

BIM Level 2 Explained

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

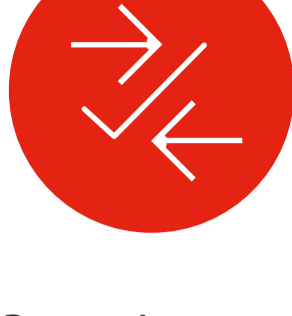
A BIM process sees the creation, collation and exchange of shared 3D models - and a range of intelligent, structured data - with the aim being to improve productivity and reduce waste.



Defined Information requirements



Collaborative working practices



Data exchange and validation



Security Minded digital working



Better outcomes & end user value

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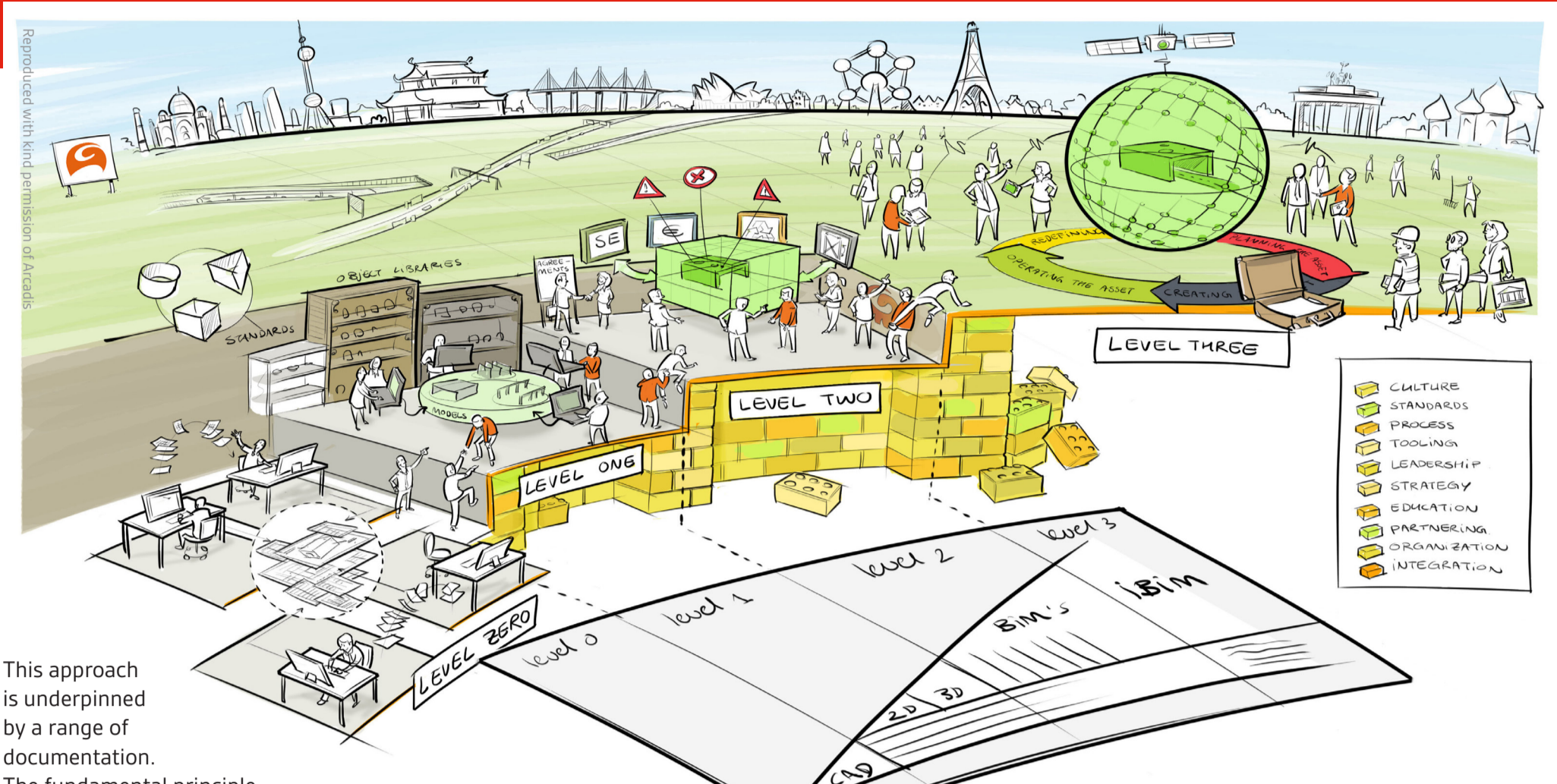
What

Collaborative BIM

BIM Level 2 is best thought of as 'collaborative' BIM as it sees structured, information rich models prepared, progressed and exchanged throughout the project life-cycle, according to a defined framework.

Domain specific models, (focussed, perhaps, on architectural, structural, services and landscape aspects),

Including both 3D geometrical and non-graphical data, are 'federated' together at defined points as information is exchanged within a Common Data Environment (CDE). In other words, a BIM Level 2 process allows participants to define, share and validate outputs via digital transactions through a range of assets that are delivered in a structured and reusable form.



This approach is underpinned by a range of documentation. The fundamental principle being that the client should have a specific idea upfront of the information required from the supply chain and when this must be delivered.

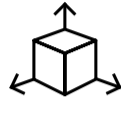
The demands a client makes will dictate the level of BIM maturity that participants should adopt with the 'maturity wedge' diagram visually representing the kind of increasing demands that might be made.

Level 2 BIM is focused on the end deliverables (and who is required to deliver what and when) with specific requirements set out in the contracts used to engage participants.

BIM DELIVERABLES - It's all about the data
Three key Level 2 requirements are:



2D reviewable PDF design deliverables cut from the models



Individual 3D domain models in native file formats



COBie data

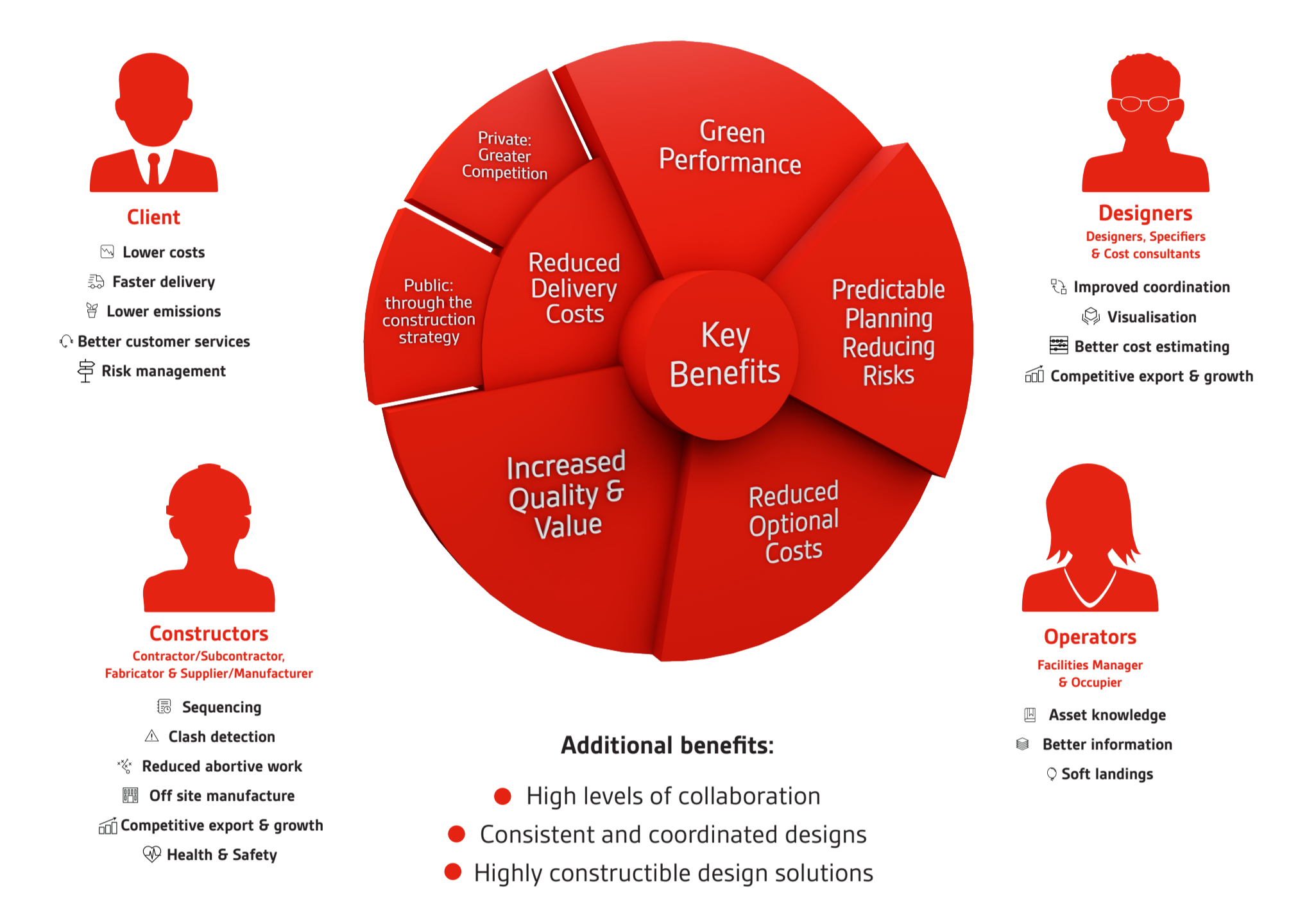
Why

BIM Level 2 works for everyone

BIM is about collaborative teamwork. Project participants are able to easily see what's being constructed in 3D and the instant effects of decisions being made given that

rehearsals of all stages of a project (through design and build and into operation) are possible.

The information contained within the models facilitates well-informed decision making and that means greater clarity, better communications, and, ultimately, better efficiency. Cost savings of around 33% across CAPEX and OPEX are possible by following a Level 2 BIM process. As the cost of operating and maintaining buildings and facilities can represent up to 85% of the whole-life cost, savings can pay back any upfront premium in construction expenses in just a few years.



How

Supported at every level

Adopting a BIM process will inevitably require some degree of organisational change as you'll need to consider how you engage with your supply chain and clients, and the tools and behaviours you need to nurture to succeed. Sharing structured data is at the heart of BIM and this means that participants across the supply chain

must adopt shared standards. These describe how data is exchanged between team members, facilitating collaboration. Standards also promote common file formats allowing information to easily be shared, used and validated regardless of which software has been used to create assets.

Thankfully, the BIM Task Group, a joint UK Government – industry working group have provided the necessary standards, guides, case studies and training to support and enable you to work at BIM Level 2. Key areas covered include:

ENABLING TOOLS

The BIM documentation references a range of key concepts that drive an effective implementation. Some terms worth noting:

Asset Information Requirements - AIR
These define the information that is required for an asset information model. An example of an AIR is a planned preventative maintenance schedule.

BIM Execution Plan - BEP
A document that is prepared by designer and contractor members of the project team. It describes the processes and standards that the team will adopt and details the information deliverables. The BEP is produced in response to the AIR.

Common Data Environment - CDE
The CDE is the combination of software and workflow that is used to ensure effective and accurate exchange of information within the project team.

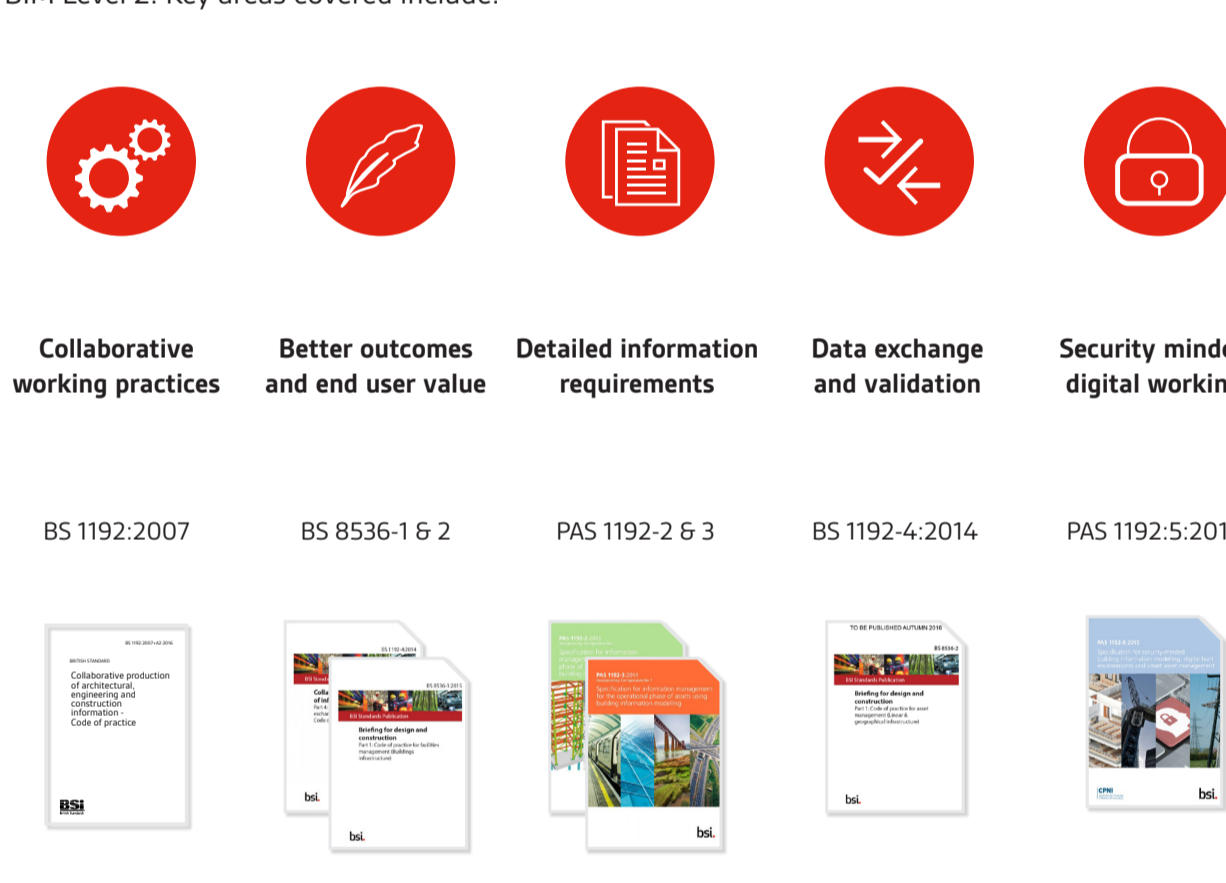
Employers Information Requirements - EIR
A document produced by the employer in advance of the appointment of members of the project team which defines information requirements, uses of information and standards to be used. Suppliers prepare their BEP in response to the EIR. The EIR is a fundamental subsection of the Employers Requirements (ER).

Master Information Delivery Plan - MIDP
This document is used to manage the delivery of information during a project. The MIDP is an example of an Information Delivery Plan which is part of the BEP.

Organizational Information Requirements - OIR
These describe what information is required by an organization for asset management systems and other organizational functions. An example of an OIR may be a requirement for occupation data from a portfolio of buildings.

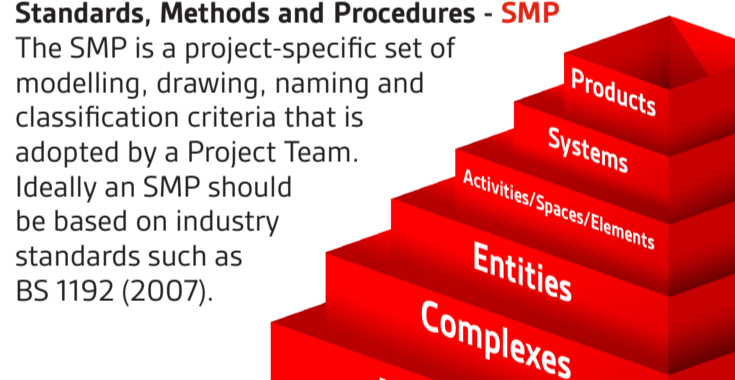
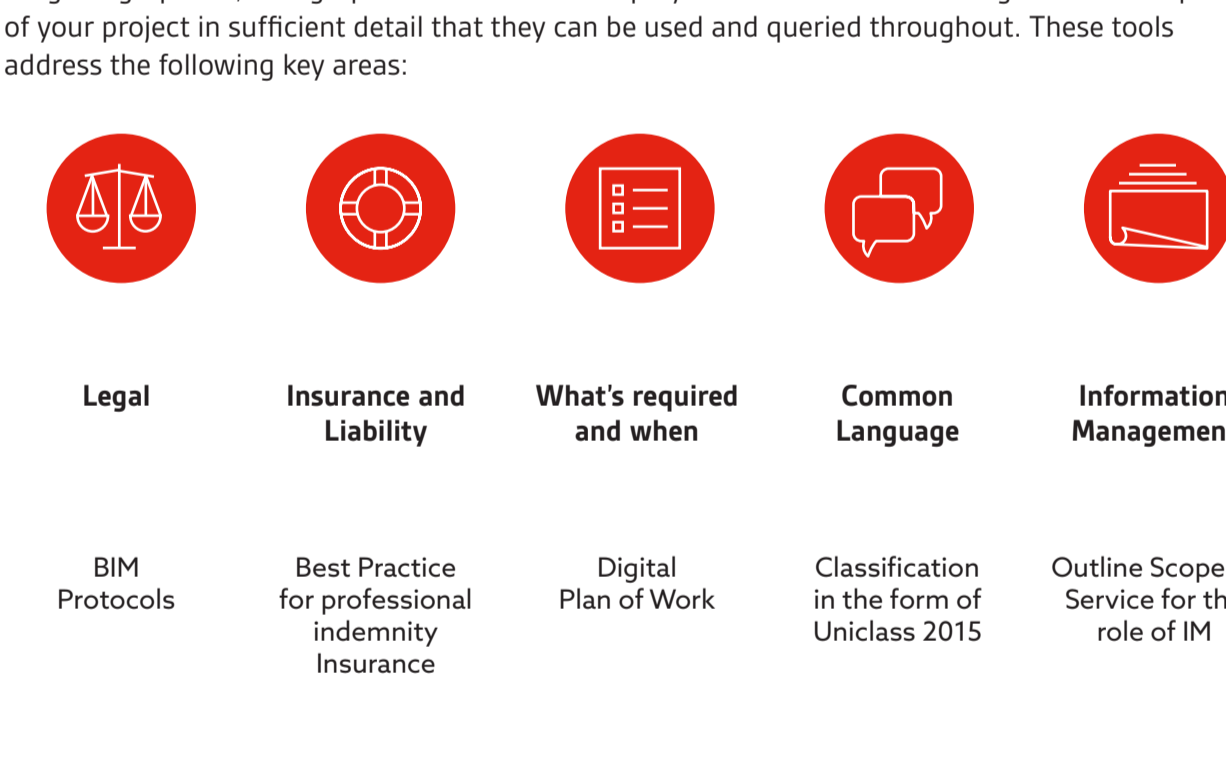
Plain Language Questions - PLQs
defines a broad information requirement against which a supplier will respond with data taken from models and other sources.

Standards, Methods and Procedures - SMP
The SMP is a project-specific set of modelling, drawing, naming and classification criteria that is adopted by a Project Team. Ideally an SMP should be based on industry standards such as BS 1192 (2007).



These are all available, for free, at: www.bim-level2.org

Enabling tools are responsible for bringing your BIM deliverables to life. They'll help build up a range of graphical, non-graphical and associated project documentation throughout the lifespan of your project in sufficient detail that they can be used and queried throughout. These tools address the following key areas:

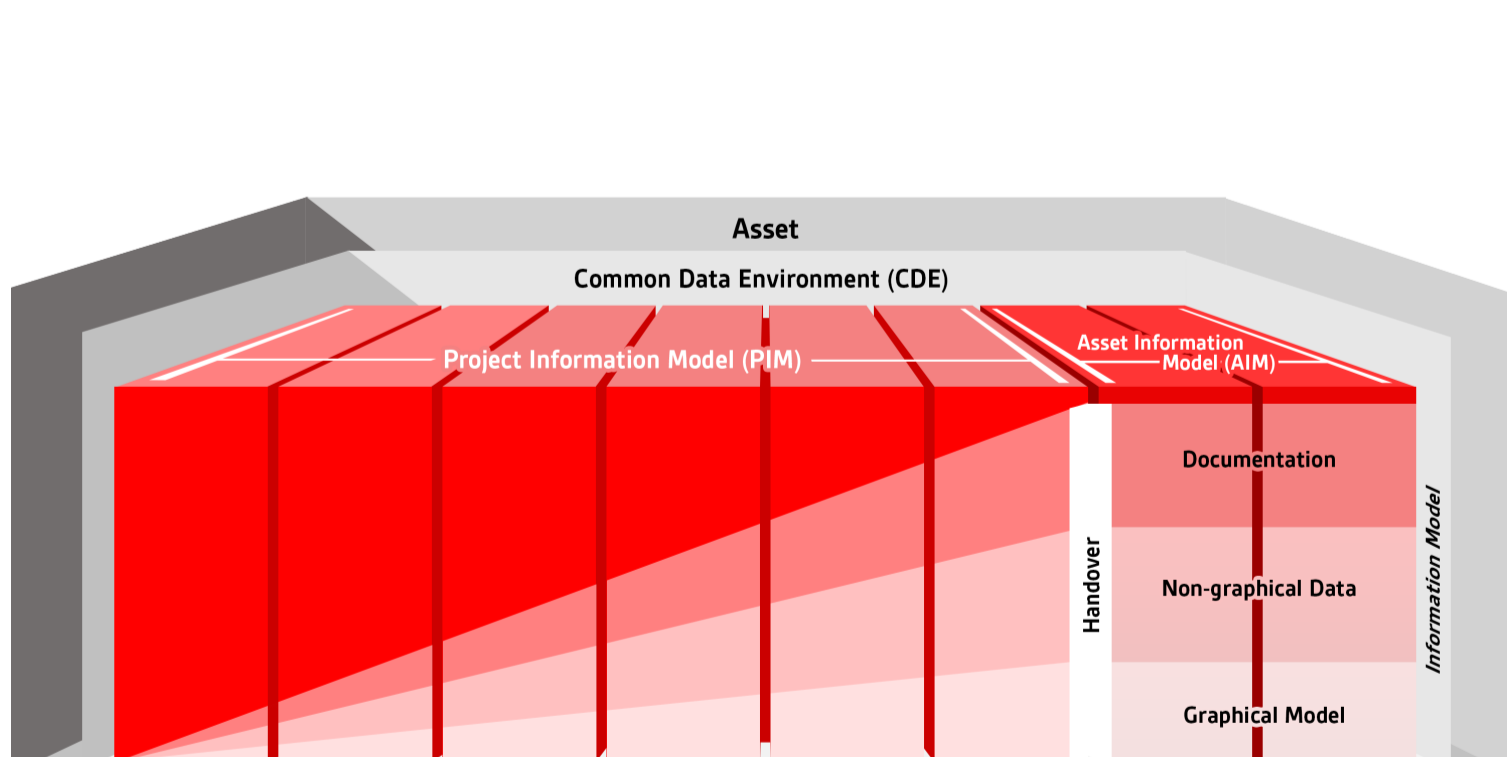


When

Efficient, cumulative and informative

Information is created at the very start of a project and continues to evolve throughout the life of the built asset through a number of distinct stages. This digital information will flow across the project time line as information is exchanged at key points – from briefing and design, through to construction and beyond into facilities management.

There are several Plans of Work available (Each with their own focus) and PAS 1192-2 provides a baseline example of work stages that enables BIM Level 2 information to be adaptable to, and beneficial across, all capital delivery plans of work, throughout the project life-cycle.



- Subdivides the delivery of asset into a number of common decision-making stages
- Provides a consistent set of predefined activities and outputs
- Stops decisions and wrong decisions being made that are expensive to change
- Contractual commitments are made and fulfilled and appropriate risk transfer takes place

The project information model is progressively developed and delivered to the employer through a series of information exchanges at key stages. The stages map to the employer's decision-making processes as defined by the EIR and the CIC BIM Protocol. These exchanges are codified in documents like the CIC Scope of Services.

Capturing and developing information effectively from the start will ensure that design, regulatory, construction and supply teams are able to collaborate efficiently, making use of well-structured and integrated information.

The starting point for your BIM implementation process, the assessment and need analysis, draws

on the information included in the existing Asset Information Model (AIM) which would provide an articulation of what a stage gate is for and how this is then enabled by BIM Level 2. This provides the context for your discussion on which project stage model to use.

How Much

Efficiency at every project stage

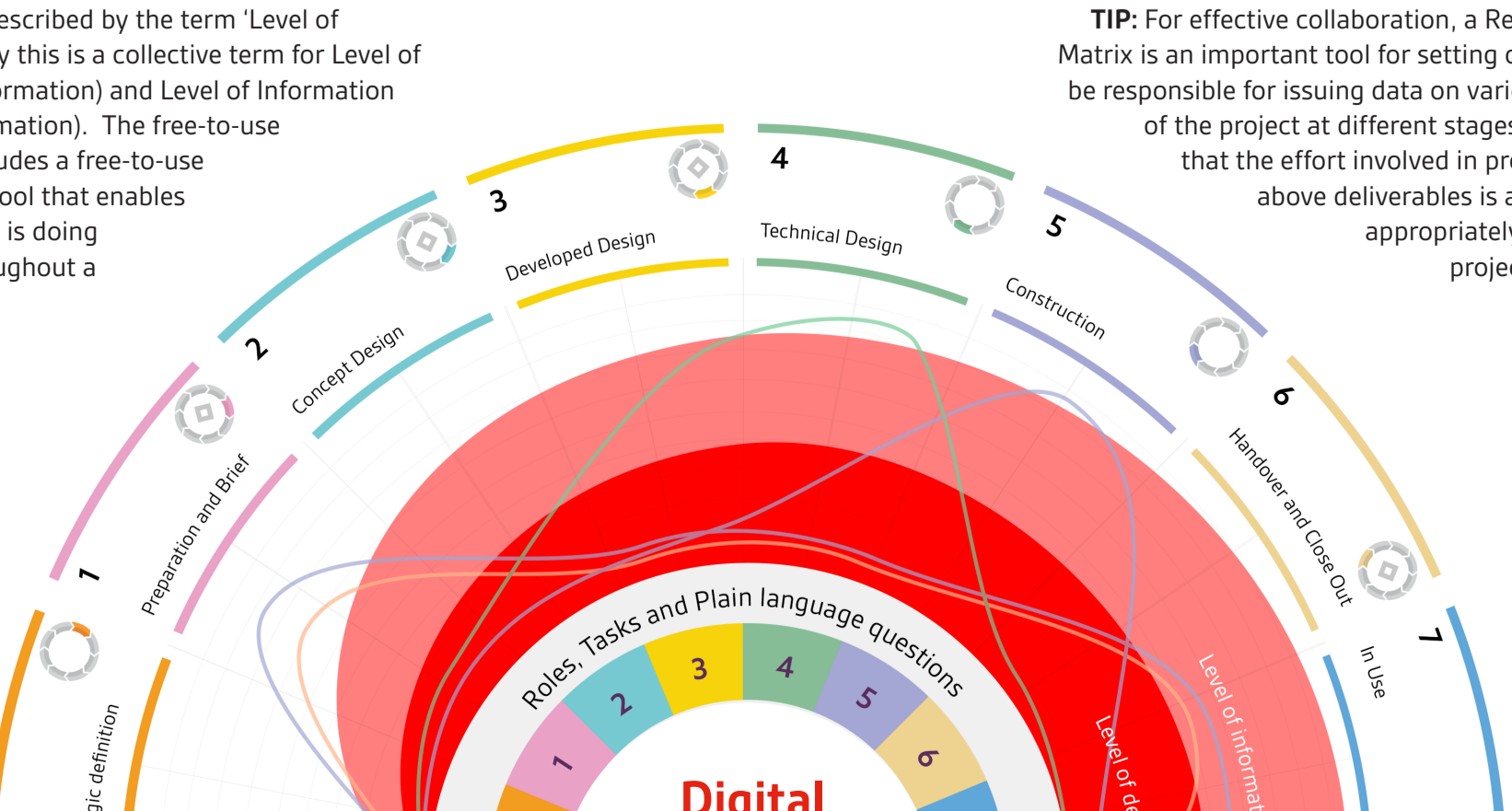
A BIM Level 2 work-flow is efficient, cumulative and informative. As a project progresses the level of information will gradually increase (or, in some cases, decrease). The rate of growth must be driven by the amount of information needed to answer each Plain Language Question: anymore and we are incurring waste, any less and we cannot effectively answer the questions.

By understanding what a 'best practice' work-flow looks like and how information can be universally structured, you need to understand requirements across the project life-cycle and, in turn, how to ensure efficiency at each project stage. PAS 1192-2 provides a logical framework for the production of pertinent information at discrete stages of the whole building life-cycle.

TIP: Information is described by the term 'Level of Definition'. Essentially this is a collective term for Level of Detail (Graphical Information) and Level of Information (Non graphical Information). The free-to-use NBS BIM Toolkit includes a free-to-use digital plan of work tool that enables the definition of who is doing what and when throughout a construction project.

TIP: Focus on the minimum amount of data you really need. Not all you could have. This drives up cost and waste.

TIP: For effective collaboration, a Responsibility Matrix is an important tool for setting out who will be responsible for issuing data on various aspects of the project at different stages. It ensures that the effort involved in producing the above deliverables is apportioned appropriately across the project life-cycle.



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For more information please visit www.bim-level2.org