Background
Objective

1. Satisfy industry requirements

2. Align with the approach of information management using BIM as mentioned in ISO 19650

3. Include all necessary information to satisfy the requirements of ISO 19650-2, in particular for those to be used as local annex for Hong Kong, and,

4. Pave the way for the Government's initiatives/roadmap for promoting and fostering the adoption of BIM in Hong Kong.
Milestones

Phase 1
1. Project Commencement
2. 1st Stakeholders Engagement Seminars
3. 1st Draft of Enhancement of CIC BIM Standards (General)
4. 2nd Stakeholders Engagement Seminars
5. 2nd Draft of Enhancement of CIC BIM Standards (General)

2020
May
JUN
JUL
AUG
SEP
OCT
NOV
DEC

Phase 2
6. CIC and Public Review and Comment
7. Completion of Final Version and Launch
Milestones

Phase 1

1 - Project Commencement
2 - 1st Stakeholders Engagement Seminars
3 - 1st Draft of Enhancement of CIC BIM Standards (General)
4 - 2nd Stakeholders Engagement Seminars
5 - 2nd Draft of Enhancement of CIC BIM Standards (General)

Phase 2

6 - CIC and Public Review and Comment
7 - Completion of Final Version and Launch

Collect the comments and reviews on the draft enhancement.
Polling Question

Question 1: Does your organisation apply or refer to CIC Standards, ISO 19650 or BS/PAS1192?

Options (Can choose more than 1):

a) CIC Standards
b) ISO 19650
c) BS/PASD 1192
1st Draft of Enhancement of BIM Standards (General)
Key Topics

• ISO 19650 Information Management
• Terminology
• Common Data Environment CDE
• Cyber Security
• Information Management Workflow across Project life-cycle
• Cost Estimation
• MiC/ DfMA
• BIM Audit
• Level of Development LOIN
• OpenBIM
• Way Forwards
Separate Publications

Current Draft contains approximate 270 pages
ISO 19650 – Information Management Framework & Workflow

1.1 Framework & Workflow
The information management framework identifies eight specific activities to be undertaken in relation to a project. No information is provided regarding the definition of a project or stages within a project, which are left to industry to interpret. The activities identified and order are defined as:
1. Assessment and Need
2. Invitation to Tender
3. Tender response
4. Appointment
5. Mobilization
6. Collaborative production of information
7. Information Model deliver
8. Project Close out

The framework also identifies three parties which are:
1. Appointing Party (Client / Employer)
2. Lead Appointed Party (Lead Consultant / Lead Contractor)
3. Appointed Parties (Task Teams)

Whilst the framework from ISO 19650 allows for multiple Lead Appointed parties and delivery teams it is recognized that this fails to achieve the benefits of collaboration and a single lead appointed party should be identified for each project stage.

<table>
<thead>
<tr>
<th>Event</th>
<th>Produced by</th>
<th>BIM Documentation &amp; Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment and need</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Invitation to Tender</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Tender Response</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Appointment</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Mobilization</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Collaborative Production</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Information Delivery</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
<tr>
<td>Project Close-out</td>
<td>Appointing Party / Client</td>
<td>BIM Requirements</td>
</tr>
</tbody>
</table>

Diagram:
- Appointing Party / Client
- Lead Consultant / Contractor
- Task Teams
- Procurement
- Planning
- Production

Table 1: Schedule of main events and content defined under ISO 19650
Parties, Function & Information Management Assignment

- Appointing Party / Client (Client / Employer)
  - Employers Representative / Agent
- Lead Appointed Party (Lead Consultant / Contractor)
  - Project Delivery Management
  - Project Information Management
  - Asset Information management function
  - Security Information Management Functions
- Appointed Parties (Task Team Management Functions)
  - Task management
  - Information management
  - Interface management
  - Information authoring

<table>
<thead>
<tr>
<th>I.D.</th>
<th>Task</th>
<th>Project Manager</th>
<th>BIM Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Confirm the delivery team’s BIM execution plan</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Confirm the names of the information management function</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Update the information delivery strategy</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Update the high-level responsibility matrix</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Confirm and document the proposed information production methods and procedures</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>Agree with the Appointing Party / Client any additions or amendments to the project’s information standard</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Confirm the schedule of software, hardware, and IT infrastructure</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Establish the delivery team’s detailed responsibility matrix</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Establish the lead appointed party’s exchange information requirements</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Information Requirement

Definitions provided for:

- Organisation Information Requirements (OIR)
- Asset Information Requirements (AIR)
- Project Information Requirements (PIR)
- Project Information Standards
- Project Information Production Methods and Procedures
- Project’s Information Protocol
- Delivery Team Capability and Capacity Assessment
- Business / Project Specific Cyber Security
- Shared Resources

2.1 Organisation Information Requirements (OIR)

The use of organisation information requirements is predominantly the definition of the information required by an organisation to answer or inform high level strategic objectives rather than asset level or project specific requirements. Organisational information requirements can be defined by multiple tiers of an organisation’s hierarchy. The intention is to allow the cascading of requirements down through organisations and the flow of information up these tiers to inform decision making. The requirements may arise for multiple decision-making needs which can include:

- Policy decision making
- Portfolio planning
- Regulatory obligations
- Strategic asset management
- Strategic business operations

Organizations have identified high level activities which may need to be considered and these can include, but are not limited to:

- Capital investment and lifecycle costing
- Health and safety compliance and management
- Security management
- Environmental management
- Space utilization
- Risk assessment and management
- Maintenance and repairs
- Asset modifications
- Asset operations

To facilitate a digital approach to decision making the organisation information requirements should be developed into digital information requirements to facilitate data verification and support solutions.
BIM Use – Phase – Process Relationship

Legend
Order revised
Proposed breakdown
Proposed additional BIM uses

1 Design Authoring
2 Design Review
3 Drawing Generation / Production
   a - Master Layout Plan / Development Plan
   b - Statutory Submission
   c - Tender Drawings
   d - Shop Drawings
   e - Sales And Lease Drawings
4 Existing Conditions Modelling
5 Sustainability Evaluation
6 Site Analysis
7 Space Programming
   a - Programme Compliance Analysis
   b - Spatial And Material Design Models
   c - Design Visualisation For Functional Analysis
8 Cost Estimation
   a - Quantity Take-off And Cost Estimating
   b - 5d Modelling / Cash Flow Forecasting
9 Spatial Coordination
10 Engineering Analysis
   a - Structural Analysis
   b - Ventilation Analysis
   c - Lighting Analysis
   d - Energy Analysis
   e - Fire Engineering
   f - Civil Engineering
   g - Other Engineering Analysis
BIM Use – Phase – Process Relationship

11 Facility Energy Analysis
12 Building Code Checking and Validation
13 Phase Planning (4D Modelling)
14 Digital Fabrication
15 Site Utilization Planning
16 3D Control And Planning
17 3D Construction Coordination
18 Construction System Design
19 Construction Quality Management / Digital Works Site Supervision (DWSS)
20 As-built Modelling
21 Project Systems Analysis
22 Maintenance Scheduling
23 Space Management And Tracking
24 Asset Management
25 Sales And Marketing
Polling Question

Question 2: Which of these BIM Uses shall be added to the existing list (the 20 nos. BIM uses)? (exact names to be confirmed)

Options (Can choose more than 1):

a) Building Code Checking and Validation
b) 3D Construction Coordination (differentiate between 3D/spatial coordination for design and specifically for construction)
c) Construction system design (Process of design and analysis of the supplementary construction systems e.g. safety plan, temporary works such as form works, excavation support, etc.)
d) Construction Quality Management / Digital Works Site Supervision (DWSS)
e) Sales and marketing (e.g. production of sales materials, virtual viewing of sale flats, etc.)
f) None of the above. Should only keep the existing 20 nos.
Polling Question

Question 3 : Do you think the following existing BIM uses should be breakdown into more specific sub-items as suggested? (exact names and breakdown items to be confirmed)

Options (Can choose more than 1):

- a) Don't breakdown the BIM Uses. Up to practitioner to interpret.
- b) Agree to breakdown for **Drawing production**
- c) Agree to breakdown for **Space programming**
- d) Agree to breakdown for **Cost Estimation**
- e) Agree to breakdown for **Engineering Analysis**
Project Execution Planning

- Project Information
- Information Management Functions
- Information Management Functions and Responsibility Matrix
- Information Delivery Strategy
- Approach to fulfilling the EIR
- Project Information Requirements (PIR)
- Level of Information Need
- Acceptance Criteria
- Project Information Production Methods and Procedures
- Project Information Standards
- Security Strategy
- High and Detail Level Responsibility Matrix
- Delivery Team Risk Register
- Mobilisation Plan
- Task Information Delivery Plans (TIDP)
- Master Information Delivery Plan (MIDP)
- Schedule of software (including versions), hardware and IT Infrastructure
Polling Question

Question 4: Do you agree adoption of ISO 19650 shall be incorporated as one of the Client requirements?

Options:

a) Agree
b) Somewhat agree
c) Neutral
d) Somewhat disagree
e) Disagree
Polling Question

Question 5: Do you agree the CIC BIM Standards (General) shall be developed to align with the approach of information management as mentioned in ISO 19650, and serve as the local annex?

Options:

a) Agree. The Standards shall align with ISO 19650 and serve as the local annex.
b) Somewhat agree. The Standards shall make reference to ISO 19650 only.
c) The Standards shall NOT follow ISO 19650 at all.
The Common Data Environment (New Chapter)

Project Information / Title
- Client Details
- Originator Details
- Project Details
- Document Title
- Internal Project Number

CDE Requirements
- Unique Identifier
- Revision
- Status Code (Suitability)
- Check / Review / Approve
- Reference Files
- Purpose of Issue
- Authorisation
- Accept

REVIEW & AUTHORIZATION

<table>
<thead>
<tr>
<th>ID</th>
<th>Date</th>
<th>Review &amp; Authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN/Design Lead</td>
<td>15-06-2020</td>
<td>A - REVIEWED &amp; ACCEPTED</td>
</tr>
</tbody>
</table>

S1
- For Coordination review

P01
- Initial Draft for coordination review
  - PA0
  - 15-05-20
  - JW
  - 15-05-20
  - DF
  - 16-05-20

P02
- 05-07-20
- JW
- 05-07-20
- DF
- 07-07-20

HK Sample Project
- Floor Plans
- HK CIC BIM Standard General
Common Data Environment - CDE

The CDE concept is reflected using the simplified approach, whilst the expanded version demonstrates the workflows and complexities of true collaborative working.

Extracted from ISO 19650-1 Common data environment (CDE) concept.
## Status Codes, Authorisation & References

### Status Codes

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Suitability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>Initial status or WIP</td>
<td>Initial state of all information in the WIP to indicate it is editable and only accessible by the authoring task team</td>
</tr>
</tbody>
</table>

#### For the Common Data Environment

**‘Shared’ section**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Suitability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Shared for Coordination.</td>
<td>Available to be ‘shared’ and used by other disciplines as a background for their information. Self-checked, reviewed and approved by authoring team as coordinated against identified reference material.</td>
</tr>
<tr>
<td>S2</td>
<td>Shared for Information</td>
<td>Available to show current progress. Self-checked, reviewed and approved by authoring team</td>
</tr>
<tr>
<td>S3</td>
<td>Shared for Lead Consultant Review, Comment</td>
<td>Available for design review and requires comment from the design lead.</td>
</tr>
<tr>
<td>S4</td>
<td>Shared for Lead Consultant Review, Comment and Authorisation</td>
<td>Available to be Shared after design review, comment, and approval by Lead Consultant. This is likely to be used where revisions include versions requiring decisions on which version should be taken forward.</td>
</tr>
<tr>
<td>S5</td>
<td>Shared for Employer / Client Review, Comment and Accept</td>
<td>Available for Client Shared after design review and approval, prior to employer / client review and acceptance</td>
</tr>
<tr>
<td>S6</td>
<td>Shared for PIM Stage Authorisation</td>
<td>Identified as suitable for stage milestone delivery</td>
</tr>
</tbody>
</table>

### Standardised Authorisation Codes

**REVIEWED & AUTHORISATION**

- **A** - AUTHORIZED
- **B** - AUTHORIZED WITH COMMENTS
- **C** - DO NOT USE

**Linked / Referenced Model File ID**

<table>
<thead>
<tr>
<th>Model File ID</th>
<th>Status</th>
<th>Revision</th>
<th>Authorisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>STP17_4-ACID-XX-XX-M3-A-03_001</td>
<td>S4</td>
<td>P04</td>
<td>CA</td>
</tr>
<tr>
<td>STP17_4-BAB-XX-01-M3-S-03_001</td>
<td>S4</td>
<td>P03</td>
<td>LA</td>
</tr>
<tr>
<td>STP17_4-BAB-XX-02-M3-S-03_001</td>
<td>S4</td>
<td>P03</td>
<td>LB</td>
</tr>
<tr>
<td>STP17_4-FCM-Z1-XX-M3-M-03_001</td>
<td>S4</td>
<td>P02</td>
<td>LA</td>
</tr>
<tr>
<td>STP17_4-FCM-Z2-XX-M3-M-03_001</td>
<td>S4</td>
<td>P02</td>
<td>LB</td>
</tr>
</tbody>
</table>

**Linked / Reference files**

- **CHECK, REVIEW, APPROVE**
- **Task Team Manager, Task Information Management if separate role**

**Date**

- CCYY/MM/DD

---

### Linked / Reference files

- STP17_4-ACID-XX-XX-M3-A-03_001
- STP17_4-BAB-XX-01-M3-S-03_001
- STP17_4-BAB-XX-02-M3-S-03_001
- STP17_4-FCM-Z1-XX-M3-M-03_001
- STP17_4-FCM-Z2-XX-M3-M-03_001

**Status Codes**

- A - AUTHORIZED
- B - AUTHORIZED WITH COMMENTS
- C - DO NOT USE
**Cyber Security**

**Security Triage process**

- **A**
  - Is the project in whole or part considered sensitive?

- **B**
  - Will access be gained to information about an organisation, its assets, products, or services that are not publicly available?

- **C**
  - Is the information considered sensitive

---

**ST1**
- Security Triage: information regarding initiative, project, asset, product or service as well as third-party sensitive information by applying action list

**ST2**
- Security Triage: protect sensitive information regarding initiative, project, asset, product or service by applying action list

**ST3**
- Security Triage: protect third-party sensitive information by applying action list. Protect any sensitive commercial and personal information

**ST4**
- Security Triage: protect any sensitive commercial and personal information
Polling Question

Question 6: Based on your understanding of Common Data Environment (CDE) and as presented, do you prefer 1 CDE or different CDE across the Project Life-cycle?

Options:

a) Client should specify one CDE throughout the Project Life Cycle
b) Different CDE at different stages maintained by different parties
Information Management Workflow across Project life-cycle

- Organisational Information Requirements (OIR)
- Asset Information Requirements (AIR)
- Exchange Information Requirements (EIR)
- Project Information Requirements (PIR)
Information Management Workflow across Project life-cycle

- Statutory Submission
- Cost Estimation
- BIM Audit
Information Management Workflow across Project life-cycle

- QTO, Cost Estimation
- DOC – Documentation
- Tendering Process
Information Management Workflow across Project life-cycle

- Construction BIM workflow
- Issue of Architect/Engineer/Site Instructions
- 5D Construction procurement
- Cost estimation, payment
- Construction Quality Management System CQMS
As-Built BIM Deliverables
Sequential 3D animations (if applicable)

As-Built Information Model
Asset Information List (Finalized)
O&M Document, As-built drawings, photo records

HANDOVER
As-built BIM Deliverables
Sequential 3D animations (if applicable)

As-Built Information Model
Asset Information List (Template)
O&M Document, As-built drawings, photo records

CONSTRUCTION
As-Built Information Management Workflow (Asset Information List Template)
Authoring of Construction Project Information Model (CPIM)
As-built BIM Deliverables
Assign Asset Code (Element ID)

CONSTRUCTION
As-Built Information Management Workflow (C0Bi6)
Authoring of Construction Project Information Model (CPIM)
As-built BIM Deliverables
Input hyperlink & essential non-graphical info LDD - 1
Verify graphical / Spatial info LDD - 1 Field Verification
Verify non-graphical info LDD - 1

OPERATION
Maintained by Facility Manager
eAAM operation Asset Information Model
DC (Connected by hyperlink)

OPERATION
Maintained by Facility Manager
eAAM operation Asset Information Model
DC (Connected by hyperlink)
Information Management Workflow across Project life-cycle
Polling Question

Question 7-12: Do you think the Workflow diagrams as presented are in the right level of information and details?
- Planning - Design - Tender - Construction - As-built - Operation

Options:
a) Looks all fine.
b) About Right. Some minor adjustment may be needed
c) Too complicated. The Diagrams should be more generic.
d) Too simplified. Doesn't help with the understanding of BIM
5.6.2 Cost Estimation/ 5D Modelling

Quantity Take-Off refers to the process of identifying elements of construction works that can be measured and priced. The QS/cost manager shall audit and plan for the QTO approaches for which elements to be taken off manually or directly from the model. The QS/cost manager shall save the model for QTO independently.
Polling Question

Question 13 : Do you agree to have Cost Estimation/ 5D Modelling section in this enhancement?

Options:

a) Agree
b) Disagree
MiC / DfMA

- Adoption of MiC/ DfMA shall be considered at the early design stage.
- In order to prevent the issues encountered in prefabrication and construction, the suppliers shall also be engaged at the early design stage.
- Design models shall be carried out to Construction stage.
## BIM Audit

<table>
<thead>
<tr>
<th>Checks</th>
<th>Definitions</th>
<th>Responsibility</th>
<th>Methodology</th>
<th>Frequency</th>
<th>Table 21 Level of BIM Audit Checks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Visual check (LOD-G)</strong></td>
<td>Ensure there are no unintended model components and the design intent has been followed; Observe unreasonable modelling errors. Geometry satisfied LOD-G level at corresponding phase.</td>
<td>Own Discipline BIM Coordinator</td>
<td>Walk Through Meetings among stakeholders using Authoring, Viewing or Collaboration platform, CDE</td>
<td>Weekly or before Information exchange and end of each work stage</td>
<td></td>
</tr>
<tr>
<td><strong>2 Interference check, Clash detection</strong></td>
<td>Detect problems in the model where two building components are clashing including soft and hard</td>
<td>Own Discipline BIM Coordinator</td>
<td>Clash Detection Software or Collaboration Platform, CDE BIM Co-ordination Meeting</td>
<td>Weekly or before Information exchange and end of each work stage</td>
<td></td>
</tr>
<tr>
<td><strong>3 Standards check</strong></td>
<td>Ensure that the Project BIM standards and BEP have been followed (e.g. fonts, dimensions, line styles, levels, file naming and room numbering.) Object Standards Object Naming, Classification, Consist of 3D Geometry, Property/ Parameters, 2D Symbol, Tag Label/ Annotation</td>
<td>Own Discipline BIM Coordinator</td>
<td>Review Standards; automated plug in tools</td>
<td>Weekly or before Information exchange and end of each work stage</td>
<td></td>
</tr>
<tr>
<td><strong>4 Model data Integrity check (LOD-I)</strong></td>
<td>Process used to ensure that the project data set has no undefined, incorrectly defined or duplicated elements and satisfied the required LOD-G level at corresponding phase. Reporting process on non-compliant elements and corrective action plans.</td>
<td>Own Discipline BIM Coordinator</td>
<td>Scheduling out from BIM model for each category with metadata. Use of data analytic tools to compare with controlling Standards and Information requirements. Use of customized Automated plugins.</td>
<td>Weekly or before Information exchange and end of each work stage.</td>
<td></td>
</tr>
<tr>
<td><strong>5 Document Deliverable Check (DOC)</strong></td>
<td>Ensure documentations are generated from the Single Source of Truth BIM model.</td>
<td>Own Discipline BIM Manager. Different Domain Knowledge required.</td>
<td>Verify published documentation such as drawings and reports with Information directly generated from BIM Model</td>
<td>Before each publication to document submission.</td>
<td></td>
</tr>
<tr>
<td><strong>6 Model Audit</strong></td>
<td>Spot check above 4 checking carried by Discipline BIM Co-Ordinator. Cross Disciplines BIM Manager and or BIM Auditor</td>
<td>Same methods stated above</td>
<td>Suggested Bi-weekly and follow BIM Progress</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Polling Question

Question 14: Do you agree a section in about BIM Audit is necessary in the CIC BIM Standards (General)?

Options:

a) Agree
b) Disagree
Polling Question

Question 15: Do you agree that the BIM auditing role as mentioned should be carried out by a 3rd-party independent checker / BIM Auditor?

Options:

a) Agree
b) Disagree
Level of Information Need - LOIN

Purpose (Use) -> Level of Information Need

Delivery Milestone

Actor

Level of Information Need:
- LOD-G -> Geometry
- LOD-I -> Information
- DOC -> Documentation

Low level of detail:
- Detail
- Dimensionality
- Location
- Appearance
- Behavior

Medium level of detail:
- Identification

High level of detail:
- Content
- Format
- Document ID
- Documentation ID
Due to the grey area and contradictory to the local practice and deliverables, LOD-350 is proposed to remove from the LOD level.
Polling Question

Question 16 : Do you agree the removal of LOD-G Level 350?

Options:

a) Agree
b) Disagree
LEVEL OF INFORMATION NEED - LOIN

LOD – Graphical (LOD-G)

6.2.1 Level of Graphical (LOD-G)

Graphical representation can mean many things with a model and there is a requirement to subdivide graphical as there can be different needs for modelling (3D), drawing (2D), and visualisation.

Geometry for drawings are often dependent upon symbology which sometimes vary depending on the representative scale. The generic levels of graphical representation are identified as:

LOD-G notations are comprised of numbers from LOD-G 100 to LOD-G 400 and are defined as follows:

<table>
<thead>
<tr>
<th>LOD-G</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>The Model Element is graphically represented within the Model by a symbol or generic representation or rough 3D shape.</td>
</tr>
<tr>
<td>200</td>
<td>The Model Element is graphically represented within the Model as a generic system, object, or assembly with approximate quantities, assumed size, shape, location, and orientation. The assumed required spaces for access and maintenance shall be indicated.</td>
</tr>
<tr>
<td>300</td>
<td>The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of quantity, size, shape, location, and orientation. The model shall include details of the required spaces for handling, installation, operation and maintenance needs and the interface details for checking and coordination with other models / objects.</td>
</tr>
<tr>
<td>400</td>
<td>The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of size, shape, location, quantity, and orientation with detailing for fabrication, assembly, and installation.</td>
</tr>
<tr>
<td>500</td>
<td>Not used. Refer to 6.3 Field Verification for details</td>
</tr>
</tbody>
</table>

Table 23 LOD-G Definition

LOD-Information (LOD-I)

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example of Attributes</th>
<th>LOD Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Properties</td>
<td>General information of the object may include equipment identification of its category / type, name and locations, etc.</td>
<td>Category / Type, Name</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Locations</td>
<td>R</td>
</tr>
<tr>
<td>Design Properties</td>
<td>Design information varies among different types of BIM objects.</td>
<td>Material (for architectural and structural elements)</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete Grade (for structural elements)</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ironmongery Set (for doors)</td>
<td>R</td>
</tr>
<tr>
<td>Classification</td>
<td>Classification title and code to be adopted</td>
<td>Classification title</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Classification code (CAT Code)</td>
<td>R</td>
</tr>
<tr>
<td>Properties</td>
<td></td>
<td>Manufacturer’s Equipment Properties</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manufacturer Brand Name</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manufacturer Name</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Model Number of element / equipment</td>
<td>R</td>
</tr>
<tr>
<td>Condition Properties</td>
<td>Installation information including month/year, latest testing / commissioning month/year, life expectancy</td>
<td>Commission Date</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Installation Date</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Life expectancy</td>
<td>R</td>
</tr>
<tr>
<td>Specification /</td>
<td>Product specification and other external documents in the form of hyperlink</td>
<td>O &amp; M Manual</td>
<td>R</td>
</tr>
<tr>
<td>Properties</td>
<td></td>
<td>Test Report</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warranties</td>
<td>R</td>
</tr>
<tr>
<td>Verification Properties</td>
<td>The field verification method used for verifying the as-built element</td>
<td>Laser Scanning (Yes/No)</td>
<td>R</td>
</tr>
</tbody>
</table>

Table 24 LOD-I Definition
The level of information need for the kind of documentation is associated with the uses to meet the professional deliverables. Each Task team / discipline will understand their deliverable requirements against a specific use – e.g. Presentation styles such as colour, font, 2D symbols associated with certain particular drawing production, information on standard title block, etc.

The level of information needed use table should identify the discipline/role expected to respond and the detail will then reside within the Task team information delivery table. Professional domain knowledge must be applied to DOC as deliverables when Statutory and Contractual liabilities are involved.

The kind of documentation to be associated with the uses to meet the identified requirements. Each Task team will understand their deliverable requirements against a specific use. The level of information need Use table should identify the discipline/role expected to respond and the detail will then reside within that Task team information delivery table.
## Appendix D LOD Responsibility Matrix

### 2. Architectural Model

<table>
<thead>
<tr>
<th>Model Element List</th>
<th>Required</th>
<th>UOM</th>
<th>CAT Code</th>
<th>Concept, Feasibility, Planning</th>
<th>Preliminary, Scheme</th>
<th>Detailed Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AUT</td>
<td>G</td>
<td>I</td>
</tr>
<tr>
<td>Building Massing Model</td>
<td>Y/N</td>
<td>m²</td>
<td>To be updated</td>
<td>ABC</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Room space, corridor, plant &amp; equipment room</td>
<td>Y/N</td>
<td>m²</td>
<td>14-11 11 00</td>
<td>ABC</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Elevator shaft space</td>
<td>Y/N</td>
<td></td>
<td>14-11 21 14</td>
<td>ABC</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Floor, slab, ramp, roof</td>
<td>Y/N</td>
<td>m²</td>
<td>23-15 00 00</td>
<td>ABC</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Basic structural columns and walls</td>
<td>Y/N</td>
<td></td>
<td>23-13 35 11 13 11</td>
<td>ABC</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Basic structural beams and framing</td>
<td>Y/N</td>
<td></td>
<td>23-13 35 11 13 13</td>
<td>ABC</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
# LOD Matrix

## Appendix E LOD-G Specification

<table>
<thead>
<tr>
<th>LOD-G</th>
<th>Requirements</th>
<th>Sample Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>Stair shall be modelled as&lt;br&gt;Generic element&lt;br&gt;Nominal size, dimension and location of the elements</td>
<td><img src="image1.png" alt="Stair 200" /></td>
</tr>
<tr>
<td></td>
<td>Overall shape&lt;br&gt;Generic model element with simple threads and risers with approximate plan (length &amp; width) and vertical (levels, landings) dimensions.</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>Stair shall be modelled as&lt;br&gt;Specific elements&lt;br&gt;Actual size, shape, dimensions and location of the elements and elements' components&lt;br&gt;Threads, risers, ganshs are modelled&lt;br&gt;Specific object for stair shall be included</td>
<td><img src="image2.png" alt="Stair 300" /></td>
</tr>
<tr>
<td></td>
<td>Overall shape&lt;br&gt;Threads, risers, ganshs are modelled accurately to indicate stringers and nosing&lt;br&gt;Create specific objects or components for staircases or steps with special shapes or geometry when the standard default stairs in the BIM authoring tool are not sufficient</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>Stair shall be modelled as&lt;br&gt;Specific elements&lt;br&gt;Actual size, shape, dimensions and location of the elements and elements' components&lt;br&gt;Threads, risers, ganshs are modelled&lt;br&gt;Specific object for stair shall be included&lt;br&gt;Sufficient detail &amp; accuracy for fabrication</td>
<td><img src="image3.png" alt="Stair 400" /></td>
</tr>
<tr>
<td></td>
<td>Overall shape&lt;br&gt;Threads, risers, ganshs are modelled accurately to indicate stringers and nosing&lt;br&gt;Create specific objects or components for staircases or steps with special shapes or geometry when the standard default stairs in the BIM authoring tool are not sufficient&lt;br&gt;All stair elements are modelled to support fabrication and installation</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>A field verified as-built model with complete non-graphics information&lt;br&gt;Same as LOD 400</td>
<td><img src="image4.png" alt="Stair 500" /></td>
</tr>
</tbody>
</table>

**Level of Information Need - LOIN**
Polling Question

Question 17: Based on presentation materials, do you agree to keep the commonly adopted 100 - 500 definition for LOD-G and LOD-I under Level of Information Need (LOIN)?

Options:

a) Agree
b) Disagree
Classification and Coding of BIM Objects

Classification and Coding of BIM Objects facilitating consistent information delivery

Design Project Information Model

BIM Objects with element coding system (Dimclass)

Generate directly from model

Generate directly by means of Dimclass

Coded Documentations (Design Drawings)

Coded Schedules

Production of B.O. making use of coded elements for quantity take-off

Specifications with element code

Material Specifications extraction from Coded Specifications

Tabulated B.O. Document

Tender Document

Construction Information Model (CPM)

Design Drawing

Project Brief and BIM Specification

ISO

BIM Use

Contractual

Documentation / Drawings

Asset Information

Model

Normal Design / Construction Process / Task

Information Management Assignment Matrix Activity No.
OpenBIM

BIM PROJECT STARTER
- Physical 3D Model
  - IFC Builder
  - Other BIM models

\[\ldots\]

SHARED INFO
- My_BIM_PROJECT
- IFC files

BIM server center

UPDATE BIM MODEL

SPECIALIZED TOOLS
- Structures, MEP, Lighting, Energy/Acoustic simulation

RESTRICTED INFO

TECHNICAL DOCUMENTS
- Specifications
- Cost estimating
- Drawings
- Schemes diagrams
- Check reports

UPDATE SPECIALIZED MODELS
Way-Forward

- Digitalisation
- GIS - BIM Integration
- DWSS - Digital Works Supervision System
- CSDI – Common Spatial Data Infrastructure
- Digital Twin
- Shareable BIM
- Smart City
Polling Question

Question 18: A number of Focus Group for further detail discussion on the enhancement of the Standards. Are you interested in joining the Focus Group Discussion?

Options:

a) Yes, focus on Appointing Party/ Client Perspective  
b) Yes, focus on Design Stage  
c) Yes, focus on Statutory Submissions  
d) Yes, focus on Tender Stage  
e) Yes, focus on Construction Stage  
f) Yes, focus on As-built Stage  
g) Yes, focus on Operation Stage  
h) No
THANK YOU!

Contact

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  A2, 35/F, TML Tower,
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