Bovis

Welcome
Fall Prevention Coordinator
Training

AUTUMNAL

2

Training Objective

Bovis

To arm delegates with
the necessary knowledge and practical advice
to fulfil the role of
Fall Prevention Coordinator

The course will cover the requirements of
Local Regulations and Bovis (locally & globally),
plus "*what to look out for and demand*" from
package contractors within their RAMS and onsite,
at all stages within the delivery process, through;
Design, Tender, Planning & Construction Operations.

3

Training Programme

Bovis

- **Introduction**
- **Programme**
- **Assessment**
- **Copy of Slides**
  Download link will be sent

4

4 Fs

Bovis






5

The trainer

Bovis

John Hynes
BEng & MSc(Eng)

- **25 years focused on safe work at height**
- **Broad range of roles & experience**
- **Involved with developing standards & trade associations**



6

Autumnal - Intro

Bovis

AUTUMNAL

Independent & Impartial
Height Safety Consultancy

(previously Higher Safety)

7

Autumnal - Services

Consultancy Service
Project advice, design support, planning, WAH reviews

Business Development
Planning, process, product development

Education & Training
Awareness, regulations, best practice

Expert Witness
Advising the court

AUTUMNAL

8

Autumnal - Project Advice






9

Autumnal - Business Development








10

Autumnal - Training

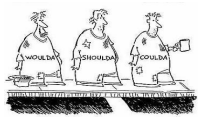



11

Autumnal - Expert Witness







12

Delegate Introductions

- **Your current role & project?**
- **Experience with Lendlease?**
- **Your expectations of the training?**
- **Something interesting about you?**



13

FPC Involvement

Bovis

When to intercept & apply…

Design, Tender, Planning, Construction

R O A D
(Risk & Opportunity At Design)

Most likely first intervention:
Contract Award

Subsequently:
Controlling risk on site

14

Agenda

Bovis

09:00	Introduction
09:30	Regulations & Hierarchy
10:15	Break
10:30	Perimeter Protection
12:00	Internal Protection
12:30	Lunch
13:15	Access Systems
14:45	Break
15:00	Access Methods
16:00	Steel & Concrete Frames
16:30	Assessment & Feedback
17:00	Finish

Assessment



15

Feedback

Bovis





16

Bovis

Regulations & Hierarchy

1

Work at Height Regulations

Bovis

Why? Falls are single biggest cause of death

When? April 2005 (almost withdrawn in 2023)

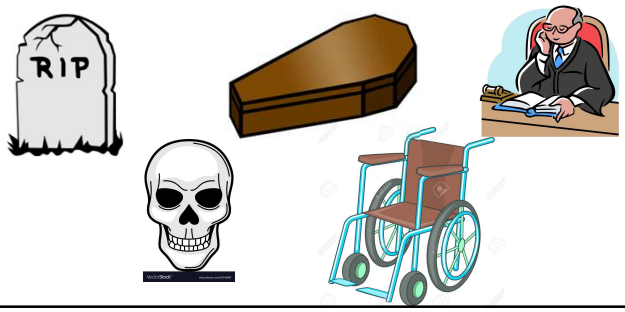
Where? Across UK & EU



2

Falls – the Biggest Cause of Death at Work

Bovis

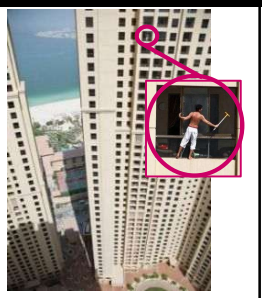


3

Is height an issue ?

Bovis





Perception or risk?...
What distance is likely to cause injury?

4

Main Sections of WaH Regs

Bovis

4. Organisation & planning
5. Competence
6. Avoidance of risks
7. Selection of equipment
8. Requirements for equipment
9. Fragile surfaces
10. Falling objects
11. Danger areas
12. Inspection of equipment
13. Inspection of places
14. Duties of persons at work

5

Definition of Work at Height

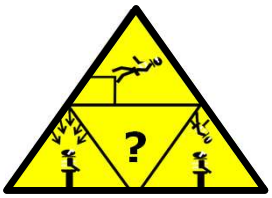
Bovis

Work or
obtaining access to (or egress from) any place,
including a place at or below ground level,
where, if measures were not taken, a person could
fall a distance liable to cause injury
(except staircase in a permanent workplace)

What is the minimum height?...

6

What are Hazards ?



Something that can cause harm

7

How to choose control measures ...



Consider....

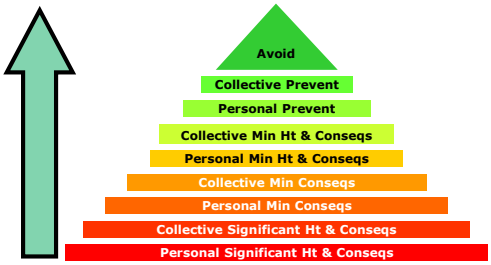
Collective before Individual

Passive before Active

Permanent before Temporary

8

Hierarchy of Controls



9

Eliminate/Avoid



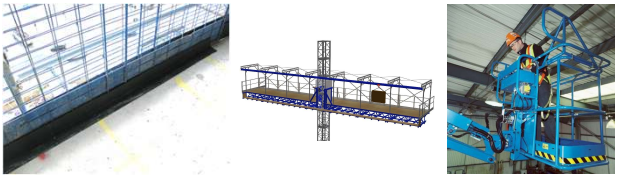
10

Collectively Prevent Falls



11

Collectively Prevent Falls



12

Personally Prevent Falls





13

Collectively Min Height & Conseqs





14

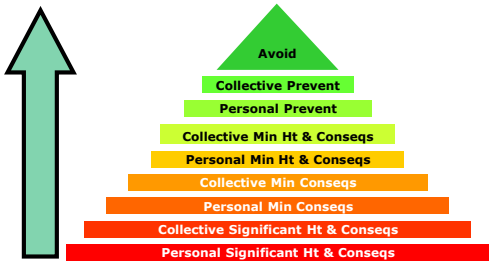
Personally Min Height & Conseqs





15

Hierarchy of Controls



16

Questions ?

17

Bovis Requirements



Falls Prevention Procedure
(July 2026)

- **At tender develop FP Strategy for costs & MS**
- **Appoint competent FP Coordinator & Deputy**
- **Develop & maintain FP Plan as part of EHS Plan**
- **Fall risks to be identified in Safety in Design CDM Register**
- **Contractors to address risks in Tender docs before approval**

18

Hierarchy of Controls

Bovis

Only if not practicable

Eliminate need to WatH	R.O.A.D. Design review. Remote connections, remote access, robotics, remote demolition, drones for inspection
Reduce need to WatH	Pre-Fab, Modularise, lift into position. Reduce components, remote installation methods
Safe Platform with Collective Prevention	Screens, Full Height EP, Access Scaffold (clad), MPVAE (MEWPs, BMU, TSAE, MCWPs)
Collective Fall Arrest or Individual Fall Prevention	Safety Nets, Air bags, Bean Bags, PAVs, Peco, Podium, PFPE Restraint
Individual Fall Arrest	PFPE to Minimise ht & consequence. Minimum Fall Factor. **USED AS LAST RESORT ONLY**

21

Hierarchy of Risk Control

Bovis

Higher Level Controls — Encourages innovation and new ideas

- **Elimination** — Completely remove or design out the RISK from the workplace
- **Substitution** — Replace the activity or process with a less hazardous one
- **Isolation** — Isolate the hazard from people
- **Engineering** — Reduce the risk through engineered solutions

Low Level Controls

- **Administration** — Implementation of safe work practices, procedures and policies
- **Protection** — Provide PPE and other suitable equipment to protect workers

24

FPC Roles & Responsibilities

Bovis

- **Ensure a Fall Prevention Plan is in place, regularly reviewed and up-to-date**
- **The FPP is to be based on the WaH hierarchy (Individual fall arrest equipment is the last resort)**
- **Ensure that the requirements of the FPP, together with any amendments, are communicated to all relevant parties**
- **Refer to full co-ordinator responsibilities as detailed in the company operating procedures**

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Fall Prevention Plan

Bovis

- Developed EARLY & kept up-to-date (by FPC)
- Include falls of People, Materials, Tools & Debris
- Include details of chosen protection method
- Reviewed (by PD, EHS Lead) Prior to Package Tender
- Package Tenders assessed against the FPP
- Reviewed Monthly

Package Contractors prepare RAMS, AND Falling Materials Prevention Plan:

- Working on Leading Edge, Open Edge, Perimeter
- Working adjacent to an Opening, Edge, Perimeter
- Any locations above a Green/ PPE-Free/ Public Zone

25

Bovis Hierarchy

Bovis

Eliminate need to WaH
Reduce need to WaH → Avoid

Collectively Prevent Falls → Collectively Prevent

Collectively Min Ht & Conseq
Personally Prevent Falls → Personally Prevent / Collective Min Ht & Consequence

Personally Min Ht & Conseq → Personal Min Ht & consequence

Require Sign-Off Competence driven

- Collective Min Consequence
- Personal Min Consequence
- Collective do Neither
- Personal do Neither

23

Bovis

Go / No-Go | Go / No-Go

Pre-Bid	Pre-Construction	Construction

R.O.A.D.
On-going Design Constructability Reviews

Fall Prevention Strategy
Outline principles to control Project Specific WatH for Costing and Bid Approval

Fall Prevention Plan
Plan covering specific Fall Prevention measures on the Project

Detailed Project Fall Prevention Plan

Package Specifics & Contractors' RAMS
Task specific Fall Prevention measures

26

Package Contractors

Bovis











Ask More !

27

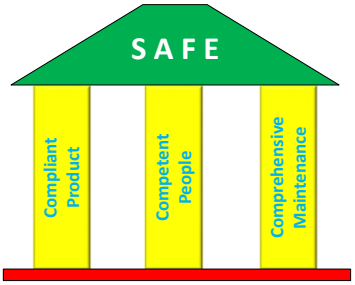
CCC of Safe Systems

Bovis

- **Tender**
- **Plans**
- **RAMS**
- **Review**
- **Investigation**
- **Court report**







28

Use of PFPE

Bovis

Limit use of PFPE (harnesses) use to specific specialist trades:

- Scaffolder
- Steel Erector
- Tower Crane Erector
- Hoist Erector
- Rope Access
- Rescue
- Short Duration Works (off-loading)

Justify "Why?"

Otherwise:

- Prior Approval Project Director, EH&S Manager
- Full specification including PFPE, Anchors & Training

29

FPP Key considerations

Bovis

Perimeter Protection
Internal Protection
Access Systems
Access Methods

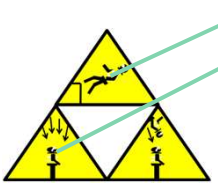
Steel frames
Concrete frames



30

Hazards :-

Bovis



Fall Prevention Plan

Drop Prevention Plan



Ask More !



31

Bovis

Regulations & Hierarchy

Any Questions?

32

Bovis

Perimeter Protection

1

Perimeter Protection

Bovis

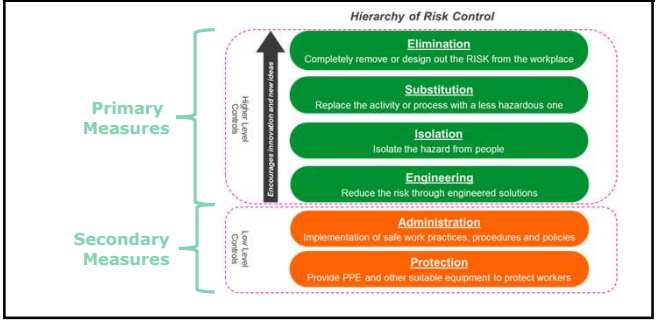
All Permanent or Temporary Structures under:
Construction, Demolition, Dismantling…
must Prevent the Fall of Persons or Objects

- Full height (floor to soffit) for multi-storey structures.
- Screens for high risk, high rise situations (railway, sensitive public interface).
- Scaffold for low rise, low risk situations.

2

Hierarchy of Controls

Bovis



3

Examples of Controls

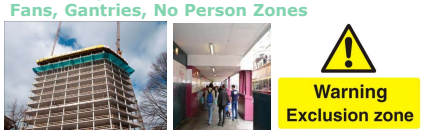
Bovis

Primary Measures
Screens, Guard-rails, Tethers



At Least One of Each

Secondary Measures
Fans, Gantries, No Person Zones



Warning
Exclusion zone

4

Signage

Bovis



5

EP Planning & Selection

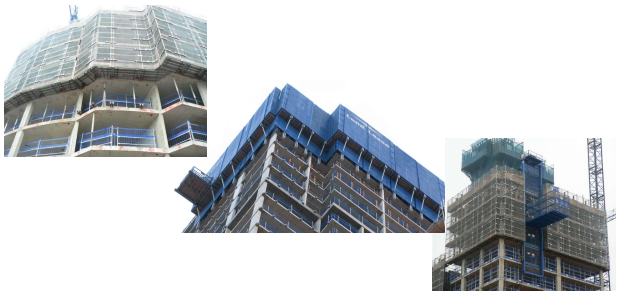
Bovis

- **Nature of Building**
  steel/concrete, height, façade design
- **Location**
  city centre, adjacent hosp, school, railway
- **Site footprint**
  distance to hoarding, weather, coast
- **Construction Method**
  tables, panels, cladding
- **Perimeter access needs**
  cladding brackets, edge trim
- **Perimeter work before cladding**
  sequence, high level services

Screens
Edge Protection
Nets & Fans

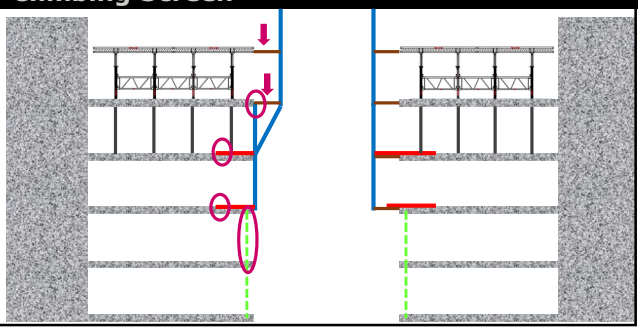
6

Climbing Screens



7

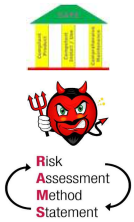
Climbing Screen



8

CCC - Climbing Screens

Compliant Products	Temporary Works - CoP BS5975 Containment - 6mm over 3 or 4 floors Offsite fabrication & Crane into position Crane or Jack to lift - Lifting Plan Install EP before moving
Competent Install / Use	Competent Design & Install of system Training to Jack TWC approval - high loads Platform ratings marked Inter-trade co-ordination
Compre'sive Maintenance	Weekly Inspection Clean skirt before lifting Lighting LOLER

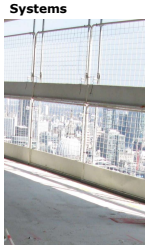


9

Edge Protection Examples

Full height - slab to soffit

Systems



Guard Rails/Nets



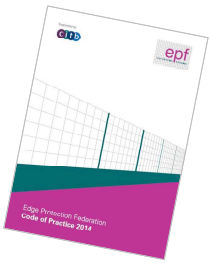
Scaffold



10

Edge Protection Guidance

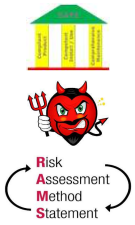
- **Trained installers ? (EPF)**
- **Method Statement ? (UI)**
- **Access Method ?**
- **Work sequence ?**
  Erection and Dismantle ?
- **Interface with other trades ?**
- **Common errors .....**



11

CCC – Edge Protection

Compliant Products	EN13374 - full height & infill net Containment Standard - EPF Fixings pre-fitted Captive components Gaps < 470mm
Competent Install / Use	TWC approval for fixings & loads Pre-fitted to steel Training – EPF / Manufacturer / CISRS Tethered fittings & tubes Plant stop blocks Cladding interface
Compre'sive Maintenance	7 day inspection Sterile zone Materials tied down

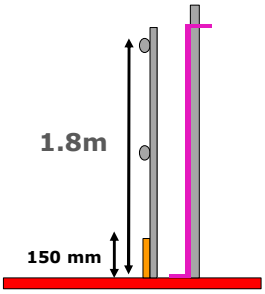


12

EP Temporary Systems

Bovis

EN13374
- **Principle Guardrail**
- **Gaps < 120mm**
- **Unintentional removal**

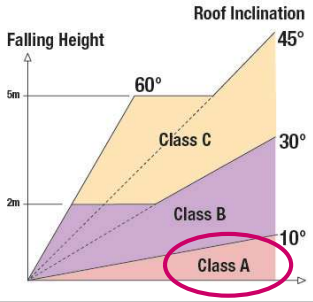


13

EP Classes

Bovis

Specify Containment
Specify Loading

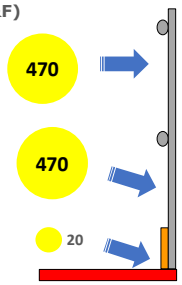


14

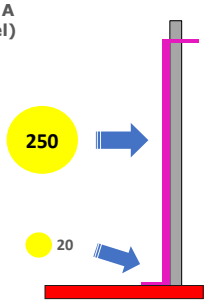
EP Containment (Regs & Standards)

Bovis

Class A (T&F)



Class A (Panel)

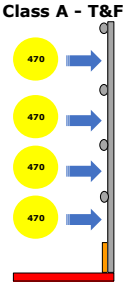


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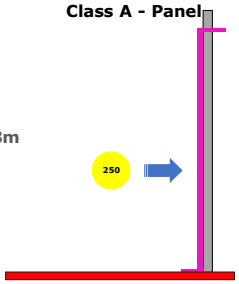
EP Containment (LL/Bovis)

Bovis

Class A - T&F



Class A - Panel

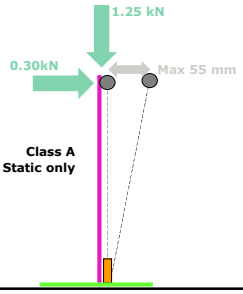


16

EP Strength & Stability

Bovis

EN13374
- **Max Elevation 40m (12 Floors)**
  Confirm post c/c if higher
- **Max wind pressure 0.6kN/m²**



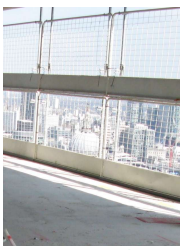
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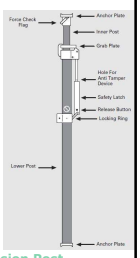
EP Extension Panels

Bovis



Double/Full height

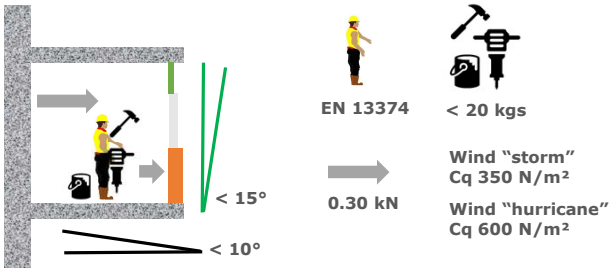




Compression Post

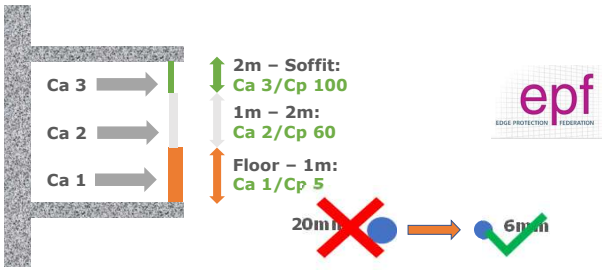
18

EP Standard Loading



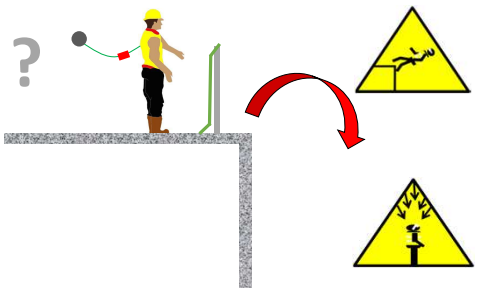
19

EPF Containment Specified



20

EP Install Risks



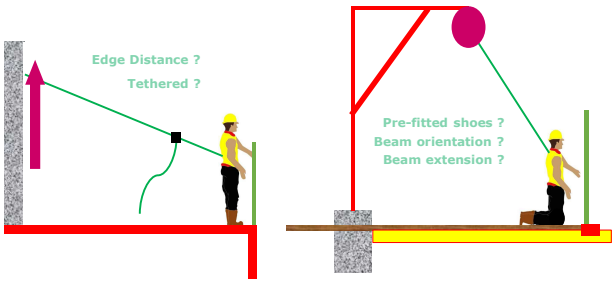
21

EP - Avoid WAH



22

EP Installer PFPS



23

EP Fixing



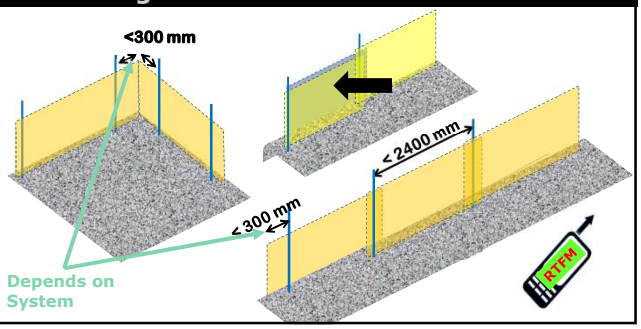
Right beams at right angle to edge



Edge distance

24

EP Setting-Out



25

EP Management



- Handover Areas
- Limit access beforehand
- Inspection:
  - 7 days
  - Weather/Adjustment/Impact
  - Tags
- Compression indicators



26

EP Detail Spec



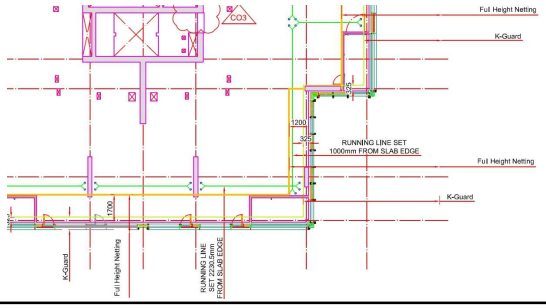
Height & External Rails



Debris Netting

27

EP General Arrangement

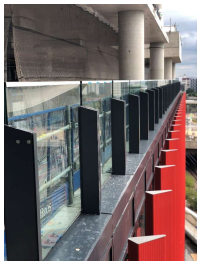


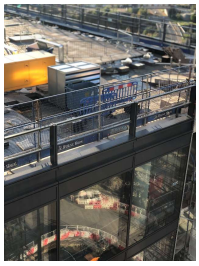
28

EP Design Opportunities

Cladding panel incorporating upper balustrade

R.O.A.D.





29

Catch Fans & Safety Nets



Which is better and Why ?

30

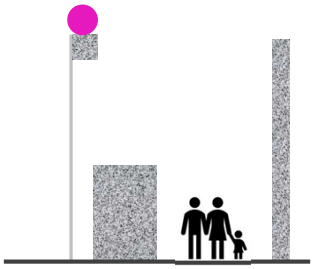
What is the main concern?

Bovis

What is the "major" concern?
What are we trying to "capture"...?



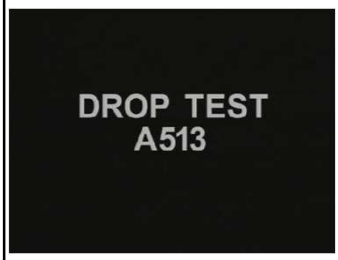
Dynamic Energy!



31

Catch Fans & Safety Nets

Bovis



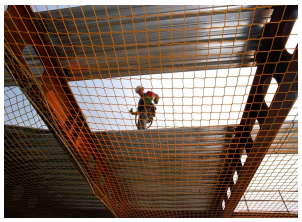


Which is better and Why ?

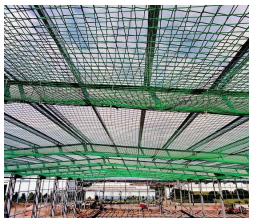
32

Safety Nets

Bovis



Metal Decking



Sheeted Roofs

33

Fans & Nets Competency

Bovis





NVQ L2

Work unsupervised
Handover
Supervise



Work under supervision

FASET

34

CCC – Fans & Nets

Bovis

Compliant Products	BS EN 1263 Parts 1 & 2 – Safety Nets No "Gravlocks" Pull test fixings EP must be in place
Competent Install / Use	Training from FASET / Manufacturer Fixing Method / Access Work Sequence (hot works) Design load / Fix capacity TWC to approve support loads & fixings
Compre'sive Maintenance	Free of Debris. 7 day inspection – resources & logging Replace if used





Risk
Assessment
Method
Statement

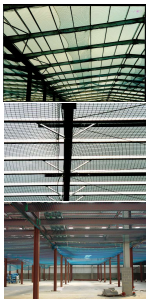
35

Net Rigging

Bovis



Rigged as close as possible to top of truss



Tied all edges or 2m Overlaps or Pinned

No gaps
Ties about 2m c/c
6kN supports

Clearance below
Labels on nets
Evidence of test ?

36

Net Rigging Access



Avoid



Prevent



Mitigate

37

Performance of Nets

- Mr Rahman fell from the 8th floor
- Landed in net on 4th floor
- 15m fell





38

Net wind loading





> 25 MPH ?

39

Net Rigging Requirements



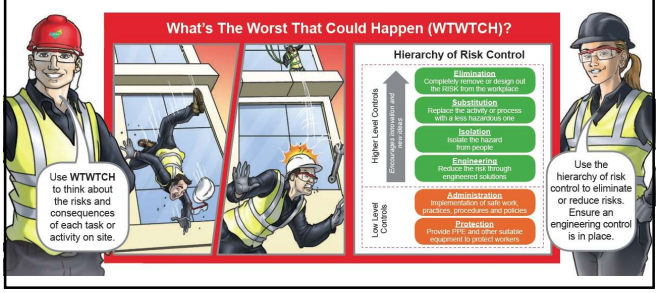
40

Net Rigging Issues



41

W.T.W.T.C.H?



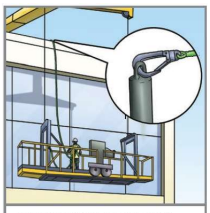
42

W.T.W.T.C.H?

Bovis

A fall protection strategy must be in place that includes riser and edge protection strategies and a drop prevention plan. A Lendlease fall prevention coordinator must also be appointed.

LENDLEASE FALL PREVENTION COORDINATOR



4.1.2 Height Access Equipment – a safety harness and lanyard must be used as secondary fall protection in case of equipment failure.

4.1.4 Risers and Shafts – fully protect openings in the slab with horizontal protection (e.g. RiserSafe) or vertical protection (e.g. handrails and full height, slab-to-soffit netting) at every level.



43

W.T.W.T.C.H?

Bovis

4.1.5 Safety Harnesses – only use safety harnesses as a primary means of fall protection as a last resort and, if you do, make sure you get a permit.



4.1.6 Rescue Procedures – have a detailed and specific rescue plan in place and practice rescue and recovery protocols for any fall of persons using arrest/ suspension equipment.



44

W.T.W.T.C.H?

Bovis

4.2.1 Enclosure of Work Areas – apply a No Gaps Policy and ensure that the chosen edge protection solution is effective at preventing falls of the largest and smallest items.



4.2.2 Tools and Equipment Tethers and Lanyards – trade contractors must identify how each tool or piece of equipment must be tethered in their drop prevention plan, which must also be in-line with the LL Fall Prevention Plan.

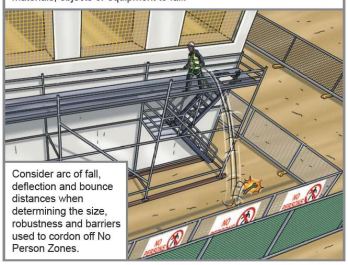


45

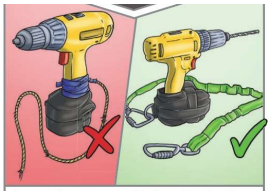
W.T.W.T.C.H?

Bovis

4.2.5 No Person Zones and Permit to Work Zones – install No Person Zones wherever overhead work has the potential for tools, materials, objects or equipment to fall.



Consider arc of fall, deflection and bounce distances when determining the size, robustness and barriers used to cordon off No Person Zones.



Ensure tethers are appropriate for each tool or piece of equipment.

46

W.T.W.T.C.H?

Bovis

4.2.6 Secondary Catch Measures – install overhead protection where there's a risk of falling objects and wherever there's a public interface on site.



WTWTCH?

To sum up GMR 4.1 & 4.2, remember the following steps:

1. Identify falling person and object hazards
2. Ensure engineering controls (or above) are implemented
3. Document the activity methodology
4. Brief the workers involved
5. Ensure there is sufficient competent supervision



47

Bovis

Perimeter Protection

Any Questions?

48

Bovis

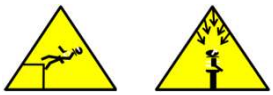
Internal Protection

1

Internal Protection.

Bovis

The Hierarchy must be applied to the method of construction and to protection of Penetrations, Shafts, and Risers



Both Hazards are as significant as on the building perimeter

Easiest to manage/influence at Design

2

Examples of Controls

Bovis

Primary Measures
Screens, Guard-rails, Tethers



At Least One of Each

Secondary Measures
Covers, Gantries, No Access



3

Design & Planning

Bovis

- Eliminate by pre-fabrication (modules/casting in)
- Permanent doors and walls early
- Small penetrations
- Guard rails and netting around each riser
- Early installation of shaft doors and gates
- Permit for access

4

Eliminate

Bovis

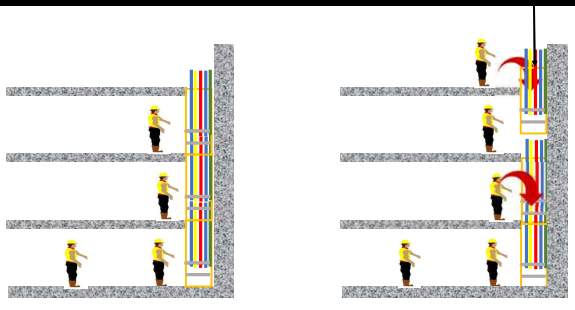


Designed-In / TWC
Communication
Coordination
Cutting controls

5

Interim Protection

Bovis



6

Void Covers



Screwed Down
NOT Nailed!

No trip hazard





Clear signs?

7

Sign Management



8

Doors & Guard Rails







Clear signs
Floor SWL

9

Doors & Guard Rails





LPS 1215



Height
Containment
Access
Live Services

10

Small Holes



11

Access Permits



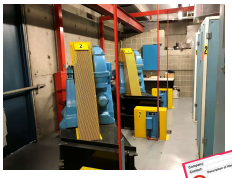
- **Control of Access - Who? FPC?**
- **Single Contractor per shaft**
- **Vertically alert - Secure decks**
- **Key/lock-out for shafts**
- **2nd guard rail inside door**
- **Signage**
- **Mesh for visibility – poor for fire**
- **Lighting**
- **Communications**
- **Safe start & left safe ?**
- **Co-ordination**

12

Motor Rooms

Bovis

Design for access

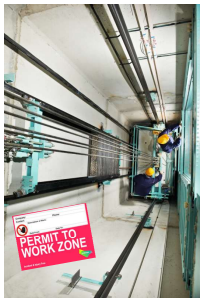


- Stairs (temporary & permanent)
- Ladders are poor for carrying materials & tools
- Handed-over weathertight & locked
- No access without permit
- No running machinery without guards

13

Lift Shafts

Bovis



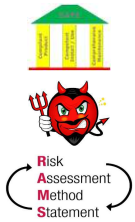
- Only one in common shaft (without full height segregation).
- Car-top guardrails
  - Min 950mm
  - Demountable?
- Use of PFPE requires rescue plan
- Pit Stops installed first & left CLEAR.
- No use of block & tackle without load arresters
- Lifting kit examined as per LOLER
- Guides lifted with shackles (not slings)
- Testing/Commissioning controls

14

CCC – Shafts & Risers

Bovis

Compliant Products	Modular & pre-install or early install EN 13374 & full height with infill Containment Standard Pre-fitted fixings & components 2nd Guard Rail inside doors Live services Visibility / compartmentation / escape
Competent Install / Use	Design provision Installation (system) One trade per shaft – control who, when & where Tethering Lighting
Compre'sive Maintenance	Permit to access 7 day inspection - logged FPC to Co-ordinate – daily meetings



15

Obstructed Access / Egress

Bovis



16

Gaps Around Doors

Bovis





17

Bovis

Internal Protection

Any Questions?

18

Bovis

Access Systems

1

Access Systems

Bovis

- Fixed or Mobile
- Temporary or Permanent

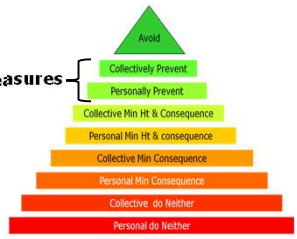
- Safe Access between floors
- Safe Access (and egress) to work area
- Safe Work area (hierarchy)

2

Access Systems Hierarchy

Bovis

- Stairs
- Scaffold (Temp work Platform)
- MPVAE
  (Mobile Powered Vertical Access Equip)
  - MEWP
  - MCWP
  - TSAE
  - BMUs
- Towers
- Podiums / Pecos / PAVs.



3

Stairs

Bovis

Pre-formed permanent stairs EARLY
Permanent handrails, or provision for Temp (design)
Max 2 floors behind the works



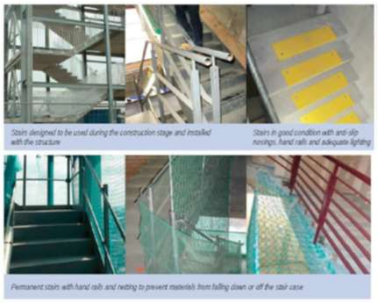


Robust temp measure (HAKI, Scaffold towers, Stairways)
Adequate capacity & width

4

Permanent Stairs

Bovis



5

Stairs Requirements

Bovis

All stairs must be :-

- Safe by design (risers < 210, antislip, handrails)
- Well lit (incl emergency)
- Kept clean and clear
- Restricted when worked upon (alternative escape)
- Checked daily

6

CCC – Stairs

Bovis

Compliant Products	Permanent preferred Permanent guard rails Protection from falling materials (internal) Anti-slip / Even risers max 210mm / Lighting EN 12811 - Access between levels
Competent Install / Use	CISRS / Manufacturer training for stair towers
Compre'sive Maintenance	Daily checks Clear No working from stairs





Risk Assessment Method Statement

7

Scaffold

Bovis

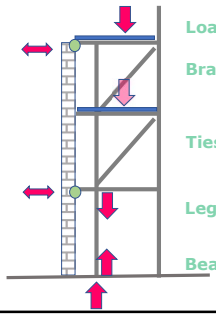
- Always Designed:
  - Using TG20:21 (compliance sheet)
  - Bespoke design (drawing)
- Erected following SG4:22
- Loaded only to Load Class
- Tied
- Regularly inspected



8

Scaffold Design

Bovis



Load Class

Bracing

Ties (?)

Leg Load

Bearing ?

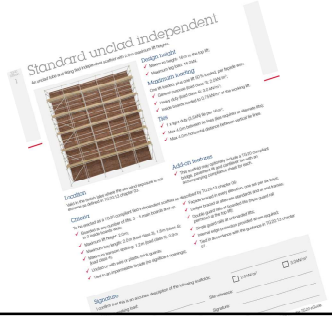
- Butted boards
- Clipped
- Gaps max 225mm
- Tethered
- RAMS (up/down)
- Handover
- Clean/Clear



9

Scaffold – Compliance Sheet

Bovis



Output from TG20

Specifies Max:
- Height
- Bearing/Leg load.
- Ties.
- Bracing.
- Load class.
- Location.

Plus add ons ….

10

Scaffold

Bovis

Loading … four main classes :-
- Class 1. 0.75 kN/m²
- Class 2. 1.5 kN/m²
- Class 3. 2.0 kN/m²
- Class 4. 3.0 kN/m²



- Width: Number of boards wide & inside Boards
- Bay length: Depends on load class & width
- Ties: Usually every other bay & every other lift (Note duty)
- Bracing: Usually every other bay

11

Scaffold – TG20 Design Features

Bovis

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



12

Scaffold – SG4 Preventing Falls



13

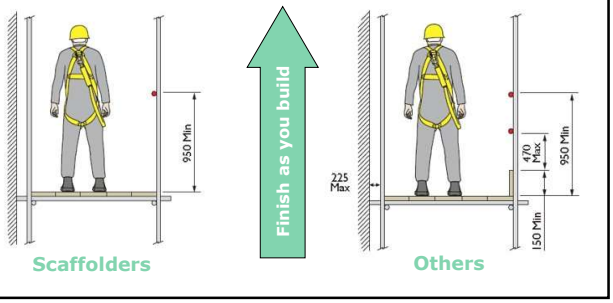
Scaffold – Collective Prevention





14

Scaffolders' Safe Zone



15

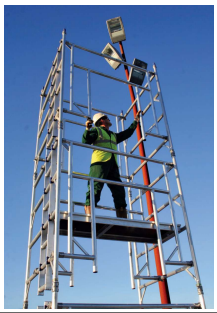
Unacceptable Traditions





16

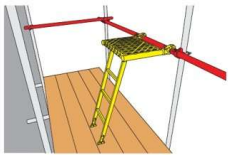
Advanced Guard Rail (AGR)

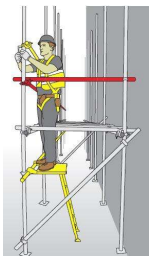


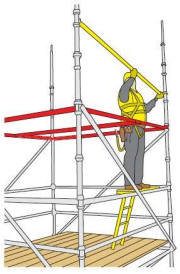


17

"ScaffStep" for AGR







18

Scaffold Design – non TG20

Bovis

Engineer's design required for:

- Dead, flying, raking shores
- Ramps, roadways, civils works
- Pedestrian walkways, footbridges
- System scaffold outside UIs
- Façade retention, suspended gantries, temp roofs
- Mobiles, guyed, kentledge, line crossings
- Marine, sign-board supports, pavement frames
- Subject to vibration, high load, long term, high risk
- Hoists
- More than 2 working lifts

19

Scaffold Requirements

Bovis

- Access by stair (not ladder) – installed progressively
- Only sheeted if designed by Engineer
- Sheeting on the outside (after complete erection).
- Flame retardant (LPS 1215)
- Tiled (lapped to prevent items falling out)

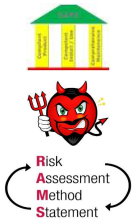
NOT TO BE USED:
Putlogs
Trestles
Bandstands

20

CCC – Scaffolds

Bovis

Compliant Products	EN12811 (T&F) or EN12810 (system) TG20:13 (compliance) SG4:15 in RAMS (check) Class load on tag Exclusion
Competent Install / Use	Trained CISRS (incl System) CISRS Advanced supervisor TWC Wind check / ties AGR/Fan when erecting Tethered components Rescue plan Ties coordinated
Compre'sive Maintenance	Footing, ties, cladding Clear of debris 7 day inspection Scaff Tags / Register



21

M.P.V.A.E. (Mobile Powered Vertical Access Equipment)

Bovis

WHAT IS THE TASK … ?
confirm most suitable method of access.

- Must have guard rails
- Selected & Operated by Competent persons
- Maintained as per manufacturer's instructions
- Rescue plan in place
- TE at least every 6 months & as specified
- Examination records available on site
- TW Engineer to check ties, anchors, safety-critical elements
- PFPE to be worn (except in Scissors)

22

M.E.W.P. (Mobile Elevated Work Platform)

Bovis

"Cherry Pickers"
&
"Scissor Lifts"







Anti-Entrapment Required

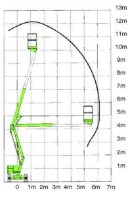
23

MEWP Selection

Bovis

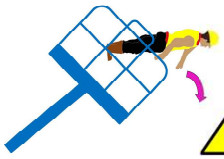


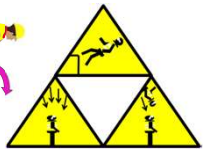




24

MEWP Hazards







Falling people – PFPE
Dropped objects – Tethering & Exclusion Zones
Collisions – Traffic Management

25

PFPE for Cherry Pickers



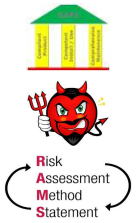
IPAF

"It is strongly recommended that a full body harness with an adjustable lanyard (used to provide work restraint & adjusted to be as short as possible) is used when working from a boom type MEWP. It may contain an energy absorber."

26

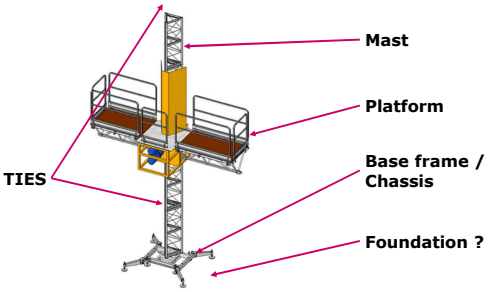
CCC – MEWP

Compliant Products	EN280 & BS8460 Capacity marked PFPE & anti-entrapment in Cherry Pickers Rated for internal or external Over-sailing of work zone or site boundary
Competent Install / Use	IPAF PAL or PAL+ IPAF "MEWPs for Managers" for selectors Task-specific issues Rescue plan Exclusion Zones & Wheel stops Tethering
Compre'sive Maintenance	Daily inspection & tagged Ground conditions & affect on bearing (weather) LOLER compliant



27

M.C.W.P. (Mast Climbing Work Platform)



28

MCWP Requirements

Must Have :-

- **Comply with BS 7981 (CoP)**
- **Twin drive (motor & brake) + Centrifugal brake**
- **PFPE attachment points**
- **Check fittings on ties**
- **Competent Selection, Installation & Inspection**
- **Independent TE (LOLER)**
- **Additional locks (lockout) anti-tamper**
- **Tie bolts doubled & 100% tested**
- **Documentation available on site**

29

MCWP Personnel

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

Supplier Competent Person
User Competent Person
Installer
Demonstrator
User/Operator



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

IPAF Guidelines for the Safe Use of Mast Climbing Work Platforms

30

MCWP – Issues?

Bovis







31

CCC – MCWP

Bovis

Compliant Products	BS 7981 CoP (installation, maintenance & examination) BS EN 1495 Spec Twin drive & centrifugal brakes Double tie bolts
Competent Install / Use	Operator – IPAF Demonstrator – Supplier/Manufacturer Inspector - Independent Temporary Works – for wind especially if netted PFPE use & rescue – plans in RAMS
Compre'sive Maintenance	Examinations: - Daily / pre-use - Following specific maintenance work - Thorough as per LOLER Exclusion Zones Platform left clean clear



32

T.S.A.E. (Temporary Suspended Access Equipment)

Bovis

Must be suitable for task
e.g. reaction to drilling

BS 5974 CoP
- Planning & Design
- Set-up & Installation
- Safe Use (exclusion/rescue)
- Maintenance
- TE (LOLER)



33

TSAE Design

Bovis

Take-off & landing scaffold platforms
Access restrictions

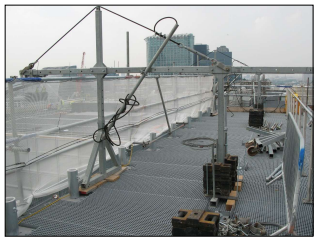
TW Eng confirm supports
Protection of supports
Lock weights
Balanced loading
PFPE in cradle
Secondary braking system



34

TSAE Issues

Bovis





35

CCC – TSAE

Bovis

Compliant Products	BS 5974 CoP Task RAMS Exclusion / access deck / locked anchors wts
Competent Install / Use	User Appointed Person SAEMA accredited users Demonstrator trained by Supplier / Manufacturer Rated load (SWL) Tempory Works to check Wind especially with netting Use of PFPE & Rescue (RAMS) Anemometer
Compre'sive Maintenance	Inspection: - Daily pre-use - Following specific maintenance - TE (LOLER) Platform left clean & clear



36

B.M.U. (Building Maintenance Unit)

Bovis

Hierarchically superior or inferior to MEWP / TSAE ?
Technically permanent so superior

Can be "re-rated" for maintenance loads
(e.g. glass replacement)
Tend to be slow
Tied-in at regular intervals (>40m)
PFPE must be used
Training generally from manufacturer
SAEMA accreditation available

37

Wind on BMUs

Bovis

Max wind speed 28mph ?



- Confirm max wind speed
- Measured where ?
- Under what circumstances ? (trigger/frequency)
- By Whom ?



38

General Wind Alerts

Bovis

Code	Average Speed (mph)	Gust Speed (mph)	Activity Guidance	General Guidance
Green	< 17mph	< 25mph	Safe for all site operations	Good housekeeping. Extra Care need for long roof sheets (>20m)
Yellow	> 17mph	> 26mph	Stop handling sheeting >5m long, or lightweight materials (insul, liner trays, glass fibre)	Check ground level storage (housekeeping). Extra Care will all roofing (exposed).
Blue	> 23mph	> 35mph	Stop felt roofing, mastic asphalt, slating, tiling, sheeting, decking. Check mobile crane limit	Check roof for loose materials. Extra Care with crane handling shutters, sheets
Red	> 38mph	> 38mph	Stop crane and hoist (exposed). Stop formwork decking.	Check scaffold and roof for loose material and missing ties. Secure scaffold boards and sheeting.
Black	> 45mph	> 50mph	Stop all exposed or external activity	Assess safety of access for internal works. Check if internal materials could be blown around, (sheets rubbish). If in doubt, stop.

39

Towers

Bovis

Only when no "safer" method is practical
Erected by PASMA trained personnel
Follow manufacturer's instructions
Narrow (half) width only where space limited

"No narrow towers"

AGR or 3T ?



40

Tower Erection / Striking

Bovis



3T
(slow & mis-used)



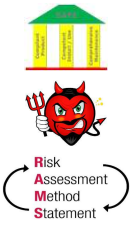
AGR
(fast & simple)

41

CCC – Towers

Bovis

Compliant Products	EN 1004 AGR preferred to 3T Legs/Riggers as per Manufacturer's Instructions Platform capacity marked Lockable the wheels !
Competent Install / Use	PASMA – to erect or adjust Users – only if significant adjustment Always leave SAFE (up/down) locked Toe Boards Tethering Don't overload
Compre'sive Maintenance	Daily pre-use PASMA Weekly PASMA Tagged



42

Podiums, Pecos & PAVs

Bovis





43

Podiums

Bovis

Task specific
Light duty, short duration, small footprint




BS 8620 or PASMA PAS 250

44

Podiums - Compliance

Bovis



With 0.75kN on platform & legs attached…

0.30 kN lateral push …

Toe board requirement ?
Risk Assess as per WaH Regs
Suitable & sufficient steps to prevent falling objects "liable to cause injury"

BS 8620 or PASMA PAS 250

45

Podium Issues

Bovis



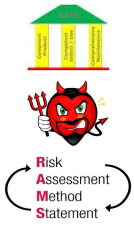


46

CCC – Podium

Bovis

Compliant Products	**BS 8620 (or PAS 250)** **Max 2 wheels** **Erect & use legs as per Manufacturer's Instructions** **Max 2.5m high as PASMA**
Competent Install / Use	**Clear & level surfaces** **Tethering** **Folding preferred – less errors** **Legs trip hazard ?** **Leave SAFE (up /down) Locked**
Compre'sive Maintenance	**Use PASMA check list** **Daily pre-use** **Weekly (tag)**



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Peco

Bovis



Internal Use Only



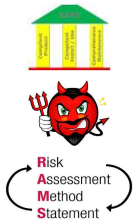
Internal or External Use

48

CCC – Peco

Bovis

Compliant Products	No specific standard Meets "some aspects" Indoor / Outdoor capacity Treated as a PAV by many
Competent Install / Use	Manufacturer's "Tool Box Talk" appropriate IPAF PAV – maybe excessive IPAF 3a/3b – may be excessive Tethering
Compre'sive Maintenance	All as Manufacturer's Instructions Should be tagged



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P.A.V. (Push Around Vertical)

Bovis

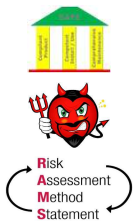


50

CCC – PAV

Bovis

Compliant Products	EN 280 "Power Tower" SWL clearly marked Bearing capacity – especially for raised flooring < 4.3m reach height ? Internal flat floors only (unless rated)
Competent Install / Use	IPAF -PAV 3a/3b Rescue / Lowering plan Exclusion zones & wheel stops Tethering
Compre'sive Maintenance	Daily User inspection - tagged TE as per LOLER



51

Bovis

Access Systems

Any Questions?

52

Bovis

Access Methods

1

Access Methods

Bovis

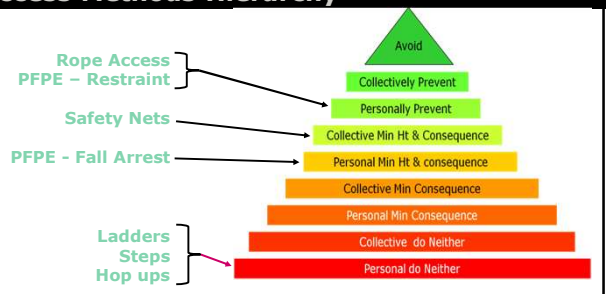
Personal Fall Protection Systems (PFPS)

- Often temporary
- Hierarchically inferior
- "Last resort" in Bovis

2

Access Methods Hierarchy

Bovis



3

Rope Access

Bovis



4

Rope Access - Intro

Bovis

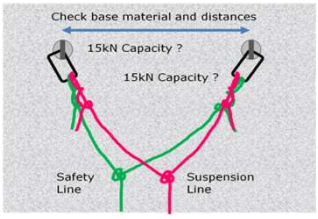
- Increasingly permanent
- NOT a "Black Art", subject to strict controls
- Consider :-
  - How easily can task be completed in suspension ?
  - What additional hazards (below environment) ?
  - Tools, reactions
  - Material reaction (drilling etc)
  - Pace of task, exposure of RAT
  - Rescue (down .. away) ?
  - Other issues (task specific hazards)

5

Rope Access - Planning

Bovis

Support, Rescue, Exclusion



Supervisor (Level 3)
Spotter/Watcher



6

Rope Access - Competency



Level 1 – entry level
- Basic 5 day course
- Log book
- Min to start

Level 2
- + 12 months as L1
- + 1,000hrs as L1
- Rescue

Level 3 - supervisor
- + 12 months as L2
- + 1,000hrs as L2
- First Aid
- Advanced rescue

7

CCC – Rope Access

Compliant Products	IRATA CoP / BS 7985 Many equipment standards (EN) 2No Anchors 15kN (CoP Annex F) "unquestionably reliable" Use justification
Competent Install / Use	IRATA Level 1-3 L3 supervisor in every team Rescue RAMS Anchor design approved by Temporary Works Exclusion Zones & Tethering Watcher
Compre'sive Maintenance	Anchor & Rope Protection TE 6 monthly (LOLER)



8

Rope Access - Issues

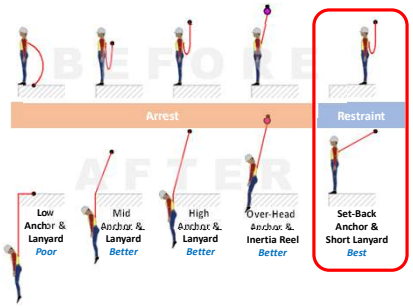






9

Work Restraint

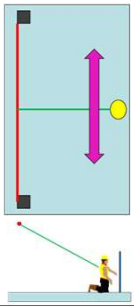


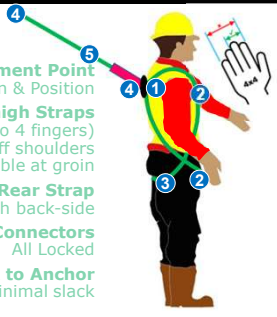
"Restraint" means user **cannot** fall



10

Work Restraint Operations





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

11

CCC – Work Restraint

Compliant Products	Prevent falls occurring Many equipment standards (EN) Harness, link, anchor Dorsal extender
Competent Install / Use	Task-specific competency TW Engineer to approve anchors Position & unique ID on certificates Passive better than active Exclusion zones, signage & tethering
Compre'sive Maintenance	Inspection: - Visual & tactile inspection BEOOU - Comprehensive every 3 months – logged & tagged Safe storage



12

Safety Nets

Bovis

Discussed previously as

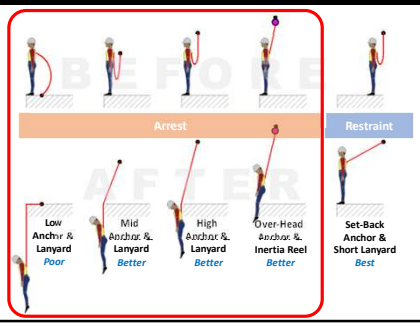
Perimeter Protection



13

Fall Arrest

Bovis

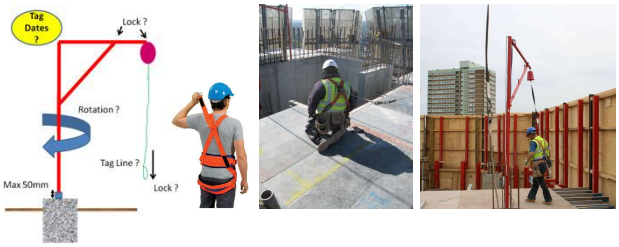


Minimise
Height
&
Consequences
of a fall

14

Fall Arrest - Hangman

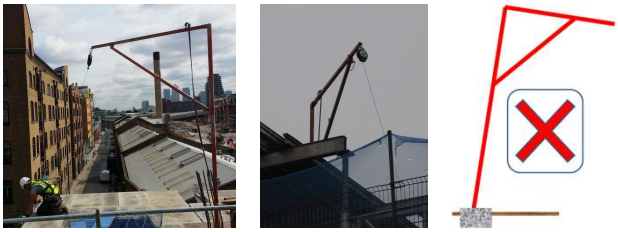
Bovis



15

Fall Arrest – Hangman Issues

Bovis

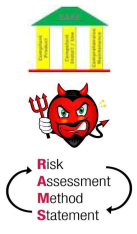


16

CCC – Fall Arrest

Bovis

Compliant Products	**Many equipment standards (EN)** **Harness, link, anchor** **- Best - inertia reel & overhead anchor** **- Good - short lanyard & high anchor** **Rescue RAMS**
Competent Install / Use	**Task-specific competency** **Minimise swing falls** **Rescue competency** **TW Engineer to approve anchors** **Position & unique ID on certificates** **Passive better than active** **Exclusion zones, signage & tethering**
Compre'sive Maintenance	**Inspection:** **- Visual & tactile inspection BEOOU** **- Comprehensive every 3 months – logged & tagged** **Safe storage**



17

Ladders, Steps & Hop-Ups.

Bovis

Minimise Use - Other means preferred - Justify decision
Short duration only(<10mins)



18

CCC – Ladders

Bovis

Compliant Products	EN 131 Professional Class only Composite or metal Means of access only where no alternative Work Platform only in special cases
Competent Install / Use	Ladder Association training Don't use top three rungs <10mins, 3 points of contact, do not over-reach Incline Sticker Secured Locked against unauthorised use
Compre'sive Maintenance	Inspection: - BEOOU by operative - Weekly by competent person - tagged & logged



19

Steps

Bovis

Options…



20

CCC – Steps

Bovis

Compliant Products	EN 131 – professional class only Composite or metal Work Platform only where no alternative Not to be used for access
Competent Install / Use	LA training Don't use top three rungs <10mins, 3 points of contacts, reach forwards only Fully open and locked Locked against use
Compre'sive Maintenance	Inspection: - BEOOU by operative - Weekly by competent person - tagged & logged

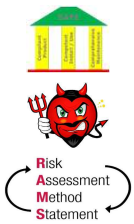


21

CCC – Hop-Ups

Bovis

Compliant Products	SWL 150kg (as for EN 131) Min plan: 600mm x 600mm Max height: 500mm Aluminium only
Competent Install / Use	LA training – tool box talk (finger traps & inspection) Light work only – justified in RAMS
Compre'sive Maintenance	Inspection: - BEOOU by operative - Weekly by competent person - tagged & logged



22

Other Possibilities?

Bovis



Delta Decks



Stilts

23

Bovis

Access Methods

Any Questions?

24

Bovis

Steel & Concrete Frame Methods

1

Steel & Concrete Frames Design

Bovis

Once frame material has been agreed...
ROAD reviews are key

Early stage **detailing** very significant





2

Steel Frames

Bovis

Assess/Plan :-

- **Loading & stability at all stages - sequencing**
- **Safe Access at all stages (perimeter, internal, shafts)**
- **Lifting (weight, positive connections, remote release)**
- **No Person Zones (NPZ)**
- **Temporary Works planning**
- **Pre-Fab, Modules (use of crane)**
- **Perimeter Edge Protection (with containment)**
- **Climbing Screens**

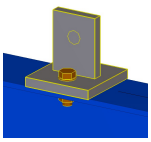
3

Steel Options - Lifting

Bovis

Positive lifting connections (fabrication detail)







Fabrication software determines position as design develops

4

Steel - Good Practice

Bovis

Column bases immediately bolted & grouted





Never leave over night

5

Steel - Sequencing

Bovis

Vertically aware – what's happening above & below
Access for personnel & materials

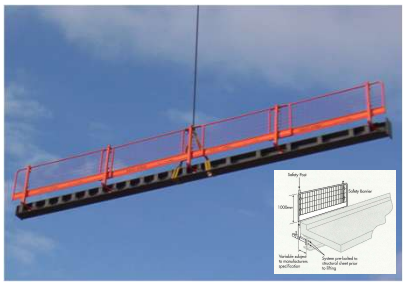


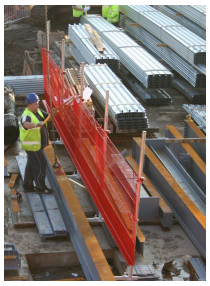


6

Steel Options - Pre-Fit EP

Bovis





7

Steel – MEWPs

Bovis





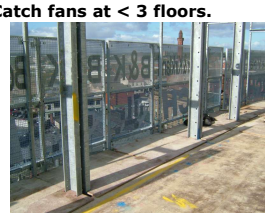


8

Drops Protection at Height

Bovis

Full-height EP or climbing screens for high-rise
Or
Catch fans at < 3 floors.





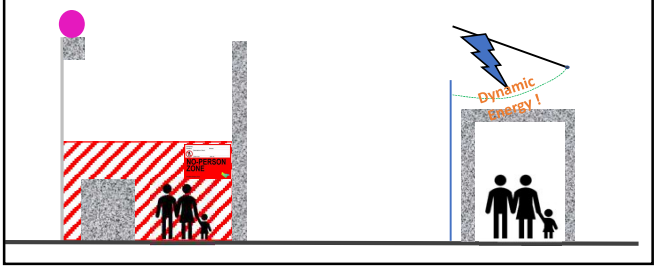
Prioritize early permanent works

9

Drops Protection Below

Bovis

No Person Zone / Gantry and Crash Deck.



10

Safety Nets for Decking

Bovis

Make provision in design





Install with a stick?

11

Pre-Cast Elements

Bovis



Lifting
Propping
Sequencing (by approval)
Bearing (steel lugs/studs).
Pre-fitting EP / nets
Grouting





12

Vehicle Access & Off-Loading



- **Pre-slung loads**
- **Retention posts**
- **Weights marked**
- **Max stack height**
- **Block & wedge to avoid sliding, collapse or distortion**

Avoid accessing vehicle

13

Concrete Frame

Assess the plan:

- **Core**
  jump/slip, interface, pump/skip
- **Cantilever above floors**
  (programme)
- **Falsework method**
  top down, pan system
- **Columns & walls**
  precast, cages, reusable shutters
- **Proprietary systems**
  access platforms, etc



14

Concrete Frame - Hierarchy

Formwork within Climbing Screen
Erected from below using poles, MEWPs Towers
Pan/ panel system e.g. Peri Skydeck, Ischebeck Titan
Max screen protection Formwork from below
Only efficient >10 floors

Formwork Erected from below
Using poles, MEWPs, towers
Pan/ panel system with robust process to pre-fit full-height EP below deck
Formwork from below
Open edges Deck eng limits for EP

Formwork Pre-Fabricated on Ground
Tables pre-formed on Ground, including EP. Controlled flying
Eliminates much WAH
Increases lifting risks

Formwork Erected from slab below
Using AGR
Ledger frame or tower system, e.g. Titan, Gas
Limited… AGR
Increases fall risk in formwork & EP

Formwork Erected from top
Using PFPE (Hangman)
Only if other solutions are NOT reasonably practicable

15

Concrete Frame - Controls

- **Provide protection at edges & penetrations to minimise risk**
- **Risk assess to prevent falls (people & stuff)**
- **Ensure BOTH**
  - **Primary (screens, EP, tethers)**
  - **Secondary (fans, gantries, NPZ).**
- **Consider following works affected by EP (frame, cladding, M&E, etc).**
- **Plan access to slab edge carefully**
- **Plan cores walls carefully**
  Options follow…

16

Core-Forming Options

Floor by floor with Slabs	+ Potential fall height reduced. Safe access via stairs.
Slipform	+ Full ht protection at all times. Reduced crane time. - Risk when dismantling at height & when installing run off/hoist platforms.
Climbtrack (shutters not removed from face when raising).	+ Full ht protection at all times, minimal alteration. Crane need and wind issues reduced. - Risk for erectors at stop ends when moving. Risk when dismantling at height.
Jumpform (shutters removed & repositioned by crane).	+ Can be used at lower levels. - Risk of falls to erectors at stop ends. Crane dependent.

17

Concrete Frame Management

- Apply **Hierarchy** to processes & protection
- Pre-fab & install permanent floor/mesh during construction
- Install permanent riser doors, guard rail, netting ASAP
- Use smaller penetrations
- Fit shaft gates ASAP
- Require permits to work for shafts & risers

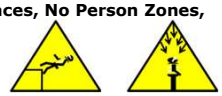


18

FPC Actions

Bovis

Check:
Access Arrangements, Work Platforms, Edge Protection, Tethers, Secure Materials Storage, Public Interfaces, No Person Zones, etc



Ensure:
- **Contractor creates & compliew with FP Plan.**
- **Pre-start meeting**
- **Co-ordination with other trades (weekly, daily briefings)**
- **Regular inspections (supervisor)**
- **Minimise harness use (specialist trades only)**

19

Bovis

Steel & Concrete Frame Methods

Any Questions?

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