



NATSPEC National BIM Guide

Appendix A

Glossary

October 2022



AS ISO 19650 Aligned

NATSPEC//
*Construction
Information*

NATSPEC National BIM Guide Appendix A - Glossary

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Comments

NATSPEC welcomes comments or suggestions for improvements to the *NATSPEC National BIM Guide* and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. NATSPEC also encourages users to share their experiences of applying it on projects with us.

Contact us via email at bim@natspec.com.au.

NATSPEC BIM Position Statement

NATSPEC believes that digital information, including 3D Modelling and Building Information Modelling will provide improved methods of design, construction and communication for the Australian construction industry. Further, NATSPEC supports open global systems. This will result in improved efficiency and quality. Visit the NATSPEC BIM Portal bim.natspec.org.

1 INTRODUCTION

This Glossary describes the meanings of terms and abbreviations used in NATSPEC National Guide documents. It can also be used as a reference when reading about BIM and related topics elsewhere.

1.1 Other terminology resources

ISO Online Browsing Platform (OBP)

Many of the terms in this glossary are found in international standards and those adopted as Australian Standards. The OBP includes a comprehensive set of definitions of terms and abbreviations, and details of the standards from which they are sourced.

See <https://www.iso.org/obp/ui>

Appendix B – AS ISO 19650 Resources Descriptions

This appendix provides brief descriptions of the documents that support the information management processes described in AS ISO 19650 Parts 1, 2 and 3.

It also includes fuller descriptions of some of the AS ISO 19650 terms found in this glossary.

Formatting conventions

In addition to the text formatting conventions used for Section headings, Clause titles, Table headings, etc, the Table below shows other text formats used in this document:

Text type	Example	Indicates
Italicised text	<i>Project BIM Brief</i>	Name of a specific document or standard.
Violet text	Data Reuse	Cross reference to a Section, Clause, Table, Diagram, etc
Blue text on blue fill	See the ABAB AIR Guide	References to relevant sources of information.
Blue underlined text	www.natspec.com.au	Hyperlink/weblink

In this document:

- ‘*National BIM Guide*’ or ‘*Guide*’ means the *NATSPEC National BIM Guide*.
- ‘*Appendices*’ means the *Appendices* of the *NATSPEC National BIM Guide*.
- ‘*Appendix*’ means this Appendix: *NATSPEC National BIM Guide Appendix A - Glossary*.

2 ABBREVIATIONS

AEC	Architecture, Engineering, Construction (industry)
AECO	Architecture, Engineering, Construction and Operation
AHD	Australian Height Datum
AI	Artificial intelligence
AIM	Asset information model
AIR	Asset information requirements
AM	Asset management
AMS	Asset Management System
APS	Architectural Programming Software
AR	Augmented Reality
BEP	BIM execution plan
BIM	Building Information Model, Building Information Modelling
BMS	Building Management System
CAAMS	Computer Aided Asset Management System
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CDE	Common data environment
CFD	Computational Fluid Dynamics
CMMS	Computerised Management Maintenance System
COBie	Construction-Operations Building Information Exchange
D&C	Design and Construct
DE	Digital Engineering
DfMA	Design for Manufacture and Assembly
DOE	US Department of Energy
ECI	Early Contractor Involvement
EIR	Exchange information requirements
FFE	Furniture, Fixtures & Equipment
FM	Facility Management
gbXML	Green Building Extensible Markup Language
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPR	Ground-penetrating radar
GPS	Global Positioning System

GTIN	Global Trade Item Number
GUID	Globally Unique Identifier
HVAC	Heating, Ventilation and Air Conditioning
ICT	Information and communication technologies
IDM	Information Delivery Manual
IFC	Industry Foundation Classes
IoT	Internet of things
IP	Intellectual Property
IPD	Integrated Project Delivery
LCA	Life Cycle Analysis
LIDAR	Light Detection and Ranging
LOD	Level of Development
LoD	Level of Detail
LoI	Level of Information
LPWAN	Low power wide area networks
MDD	Model Description Document
MEA	Model Element Author, Model Element Authoring
MEP	Mechanical Electrical Plumbing
MIDP	Master information delivery plan
ML	Machine learning
MR	Mixed reality
MVD	Model View Definition
OBOS	Open BIM Object Standard
OIR	Organisational information requirements
PBB	Project BIM Brief
PFD	Program for Design
PIM	Project information model
PIR	Project information requirements
QR	Quick response (code)
RFI	Request for Information
RFID	Radio Frequency Identification
TIDP	Task information delivery plan
VDC	Virtual Design and Construction
VR	Virtual reality

3 GLOSSARY

#

4D BIM A 3D model linked to time or scheduling information. Model objects and elements linked this way can be used to create animations of project construction processes for construction management, analysis, optimisation and communication purposes.

5D BIM A 3D model linked to cost information for quantity surveying and cost management purposes. Coupling cost with time information enables expenditure to be mapped against the project program for cash flow analysis, etc.

A

Appointed party [AS ISO 19650] The party appointed by the lead appointed party to provide works, goods or services, e.g. specialist sub-consultants, subcontractors and suppliers to the lead appointed party. They do not provide information directly to the appointing party.

Appointing party [AS ISO 19650] The recipient of information, e.g. the client, employer, asset owner or operator. Apart from taking ownership or responsibility for the works, goods and services delivered by the project, they are the ultimate recipient of the information provided by the lead appointed party. There is only one appointing party per project.

Architectural Programming Software (APS)
A database driven software application used to manage and analyse data about the spatial requirements of a building (room function type, floor area, required proximities to other functions, building services, etc). It is also used to generate a spatial Program for Design, or brief, for a project and to assess design proposals against the brief.

Artificial intelligence (AI) A branch of computer science concerned with building machines that employ advanced algorithms to mimic cognitive functions such as learning and problem solving. They are capable of performing tasks that typically require human intelligence but are generally reserved for those tasks that require the quick analysis of large volumes of data, e.g. model checking.

As-built model The construction model updated with actual constructed locations for equipment, systems, walls, etc. which will be used for Facility Management. It only needs to be a lightweight model without overly detailed elements but with enough detail to enable facilities management operations. Also called as-constructed model.

Asset Item, thing or entity that has potential or actual value to an organisation. In the Guide it generally refers to built assets, e.g. buildings, facilities or infrastructure.

Asset information model (AIM) [AS ISO 19650]
The information provided by the delivery team in response to the appointing party's/ client's asset information requirements. It can include models, 2D documentation and data. The AIM supports the appointing party's strategic and day-to-day AM/FM processes. It can also provide information at the start of a refurbishment or extension of an existing asset.

Asset information requirements (AIR) [AS ISO 19650]
The information needed to operate and maintain a built asset throughout its lifecycle. Informed by the OIR, they define the content, form and structure of information that needs to be included in the asset information model (AIM).

Asset life cycle The complete life of an asset from feasibility and planning through design, construction and operation phases to eventual disposal or repurposing.

Asset management (AM) [ISO 55000] Coordinated activity of an organisation to realise value from assets.

Asset Management System (AMS) Technology that supports the management of an organisation's assets.

Attribute [ISO 22274] A data element for the computer-sensible description of a property, a relation or a class. (Often used interchangeably with property, but see definition of property for the difference. "first name", "last name" are properties. Metadata about properties and classes such as "date created" are attributes.)

Augmented Reality (AR) Technology that superimposes a computer-generated image or information on a user's view of the real world, providing a composite view.

Australian Height Datum (AHD) The datum used for the determination of elevation in Australia. The determination uses a national network of benchmarks and tide gauges and set Mean High Water as zero elevation.

B

Barcode A unique code embodied in a graphic comprising a row of vertical lines that is applied to an item so it can be identified by a visual scanner. A barcode embodies a limited set of alphanumeric characters and cannot include as much information as a QR code.

BIM coordination room A purpose-designed room set up to facilitate the coordination of digital models by members of a project team.

It includes IT infrastructure such as cabling, projectors and/or Smart Boards that allow the room's occupants to view models together for coordination, collaborative design, etc.

BIM Coordinator, Lead BIM Coordinator A person who performs an intermediary role between the BIM Manager and the modelling team. They implement the BIM Manager's modelling standards and protocols and deal with the day-to-day coordination of team members to achieve project goals.

BIM evaluation and response form See Summary of delivery team capability and capacity.

BIM execution plan (BEP) A formal document that defines how the project will be executed, monitored and controlled with regard to BIM. A pre-appointment BEP is developed by the prospective lead appointed party in response to the appointing party's EIR and supporting invitation to tender information. It includes a master information/data management plan and assignment of roles and responsibilities for model creation, data integration and information management throughout the project. Following the appointment of the successful tenderer, the lead appointed party – in agreement with appointed parties – should confirm any changes required and incorporate them in the delivery team BEP (as the updated document is known).

BIM information manager Same as BIM Manager.

BIM management plan (BMP) Use BIM execution plan.

BIM Manager A person responsible for leading BIM implementation within an organisation and on projects. This includes the development and management of standards,

modelling processes and quality assurance measures. It can also entail training. Variants of this role description include Project BIM Manager, Design BIM Manager, Construction BIM Manager and Discipline BIM Lead, depending on the scope of their responsibilities. As there are no widely accepted industry definitions of the responsibilities associated with each, the responsibilities and capabilities required for any of these roles should be specified.

BIM use (or BIM use case) “A unique task or procedure on a project which can benefit from the application and integration of BIM into that process.” (Penn State *BIM Project Execution Planning Guide*) The application of BIM for a specific purpose or outcome, e.g. design authoring, 3D coordination, asset management, simulation.

Blockchain A system of recording digital transactions in a ledger that is duplicated and distributed across a wide network of computer systems with the intention of creating a permanent and unalterable record.

Bluetooth A short-range (up to 10 m) wireless technology that enables communication and data exchange between fixed and mobile devices using UHF radio waves. It is mainly used as an alternative to wired connections.

Building Information Management (Data Definition) Building information management supports the information standards and information requirements for BIM use. Data continuity enables the reliable exchange of information in a context where both sender and receiver understand the information.

Building Information Model (BIM) (Product) An object-based digital representation of the physical and functional characteristics of a built asset. The Building Information Model serves as a shared knowledge resource for information about a built asset, forming a

reliable basis for decision making during its life cycle from inception onward.

Building Information Modelling (BIM) (Process)

A collection of defined model uses, workflows, and modelling methods used to achieve specific, repeatable, and reliable information results from the model. Modelling methods affect the quality of the information generated from the model.

Building Management System (BMS) A network of integrated computer components that is used to monitor and control a wide range of building operations such as HVAC, security/access control, lighting, energy management, maintenance management, and fire safety control.

C

Capability The ability to perform a given activity, e.g. by having the necessary experience, skill or technical resources.

Capacity The ability to complete an activity in the required time.

Clash detection The process of detecting conflicts between model elements to minimise or eliminate construction or functional problems on site. Purpose-made software is usually used for this process.

Cloud computing ('The Cloud') A type of Internet-based computing, where different services including servers, data storage and applications are delivered to a user's computers and devices through the Internet without direct active management.

Collaboration Multiple parties working in a way that is focussed on a common outcome rather than individual goals.

Common data environment (CDE)

[AS ISO 19650] A single source of information for any given project. A CDE functions as a digital hub from which project stakeholders can collect, manage, and disseminate relevant approved project information in a managed environment.

Computational Fluid Dynamics (CFD)

A branch of fluid mechanics that uses computer programs to simulate the behaviour of fluids and gases when interacting with surfaces. In an architectural context CFD is used to analyse airflows around buildings, ventilation patterns, stack effects in multistorey buildings, fire/smoke behaviour, etc.

Computer Aided Asset Management System (CAAMS)

See CAFM.

Computer Aided Design (CAD) A geometric/symbol-based computer drawing system that replicates hand drawing techniques.

Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) The process in which digital information from CAD or BIM is used to direct machines such as cutters, drills, lathes, 3D printers and milling, punching and folding machines that would otherwise be controlled by human operators.

Computer Aided Facilities Management

(CAFM) An IT system that supports facilities management. CAFM systems focus on space management issues, asset information, maintenance history, and equipment documentation. A Computerised Maintenance Management System (CMMS) focuses on facility maintenance and is often part of CAFM. CMMS can manage asset information, maintenance history, equipment documentation, fleet maintenance and staff and subcontractor activities. CAFM and CMMS are often used interchangeably, and for most practical purposes there is little difference between the two systems.

Computerised Maintenance Management System (CMMS)

See CAFM.

Conceptual design (phase) The phase of the design process in which the overall scope and nature of the project is determined in response to the site, planning considerations and the client's brief, budget and program.

Construction BIM execution plan A BIM execution plan for the construction phase of a project.

Construction documentation (phase) The project phase in which design relationships in the Design Development phase are resolved and documented to the extent that they can be used for the construction process. Documentation can comprise models, drawings, schedules, specifications and data that can be used for calling tenders or negotiating prices with a contractor.

Construction model A model used for construction purposes on a project.

Construction-Operations Building Information Exchange (COBie) An open data exchange specification for capturing information during the design and construction of projects for facility management purposes including operation and maintenance. It enables information to be captured and exchanged at each phase of a project. A key element of COBie is a preformatted Excel spreadsheet for recording this information.

Coordination (3D) The process of ensuring the correct spatial relationship of elements within a model or on a site.

D

Data security management plan

A documented protocol that defines how project data will be protected from loss or unauthorized access during creation, exchange, and retention.

Deliverable [ISO 22128] A measurable and verifiable outcome, result or item to be produced within a specific timeframe to complete a project or part of a project. In the Guide this is generally referring to information deliverables such as models, documents and data.

Delivery team [AS ISO 19650] Includes all parties responsible for the production and delivery of information to the appointing party: the lead appointed parties and appointed parties. There can be multiple delivery teams for a project.

Design and Build (D&B) Same as Design and Construct.

Design and Construct (D&C) The project procurement method in which the client enters into one contract for the design and construction of a project with an organisation, generally a construction company which provides all project management, design, construction and project delivery services.

Design-Bid-Build (DBB) The project procurement method in which the client enters into separate contracts for the design and construction of a project. Design and documentation services are generally provided by a professional design consultancy. Their documents are used for bidding (tendering) purposes, and the successful tenderer, generally a construction company, enters into a contract with the client to build the project. Often referred to as the 'traditional' method of procurement.

Design BIM execution plan A BIM execution plan for the design phases of a project.

Design BIM Lead The BIM lead for each design discipline or sub-trade.

Design Development (phase) The phase of the design process in which the general relationships represented in the schematic design phase are resolved in more detail. During this phase the dimensions of all major elements are defined and forms of construction finalised.

Design for Manufacture and Assembly (DfMA)

A design approach that focuses on ease of manufacture and efficiency of assembly. By simplifying the design of a product, it is possible to manufacture and assemble it more efficiently, in the minimum time and at a lower cost. It can be adopted for the off-site prefabrication of construction components such as concrete floor slabs, structural columns and beams.

Design-intent model A complete and coordinated expression of the designers' design. Design-Intent model can also refer to individual models, e.g. a particular discipline model, or a model as a whole, e.g. a composite or federated model.

Detailed responsibility matrix [AS ISO 19650] A development of the high-level responsibility matrix that describes what information is to be produced, which task team is responsible for its production and when the information is to be exchanged, and with whom.

Digital Engineering (DE) The convergence of emerging technologies such as Building Information Modelling (BIM), Geographic Information Systems (GIS) and related systems to derive better business, project and asset management outcomes. Digital Engineering

enables a collaborative way of working using digital processes to enable more productive methods of planning, designing, constructing, operating and maintaining assets through their life cycle.

Digital Twin A digital representation of an asset to support operational functions. What distinguishes them from building information models in general is their linkage to the physical asset they represent and the exchange of data between them.

Drone An unmanned aerial vehicle (UAV) which is remotely or autonomously operated.

E

Early Contractor Involvement (ECI) The project procurement method where a contractor is engaged during the design phase (with no assurance of continuing to provide physical construction services) to provide buildability, programming, and systems selection advice.

Edge computing Data processing and storage that is done in proximity to the source of the data, rather than being sent to a remote cloud computing location to be processed. It improves response times and saves bandwidth.

Exchange information requirements (EIR) [AS ISO 19650] Information requirements derived from the project and asset information requirements as information to be delivered (exchanged) by respective lead appointed parties to the appointing party (client) at key project delivery milestones. Each EIR is appointment-specific and forms part of the invitation to tender package for each lead appointed party.

F

Facility Management (FM) The process of managing and maintaining the efficient operation of facilities including buildings, properties and infrastructure. The term is also applied to the discipline concerned with this process.

Facility Manager A person responsible for the facility management of buildings, properties or infrastructure.

Federation/ federated model The combination of multiple models into a single model for review or coordination.

Federation strategy [AS ISO 19650] This high-level document sets out how different information models relate to each other. Models are typically differentiated by discipline or system. It can take the form of a table or relationship diagram. The federation strategy informs the information container breakdown structure.

G

Generative design Creating alternative design solutions in model authoring software by applying form generating algorithms to a range of inputs and output goals.

Geographic Information System (GIS) A system that integrates hardware, software, and data for capturing, managing, analysing, and displaying all forms of geographically referenced information.

Global Navigation Satellite System (GNSS) A broad term encompassing different types of satellite-based positioning, navigation and timing (PNT) systems used to accurately map locations on the earth's surface. Global Positioning System (GPS) is one such type of system. The data from these systems is used by GIS systems.

Global Positioning System (GPS) See Global Navigation Satellite System (GNSS)

Global Trade Item Number (GTIN) An identification number used by companies to uniquely identify products or services that are priced, ordered or invoiced in the supply chain. They are typically embedded in barcodes and QR codes. GTIN are managed by GS1, an international not-for-profit organisation.

Globally Unique Identifier (GUID) A unique code identifying each object or space. A GUID should not be confused with “code” in “room code,” “equipment code,” or “space code.” The GUID is metadata assigned by model authoring software to objects/spaces that persists through object or room name changes and other modifications, enabling them to be tracked throughout the project.

Golden thread The concept of a contiguous thread of safety-related information about a building. It is both the information that enables understanding of the building (e.g. details of active and passive fire safety systems) and the steps needed to keep both the building and its occupants safe, now and in the future. It includes the management processes required to keep the information accurate, up-to-date, fit for purpose and accessible to those who need it throughout the building’s life cycle.

Green Building Extensible Markup Language (gbXML) A digital file format for exchanging sustainability information with simulation applications.

Ground-penetrating radar (GPR) A geophysical method that uses radar pulses to create an image of subsurface conditions including utilities (pipes, cables, etc) without the need to excavate.

H

High-level responsibility matrix [AS ISO 19650] A tabulation of information deliverables that a prospective lead appointed party proposes to provide in response to the appointing party’s EIRs. It is developed and included in the pre-appointment BIM execution plan to ensure there is no duplication of effort between delivery teams and clarifies what, at high level, they expect to deliver.

Horizontal infrastructure Geographically distributed network assets, including road, rail, water, power and communications distribution systems.

I

Industry Foundation Classes (IFC) An open data schema for defining and representing standard architectural and construction-related graphic and non-graphic data as 3D virtual objects. It enables the interoperability/exchange of data between proprietary software applications. See <https://technical.buildingsmart.org/standards/ifc/>

Information and communication technologies (ICT) An extension of the term information technology (IT) that stresses the role of the integration of telecommunications and computers that enables users to access, store, transmit, understand and manipulate information.

Information container [AS ISO 19650] A ‘named persistent set of information retrievable from within a file, system or application storage hierarchy’. The key words here are ‘named’ so that its contents can be identified and ‘persistent’ indicating that it is a record of information at the time it is issued. Its contents may change with each issue but regardless of when a specific information container is opened, its contents should be the same. In practice, it has effectively the same meaning as file, and can generally be used

interchangeably. As a general rule it is only applied to a single file, i.e. not a collection of files in a folder.

Information container breakdown structure [AS ISO 19650] A framework that sets out the hierarchical organization of information containers in a CDE. It can take the form of a table or relationship diagram and is used to develop responsibility matrices.

Information Delivery Manual (IDM) [AS ISO 29481.1] Documentation which captures a business process or BIM use case and gives detailed specifications of the information that a user fulfilling a particular role would need to provide at a particular point within a project.

Information delivery milestones [AS ISO 19650] A scheduled event for a predefined information exchange. Milestones are deadlines/dates specified by the appointing party for required information deliverables, aligned to the project's plan of work (stages) and key decision points.

Information manager [AS ISO 19650] A shorthand way of describing the information management function embedded into existing project roles. AS ISO 19650.2 never uses the term 'Information Manager' but instead always refers to "an individual or individuals nominated by the appointing party to undertake the information management function" for a project".

Information model/ model [AS ISO 19650] A broader interpretation of the term 'model' adopted by AS ISO 19650 to describe an integrated set of information comprising geometrical information, graphical and textual documentation and non-graphical information.

Information standard The standard for information management adopted for a project; generally AS ISO 19650.

Information technology (IT) The field concerned with all aspects of managing and processing information, especially within an organisation or company. IT describes computers and computer networks including the physical hardware, operating systems, applications, databases, storage, and servers.

Integrated Project Delivery (IPD) The project procurement method in which the client enters into a contract with a number of organisations including design consultants and building contractors at the earliest stages of the project to create an integrated team. It is characterised by an expectation that the team will work collaboratively to deliver a product that meets the client's requirements.

Intellectual Property (IP) The legal term relating to the ownership of specific design elements, tools, and processes. IP ownership should be defined in the contracts between parties.

Internet The global system of interconnected computer networks that uses protocols to communicate between networks and devices. It is a network of networks linked by a broad array of electronic, wireless, and optical networking technologies.

Internet of things (IoT) Describes physical objects embedded with electronic devices such as computing/ sensing chips that connect and exchange data with other devices and systems over the Internet or LPWAN.

Interoperability The ability of two or more systems or components to exchange information securely and to use the information that has been exchanged.

Semantic interoperability refers to the ability to interpret the information exchanged automatically to produce results that are deemed useful by the end users of both systems.

L

Laser scanning A surveying method that collects measurements used to create 3D models of objects and environments. It uses a laser beam to gauge spatial relationships and shapes by measuring the time it takes for laser beam signals to bounce off objects and return to the scanner. It is a non-contact, non-destructive methodology that generates “point clouds” of data from surfaces.

Lead appointed party [AS ISO 19650] The party (individual or organisation) directly appointed by the appointing party to provide works goods or services, e.g. project manager, architect, contractor. They are the party responsible for providing information to the appointing party in response to their information requirements. They coordinate the production of information by any appointed parties or task teams for which they are responsible. There can be multiple lead appointed parties per project.

Level of Detail (LoD) A measure of the geometrical completeness and accuracy of a model object compared to the physical object it represents at each stage of a project.

Level of Development (LOD) A scale used to describe the level of completeness to which a model element can be relied on at different times during model development. The American Institute of Architects *Document E202 – 2008 Building Information Modeling Protocol Exhibit* defines five LODs: LOD 100, LOD 200, LOD 300, LOD 40, LOD 500. Each subsequent level builds on the previous level and includes all the characteristics of the previous ones. LOD, by definition, applies to

individual model elements, so should not be used to describe the model as a whole.

Level of information need AS ISO 19650.1 incorporates the concept of level of information need, a framework from EN 17412-1 for describing the extent and granularity of information needed at key information exchanges during a built asset’s life cycle. Its purpose is to guard against delivery team members producing too much information or information that is too detailed.

Level of Information (LoI) A measure of the extent of non-graphical information attached to a model object at each stage of a project.

Life cycle The life of a built asset from the definition of its requirements to its end of use, covering its conception, development, operation, maintenance, support and disposal.

Life Cycle Analysis (LCA) Analysis of the whole-of-life impact of various initiatives on the environment. In the built environment context LCA is concerned with the impact of the construction and operation of built assets on the environment. This includes assessing the sustainability of construction materials (embodied energy, potential for recycling or reuse, etc).

Light Detection and Ranging (LIDAR) A remote sensing process similar to laser scanning (and often used interchangeably). Laser scanning usually refers to the scanning of large areas whereas LIDAR applies to a process that uses a more focussed beam for measuring the speed and distance of an object from the scanner.

Low power wide area wireless networks (LPWAN) Wireless networks designed to allow long-range communication at a low bit rate between devices such as sensors. The devices employ battery-powered transceivers and typically form part of an IoT system.

M

Machine learning (ML) A sub-branch of AI concerned with enabling computers to learn, adapt, and perform desired functions autonomously. ML algorithms can learn patterns from previous inputs and processing and adjust their approach to tasks accordingly.

Master information delivery plan (MIDP) [AS ISO 19650] A compilation of all the task information delivery plans (TIDP) of a delivery team. It enables lead appointed parties to coordinate all the TIDPs to make sure they will all fit within the overall delivery schedule.

Mechanical Electrical Plumbing (MEP) An acronym referring to this group of building services or the engineering disciplines associated with them.

Metadata Commonly defined as data about data, it can also be described as data attached to a file for identification and management purposes, e.g. creation date, author, classification code.

Mixed reality (MR) Technology that enables a viewer of a virtual model to interact with and manipulate both physical and virtual items and environments.

Mobilization plan A lead appointed party's plan for mobilising information management activities after appointment. It also informs the appointing party of their proposed approach.

Model An individual model comprising various objects, a combination of models, and/or the process of modelling in general. The most appropriate meaning will depend on the context in which it is used.

Model Description Document (MDD) A document issued with a model to describe what it contains and any limitations of use.

Model Element Author (MEA) An appointed party responsible for authoring specific model elements to a predefined level of information need or level of development by a specified milestone, typically described in a LOD table or MEA schedule.

Model Element Authoring (MEA) schedule A table or matrix for assigning responsibilities for the development of model elements to a defined level by project milestones to each MEA. In AS ISO 19650 terms, a responsibility matrix for showing who is responsible for modelling what, and when during the project.

Model View Definition (MVD) A defined subset of the IFC schema that is needed to satisfy one or many exchange requirements. A MVD defines requirements for all IFC concepts (classes, attributes, relationships, property sets, quantity definitions, etc.) within the subset. It represents the software requirements specification for the implementation of an IFC interface to satisfy the exchange requirements.

N

NATSPEC The Australian National Building Specification system. Also used in the Guide to describe the worksection classification system used to organise it, or the name of the organisation that produces it, Construction Information Systems.

Non-graphical Information Broadly, any information other than graphic information, e.g. textual information, digital data. In the context of modelling it often refers to information embedded in model objects.

O

Object A digital representation of a product, component or material that, when combined with other objects, forms a building information model.

Object library A repository of objects. Object libraries save modellers duplicating the effort required to create objects from scratch each time they are needed. They provide the opportunity to introduce quality assurance and standardisation measures, e.g. naming conventions for objects and their properties.

OmniClass The OmniClass Construction Classification System is a construction industry classification system developed by the Construction Standards Institute (CSI). OmniClass tables for different types or aspects of construction information incorporates other existing systems such as MasterFormat™ for work results, UniFormat for elements, and EPIC (Electronic Product Information Cooperation) for products.

Open BIM Object Standard (OBOS) An open standard developed by NATSPEC Australia and Masterspec New Zealand to address the lack non-proprietary standards for the creation of good quality BIM objects. Proprietary standards for products or services such as object libraries inhibit the ready exchange of BIM content across industry and between members of project teams.

Open standards Standards that are designed to enable the ready exchange of information including interoperability between the many types of proprietary software necessary to deliver a project, e.g. Industry Foundation

Classes (IFC). Standards such as AS ISO 19650 provide procedural frameworks and a common language for a shared approach by a diverse group of stakeholders.

Operation or operational (phase) The part of a built asset life cycle during which it is used, operated and maintained. It can include management, maintenance, refurbishment, repurposing, decommissioning and demolition.

Organisational information requirements (OIR) [AS ISO 19650] The information needed by an organisation to inform decision-making about high-level strategic objectives. OIR inform the Asset Information Requirements (AIR) and the Project Information Requirements (PIR) but are generally not issued as part of tender documentation.

P

Parametric design, parametric modelling The creation of models based on a series of pre-programmed rules typically used to define relationships within and between model objects and elements so that when one is changed, the others are automatically changed.

Photogrammetry The application of image processing software to generate 3D measurements from a series of digital photographs. GIS can be used to geo-locate them. It represents a lower cost alternative to laser scanning for smaller areas, e.g. rooms or where less accuracy is required.

Plan of work A framework that details principal stages in the design, construction and maintenance of a project and identifies the main tasks and people associated with them. A plan of work may be extended to include the demolition and recycling of a project.

Point cloud A collection of spatial data points analogous to the real world in three dimensions. Each point is defined by its relative position to the others. The points can then be rendered as pixels to create a highly accurate 3D model of the object.

Pre-appointment BIM execution plan (BEP) [AS ISO 19650] A BEP developed by prospective appointed parties in response to an invitation to tender. It focuses on the delivery team's proposed approach to information management and their capability and capacity to manage information.

Program for Design (PFD) (Also referred to as an accommodation schedule.) A formal quantitative schedule of spaces and fixtures, furniture and equipment that informs the design process. It represents a detailed development of the design brief derived from analysis of the client's brief, design guidelines and design assessment criteria. It can be manually compiled or generated with the assistance of purpose-made Architectural Programming Software.

Project The process of creating or modifying a built asset.

Project BIM Brief (PBB) A document developed by a client to outline their BIM requirements when engaging designers or design and build teams. Not referred to in AS ISO 19650 but similar in function to project and exchange information requirements.

Project information delivery milestones [AS ISO 19650] Information delivery milestones that are defined to determine when information models will be exchanged from the delivery team to the appointing party and/or between delivery teams.

Project information model (PIM) [AS ISO 19650] The information model relating to the design and construction delivery phase. May contain the information model, contracts, reports, certificates, and communications data set.

Project information production methods and procedures [AS ISO 19650] Specific information production methods and procedures required for the project by the appointing party.

Project information protocol An agreement between an appointing party and each lead appointed party that documents the rights and obligations of parties entering into an appointment for the production or management of information. It is a supplementary legal agreement that is incorporated into professional services appointments and construction contracts by means of an amendment. The project information protocol is also included within all lead appointed party sub-appointments throughout the delivery team(s).

Project information requirements (PIR) [AS ISO 19650] Information requirements defined by the appointing party to establish the information needed to answer or inform high level strategic objectives in relation to the purpose, design and construction of a built asset. They are identified from both project and asset management processes and inform the exchange information requirements. PIR set out the information required by the appointing party for decision-making at key decision points during its delivery.

Project information standard [AS ISO 19650] The specific information standard required for the project by the appointing party.

Project objectives Overarching outcomes that the appointing party aims to achieve from the project, e.g. improved operating efficiency, stakeholder satisfaction, reduced journey times.

Project reference information [AS ISO 19650] Available information useful or relevant to prospective appointed parties when tendering and throughout the project.

Project shared resources [AS ISO 19650] Information provided to help promote consistency in the formatting and structuring of information to facilitate its exchange including templates, style libraries and object libraries.

Project team [AS ISO 19650] Includes all parties participating in a project: the appointing party, lead appointed parties and appointed parties. There is only one project team per project.

Property [ISO 22274] A defined characteristic suitable for the description and differentiation of the objects in a class. (Often used interchangeably with attribute, but see definition of attribute for the difference.)

Q

Quick response (QR) code A code or data embodied in a square graphic that is applied to an item so information about it can be retrieved by a visual scanner. The graphic can embody more information than a barcode, e.g. a URL, so can be more useful for asset management.

R

Radio Frequency Identification (RFID) Radio Frequency Identification (RFID) uses a similar principle to QR codes for encoding information but stores it on a silicon chip that can be read by a radio scanner.

Record model The final updated version of the construction model used to construct the built asset.

Record modelling The process of creating a record model of a built asset.

Request for Information (RFI) A documented request for information on a matter from one party to another. They are usually managed through formal procedures agreed by members of the project team.

Risk register An assessment of project risks including information management risks and appointment risks. It helps identify appropriate risk-mitigation measures.

Robotics An interdisciplinary branch of computer science and engineering that encompasses the design, construction, operation, and use of robots. In a construction context they can be used to automate tasks such as information gathering, carrying materials and assembling building elements guided by geospatial data or spatial data derived from a model.

S

Schematic design (phase) The phase of the design process in which the general arrangement of the project, including functional relationships, indicative room sizes and layout, overall form of the building/s and its/their relationship to the site, is determined.

Smart cities The digital twin concept extended to cities (buildings, open space, infrastructure, utilities) for the purposes of data collection, analysis, simulation, management and control including urban and transportation planning.

Smart infrastructure The digital twin concept extended to infrastructure for the purposes of data collection, analysis, simulation, management and control. See Digital twins in *Appendix C – BIM use descriptions*.

Structured data Data organised according to a data schema that defines data elements and their relationships to each other. The schema is expressed through classification systems, naming conventions, codes, etc incorporated in file names or metadata. The organisation of the schema is driven by use cases.

Summary of delivery team capability and capacity [AS ISO 19650] A documented evaluation of the delivery team's overall capability and capacity. It is produced by the lead appointing party by aggregating each task team's assessments of their capability and capacity.

T

Task information delivery plan (TIDP) [AS ISO 19650] A plan developed by each task team scheduling out the information they will deliver (analogous to a documentation schedule). It includes information container (file) name and title, predecessors or dependencies, level of information need, estimated time required for production, author and delivery milestones.

Task team [AS ISO 19650] A team (or individual) responsible for the production and delivery of information to a lead appointed party. As the name suggests, they are formed to complete specific sets of tasks and are typically discipline-based, e.g. cost management, surveying, engineering design.

There can be multiple task teams in a delivery team.

U

Uniclass 2015 A unified classification system including tables for classes of building information such as elements, spaces and products. It is managed by NBS UK.

Uniformat A classification system for building elements (including designed elements) that forms the basis of Table 21 of the Omniclass system. A product of the Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC).

Unmanned aerial vehicle (UAV) Use drone.

V

Vertical infrastructure Buildings, discrete, non-geographically distributed built assets.

Virtual Design and Construction (VDC) Like digital engineering, VDC can be considered a broader term than BIM that nonetheless shares many concepts and principles with BIM, i.e. a collaborative way of working using digital processes to enable more productive methods of planning, designing, constructing, operating and maintaining assets through their life-cycle.

Virtual reality (VR) An immersive 3D environment, isolated from the real world, where graphical and non-graphical information can be viewed and manipulated.

W

Wayfinding All of the methods people use to orient themselves in physical space and navigate from place to place, i.e. find their way.

Wi-Fi A family of wireless network protocols commonly used for local area networking of devices and internet access enabling digital devices to exchange data by radio waves in ranges between 20 to 150 metres. It is typically used to link computers, smartphones, printers, smart TVs, smart speakers, etc

together and to wireless routers that connect them to the internet. It is also used to create wireless access points to the internet and other networks in public places.

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