSCS (Construction Skills Certification Scheme) cards. The first card is for 'NVQ L2' and lists 'Work unsupervised', 'Handover', and 'Supervise'. The second card is for 'EXPERIENCED WORKER'. The third card is for 'TRAINEE' and lists 'Work under supervision'. Each card includes a photo of the holder, a CSCS Reg No, and an expiry date.

23

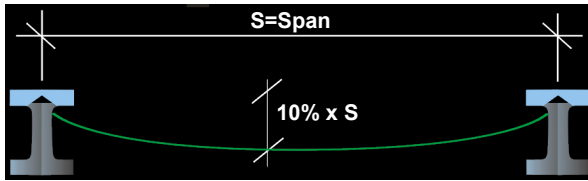


24

Competent Installation



Sag



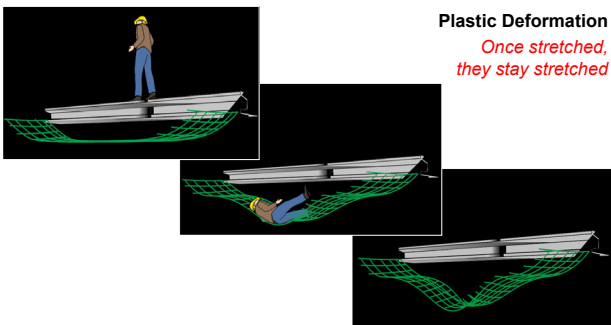
Set sag at 10% of span

25

Competent Installation

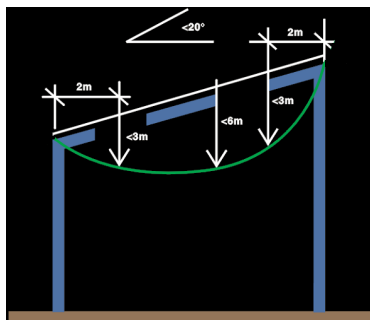


Plastic Deformation
*Once stretched,
they stay stretched*



26

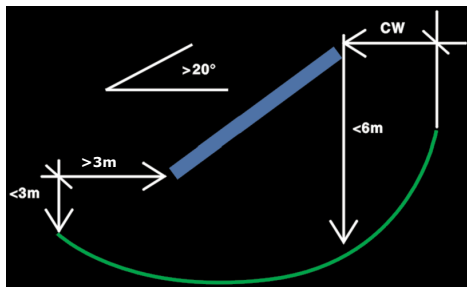
Competent Installation



Positioning Limits EN 1263-2

27

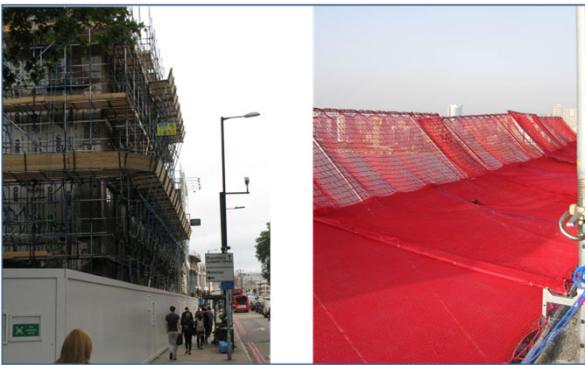
Competent Installation



Positioning Limits EN 1263-2

28

Trajectory ?



29

Competent Installation

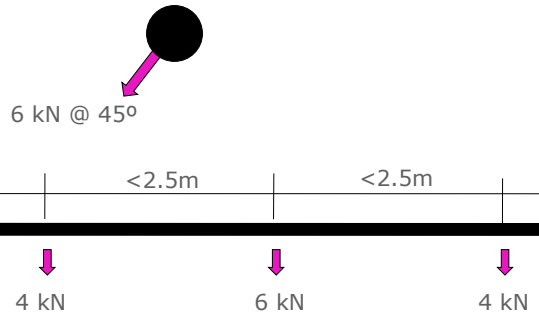


30

Competent Installation



What to attach to ?

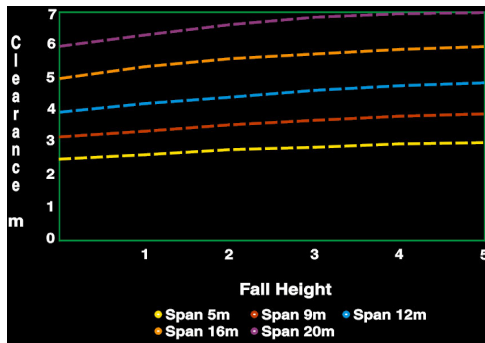


31

Competent Installation

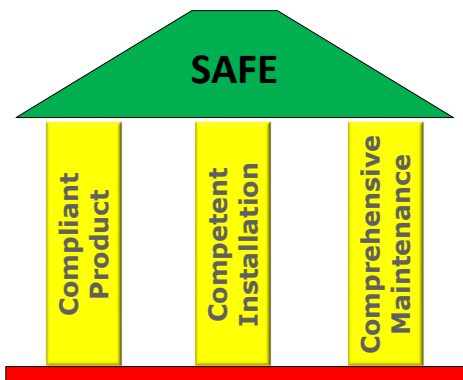


Clearance below



32

The 3 C's of a Safe Installation



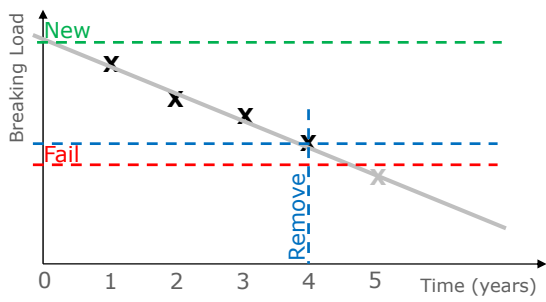
33

Comprehensive Maintenance



34

Comprehensive Maintenance



35

Competent Installation



36



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Questions?



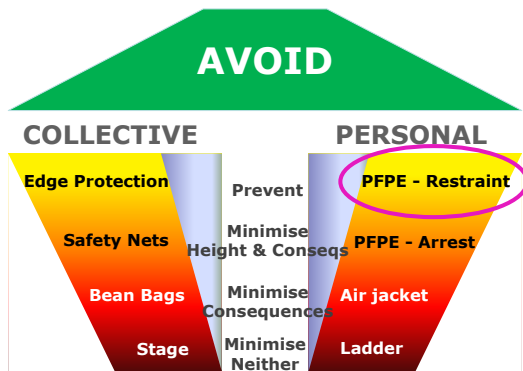
AUTUMNAL

Work Restraint

(Personal Fall PREVENTION)

1

Hierarchy Examples



2

Personal Prevention



Lanyard must be shorter than anchor's edge distance



3

Length of Lanyard & Anchor Location



Restraint?
Prevented
from falling?



4

Single Anchors

Arcs of movement
Shorter Edge Distance
Pendulum Swing Falls





5

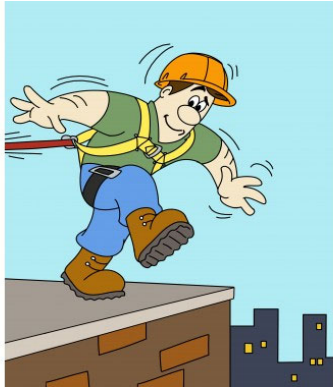
Adjustable Prevention





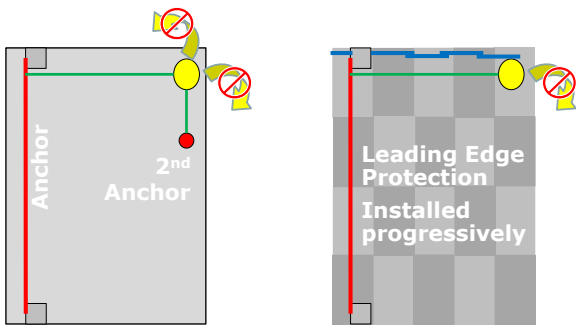
6

Crossing the Edge?



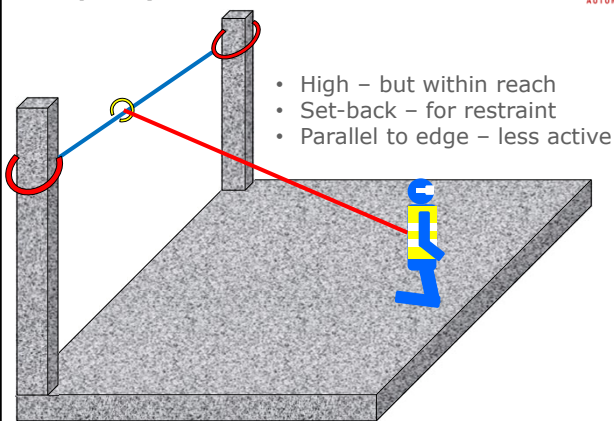
7

Working into Corners



8

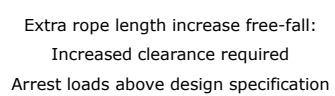
Temporary Anchor Lines



9

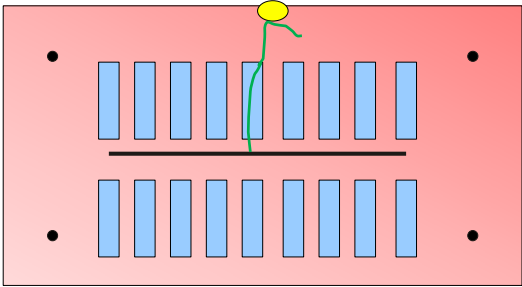
[illegible]

Fall in front!
Anchor behind!



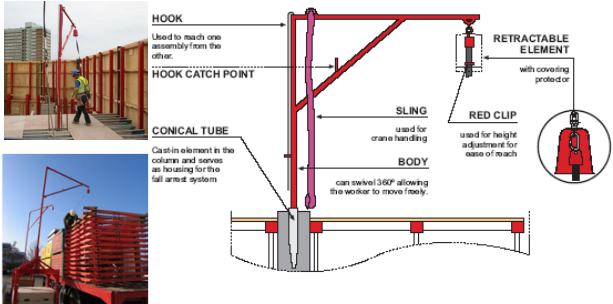
12

Fragile Surfaces – Fall Risks



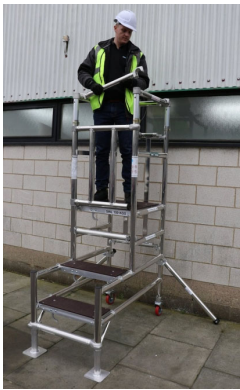
13

"Hangman" –
Temporary Overhead Anchors



14

Podium Steps



Compliant with BS8620

- Not all do comply
- Stability test

PASMA Guidance

- Max 2.5m
- Max 2 wheels

15

Single user MEWP

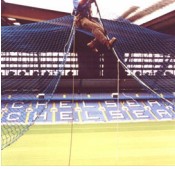


- Limited Reach
- Lifting Operation
- IPAF PAV (Push Around Vertical)
- Indoor / Outdoor – Wind Rated
- Use PFPE



16

Roped Access (“Abseiling”)



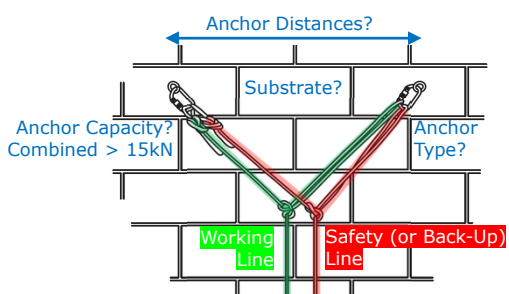
- Very “Active”
- Very High Competency
 - Level 3 in every team
- Rescue Plan in RAMS always
- Build-In Redundancy
- Follow IRATA CoP





17

Rope Access – Anchors & Rigging



Anchor Distances?

Substrate?

Anchor Capacity? Combined > 15kN

Anchor Type?

Working Line

Safety (or Back-Up) Line



18

Vertical Systems



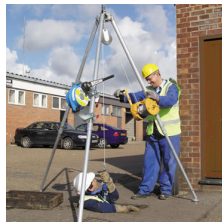
19

Controlled access systems



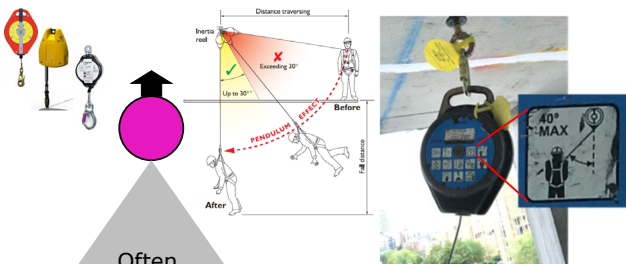
Specialist competencies
Other risks

- Height access
- Fall Protection (prevention?)
- Recovery



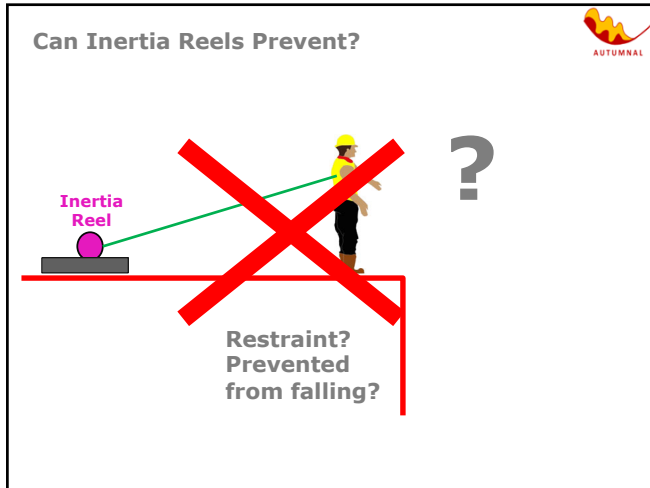
20

Inertia Reels

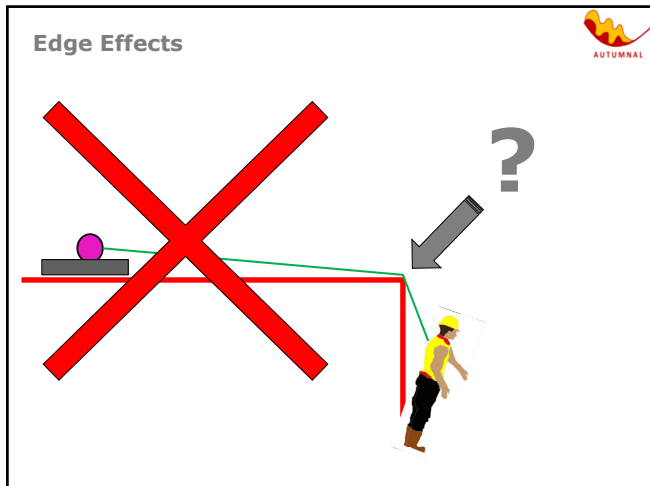


- Not prevention!
- Most units not for horizontal use!

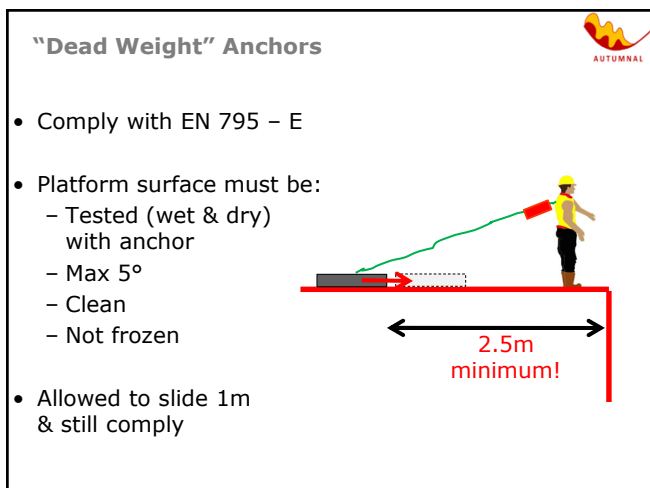
21



22



23



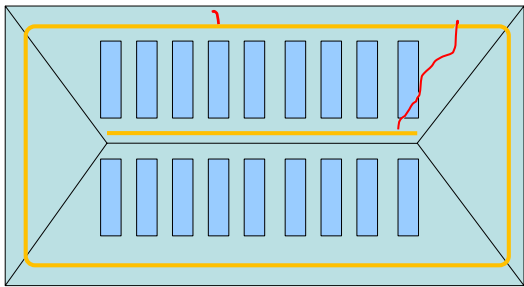
24

Permanent Roof Access "Restraint"



25

Permanent Access Common "Design" Compromise



26



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Questions?

27



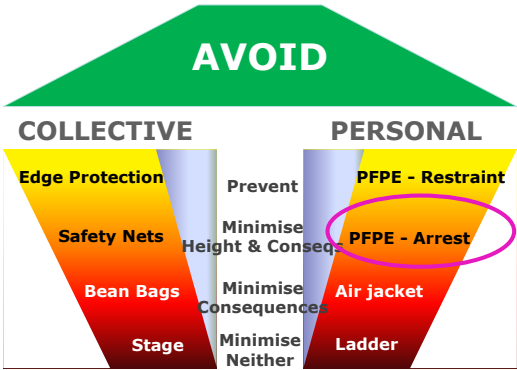
AUTUMNAL

Fall Arrest
(Personal Fall MITIGATION)

1

Hierarchy Examples



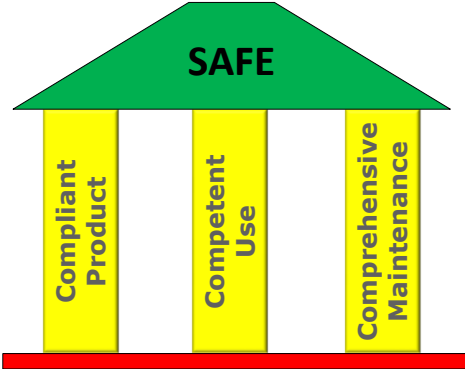


The diagram is a pyramid with a green top section labeled 'AVOID'. Below it are two main sections: 'COLLECTIVE' on the left and 'PERSONAL' on the right. The 'COLLECTIVE' section is divided into four horizontal layers: 'Edge Protection' (yellow), 'Safety Nets' (orange), 'Bean Bags' (red), and 'Stage' (dark red). The 'PERSONAL' section is also divided into four horizontal layers: 'PFPE - Restraint' (yellow), 'PFPE - Arrest' (orange, circled in purple), 'Air jacket' (red), and 'Ladder' (dark red). Between the two sections, there are four horizontal lines with the following text: 'Prevent', 'Minimise Height & Conseq', 'Minimise Consequences', and 'Minimise Neither'.

2

The 3 C's of a Safe Installation





The diagram is a temple-like structure with a green roof labeled 'SAFE'. It has three yellow pillars. The first pillar is labeled 'Compliant Product', the second 'Competent Use', and the third 'Comprehensive Maintenance'. The pillars are set on a red base.

3

Compliant PFPE Product Standards

Equipment Specific		General	
EN 354	Lanyards	EN 363	Systems
EN 355	Energy Absorbers	EN 365	U.I. and Marking
EN 360	Retractable Blocks		
EN 361	Harness	Use	
EN 362	Connectors	BS 7883	Use of Anchors
EN 795	Anchor devices	BS 8437	Selection & Use

CE

BREXIT

UK

CA

Should be “CE” marked with reference to “EN####”

4

Personal Fall Protection Equipment

Anchor Lanyard / Rope Grab Connectors Energy Absorber Harness

Complete, comprehensive specification from harness to anchor

BS 8437:2005 Code of Practice .. selection, use, and maintenance of PFPE

5

Harness Types

“Construction” “Utilities” “Rope Access”

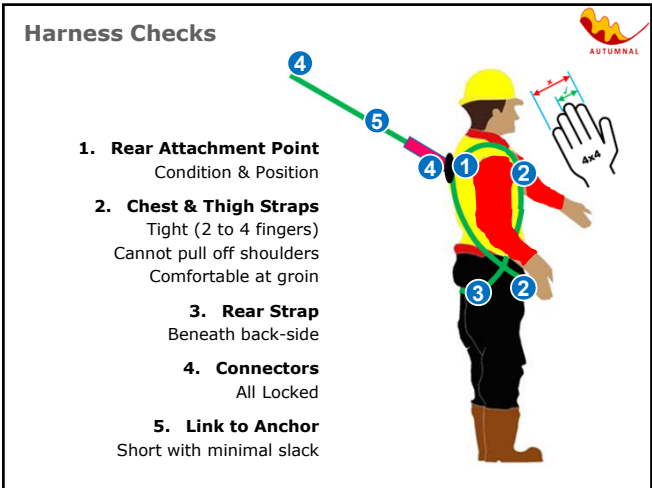
6

83

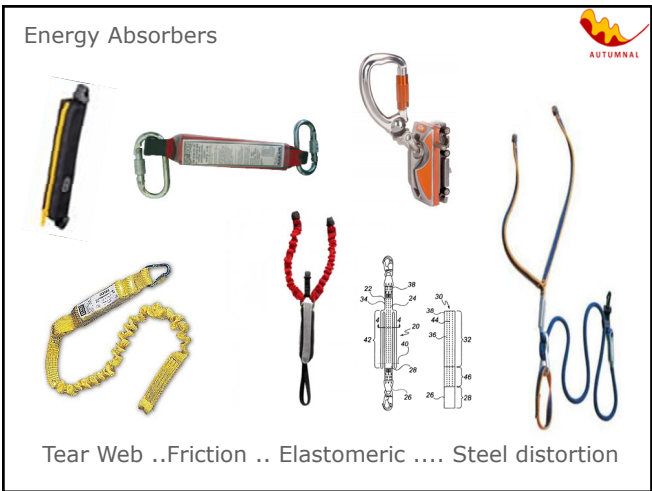
2



7



8



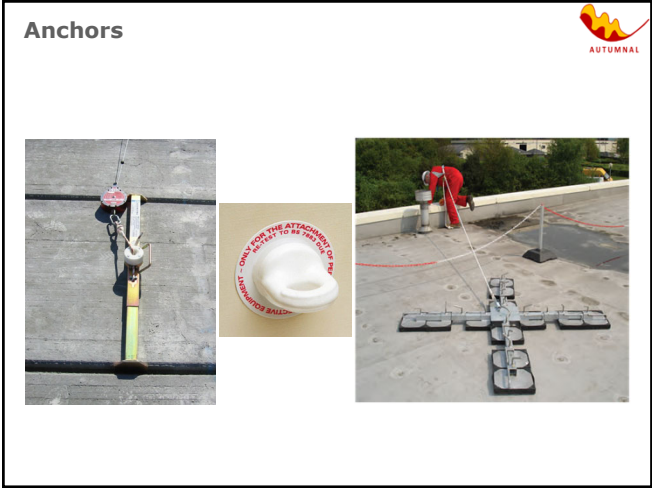
9



10



11



12

Horizontal Life Line (HLL)

13

Anchor Strength Requirements

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

14

Attachment Practices

15

Attachment Practices



CE Marked - EN 362

NO!


Screw Gate


Twist / Auto Lock


Triple Lock


Scaff Hook


Equipment Clip

16

Min Ht & Consequence


POOR


BETTER


BETTER


BEST

17


AUTUMNAL

Questions?

18



AUTUMNAL

Rescue From Suspension

1



AVOID

Collective

Personal

Edge Protection

Prevent

Restraint

Safety Nets

Min Ht & Con

PFPE

Life Boat

Min Con

Life jacket

Stage

Neither

Ladder

2

Orthostatic Intolerance (Suspension Trauma)



- Time critical
- Medical issues can develop for 20% within 10 minutes
- Site-based plan required
Emergency services too slow
- All equipment & competent resources to be at work locations
- Practice drills as tool-box talk
- Aim for 10mins



3

Rescue Equipment

- Keep it Simple
- Training + Experience
- Practice Regularly
 - Experience required
 - On ground – no risks
- Immediately available



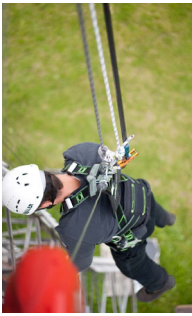
Patent No. GB 2320805



4

Rescue R.P.D.

- **Raise** the alarm
Get help from site immediately, just in case
- **Protect** yourself
No heroics, calm & competent
Don't create a further problem
Always minimum 2 in harnesses
- **Deliver** help
Varies by application
Follow the plan... practiced...



5



AUTUMNAL

Questions?

6
