

BIM4^{rail}

MAKING BIM REAL

HEALTH & SAFETY MATTERS

APPLYING PAS PART 6 – H&S INFORMATION
REQUIREMENTS & ISO 19650 INTEGRATION

23rd March 2022

Hosted by BIM4Rail

David White, Chair BIM4Rail, HS2 Head Strategic Planning & Asset Management

PAS 1192-6:2018

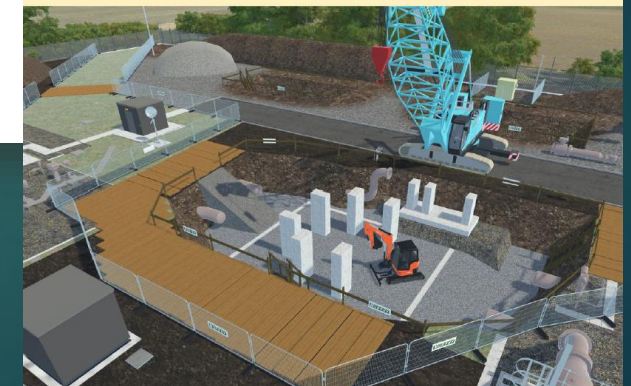
Specification for collaborative sharing
and use of structured Health and Safety
information using BIM



Guidance Note for Clients writing an
Employers Information Requirements (EIR)

BIM 4 Health & Safety Working Group

Based on PAS 1192-6: 2018



Webinar Outline

- ▶ **Welcome and Introduction**
 - David White, Chair BIM4Rail
- ▶ **Implementing PAS Part 6 H&S Information Requirements - Q&A**
 - Ian Chambard, NR Representative BIM4Rail
- ▶ **Applying PAS Part 6 on a Major Project**
 - Barry Gleeson, Member BIM4Rail
- ▶ **Overall Q&A & Closing Remarks**

HEALTH & SAFETY MATTERS

WEBINAR MAR 2022



About the speakers

David White,

Ian Chambard

Barry Gleeson



***HEALTH & SAFETY
MATTERS***

Presentation: Improving H&S Outcomes: Use of PIRs

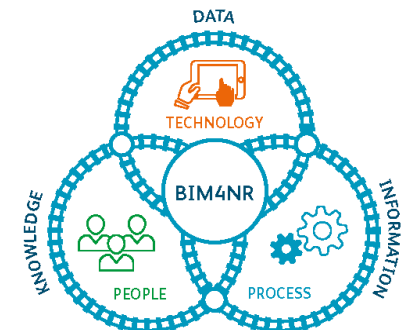
Public Sector Information Management Group Meeting
06/07/2021

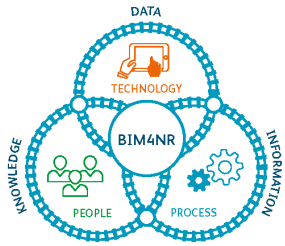
A Client's maturity matrix for improving management of
information in CDM – Using PIR's
(Transition from PAS 1192-6:2018 to ISO 19650-6:####)

BIM 4 Health and Safety Working Group

Based on PAS 1192-6: 2018

Ian Chambard MSc. LCGI FRGS
Principal Engineer (BIM)





The Group

NetworkRail

➡ A sub-group for the BIM4HSE Working Group – Chaired by Gordon Crick



Steve Williams &
Ian Chambard



Gordon Crick



Andrew E. Rouse



Steve Coppin



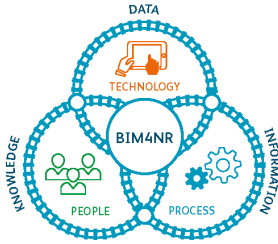
Peter Nicholas



Martin Couling

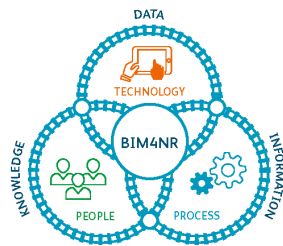


Ambition

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Guidance document to help Clients (Appointing Party) to know what is expected of them and where to get help to correctly manage information to deliver the desired outcome to meet the needs of themselves, their organisation or comply with the law.





BIM4HSE Group Formed (2015)



PAS 1192-6 Launched

OFFICIAL
BIM Risk Library Project (Lloyd's Register)
"Discovering Safety" Manchester University

Open Learning Environment (OLE)
Running an Industry Pilot 5 Projects Selected

Community of Practice to share Design Risk information

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PAS 1192-6 ISO Review (2024)

Challenges:
• International Practices and Standards

2016 2017 2018 2019 2020 2021 The Future

PAS 1192-6 (Planned Publication Aug 2017)

UK Government set minimum BIM target for public-sector to at least Level 2 by 2016.

Challenges:
• Use of language – CDM / H&S / Engineering / Project Management / BIM
• Launching the PAS.
• Ownership.
• Guidance of H&S in the BIM world.

Creation of 10 Questions

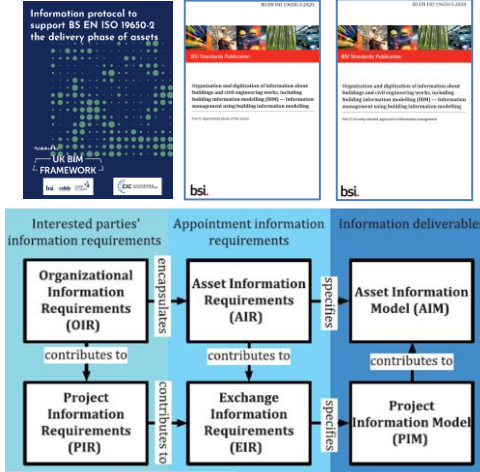
Challenges:
• Getting Client involved.
• Knowing what to ask duty holders.

ISO 19650 Parts 1 & 2 (Supersede BS & PAS 1192)

Guidance for Client's EIR



Information Protocol and ISO 19650 Parts 3 & 5 Released



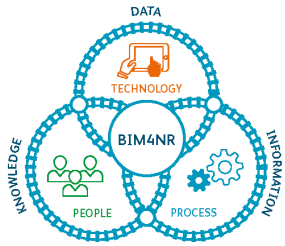
Guidance for Client's PIR

Development of PIRs (PAS1192-6 (19 written) + specific PIRs covering Big Risks



Focus For Today

NetworkRail



bsi.

Users of [BIM](#) (Building Information Modelling) have been slow to collaborate on sharing structured [health and safety](#) (H&S) information across project and asset lifecycles. This PAS aims to remedy that by providing guidance on applying H&S information through BIM processes and applications.



Guidance to help all duty holders improve their understanding of use of digital information. Where to get help and what to ask.

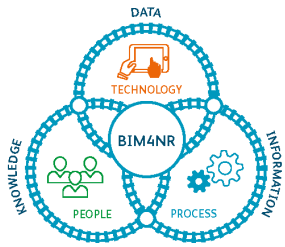
Issue: No host so only made its way into the industry by authors and supply chain partners.



Guidance updated to help all duty holders understand their current maturity and sets out where to get help and what to ask for through 10 plain language questions.

Need support to embed with Clients and the Industry.





Aim of the document

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- Guidance to any **Client** (*The Appointing Party*)
- Planning to use Project Information Requirements (PIR) to implement a Building Information Model (BIM) for a project.
- 10 plain language questions that will help Clients prioritise key (H&S) issues
- Questions have an associated maturity matrix, which will help Clients to understand how to answer the questions and give an indication of actions they might consider or be asked to perform.
- The digital maturity of the Client will need to be confirmed (ISO 19650:1)
- Ensures information can be read and stored (management system).
 - Paper to Paper
 - Paper to Digital
 - Digital to Digital
 - All in one Model

Available

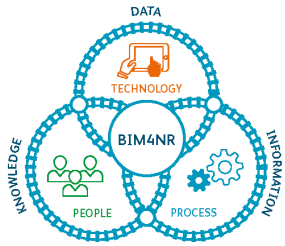
Accessible

Archived



Overview

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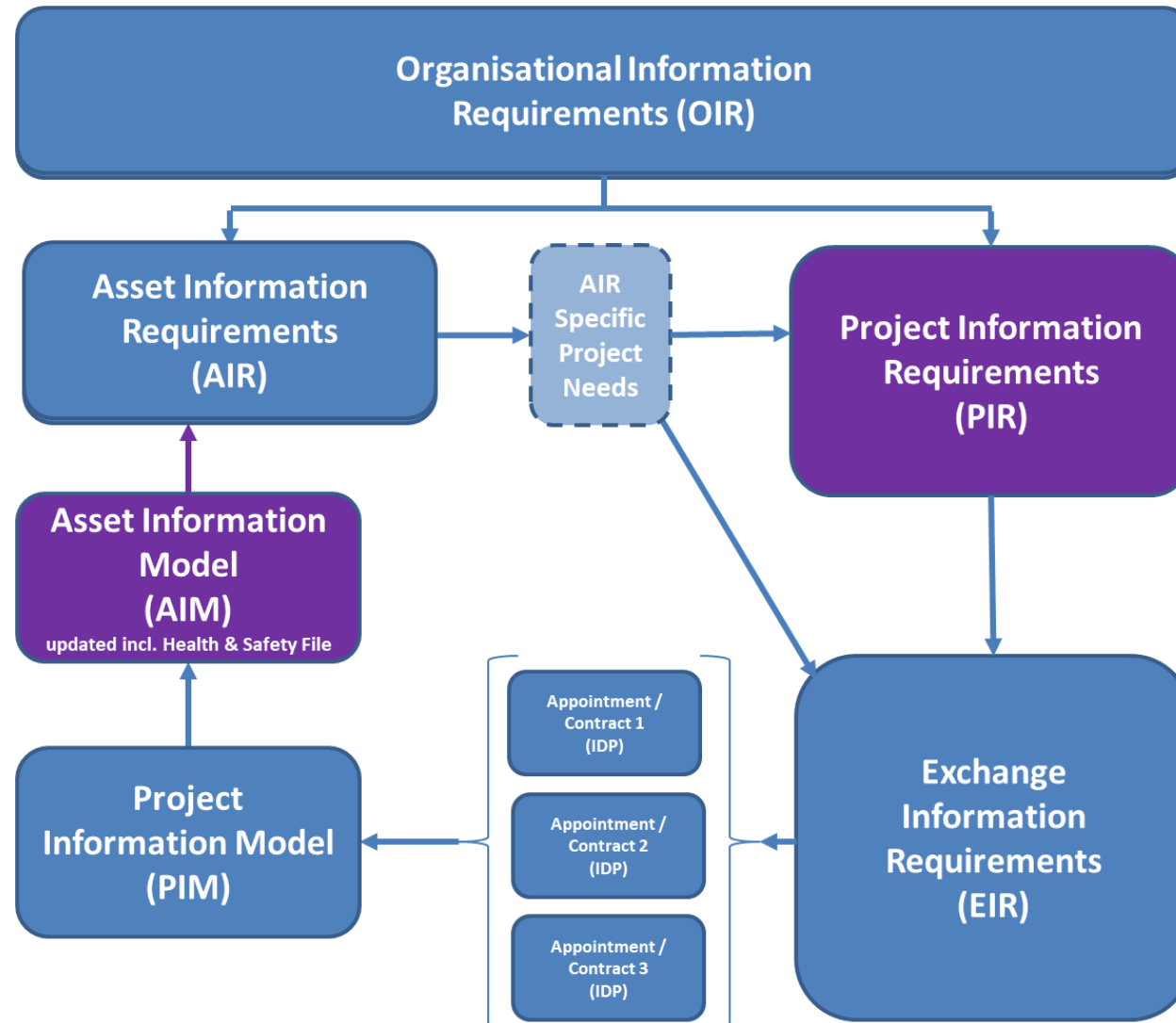


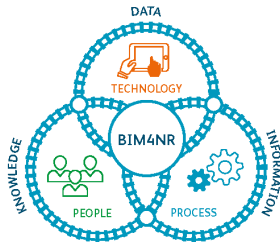
**Strategic
Information
Requirements**

**High-level
Information
Requirements**

**Detailed
Information
Requirements
during Project
Delivery**

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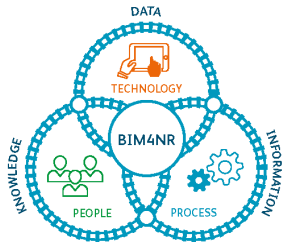


Information Requirement Progression *NetworkRail*

- OIR** The organization needs information about safety critical services, systems and equipment to enable them to comply with health and safety legislation.
- AIR** Up to date details of all asset management service providers (such as consultants, contractors and suppliers) of safety critical services, systems and equipment recorded to enable rapid retrieval of key information in response to a trigger event.
- PIR** Maintain details of all services providers (such as consultants, contractor and suppliers) who safety critical services, systems and equipment.

For the **EIR** (Delivery) to meet the **PIR** suggested is the following:

PIR	EIR (Delivery)	Information purpose
Details of all service providers of safety critical services, systems and equipment used during the Project	Schedule of contact details of all organizations delivering any safety critical services, systems and equipment for use in the construction project	To collate, track and handover to the operational user, the suppliers of safety critical services, systems and equipment used during the Project



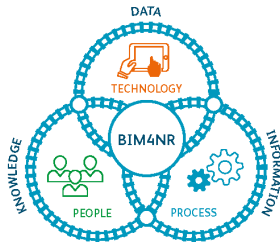
Information Requirement Progression *NetworkRail*

B.4. We require a compliant Health and Safety File for project completion and for asset operation



Replace previous with worked example from Guidance D

<https://ukbimframeworkguidance.notion.site/ISO-19650-Guidance-Part-D-Developing-information-requirements-4735648bd36f468d8694a25d44f94bfc#1e1fe41853bd4db9b0f43f0af82479c6>



List of PIRs to reflect PAS 1192-6 *NetworkRail*

- 1 Maintain digital Pre Construction Information (PCI)
- 2 Maintain information required by the Client
- 3 Maintain Information and RACI Matrix
- 4 Maintain a catalogue of lessons learned
- 5 Maintain a Skills & Training Matrix
- 6 Maintain a PHASR Compliance schedule
- 7 Maintain digital elevated risk information
- 8 Maintain a risk study schedule
- 9 Maintain a schedule of risk study findings.
- 10 Maintain a table of H&S information shortfalls and gaps
- 11 Maintain a table of surveys and investigations
- 12 Maintain a design plan
- 13 Maintain digital design risk information for sharing and use
- 14 Maintain a construction plan
- 15 Maintain a validation and verification schedule
- 16 Maintain a list of digital models
- 17 Maintain a tabulated list of service providers and suppliers information
- 18 Terms of Reference for Risk Studies
- 19 Maintain a schedule of as-built information

How should we apply these consistently?

Are there others that would be useful to include?



CLIENT MONITORING INFORMATION

CLIENT INFORMATION STANDARD

18 Terms of Reference for Risk Studies

2 Maintain information required by the Client

CDE – Track All PIR's

12 Maintain a design plan

3 Maintain Information and RACI Matrix

5 Maintain a Skills & Training Matrix

17 Maintain a tabulated list of service providers and suppliers information

14 Maintain a construction phase plan

PD & PC CO-ORDINATION TOOLS

1 Maintain digital Pre Construction Information (PCI)

11 Maintain a table of surveys and investigations

10 Maintain a table of H&S information shortfalls and gaps

8 Maintain a risk study schedule

16 Maintain a list of digital models

15 Maintain a validation and verification schedule

PROJECT RISK MANAGEMENT

6 Maintain a PHASR Compliance schedule

7 Maintain digital elevated risk information

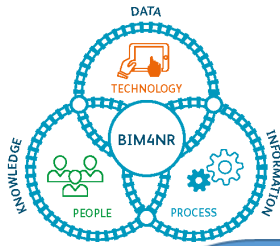
13 Maintain digital design risk information for sharing and use

9 Maintain a schedule of risk study findings.

19 Maintain a schedule of as-built information

4 Maintain a catalogue of lessons learned

RISK MANAGEMENT OUTPUTS

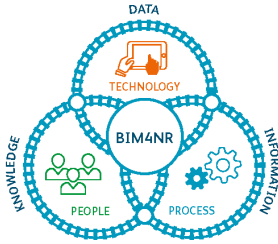


10 Plain Language Questions

1. What early project decisions will have health and safety implications for the operation and end use of the asset?
2. Is there a Client's CDM compliance strategy (CDM Plan) in place that sets out the Client's management arrangements for projects? Furthermore, have you provided all relevant and good quality Health & Safety (H&S) Pre-Construction Information (PCI) to the design team?
3. Have you specified what you want from the Common Data Environment (CDE) solution for this project in order to enable Health & Safety, incl. specialist design information to be captured, stored and retrieved as (needed) at every stage of the project lifecycle and by parties affected beyond the project?
4. Have you specified reviews at key stages to enable collaborative working and feedback on risk management? These reviews should be led by the CDM Principal Designer and involve the Client, Designers, safety professionals, end users, Principal Contractors and Contractors. In health and safety terms these reviews will be key to identify sources of harm in the project, and to ensure risks are where possible, eliminated, or otherwise reduced and treated.
5. What are the design risk objectives to eliminate and reduce risks in the project? These objectives should be set by the Client to guide the design team, in the treatment of health & safety risks, using BIM methodologies.
6. Has a design plan been requested, which maximises the opportunities for collaboration in design risk management? This should cover how design risk objectives will be met, how the different design disciplines will work together, and, for example, how clash detection will be carried out, and who will check that necessary design for temporary works has been enabled.
7. Has it been requested that models produced by different design disciplines are capable of effective federation and that Health & Safety Information has been integrated and conserved for re-use. This will enable automated model checking to reduce risk and efficient co-ordination of effort during the design stage.
8. What are the arrangements that will be put in place at the outset to ensure testing and commissioning is carried out effectively? These arrangements will include the need to assure the client that what was specified has actually been built, and how to feed forward vital operational health and safety information.
9. What are the arrangements that will be put in place at the outset to ensure that information in a Health & Safety File is made available to the end user? The Health and Safety File is required by Law, it provides relevant health and safety information which may be needed to be taken into account during any subsequent project.
10. How will you be able to ensure that lessons are learned from this project experience, in relation to health and safety? PAS 1192-6:2018 requires lessons learned in relation to innovation, good practice and sharing of knowledge to be generalised and shared for re-use by the industry.

Question	PIR's To Consider	First steps	Keeping up with the pack	Taking the lead
<p>1. What early project decisions will have health and safety implications for the operation and end use of the asset?</p> <p>Key clause(s): PAS1192:6 Section 6.1 & 6.2</p>	1,2,6,7,13	<p>1) Client carries out an initial Preliminary Hazard Analysis & Safety Review (PHASR) to identify hazards and risks, including the asset in use.</p> <p>2) Information recorded for others to use.</p> <p>3) Client identifies where support is needed (high uncertainty, significant hazards identified).</p>	<p>1) PHASR results recorded on CDE</p> <p>2) PHASR outputs embedded into contract documents and informs focus areas for tender returns</p> <p>3) Output of PHASR feeds into project life cycle design risk management requirements (HAZOP / HAZCON, site layout study etc.)</p>	<p>1) Comprehensive PHASR with independent chair carried out early with multi-discipline designer/contractor involvement.</p> <p>2) Time bound actions recorded from all design reviews on CDE, significant risks added to the CDM risk log/register/tracker/schedule.</p> <p>3) Formal risk study for operations and maintenance carried out.</p>
<p>2. Is there a Client's CDM compliance strategy (CDM Plan) in place that sets out the Client's management arrangements for projects? Furthermore, have you provided all relevant and good quality Health & Safety (H&S) Pre-Construction Information (PCI) to the design team?</p> <p>Key clause(s): PAS1192:6 Section 5</p>	2,3,4,5,14,17	<p>1) Client identifies knowledge he has to share.</p> <p>2) Client sets up meeting with design team to identify gaps.</p> <p>3) Client sets up check that information is understood, valid and reliable.</p>	<p>1) Client identifies age and confidence in data as part of knowledge share, highlighting potential surveys required.</p> <p>2) CDM Principal Designer (PD) and Design team involved in validating and seeking gaps in PCI.</p> <p>3) Client checks the supply chain has received the PCI.</p>	<p>1) Client captures feedback on gap analysis and progressively closes gap to improve asset and H&S data.</p> <p>2) PCI issued in same format, structure and index as H&S File return.</p> <p>3) Client regularly checks the supply chain has received, understood and has access to early H&S Information.</p>
<p>3. Have you specified what you want from the Common Data Environment (CDE) solution for this project in order to enable Health & Safety, incl. specialist design information to be captured, stored and retrieved as (needed) at every stage of the project lifecycle and by parties affected beyond the project?</p> <p>Key clause(s): PAS1192:6 Section 6.2.1-6.2.8</p>	1	<p>1) Client specifies use of appropriate and accessible IT tools to share information.</p> <p>2) Client specifies who will have access to information.</p> <p>3) Client specifies format and structure of H&S File.</p>	<p>1) A project information manager is appointed to manage the CDE.</p> <p>2) Periodic reviews of H&S File quality, accessibility and content undertaken.</p> <p>3) Progressively developing and sharing H&S information within the CDE.</p>	<p>1) A CDE is established early, and controlled access is granted to all project participants.</p> <p>2) Seamless integration from inception (PCI) to construction phase to handover (H&S File); and operational use from the CDE.</p> <p>3) Tools are specified to enable H&S federation and sharing of models</p>
<p>4. Have you specified reviews at key stages to enable collaborative working and feedback on risk management? These reviews should be led by the CDM Principal Designer and involve the Client, Designers, safety professionals, end users, Principal Contractors and Contractors. In health and safety terms these reviews will be key to identify sources of harm in the project, and to ensure risks are where possible, eliminated, or otherwise reduced and treated.</p> <p>Key clause(s): PAS1192:6 Section 6.3</p>	6,8,9,11,13	<p>1) Client specifies reviews at key stages- Minimum terms of reference developed for reviews.</p> <p>2) Reviews include key participants (including early contractor involvement and experts where required).</p> <p>3) Reviews are led/managed by PD / PC</p>	<p>1) Design review actions generated and assigned owner and time bound actions to resolve.</p> <p>2) Residual actions from project phase are formally passed forward to next stage.</p> <p>3) Design review requirements revalidated and reset at each project stage.</p>	<p>1) Design reviews are regular, comprehensive and include model federation and clash detection / avoidance.</p> <p>2) A constructability review/ construction phase rehearsal informs Temporary Works register & Design risk log/register/tracker/schedule.</p> <p>3) Design decisions and assumptions recorded on CDE and linked to formal risk management systems.</p>
<p>5. What are the design risk objectives to eliminate and reduce risks in the project? These objectives should be set by the Client to guide the design team, in the treatment of health & safety risks, using BIM methodologies.</p> <p>Key clause(s): PAS1192:6 Section 6.2.11</p>	11,12,18,	<p>1) Client states those hazards or risks they want eliminated by design</p> <p>2) Client sets out what H&S risks he wants information on.</p> <p>3) Designers explain how BIM methods will be used to aid H&S in design through the BIM Execution Plan.</p>	<p>1) Client/design team agree which risks will be eliminated, reduced or controlled by the design</p> <p>2) Objective set on how to use models, symbols, animations to share information via the project team, including construction.</p> <p>3) Active review by client and design team of design risk objectives.</p>	<p>1) Client design risk objectives are cascaded through the project and supply chain.</p> <p>2) Client requires greater use of visualisation for project, operations and stakeholder engagement.</p> <p>3) Client specifies H&S health reporting / dashboard reporting from Principal Designer and Principal Contractor via CDE.</p>
<p>6. Has a design plan been requested, which maximises the opportunities for collaboration in design risk management? This should cover how design risk objectives will be met, how the different design disciplines will work together, and, for example, how clash detection will be carried out, and who will check that necessary design for temporary works has been enabled.</p> <p>Key clause(s): PAS1192:6 Section 6.3.4</p>	12, 14	<p>1) Client specifies a design plan is produced with design risk management included.</p> <p>2) All design participants identified and co-ordinated in the design plan.</p> <p>3) Design plan includes design risk objectives.</p>	<p>1) Pre-contract design plan forms part of the tender return.</p> <p>2) Design plan includes design assurance activities</p> <p>3) Design plan incorporates constructability and temporary works requirements.</p>	<p>1) Design plan is comprehensive and shows in detail how objectives will be met.</p> <p>2) Plan shows how design of temporary works will be enabled by design team.</p> <p>3) Plan shows how risk burden will be measured and minimised.</p>
<p>7. Has it been requested that models produced by different design disciplines are capable of effective federation and that Health & Safety Information has been integrated and conserved for re-use. This will enable automated model checking to reduce risk and efficient co-ordination of effort during the design stage.</p> <p>Key clause(s): PAS1192:6 Section 7</p>	7,9,10,16	<p>1) The BIM Execution Plan (BEP) identifies how models shall be segregated and combined to support H&S.</p> <p>2) PD and design team decide how information is to be shared and recorded through the CDE.</p> <p>3) H&S information is made available for re-use.</p>	<p>1) Temporary works information is included in the CDE.</p> <p>2) Soft clash (temporary works) detection / avoidance includes consideration to workers, the public and end users.</p> <p>3) Reviews regularly see opportunities for improving risk management as clashes are identified and shared.</p>	<p>1) Soft and hard clash detection / avoidance is continuous</p> <p>2) Combined models are used in reviews and designers aware of pending changes and revisions.</p> <p>3) H&S File are inclusive of as built models.</p>
<p>8. What are the arrangements that will be put in place at the outset to ensure testing and commissioning is carried out effectively? These arrangements will include the need to assure the client that what was specified has actually been built, and how to feed forward vital operational health and safety information.</p> <p>Key clause(s): PAS1192:6 Section 6.5</p>	14,15,18,19	<p>1) Client specifies who will be responsible for commissioning.</p> <p>2) Client identifies early what commissioning tasks are needed and how these will be recorded.</p> <p>3) Commissioning, test and validation results integrated with H&S File and available in the CDE.</p>	<p>1) Commissioning reviews (including temporary works) completed through visualisation.</p> <p>2) Model and visualisation supplied to the end user for continual / reuse.</p> <p>3) As built models and information identified in the CDE.</p>	<p>1) Incorporating the commissioning plan into soft landing scope.</p> <p>2) Model information is used to populate asset management system.</p> <p>3) Clear index to all H&S information required for asset operation, maintenance and end use is recorded in the CDE.</p>
<p>9. What are the arrangements that will be put in place at the outset to ensure that information in a Health & Safety File is made available to the end user? The Health and Safety File is required by Law, it provides relevant health and safety information which may be needed to be taken into account during any subsequent project.</p> <p>Key clause(s): PAS1192:6 Section 6.5</p>	1,2,19.	<p>1) Client specifies contractually who will be responsible for compiling and handing over the H&S File.</p> <p>2) Client specifies H&S File content.</p> <p>3) H&S File is pre-structured in the CDE.</p>	<p>1) Client provides the PCI to reflect H&S File handover.</p> <p>2) End user reviews are carried out progressively through the project life cycle on H&S File content and structure for usability.</p> <p>3) All handover info on CDE tested and exchanged with the end user.</p>	<p>1) All H&S File info is indexed on CDE and incorporated into soft landing strategy.</p> <p>2) H&S File is in a format to enable ready access to end users and next project manager.</p> <p>3) As-builts validated through laser scanning / point clouds for construction tolerances.</p>
<p>10. How will you be able to ensure that lessons are learned from this project experience, in relation to health and safety? PAS 1192-6:2018 requires lessons learned in relation to innovation, good practice and sharing of knowledge to be generalised and shared for re-use by the industry.</p> <p>Key clause(s): PAS1192:6 Section 5.5</p>	4	<p>1) Client requests from all Duty Holders to provide appropriate best practices and lessons learned from previous projects.</p> <p>2) Action plan and process in place to capture new lessons learnt from appointed all Duty Holders.</p> <p>3) Client sets Key Performance Indicators from the lessons learnt from appointed all Duty Holders.</p>	<p>1) Best practices and lessons learnt reviewed by Client and all appointed Duty Holders and where appropriate, issued in timely fashion within industry</p> <p>2) KPI utilised for measuring the quantity and type of H&S lessons learnt, forms part of project reporting to Client.</p> <p>3) Identification of new lessons learnt in relation to BIM / PAS1192:6.</p>	<p>1) Client reviews action plan and outcomes at regular intervals.</p> <p>2) Lessons learned and best practices fed back by all Duty Holders to all relevant design disciplines and supply chain in project.</p> <p>3) Client shares generalisation of learning and best practices across industries for open learning.</p>

Example PLQ 2

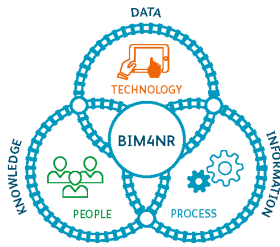


2. Is there a Client's CDM compliance strategy (CDM Plan) in place that sets out the Client's management arrangements for projects? Furthermore, have you provided all relevant and good quality Health & Safety (H&S) Pre-Construction Information (PCI) to the design team?

Key clause(s): PAS1192:6 Section 5

PIRs to consider: 2, 3, 4, 5, 14, 17

First steps	Keeping up with the pack	Taking the lead
<ol style="list-style-type: none"> 1) Client identifies knowledge he has to share. 2) Client sets up meeting with design team to identify gaps. 3) Client sets up check that information is understood, valid and reliable. 	<ol style="list-style-type: none"> 1) Client identifies age and confidence in data as part of knowledge share, highlighting potential surveys required. 2) CDM Principal Designer (PD) and Design team involved in validating and seeking gaps in PCI. 3) Client checks the supply chain has received the PCI. 	<ol style="list-style-type: none"> 1) Client captures feedback on gap analysis and progressively closes gap improve asset and H&S data. 2) PCI issued in same format, structure and index as H&S File return. 3) Client regularly checks the supply chain has received, understood and has access to early H&S Information.



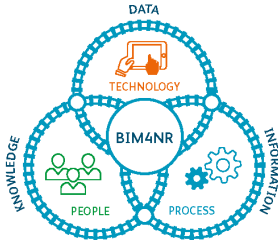
How can you help?

NetworkRail

- Provide feedback.
- Help the BIM4HSE working group land & embed within our industry.
- Help host the document.
- Start using the guidance on your projects and provide feedback.
- Help bridge the gap between H&S and the Digital world.



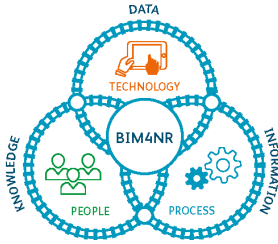
Next Steps



- Receiving feedback.
- UK BIM Alliance: including examples within Guidance D
- Finalise document (August 2021).
- Publish on line (Summer 2021).
- Volunteers – Pilot the approach and capture learning.



Update

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Email: **BIM 4 Health & Safety Working Group - Next Meeting on Feb 15th 2022**

Sent: **Mon 29/11/2021**

Dear All,

I do apologise if any of you have been confused about the date of our next meeting. I did intend to hold a meeting before Christmas, but taking everything into account I have decided now to hold off meeting again until the afternoon of Feb 15th next year. I will shortly be sending out a Teams meeting invitation for that date.

The Dates for our next run of meetings will be- Feb 15th at 3.30 pm, April 12th at 3.30 pm, July 12th at 3.30 pm, Sept 13th at 3.30pm.

The news I do have for you all is that the UK BIM Framework have now published a new Interactive version of Guidance D, alongside the existing pdf, and the interactive version contains 4 of the Health & Safety Information Requirements examples that we have been working on. See Annex B -

<https://ukbimframeworkguidance.notion.site/ISO-19650-Guidance-Part-D-Developing-information-requirements-4735648bd36f468d8694a25d44f94bfc#f8ebcf8a1296496e885d3f8814918c4a>

Another example on High Level Glazing will be added soon.

I will keep you in touch with any further developments. Please do contact me directly if you have any questions or comments or want to contribute further to any of our ongoing work streams.

Kind Regards

Gordon

Gordon Crick
HM Inspector of Health and Safety
Health and Safety Executive
Osprey House
Colchester Rd
Chelmsford
Essex CM2 5PF

Attendee Poll Question



WEBINAR
HEALTH & SAFETY
MATTERS



North London Heat & Power Project - NLHPP

North London Waste Authority EcoPark Facility

**north
london**



Implementing PAS Part 6 on a Major Project North London Heat & Power Project

Mar 2022

Presented on behalf of NLHPP/ NLWA by Barry Gleeson

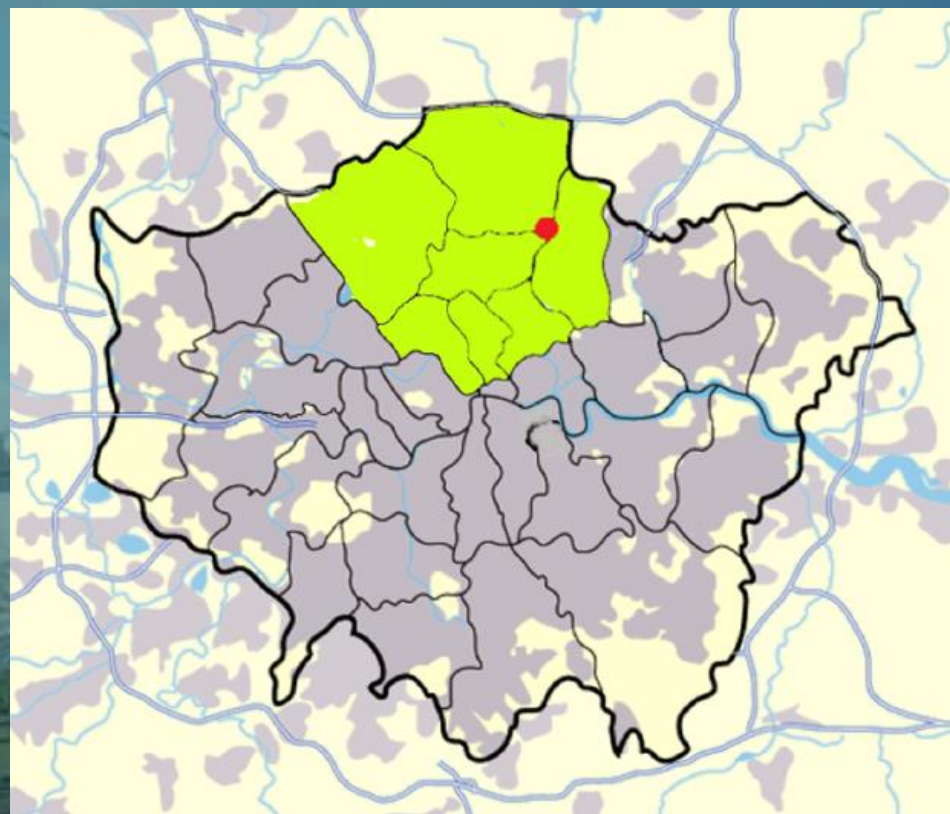


EcoPark Facility Background

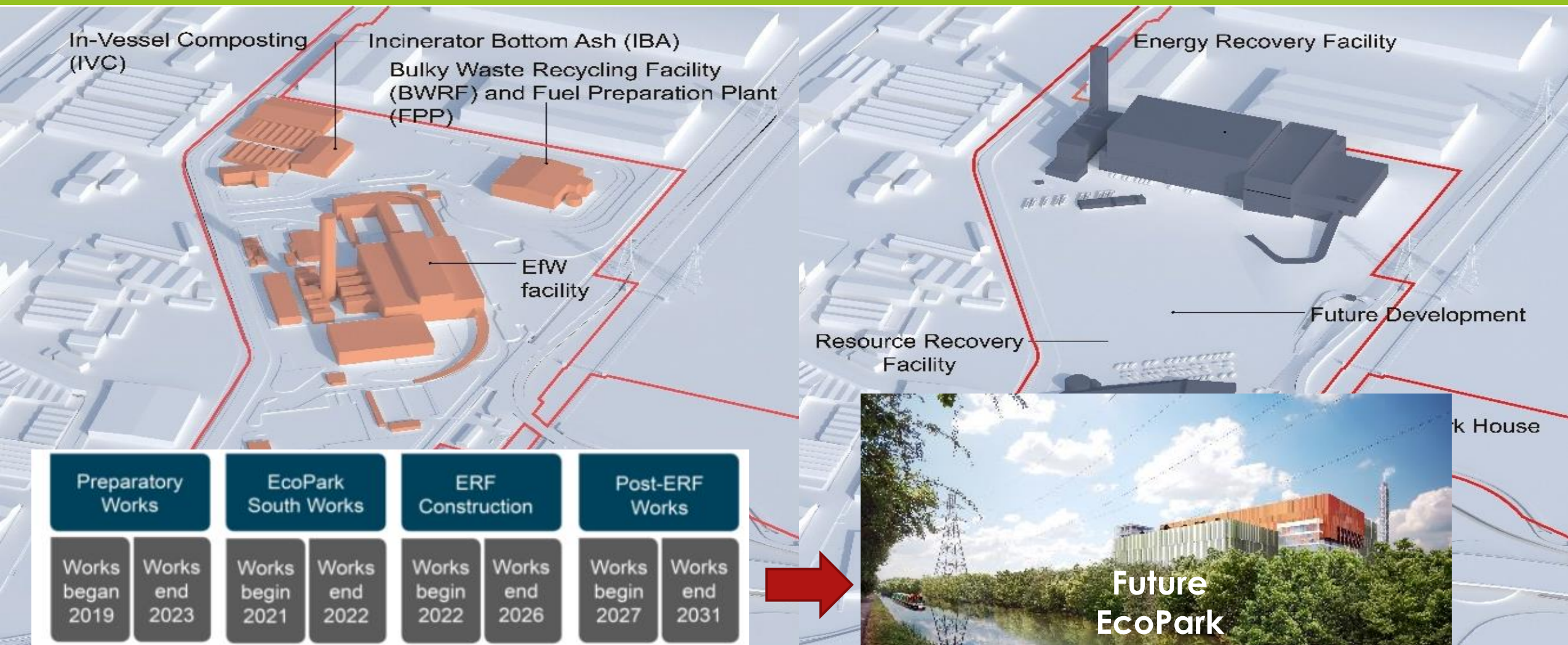
North London Waste Authority Edmonton EcoPark Facility – Key Stats

- **2nd Largest** Waste Authority in UK
- **3% of UK** household waste
- **Serves 2 million people** covering London Boroughs of Enfield, Hackney, Haringey, Islington, Camden, Barnet and Waltham Forest
- **One of the oldest** energy from waste plants of this nature in Europe – *its time for a change*

“Our highest priority is to minimise and avoid waste to help to protect the planet and preserve resources for future generations”

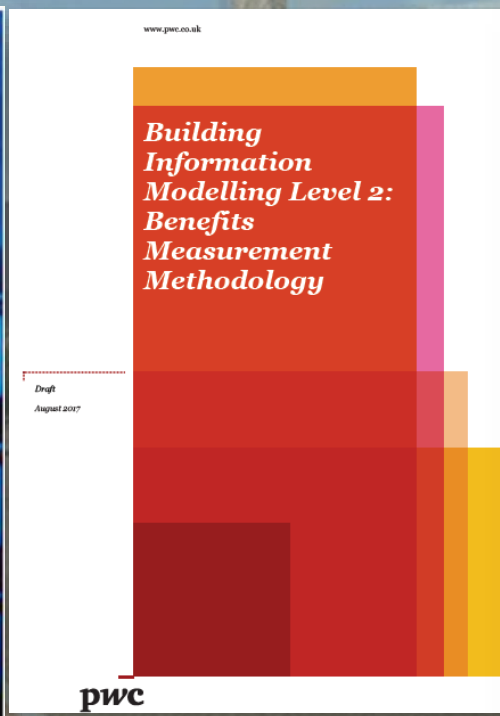


EcoPark Redevelopment Challenge



*“To create a waste management facility in which **local communities take pride**, **demonstrates value** and is a **model for public sector project delivery**”*

What is important to us as a public sector client?



PAS Part 6 Kick Off Workshop



1. All participants as pre-reading to familiarise themselves with PAS 1192-6
2. Each function from H&S, BIM and IM to present a summary of their approved strategy and objectives
3. Review and agree the issue and outcome statements
4. Based on these objectives agree a set of common objectives to meet the outcome statement
5. Based on the agreed common objectives develop a set of activities and plan to deliver the outcome statement. Assign tasks and set dates for completion
6. Agree on a forum for reviewing progress and frequency for meeting

Purpose of the workshop

Purpose of the workshop is to develop a plan to improve the alignment between the BIM working group and HSE working group to better support the requires of PAS1192-6

Issue statement

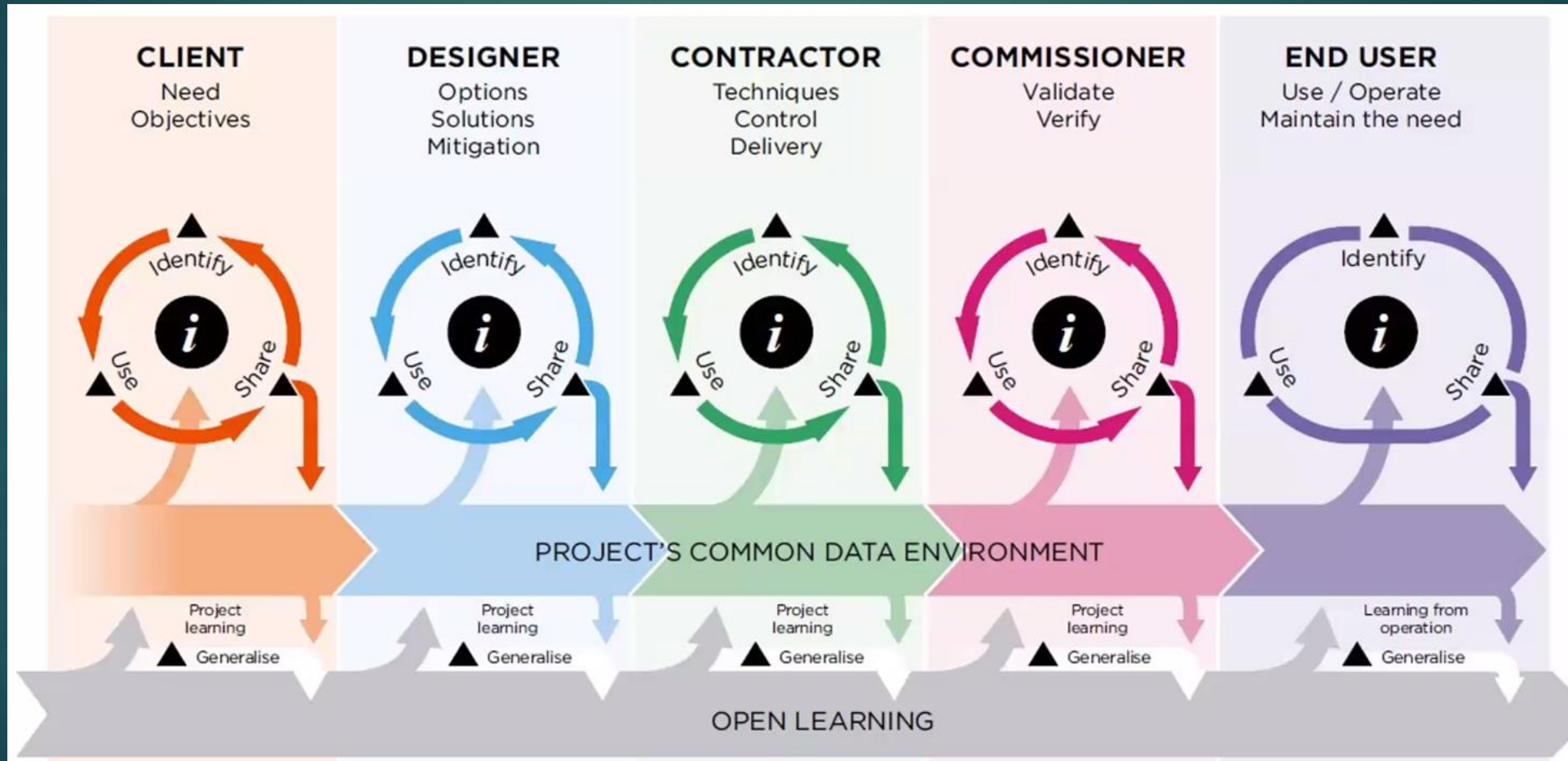
There has been limited progress in developing a plan to closely align the objectives of BIM development and PAS 1192-6:2018 Specification for Collaborative Sharing and Use of Structured Health & Safety Information Using BIM. There is a need to establish a forum at which the collective knowledge of H&S, BIM and Information Management function can work collaboratively to develop a set of common objectives and road map. This is to improve alignment to achieve industry H&S best practice and to maximise the use of BIM as a digital enabler.

Outcome statement

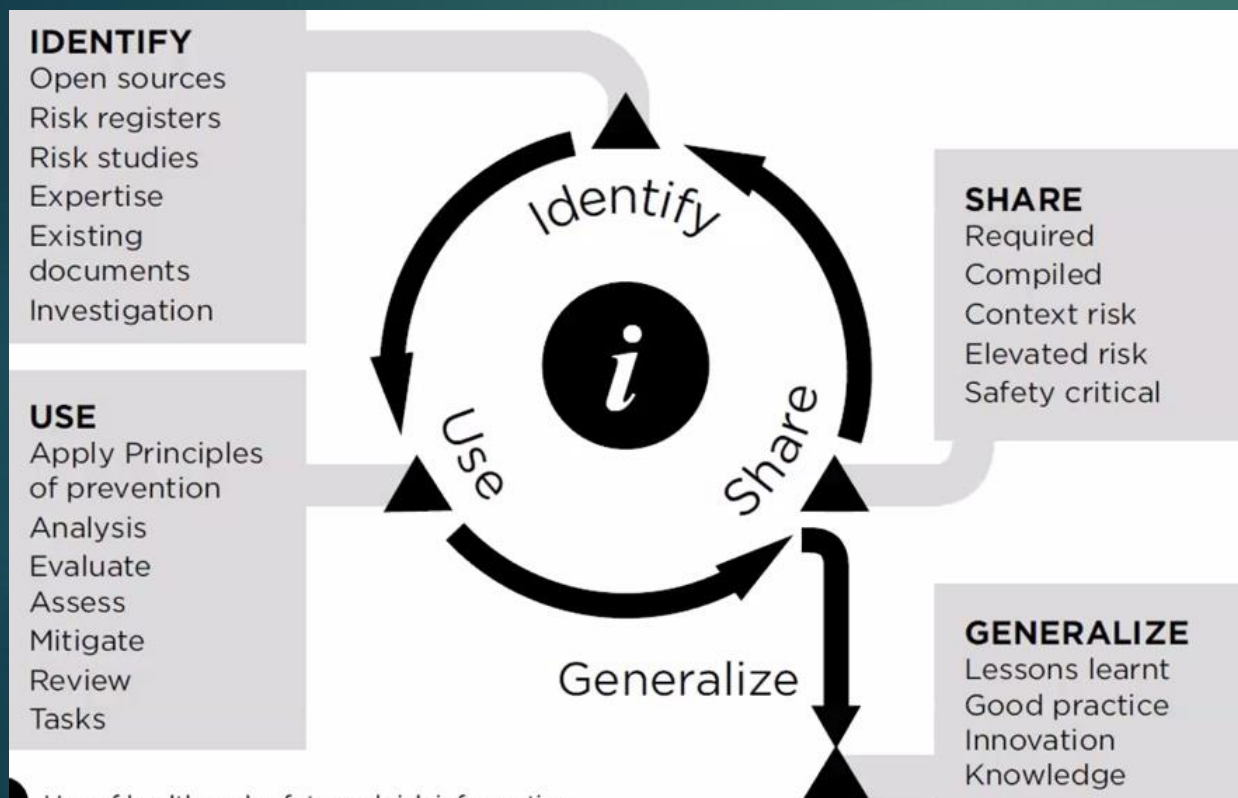
Develop and implement a set of strategic objectives that support collaboration and encourage the opportunity that appropriately shared structured information can offer specific to PAS 1192-6:2018. A working group, as a subcommittee to the H&S working group, will be formed to provided recommendations and solutions using proven techniques as to how information management, BIM processes and applications can be adopted to improve H&S standards and reduce the potential for harm.

Project Organisational Structure

PAS Part 6



H&S Information Core objectives PAS Part 6



Client Strategy

(Clause 6.2)

- Establish and make available all existing H&S, hazard and risk info
- Draw on their knowledge of risks during normal functions
- Specify risk management tasks
- Set out H&S info required for design, construction, commissioning and post handover
- Specify the frequency, format and range of H&S info exchanged at key stages

Start Gap Analysis Requirements

Guidance Note for Clients writing an Employers Information Requirements (EIR)

BIM 4 Health & Safety Working Group

Based on PAS 1192-6: 2018



Assessment Criteria (Based on UK BIM task Group)

Not applicable	0
No evidence	1
Verbal evidence	2
Work in progress / emerging but not in full use	3
Shared, in use and compliant	4
Published as business as usual [there are no gaps/updates needed]	5

#	Question	Key clauses from PAS1192:
1	What early project decision will have health and safety implications for the operation & end use of the asset?	6.1 and 6.2
2	How will you use the construction environment to share information through the project? What information available to affected parties?	
3	What relevant and good information (pre-construction information) will be provided to the designer who needs it and to the members of the supply chain and the construction team?	

First Steps

- 1) Client carries out an initial Preliminary Hazard Analysis & Safety Review (PHASR) to identify hazards and risks, including the asset in use
- 2) Information recorded for others to use

Keeping up with the pack

- 1) PHASR results recorded on CDE
- 2) PHASR outputs embedded into contract documents & informs focus

Taking the lead

- 1) Comprehensive PHASR with independent chair carried out early with multi-discipline designer/contractor involvement
- 2) Time bound actions recorded from all design reviews on CDE, significant risks added to the CDM risk register

Start Gap Analysis Requirements

BIM PAS Part 6 - Application to NLWA - GAP Analysis on PLQs Guide		Assessment Criteria (Based on UK BIM task Group)						Not applicable		0		
								No evidence		1		
								Verbal evidence		2		
								Work in progress / emerging but not in full use		3		
								Work in progress shared, in use and compliant		4		
								Published as business as usual [there are no gap		5		
#	Question	Key clauses from PAS1192:2	First Steps	Supporting evidence	Keeping up with the pack	Supporting evidence	Taking the lead	Supporting evidence	Status Rankin	Accountable Lead - H&S	Accountable Lead - BIM/IM/Digital	
1	What early project decision will have health and safety implications for the operation & end use of the asset?	6.1 and 6.2	1- PHASR terminology not used 2- Information available on Asite	- DRMR at design feasibility stage produced - Indirectly significant involvement with LEL (as asset operator) to document current known risks - Consensus that no formal H&S group workshop discussion took place at project inception	1- DRMR available in the CDE 2- DRMR and similar provided to the tenders and contractors as appropriate 3- task specific for each project and each contractor	- LEL fully engaged with developing design solutions - Numerous minutes of meeting or similar produced that document this source information. - DRMR and RIBA stage 2+ design report contain the information collated specific to the standard tasks described under PHASR that then informs HAZOP and HAZCON	1- Principal Designer appointed 2- DRMR is time bound	- Multiple party engagement has been completed and will continue - DRMR has time bound targets for management and mitigation of identified risks - DRMR is the process that produces a document similar to PHASR - There is no audit trail that documents when a design risk is first identified - is this valid reference CO comment on 20+ minutes of meetings produced? - The main source of risk identification is from subject matter	4	H&S Lead (NLHPP) Paul Craddock but to be handed over to Safety Sphere	Information Manager (Dave Marks)	
2	How will you use the common data environment to share H&S information through the project lifecycle and to make information available to stakeholders and affected parties beyond the project?		5 1- Asite 2- IM strategy approved 3- Not currently specified	- Asite selected as CDE for sharing use only - IM strategy approved that documents principles of access provisions - H&S file structure is priority task	1- Project IM appointed 2- Principal Designer conducts regular reviews 3- Information shared via the CDE (daily as output through various forums)	- DRMR used to document - Design information documents the proposed mitigation to design risks	1- CDE established 2- not established 3- in development	- Asite as the CDE was not available at project commencement, consequently required migration between systems and potential duplication - Seamless integration and inception not currently established - In development with a digital road map to be produced that enables achievement	3	H&S Lead (NLHPP) Paul Craddock but to be handed over to Safety Sphere	Information Manager (Dave Marks)	
3	What relevant and good quality H&S information (pre-construction information) will be provided to every designer who needs it and relevant members of the supply chain, including the construction team?	6.2.1-6.2.8	1- PCI pack 2- Process established and used 3- Process established and used	- Robust process used to compile the PCI	1- Low confidence 2- Full mature 3- Managed through the procurement and contract award process (standard CDM process)	- Confidence in complete set of historic / legacy information existing information is low -		- H&S information gap analysis reliant upon technical advisors identifying requirement - PCI and H&S file structures are not currently the same - Client undertakes review of the CPP to ensure that the PCI has been considered and managed. High risk RAMS submitted for review and or comment as required. - Client team deemed to include anybody who is formally representing NLWA in a technical or professional role - Does the client have a role beyond interface with the tier 1 specific to H&S performance, etc? - PC feedback question uses word provided as opposed to available [consider as part of gap analysis]	4	H&S Lead (NLHPP) Paul Craddock but to be handed over to Safety Sphere	Information Manager (Dave Marks)	

Start Gap Analysis Tools

PAS 1192-6:2018

Specification for collaborative sharing and use of structured Health and Safety information using BIM



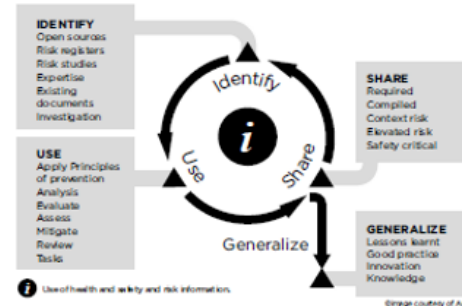
Assessment Criteria (Based on UK BIM task Group)

Not applicable	0
No evidence	1
Verbal evidence	2
Work in progress / emerging but not in full use	3
Shared, in use and compliant	4
Published as business as usual [there are no gaps/updates needed]	5

Ref#	IDENTIFY	Essential	Non-Essential
1	Well defined EIR	Y	
2	Design and managed CDE	Y	
3	Information hosting strategy and resource(s)	Y	
Expertise			
Existing documents			
Identify			
SHARE			
Required			
Ref#	SHARE	Essential	Non-Essential
1	Structured and secure CDE(s) - access authorizations/restrictions	Y	
2	Quality and accuracy of populated H&S attributes	Y	
3	Visualisation of design assumptions, sequences and preferred methods of work - for acceptance by others	Y	
of prevention			
Analysis			
Evaluate			
Ref#	USE	Essential	Non-Essential
1	CDE(s) capable of being amended for new / emerging H&S information	Y	
2	H&S attributes capable of being added for use and risk mitigation	Y	
3	Auto-queries such as: clash detection; infringement of spaces / zones; rules based limitations; location/proximity risks; examination/interrogation risk sources; management elevated risks; hazards referenced by legislation; monitoring compliance	Y	
Use of health and safety and risk information			

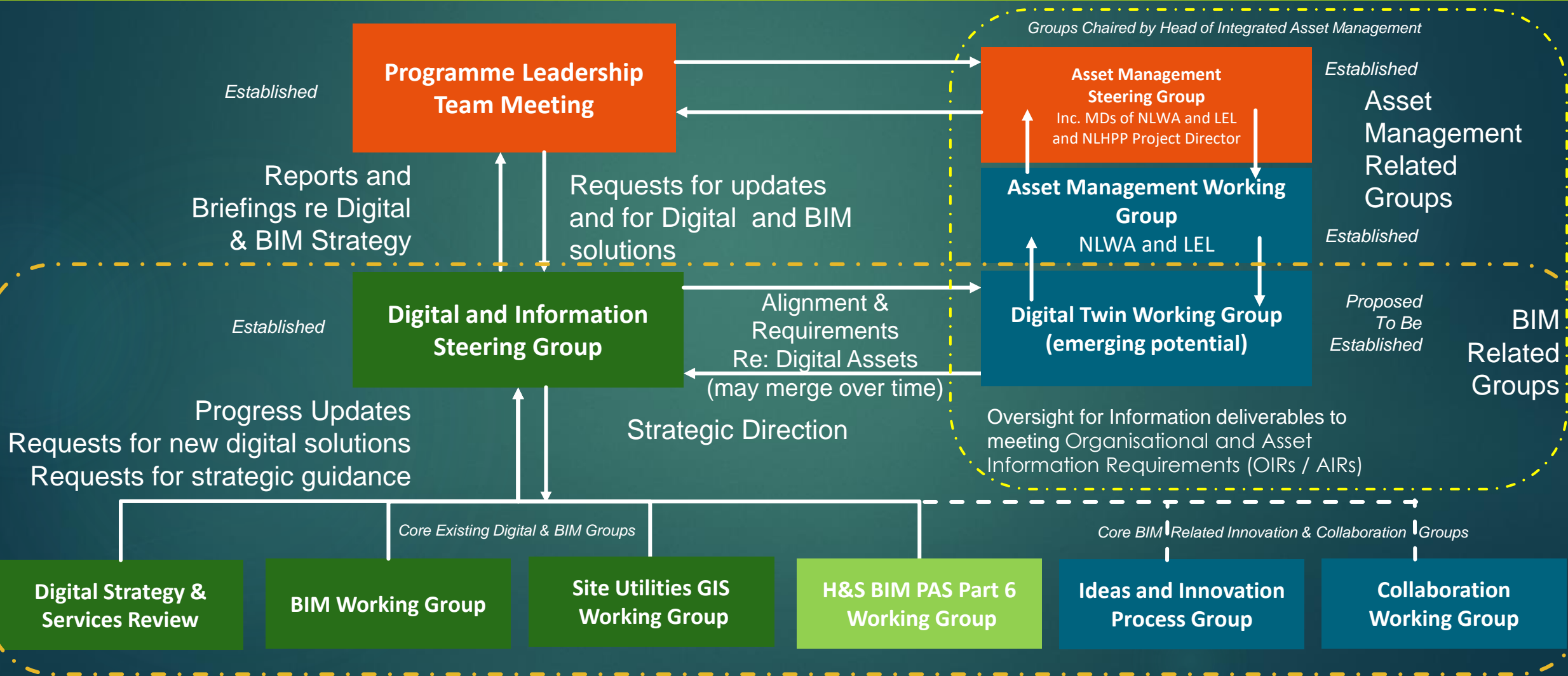
Start Gap Analysis Tools

BIM PAS Part 6 - Application to NLWA - GAP Analysis Identify - Use - Share and Generalise Toolsets



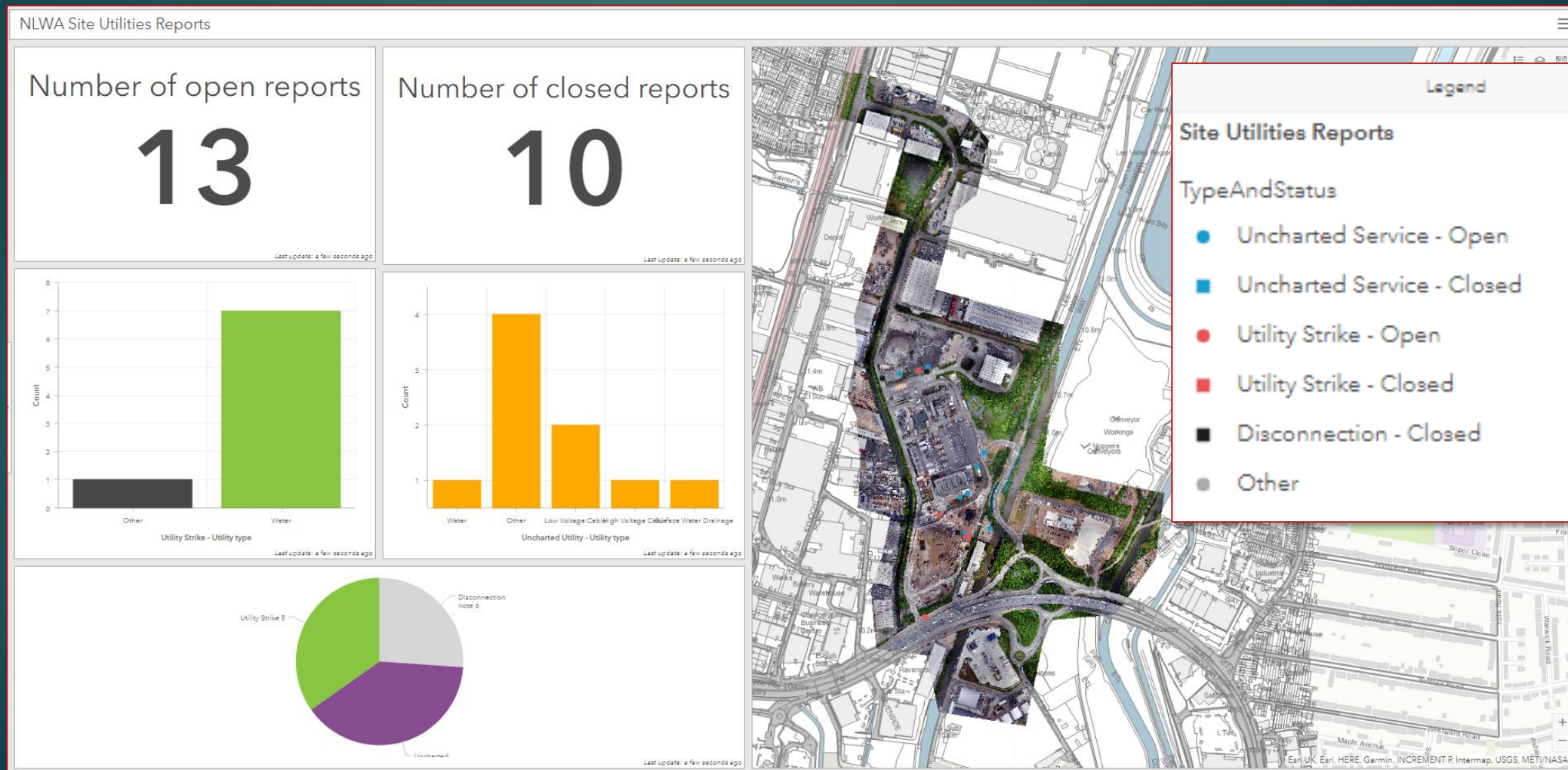
Not applicable	0			Not applicable	0			Not applicable	0					
No evidence	1			No evidence	1			No evidence	1					
Verbal evidence	2			Verbal evidence	2			Verbal evidence	2					
Work in progress / emerging but not in full use	3			Work in progress / emerging but not in full use	3			Work in progress / emerging but not in full use	3					
Work in progress / shared, in use and compliant	4			Work in progress / shared, in use and compliant	4			Work in progress / shared, in use and compliant	4					
Published or business as usual (there are no gaps!)	5			Published or business as usual (there are no gaps!)	5			Published or business as usual (there are no gaps!)	5					
<i>(Tables are additional models by NLWFP)</i>														
Rn #	IDENTIFY	Overall	Non-Overall	Status	Rn #	USE	Overall	Non-Overall	Status	Rn #	SHARE	Overall	Non-Overall	Status
1	Well defined EIR	✓		3	1	CDE(x) capable of being amended for new / emerging H&S information	✓		3	1	Structured and secure CDE(x) - access authorisation / restrictions	✓		4
2	Design and managed CDE	✓		4	2	H&S attributes capable of being added for use and risk mitigation	✓		3	2	Quality and accuracy of populated H&S attributes	✓		5
3	Information handling strategy and resources	✓		3	3	Auto-queries such as: clash detection; infringement of space / zones; rules based limitations; location / proximity risks; examination / interrogation risks / sources; management elevated risks; hazards referenced by location; maintenance compliance	✓		3	3	Visualisation of design assumptions, sequences and preferred methods of work - for acceptance by others	✓		6
4	Field (site capture) and entry conventions (specific to H&S)	✓		3	4	Digital survey information overlays	✓		3	4	Visual representation of elevated risks, including mitigation details and design-in provisions - to inform others	✓		6
5	Competent Information Manager and sufficiently	✓		5	5	Project planning visual / animated models	✓		3	5	Information models for hazard evaluation risk studies - to be undertaken at a later stage	✓		7
6	Information security policy and authorization	✓		4	6	Visual models of specific challenges / difficulties	✓		4	6	Structure risk assessments on the prepared and after agreed mitigation	✓		6
7	Digital library of available information	✓		3	7	Visual models focusing on elevated risks	✓		2	7	Representation / visualisation of real-time danger zones - to inform others	✓		7
8	Digital library of products and prefabrication (standard design catalogue)		✓	2	8	Detailed 3D visualisation of models	✓		4	8	Digital method statement and risk assessments, including 3D and 4D animation - to assess and inform those affected	✓		8
9	Development H&S attributes for auto-queries	✓		3	9	Models annotating risk - time / duration / details	✓		3	9	Enable communication of H&S arrangements: safe routes, restricted areas, hazard zones; temporary work impacts in real-time; mandated permit to work activities	✓		9
10	Development H&S attributes for risk study models	✓		4	10	Models for risk management / risk studies	✓		2	10	Automated time-based dissemination of H&S bulletin (information) linked to assessed levels of risk	✓		9
11	Development of H&S attributes for monitoring risk mitigation	✓		4	11	Optimising off-site build and prefabrication	✓		2	11	Automated notifications of available H&S information, now or change in elevated risks, reminders of safety critical tasks	✓		9
12	Digital library of elevated risks	✓		3	12	Verification of pre-assembly work	✓		3	12	Immediate automated comparison of intent against achieved - enabling analysis of H&S		✓	8
13	Digital library of Design Risk Objectives	✓		3	13	Construction to technique / selection / planning	✓		3	13	Record of deviations, functional variance and latent defects - enabling analysis of H&S consequences	✓		9
14	Digital data exchange e.g. digital technical query	✓		4	14	Text and communication to technique / selection / planning	✓		2					
15	Rendered and visualised representations	✓		3	15	Visual methods of work / safety briefing	✓		2					
16	Detailed 3D and 4D models for specific risk studies	✓		3	16	Visual key sequences and key risk controls	✓		2					
17	User of photographs and physical evidence of risks	✓		2	17	Digital permit to work systems	✓		2					
18	Light detection and ranging (LIDAR) / (Survey of the)	✓		4	18	Verification of safe routes, access and evacuation	✓		3					
19	360 degree photography		✓	4	19	Site based digital upload of H&S information	✓		3					
20	Total station survey	✓		4	20	Preparation checker prior to build - LIDAR	✓		2					
21	Geographic information systems (GIS)	✓		3	21	Validation of as-built against design intent	✓		3					
22	3D laser scanning	✓		4	22	Comparison functional specification against functional performance	✓		3					
23	Photograph	✓		4	23	Share structured data for H&S use including lifting equipment locations, details, risks; substance locations, details, assessments; safety critical aspects, details, locations; temporary work locations, details, duration; work maintained clear at height, provisions; noise / vibration; data and time sector	✓		4					
24	Physical evidence	✓		4	24	Access to project risk management plans, documents, tools and processes	✓		4					
25	Remote and automatic monitoring		✓	4	25	Access to assumptions - unknown risks and uncertainty	✓		4					
26	Internet of things		✓	4	26	Access to key risk decisions - prevention of reintroduced risks	✓		4					
27	Agreed convention for risk H&S information symbols	✓		3	27	Access to mandatory preferred risk controls, sequences and / or technique - risk liability	✓		2					
					28	Attribute, field and entry tags for future insertion of key H&S information; physical validation; functional verification transfer H&S information at handover; category for future H&S information retrieval - (available, assessable, archive)	✓		4					

H&S PAS Part 6 Implementation Impact – Focus Groups

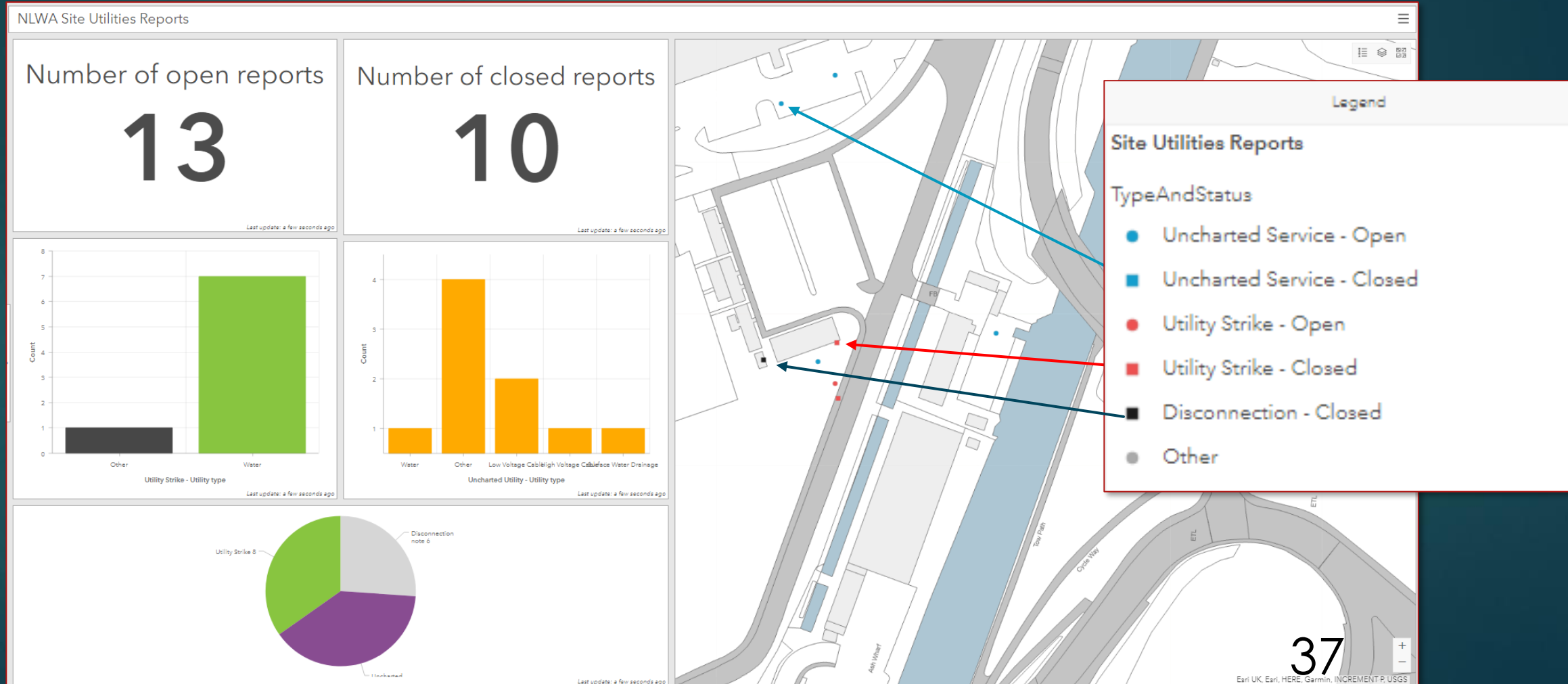


H&S PAS Part 6

Implementation Impact - Utilities



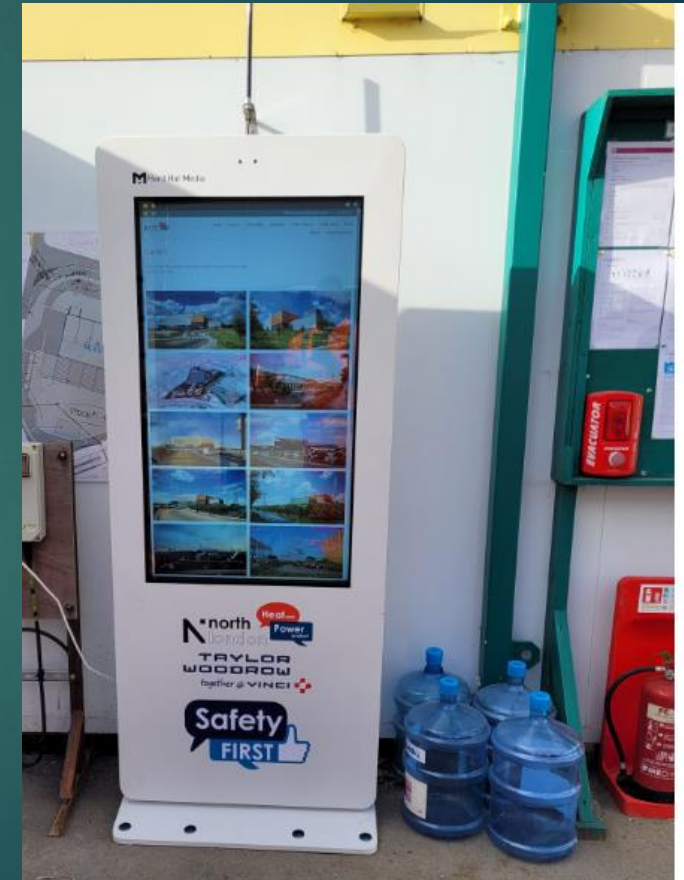
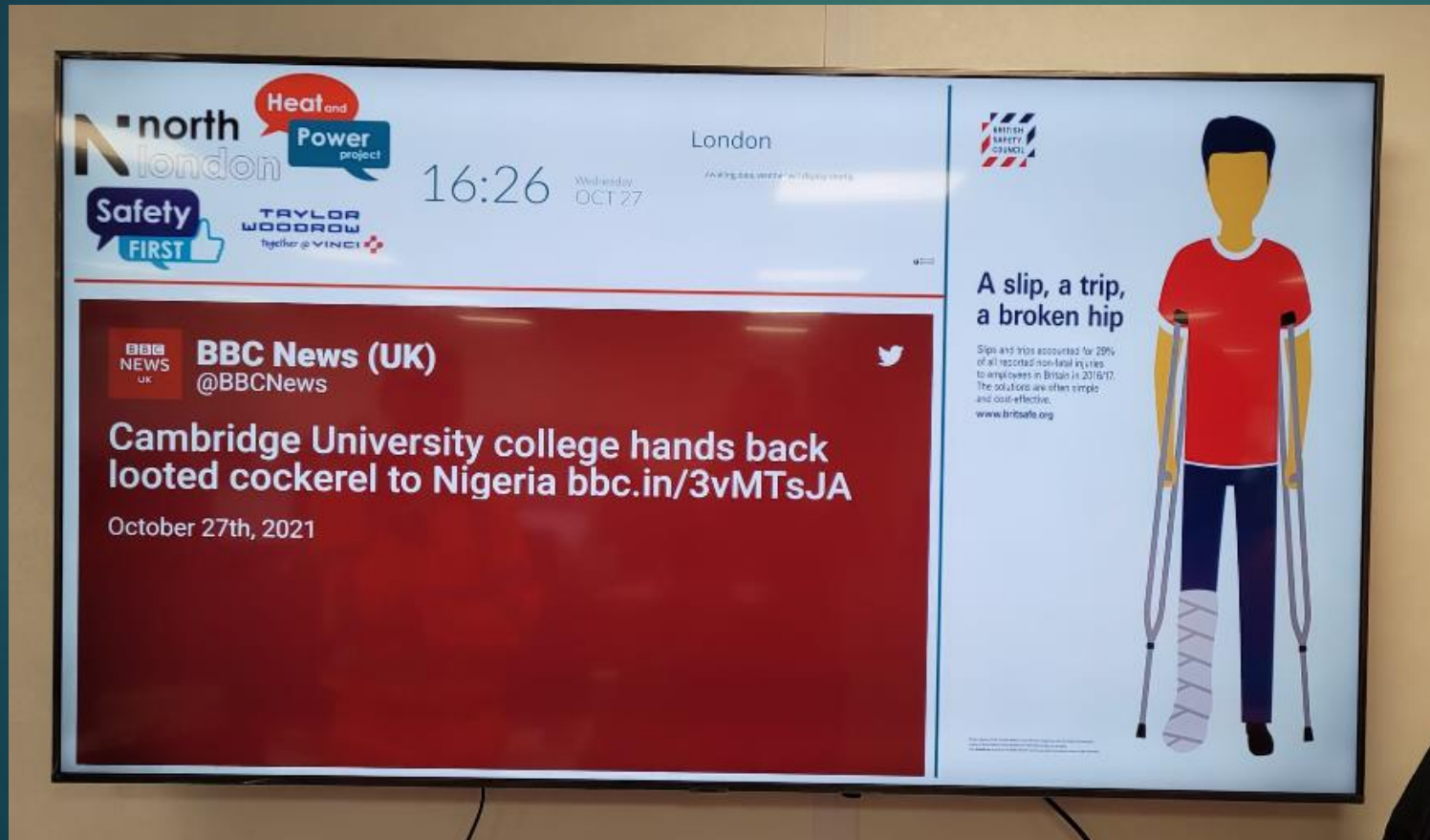
Site Utilities Challenge



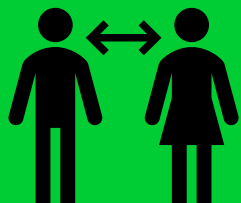
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H&S PAS Part 6

Implementation Impact - Information



H&S PAS Part 6 Implementation Impact - COVID



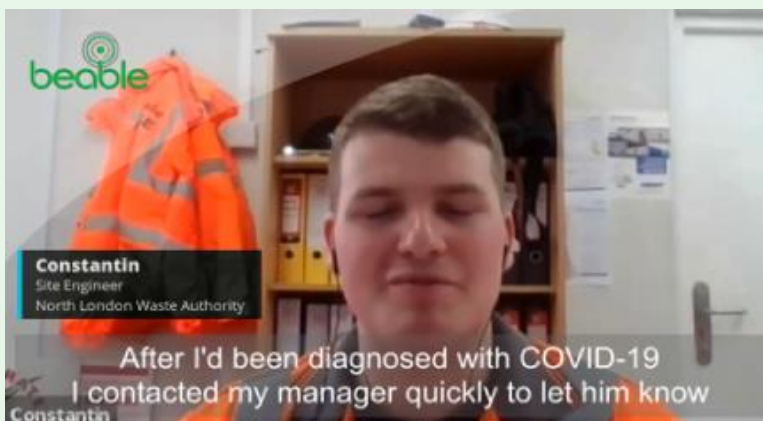
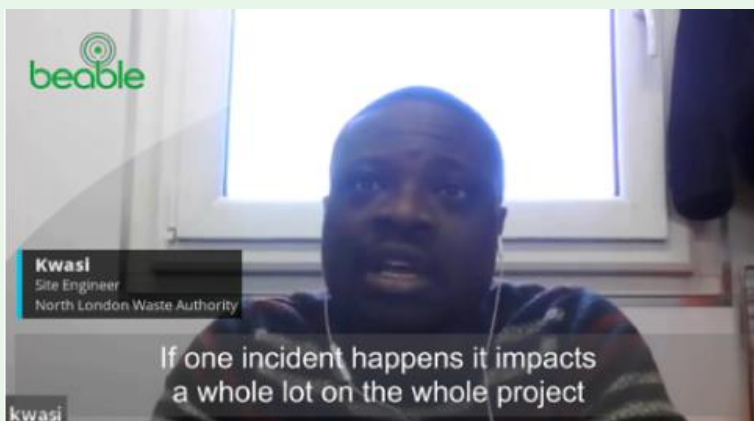
**SELF
AWARENESS**



**REACT QUICKLY
& ACCURATELY ON
SITE**















**WORKER
MANAGEMENT**



Use **beable** data to analyse movements & shift patterns based on times of greatest breaches of social distancing – address peaks by identifying causation – staggering break times, extra welfare unites etc.


H&S PAS Part 6






Implementation Impact - Hazards

HZ0123-R014	Visibility of operations - Control room location	3N Organisation etc of traffic routes (reg 17)	2.4 - Handling	Visibility of operators - Control room location	End user	A crows nest has been put in above the north east corner of the tipping aprons to provide visibility...	19 Jan 2021	Nick Williams (Safer Sphere)	26 May 2021	Paul Sayer (Race Cottam Associates Ltd)	Moderate	   
HZ0123-R015	Pedestrian / vehicle interface tipping bays	3N Organisation etc of traffic routes (reg 17)	2.5.2 - Struck by moving vehicle	Accidental damage to people or plant - reverse tipping into bays	End user Cleaning & maintenance	Bays have been located to be right hand down reverse. There is a by-pass lane provided to reduce cr...	19 Jan 2021	Nick Williams (Safer Sphere)	26 May 2021	Harry Chetty (Waterman)	Moderate	   
HZ0123-R017	Gully waste bay - risk of slips / trips	3I Conditions of floors and traffic routes (reg 12)	2.1.5 - Slip or Trip on same level	Gulley waste bay - Risk of slips and trips Slips/trips/angled floor - Gully waste on floor. Wet sl...	End user Cleaning & maintenance	Gulley waste bay will have a sloping floor - will be kept clean through regular sweeping and drainag...	19 Jan 2021	Nick Williams (Safer Sphere)	22 Apr 2021	Edwin Bergbaum (Waterman)	Moderate	   

EcoPark (South)

Comments



Applying H&S PAS Part 6 Lessons to be shared

1. The **PAS part 6 structure and guidance** provides a great starting point to **assess how you are doing already**
2. You need to **coordinate and communicate** what you are doing with **end users H&S needs, feedback and buy in**
3. **A safety leadership vision and culture** that empowers everyone involved to live the principle **that it is everyone's job to stay safe, get home safe and protect each other on site**, is key to continuously striving to improve project safety and successful outcomes on all objectives

Attendee Poll Question



WEBINAR
HEALTH & SAFETY
MATTERS

Attendee & Panel Q & A



MAKING BIM REAL WEBINAR
HEALTH & SAFETY MATTERS
23RD MARCH 2022



Thank you for joining us

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