Supporting the digital transformation of the Built Environment through standards

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Head of Built Environment, BSI Standards

26th March 2018
BSI Group supporting the digital transformation of the Built Environment through standards

- Introduction to the BSI Group
- The process of developing Standards to support the Built Environment Sector
- Development of Standards to support the implementation of BIM
- Global adoption of BIM Standards
- Opportunities for BIM Standards to support the UAE market
- Future Standards development, including Smart Cities & IoT
BSI Group structure

Policy, Engagement

National Standards Body

Standards

Information Solutions

Market Development, Committee management

Sales, Membership, ICT Platforms

Assessment and Certification

Compliance support

Training

Advisory Services
The process of developing standards to support the Built Environment Sector
Standards are made by people for people.

BSI publishes 2,500 and withdraws over 1,000 standards per year, supporting the single standard model wherever possible.

This maintains a coherent, consistent body of knowledge for the entire sector.

BSI is a neutral facilitator for industry experts.

For BSI, standards are a consensus of what good looks like.
The role of consensus knowledge in accelerating innovation

Standards managed by BSI provide:

• A forum for stakeholder consultation and shared understanding under independent governance,
• Access to leading industry knowledge in a dynamic and regularly revised format,
• Increased confidence in the commercialisation of complex or novel technologies,
• Connectivity to rapidly evolving supply chains,
• Rapid global reach to engage with international and European practice,
• No IP barriers or risk of technology lock-in,
• A channel to build public and investor confidence in new technologies and products.
BSI as NSB manages BS, EN & ISO, IEC standards.

All EN and most international standards are “adopted” as British Standards

PAS route to national and international standards
How do we make our standards?

1. Idea
2. Feedback and new proposals
3. Stakeholder 'community'
4. Committee drafting
5. Public consultation
6. Review comments
7. Consensus
8. Publish and support
How do we define the Built Environment?

‘The Built Environment encompasses all forms of **buildings** ... housing, industrial, commercial, hospitals, schools ... as well as civil engineering **infrastructure** both above and below ground and the **urban space and landscape** between and around buildings.’
Built Environment standards landscape

- Energy Performance of Buildings
- Asset/Facilities Management
- Building Information Modelling (BIM)
- Digital Transformation – IoT, GIS, Smart Infrastructure, Offsite, Security...
- Smart Cities
- Structural Eurocodes
- Sustainable Construction
- Construction Products
- Infrastructure
- Fire
Development of Standards to support the implementation of BIM
So, what was the problem?

Not that long ago it wasn’t uncommon for our new assets to be drawn 2.5 times, and constructed 1.5 times...

= poor value, and poor productivity - and that was just the construction phase...
UK Market Driver

Since April 2016, all centrally procured Government construction should be carried out to BIM Level 2:

"Government will require fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016."

The way in which BIM readiness is judged is through a pre-tender pre-qualification questionnaire (PQQ): PAS 91 (Table 8)
The UK BIM Maturity Model - Level 2: Managed ‘Collaborative’ 3D environment.
But what is BIM?

Building Information Modelling (BIM) is a collaborative process that seeks to add value throughout the life-cycle of an asset.

A BIM process sees the creation, collation and exchange of shared 3D models - and a range of intelligent, structured data - with the aim being to improve productivity and reduce waste.

- Defined Information requirements
- Collaborative working practices
- Data exchange and validation
- Security Minded digital working
- Better outcomes & end user value

part technology - part process - part culture shift
The benefits of BIM

Key Benefits:
- Reduced Delivery Costs
- Predictable Planning Reducing Risks
- Increased Quality & Value
- Reduced Optional Costs
- Green Performance

Additional benefits:
- High levels of collaboration
- Consistent and coordinated designs
- Highly constructible design solutions

Roles:
- Client:
  - Lower costs
  - Faster delivery
  - Lower emissions
  - Better customer services
  - Risk management

- Designers:
  - Improved coordination
  - Visualisation
  - Better cost estimating
  - Competitive export & growth

- Constructors:
  - Sequencing
  - Clash detection
  - Reduced abortive work
  - Off site manufacture
  - Competitive export & growth
  - Health & Safety

- Operators:
  - Asset knowledge
  - Better information
  - Soft landings
Essential Components

- PAS 1192-2:2013 Project delivery
- PAS 1192-3:2014 Asset management
- BS 1192-4:2014 COBIE Data exchange
- BS 1192-5:2015 Security minded BIM
- BS 1192:2016 Principles
- PAS 91:2013 Construction PQQ
- BS 8536:1&2 Briefing for design and constr.
- Digital Plan of Works (DPoW)
- Classification system - Uniclass
- BIM Protocol - IP/Copyright
- PAS 1192-6: BIM4 Health & Safety

Just published
Applying BIM throughout the asset lifecycle

BRIEF | DESIGN | CONSTR. | USE | DECOM.

BS 1192

PAS 1192-2 | PAS 1192-3

BS 1192-4

PAS 91 | BS 8536 | PAS 1192-5
Introducing BIM 4 Health & Safety – PAS 1192-6:2018

PAS 1192-6 sets out a model process of how digital health and safety risk information should flow through every stage of a construction project, focusing in particular on the needs and perspective of the end user.

It specifies how H&S information can be used in order to:

a) Provide a safer and healthier environment for end-users
b) Mitigate the inherent hazards and risks across the asset lifecycle
c) Result in improved construction H&S performance, fewer incidents and associated impacts
d) Provide for clearer and more relevant H&S information to the right people at the right time
e) Reduce construction and operational costs
Global BIM Standardization

Committee: ISO/TC 59/SC13 Construction works information
ISO 19650-1 BIM Concepts and principles (2018/19)
ISO 19650-2 BIM Delivery phase of assets (2018/19)
ISOs based on PAS 1192-5 (Security) and PAS 1192-3 (Opex) confirmed

Committee: CEN/TC 442 Building Information Modelling
Adopts ISO/IECs i.e. EN ISO 19650?(TBC)
Develops ENs to complement ISO/IEC
4 new work items being developed in CEN – LOD and PDT’s.

Committee: B/555 Construction design, modelling and data exchange
Coordinates UK input into CEN an ISO
Develops BS and PAS
Adopts ENs and ISOs
Innovation in Building Information Modelling (BIM)

- **Official BIM Level 2 Hub**, provides guidance aimed at the UK and international markets,
- International chapters to be translated into a number of languages, including Arabic and Chinese,
- 145,000+ copies have been downloaded of the standards since 2013 (~20% from outside UK),
- Our standards are being utilised all over the globe including UAE, Australia, Germany, Netherlands, Belgium, Spain, Romania, Russia, Chile

www.BIM-level2.org
But where is digital transformation taking us?

- Creation of markets for data analytics
- Use of performance data to optimise operation
- Creation of a hierarchy of data for different purposes
- Extension into asset performance
- Integration across portfolios of assets
- Feedback of performance into design and assembly
- Greater emphasis on Asset Operation
Development of BSI’s Smart City and IoT Standards
Smart city standards landscape

- **Principles-based standards**
  guidance to help the City Authority define its targets

- **Performance standards**
  help the City Authority procure and deliver the infrastructure and services

- **Technical standards**
  ensure data across the city is suitable for use in a range of service delivery sectors
Integrated suite of BSI smart city publications

**PD 8100:** Smart cities overview

**PAS 181:** Smart City Framework

**PAS 184:** Developing project proposals for delivering smart city solutions

**PAS 182:** Concept model for data interoperability

**PAS 183:** Sharing data and information services

**PAS 185:** Data security

**PD 8101:** Guide to the role of the planning and development process

**PAS 212:** IoT Interoperability
Smart city leadership programme

- Based on our PD 8100 - *Smart City Overview* and PAS 181 - *Framework*
- Brings together city leaders to help set smart city strategy
- Results in development of a bespoke smart city roadmap
Smart infrastructure / assets standards

Developing a Smart Infrastructure standards strategy which will support industry and governments through:

- **Take up** – create clarity over existing landscape, consistent standards framework across data, communications, security, IoT and BIM,

- **Knowledge transfer** – grow communities of interest with cross-sector expertise to ensure a joined-up IOT led approach to BIM, Smart Cities,

- **Innovation** – identify where agile approaches to consensus standards development can build trust in technology and supply chain, accelerate routes to market and the adoption of good practice by clients and industry.
So, we start with truly **Smart cities**
Which are served by **smart infrastructure**
Which contain **smart buildings and assets**

Source - Hypercat
In conclusion...

- **Collaborative BIM** is being embraced around the globe,
- The **first ISO BIM standards** should be available around the end of the year,
- BSI host all of **our BIM standards** and supporting guidance on –
  
  www.BIM-level2.org

- We have now started work on the **convergence** of BIM with Smart Cities, and IoT,
- It’s been a long time coming but the **digital revolution** of our sector has truly begun - care to join us?
BSI Group Supporting the digital transformation of the Built Environment

- Andy Butterfield
- Director of Built Environment,
- Global Product Certification
- 26th March 2018
BSI Group Supporting the digital transformation of the Built Environment through Certification solutions

- Introduction to BSI Product Certification and the BSI Kitemark
- The process of developing BSI Kitemark certification, collaboratively
- Global adoption of the BIM Kitemark, and overview of market development
- Supporting clients with BIM Certification, a case study (RTA case study)
- Future Certification development, including Smart Cities and the IoT
Introduction to BSI Product Certification and the BSI Kitemark
The Kitemark™

The Kitemark:
- Was introduced by BSI in 1903
- Is a ‘trust mark’ owned by BSI
- Is used on products, services, websites and now organisations

The Kitemark stands for British Standards Verified

All Kitemark schemes are voluntary

The Kitemark demonstrates that the product or service has been tested as it will be used

The Kitemark has Global reach

Above all, the Kitemark remains relevant
BSI Kitemark, a diverse product & service portfolio
Supporting digital transformation of the Built Environment

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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<tbody>
<tr>
<td>Smart City Strategy</td>
<td>4,000 + cities</td>
</tr>
<tr>
<td>Smart City projects</td>
<td>60+ projects per city e.g. smart lighting</td>
</tr>
<tr>
<td>Information Security</td>
<td>600+ data sets per city</td>
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<tr>
<td>Internet of Things (IoT)</td>
<td>8.4 Billion connected devices (2017)</td>
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<td>BIM</td>
<td></td>
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<tr>
<td>Construction Products</td>
<td>Manufacturing – Industry 4.0 Physical and Digital Products</td>
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The digital approach connects across many other facets of BSI activity and thought leadership.
Applying BIM through Standards and Kitemark

- **Stage 0**: Strategic definition
- **Stage 1**: Preparation brief
- **Stage 2, 3, 4**: Design
- **Stage 5-6**: Construction, handover & closeout
- **Stage 7**: In use
- **Stage 8**: Decommissioning

**PAS 1192-3**: Asset Management

**PAS 1192-2**: Capex phase

**PAS 1192-5**: Cyber security

**BS 1192:2007**: Collaborative Information

**BS 1192-4**: Using COBie

**BS 1192-5**: Asset lifecycle
The process of developing BSI Kitemark certification, collaboratively
The process for shaping our certification collaboratively

1. **Standard**
2. **Stakeholder ‘community’**
3. **Consensus**
4. **Review comments**
5. **Global alignment**
6. **Shaping of Kitemark Framework**
Developing the Kitemark through collaboration
Developing the Kitemark through collaboration
Global adoption of the BIM Kitemark, and overview of market development

Supporting clients with BIM Certification, - RTA case study
Global adoption of BIM Kitemark - China

Wanda Group, Beijing – largest commercial property owner in China

- 3 day BIM Kitemark Gap Analysis
- BIM & Smart Cities awareness seminar
Global adoption of BIM Kitemarker - Europe
Cobouw50 speaker & BAM Infra certificate Ceremony
Global adoption of BIM Kitemark - Europe

Press Release

Social media

In progress

Cobouw article (base on joint interview)

BAM video with stakeholder interviews

BAM case study
Global adoption of BIM Kitemark - Australia

BIM Launch
Roundtable in Sydney
20+ potential clients and influencers

February

CIMIC certified
Gary Pattison certifies one of largest contractors in APAC
Cross trains Oz team
Attends meetings with TfNSW and Ventia

October

Ferrovial certified
Introduction from UK team as certified in UK
Audit delivered by Australia auditor

November

Press Release
Joint PR with CIMIC about first Kitemark being released in December

December
Global adoption of BIM Kitemark

BIM Kitemark clients in 8 countries

UAE, UK, China, Australia, Germany, Netherlands, Belgium & Spain
Case study: RTA

Creating consistent requirements across the entire asset lifecycle.
Case study: RTA

Ensuring that BIM is embedded from the start.

- Problem: lack of EIRs / information specification
- RTA 1st BIM Kitemark specifier scope

EIR / AIR specification
Veriﬁcation of the delivery team’s capability
CDE setup & management
Project management
First organisation globally to achieve
PAS 1192-2 & PAS 1192-3 Kitemark

- Applying BIM to the entire lifecycle of the asset
- Adoption of Partnership approach across the supply chain

“I congratulate RTA on their achievement in becoming the World’s first organisation to be awarded Kitemark across the whole asset lifecycle”

BSI Group
BSI certification model

Specifier/Client

Thought Leadership

Main contractors

Alignment

Supply chain partners

Collaboration
Future Certification development, including Smart Cities and the IoT
Built Environment, next steps

- Information Security
  - BIM – PAS 1192-5,
  - Smart City information security (PAS 185)
  - Internet of Things (IoT) Kitemark

- Smart Cities, Communities and Assets
  - Smart City Kitemark (PAS 181)
  - Development of a Smart Assets PAS
  - IoT international projects & programmes
Smart Cities Kitemark: PAS 181

- Assesses the maturity of Smart Cities and Communities
- Measures cities progress against four defining smart city principles:
  - Visionary
  - Digital
  - Citizen centric
  - Open & Collaborative
The evolution of our cities

• Mobility as a service

• Summon a vehicle with your phone (e.g. Uber)

• Autonomous vehicles
Summary

Thought leadership, RTA demonstrating best practice, globally

Alignment with Tier 1 contractors critical to success

Collaboration through the entire supply chain

...Congratulations to RTA

What is expected from Supply Chain & Partners

- Continues engagement to enhance the BIM maturity in the UAE
- Support RTA to develop a full fledged BIM Environment throughout the Asset lifecycle stages
- Full compliance with RTA’s future proposed mandate
- Enrich and enhance the supply chain capability to carry out high standard BIM implementation
When it matters most trust the BSI Kitemark™

Quality, Safety, Trust