



دائرة البلديات والنقل  
DEPARTMENT OF MUNICIPALITIES  
AND TRANSPORT  
بلدية مدينة أبوظبي  
ABU DHABI CITY MUNICIPALITY

**Department of Municipalities and Transport**

**Municipality of Abu Dhabi City**

**Municipal Infrastructure and Assets Sector**

**BUILDING INFORMATION MODELLING (BIM) DOCUMENTATION**

**Code of Practice**

**Version 1**

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**BIM Glossary of Terms:**

<b>2D</b>	Two-dimensional geometric representation (x, y)
<b>3D</b>	Three-dimensional geometric representation (x, y, z)
<b>4D</b>	The combination of three-dimensional geometric representation and time, including the construction sequencing, scheduling of resources, and quantities information, creates the fourth construction dimension.
<b>5D</b>	The analysis and estimation of the cost. Including the generation of bills of quantities and derivation of productivity rates and labour costs.
<b>Appointed party/lead appointed party</b>	The party who has signed an agreement or a contract to provide information concerning work or services with the appointing party/ The Employer. A lead appointed party shall be identified for each delivery team, such as the lead consultant and sub-consultants, the main contractor, and sub-contractors.
<b>Appointing party</b>	The provider of the information which will always be the Employer.
<b>Appointment</b>	Contract or agreement for involvement in information production concerning work or services.
<b>Asset Information Requirements (AIR)</b>	Data and information requirements of the organization in relation to the asset(s) it is responsible for.
<b>Asset Information Model (AIM)</b>	A Model developed to manage, maintain, and operate the asset(s) of which the project had comprised during the production to the Completion.
<b>Author</b>	The originator of model files, drawings, and/or documents.
<b>BIM Execution Plan (BEP)</b>	Defines the methodology to be adopted by the Project Team Member in respect of the production, sharing, and publication of the BIM Material.



<b>Building Information Modelling (BIM)</b>	An integrated collaboration process of designing, constructing, and/or operating a building or infrastructure asset using electronic object-oriented information throughout all project stages.
<b>Clash Detection / Interference Check.</b>	A process where software functionality allows for identification of spatial conflicts among BIM objects deriving from various interrelated building and infrastructure elements
<b>Collaboration Site</b>	A BIM management and collaboration platform that connects all involved parties through digital access to the Federated Model and data, as well as streamlining the BIM workflows during the entire lifecycle of a project.
<b>Common Data Environment (CDE)</b>	The single source of information used to collect, manage, and disseminate Project Information. It consists of the four states (Work-in-progress (WIP), Shared, Published, Archive) representing various stages of collaboration and three main gateways for approval and quality control QC.
<b>BIM Submissions</b>	Information on a particular format and level of detail issued to the Client at various project stages.
<b>Delivery Phase</b>	Stage of the life cycle where an asset to be developed. Such as concept phase, construction phase, and commissioning.
<b>Element Level of Development (LOD)</b>	The level of development of the information, including the structure and unstructured information.
<b>Element Level of Detail (LOD)</b>	The level of details of a model element.
<b>Employer</b>	The party is named as Employer under the Contract (Usually - Municipality).



<b>Exchange Information Requirements (EIR)</b>	A document that sets out the information to be delivered, the standards, and processes to be adopted by the Project Team Member as part of the project delivery process in relation to an appointment.
<b>Facilities Management (FM)</b>	The interdisciplinary process is devoted to the management and operation of buildings, structural objects, or infrastructure installations.
<b>Federated Model</b>	A Federated Model is a BIM model that links (does not merge), several single discipline models, into one. As opposed to an Integrated Model, Federated models do not merge the properties of individual models into a single database. They are linked as a reference. A Federated Model is primarily used for coordination, clash detection, design, and construction development.
<b>File Naming Conventions</b>	A set of rules for constructing unique and descriptive names for digital files. The rules specify the order and the length of words, phrases, or abbreviations used in the name.
<b>Information Level of Detail (LOI)</b>	The relevant level of information of a model element.
<b>Integrated Model</b>	An Integrated Model is a BIM model that aggregates several single discipline models into one. As opposed to the Federated Model, an Integrated Model merges all properties of individual models into a single database. Integrated models are deemed coordinated, clash-free, and contain all required deliverables as agreed and stated within the Project BIM Execution Plan.
<b>ISO 19650</b>	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) published by the International Standards organization ISO.



<b>Life Cycle</b>	Life of an asset from the day it is required and defined to the day it is demolished or terminated, passing through all phases of conception, detailing, construction, operation, maintenance and demolish
<b>Material Quality Manager</b>	Assure delivery of Material selection and information exchange, confirm material specification, Accept/reject materials information exchange within the common data environment.
<b>Master Information Delivery Plan (MIDP)</b>	The primary plan for when Project Information is to be prepared and by whom, as is produced by the Lead Consultant gathering all Task Information Delivery Plans (TIDP's)
<b>Master Format</b>	Master Format is a standard used for organizing specifications and other written information to assist the user in organizing design/ construction specifications into distinct groups.
<b>Model Production and Delivery Table</b>	Identifies the responsibilities for the production and delivery of Models in relation to the project.
<b>Employer's LOD Matrix</b>	The matrix identifying the applicable Levels of Detail/ Information to be used on the project as is approved by the appointing party (Employer).
<b>Organizational Information Requirements (OIR)</b>	Data and information required to achieve the organization's needs, necessities, and objectives
<b>Object ID</b>	Unique identity code that every element/ object is assigned in a Building Information Model for seamless data transfer between various applications.



<b>PAS1192-2:2013</b>	Specification for information management for the capital/delivery phase of construction projects using building information modelling and published by The British Standards Institution BSI. ISO 19650 is the equivalent International Standards.
<b>Project BIM Execution Plan (BEP)</b>	The BIM execution plan prepared by the lead appointed party post Contract award. Which defines the methodology it will adopt in respect of the production, sharing, and publication of the BIM Material, and how the requirements set in Exchange Information Requirements will be implemented.
<b>Pre-appointment BIM Execution Plan (Pre-contract BEP)</b>	Prepared by the appointed party during the tender response process to demonstrate their proposed approach, capability, and competence of bidder's firm and supply chain to meet the Exchange Information Requirements.
<b>Project Information Model (PIM)</b>	PIM is the term for the information (structured and unstructured information), which is developed during the design/construction phase of the project.
<b>Project Information Requirements (PIR)</b>	Information requirement in relation to the delivery of an asset as it defines the project BIM brief and project requirements to form an essential part of the EIR.
<b>Project Team Members</b>	The consultant is entering into the Contract with the Employer.
<b>Property set</b>	A property set is the content and advancement of any BIM Material (or part thereof) carrying all the element attributes.
<b>Published state</b>	Approved and uploaded or issued into the 'Published' state of the Common Data Environment (CDE).
<b>Shared state</b>	The information which has been issued with a status code identifying the Permitted Purpose for sharing with other project team members and uploaded or issued into the "shared" state of the (CDE).



<b>Stakeholders</b>	Consultants, Main contractor, and supply chain
<b>Start Model</b>	The initial project developed model containing the project coordinates and orientation. Typically developed by the design consultant and is shared with all project-related disciplines as a model of coordination reference.
<b>Status Code</b>	The code allocated to BIM Material identifying the Permitted Purpose of the information therein and describing the suitability of its contents.
<b>Structured Information</b>	Referring to geometrical models, material schedules, project schedules and databases.
<b>Task Information Delivery Plan (TIDP)</b>	Federated lists of information deliverables by each task, including format, date, and responsibilities. TIDP is expected to be compiled by individual project task teams and project suppliers for their scope of works and to be populated into the overall Master Information Delivery Plan (MIDP).
<b>Task Information Manager</b>	Task Information Manager is responsible for directing the production of task information in compliance with the project BIM standards and methods, using agreed systems within their project team, and verification of outputs to be submitted on the SmartHub/PMWeb.
<b>Task Teams</b>	Individuals assembled to perform a specific task within a delivery team.
<b>UniFormat II</b>	UniFormat II is an elemental classification system used for building specifications, cost estimating, and cost analysis.
<b>Unstructured Information</b>	Referring to documentation, video clips, and sound recording (e.g. rendering and work simulation developed with 3D Model)



**Project Information and Contact Details**

**Document Control**

Version No	Date of the first issue	Purpose of the issue	Amendment detail
Rev 00	15 <sup>th</sup> October 2020	Issued for tender	N/A

Project name	TBC
Project Location/ Address	TBC
Project Ref. number	xxxxx
Project design start date	TBC
Design stage duration	TBC
Project construction start date	TBC
Construction stage duration	TBC
Project preliminary handing over date	TBC
Project final handing over date	TBC
Project description	It could be an additional document (Add reference)
Project Phases	TBC



**Project contact list**

Project Role – Appointing Party -

Developer xxxx

Contact:

Name:

Email:

Tel No:

Project Role – Lead appointed party – Consultant -

Company:

Contact:

Name:

Email:

Tel No:

Project Role – Lead appointed party – Contractor -

Company:

Contact:

Name:

Email:

Tel No:

## 1. Introduction

This document is to form the BIM Code Of practice. The development of the Code shall start either with the assessment of an existing asset leading to the development of the ADM need, or directly with the ADM need if there is no current asset or asset information model is to be considered. The Appointing party (Developer) should include the requirements of this Code within the project EIR for Lead Appointed Parties and shall be an integral part of the tender documents in use on the project.

The Municipal infrastructure and asset sector BIM guidelines for infrastructure are to be considered when developing a project EIR as a reference for any BIM deliverable.

The EIR is a contractual document that should be issued as part of any tender by the appointing party (Developer) for the design or construction of development projects under the Municipal Infrastructure and Assets sector's purview.

Note that the EIR should align with the BIM Specification. In the document hierarchy, BIM Specification will supersede the EIR.

### 1.1. The Code of Practice Definition

The Code of Practice sets the requirements of the BIM Specification, which will form part of the prerequisites for Design or Construction Permits for Infrastructure Projects submissions and confirm the requirements for the as-built submission for handover to Asset Management.

This document will detail the BIM needs of the Sector and the mandatory requirement for all infrastructure projects where ADM will be the facility manager upon completion.

The lead appointed party to read the ADM guidelines for infrastructure carefully in conjunction with this Code of Practice and the project EIR (Exchange Information Requirement).

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To define the Code of Practice, we should define the following referring to **(ISO 19650-1)** :

### **OIR (Organizational Information Requirements)**

The OIR explains the information needed to answer or inform high-level strategic objectives within ( Municipality – Employer). These requirements can arise for a variety of reasons, including:

- strategic business operation
- strategic asset management

and that is reflected in the Strategic BIM Uses in sections 2.1 to 2.5.

### **AIR (Asset Information Requirements)**

The AIR sets out managerial, commercial, and technical aspects of producing asset information. The managerial and commercial aspects should include the information standard and the production methods and procedures implemented by the delivery team. The technical aspects of the AIR specify those detailed pieces of information needed to answer the asset-related OIR.

### **PIR (Project Information Requirements)**

The PIR explains the information needed to answer or inform high-level strategic objectives within the appointing party (i.e., Employer) concerning a particular built asset project. Project Information Requirements are identified from both the project management process and the asset management process.

### **PIM (Project Information Model)**

The PIM supports the delivery of the project and contributes to the Asset Information Model (AIM) to support asset management activities. The PIM should also be stored to provide a long-term archive of the project and for auditing purposes.

### **AIM (Asset Information Model)**

The AIM is the final result of the collaborative production of information throughout the project life cycle. This model supports the strategic and day-to-day asset management processes established by (Municipality –

Employer). The model to be used by the asset management team for operation and maintenance as it will carry the project asset information through the predefined assets list of attributes.

The Code of Practice shall be considered for use to support information provided for further Project Team Members appointments. And to define the requirements for task teams' deliverables.

The main key elements to define the Code of Practice are the following three requirements: OIR (Organization Information Requirements), AIR (Asset Information Requirements), and PIR (Project Information Requirements).

Diagram 1 below is showing the relation between the three main requirements and the Code Of Practice.

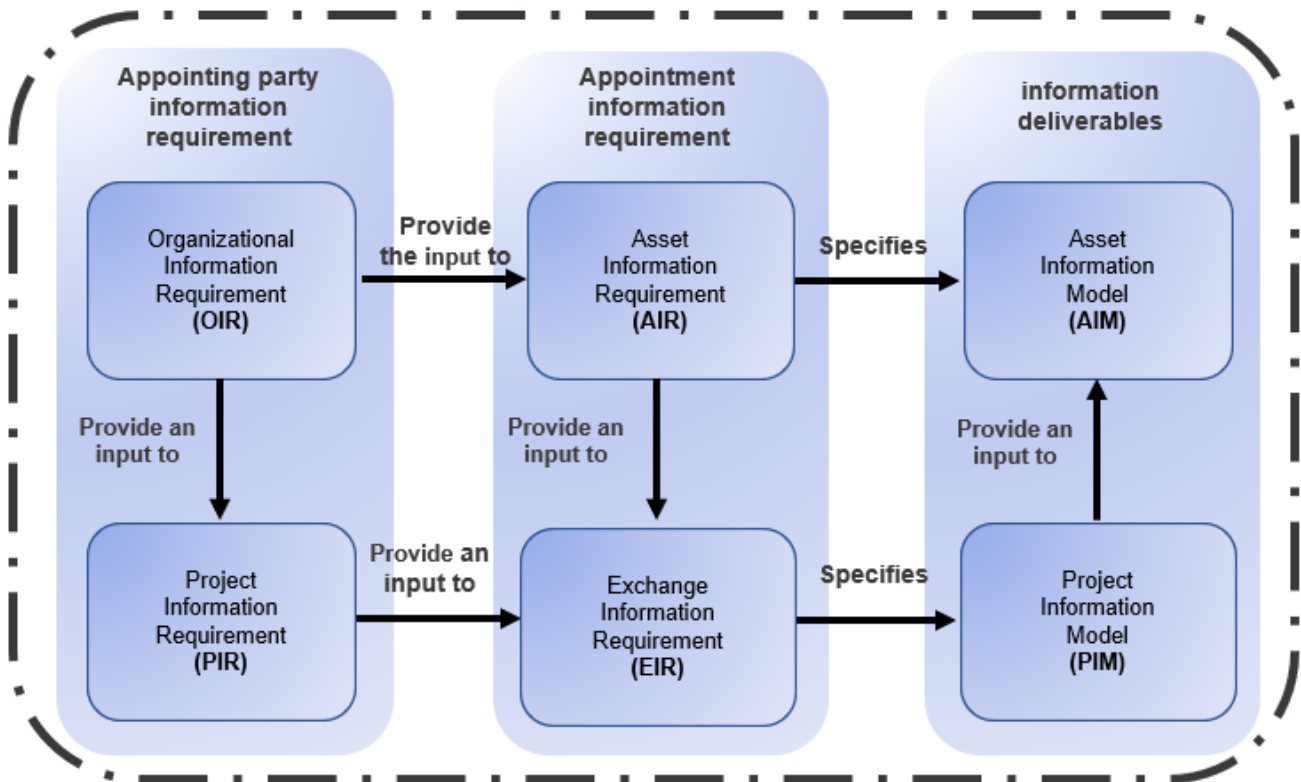


Diagram 1: Hierarchy of information requirements – Creating the Code Of Practice

The information required under the Code of Practice sections has input from these main essential requirements.

This table is showing the cross-relation between the EIR sections and the OIR, AIR, and PIR.

	Technical Requirements	Management Requirements	Commercial Management Requirements
<b>AIR</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Software Platforms</li> <li><input type="checkbox"/> Data Exchange Format</li> <li><input type="checkbox"/> Coordinates</li> <li><input type="checkbox"/> Level of Development (LOD/LOI)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Asset Delivery Strategy</li> </ul>	
<b>OIR</b>		<ul style="list-style-type: none"> <li><input type="checkbox"/> Standards</li> <li><input type="checkbox"/> Classification</li> <li><input type="checkbox"/> specification</li> <li><input type="checkbox"/> Security</li> <li><input type="checkbox"/> BIM Coordination and Clash Detection Process</li> <li><input type="checkbox"/> Quality control checks</li> <li><input type="checkbox"/> Collaboration Process</li> <li><input type="checkbox"/> Systems Performance</li> <li><input type="checkbox"/> Evidence of BIM Competency, understanding descriptions</li> </ul>	
<b>PIR</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Project Phases</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> BIM Functions-Roles and Responsibilities</li> <li><input type="checkbox"/> Planning the Work and Data Segregation</li> <li><input type="checkbox"/> Compliance Plan</li> <li><input type="checkbox"/> Project Information Model (PIM)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Data Drops and Project deliverables</li> <li><input type="checkbox"/> Project BIM Implementation Plan Requirements &amp; BIM Specific Competency Assessment</li> </ul>

All stakeholders should be aware of the flow of information management throughout the project life cycle. This will allow for a better understanding of who, when, and what to be delivered at each phase.

The information management processes to be applied throughout each appointment regardless of the project

stage (Design or Construction). The order in which activities are presented in - Diagram 2 reflects the order in which they are undertaken.

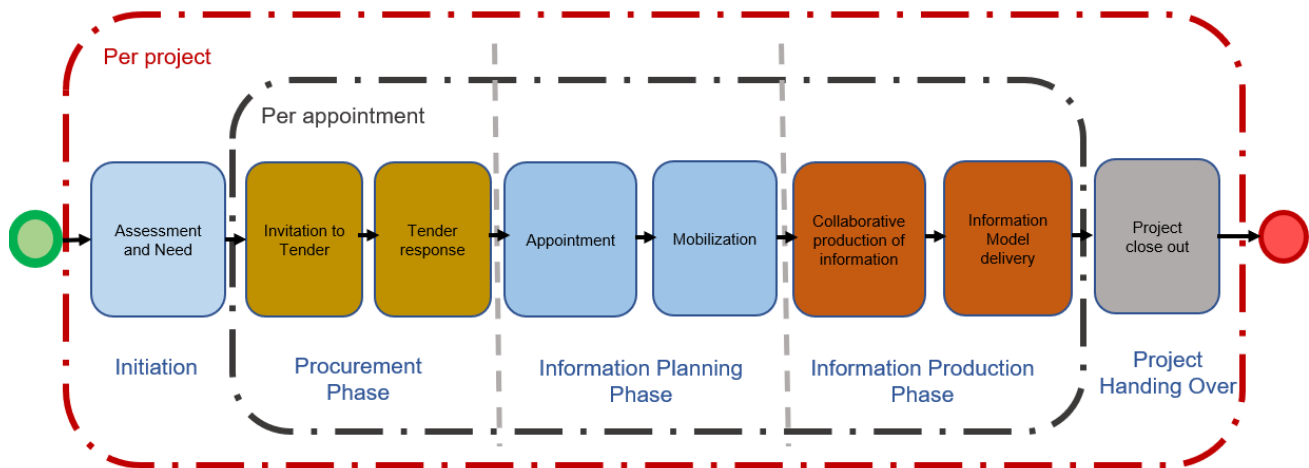


Diagram 2: Information management processes during the delivery phase of assets.

For more information, please find the ADM Documentation Guidelines for infrastructure.

## 1.2. Applied Standards

- ISO 19650-1:2018 - Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles
- ISO 19650-2:2018 - Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets
- ISO 16739-1:2018 - Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries — Part 1: Data schema
- BS 1192:2007+A2:2016 - Collaborative production of architectural, engineering, and construction information. Code of practice.
- PAS 1192-5:2015 –Specification for security-minded building information modelling, digital building environments, and smart asset management.

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All Project Team Member(s) must understand the critical purpose of applied standards, understanding the core principles of significant collaborative information production, management, and the integrated approach to design and construction.

### 1.3. Adaptation to EIR

Adaptations to EIR will be required to align with the requirements of the project, where adjustments may be necessary, are:

- BIM uses
- Project Stages: BIM Submissions and associated information requirements are to be mapped against project-specific stages.
- Information Requirements: BIM Submissions are to be aligned against the needs of the project.
- Procurement Strategy: BIM Submissions are to be aligned with the procurement strategy adopted by the project team manager.

## 2. Strategic BIM Uses

The purpose of the Project Team Member using BIM processes for infrastructure projects is to accomplish the following BIM objectives, goals, and uses.

### 2.1. Existing Conditions Modelling

#### **BIM Use Description:**

A process in which a project team develops a BIM model of existing site conditions, buildings, infrastructure, and all other associated assets. This Model shall be developed in multiple ways, including Topographic survey, 3D laser scanning, reality capture, aerial mapping, and other agreed surveying techniques.

#### **Geo-Technical Model:**

A visual Model of the geo-technical analysis report. A process in which BIM tools are used to evaluate the existing properties in a given area and to determine the most optimal design for a future project. For instance, the intent and requirement for a topographic laser scan survey can be as following:



the scanner to digitize all the 3D information concerned with a real-world object such as buildings, trees, and terrain down to millimeter detail. Adding to capture all existing ground conditions, with a high-level accuracy of utility tracing, boundary mapping, existing surface, and existing structures.

**Infrastructure:**

Roads, bridges, airfields, tunnels, transportation, and underground utilities must be developed as separate discipline models. These models should be coordinated with the most up-to-date existing site survey data and underground utilities to have all the existing condition information in BIM/3D. The intent and requirement for existing infrastructure surveying are to capture and detect the location, positioning, and identification of existing underground utilities and structures coordinated with a corresponding topographical survey. A proper survey methodology shall be adopted, and the critical nature of existing utilities are to be accurately located and recorded.

**BIM Project Goals:**

- Enhance the efficiency and accuracy of existing conditions data.
- Aid in future modelling and 3D design coordination.
- Provide an accurate representation of work that has been put into place.
- Use for visualization purposes.
- Capture accurate site conditions

**2.2. Design Authoring**

**BIM Use Description:**

3D software is used to develop the Information Model based on criteria that are important to the translation of the project asset design. Authoring tools create models, while audit and analysis tools add to the richness of information in a model. Audit and analysis tools to be used for Design review and Engineering analysis.

**BIM Project Goals:**

- Transparency of design for all stakeholders.

- Better control and quality control of design, cost, and schedule.
- Powerful design visualization.
- A true collaboration between project stakeholders and BIM users.
- Improved quality control and assurance.
- Following the Naming convention and strategy allow for better control of documentation.

### 2.3. Design technical Reviews

#### **BIM Use Description:**

All project team members view a 3D model and provide their feedback to validate multiple design aspects. These aspects include evaluating utility analysis, various engineering disciplines within typical ADM projects, and compliance with the program.

#### **BIM Project Goals:**

- Various design options and alternatives may be easily modelled and changed in real-time during design reviews, based on end-users and owner feedback.
- Enable more efficient design and design review processes.
- Evaluate the effectiveness of design in meeting the project program criteria and owner's needs.
- Align and integrate designs of the various project disciplines by avoiding clashes and ensure inter-disciplinary functioning
- Enhance the health, safety, and welfare performance of their projects
- Increase coordination and communication between different parties
- Generate better decisions for design and construction

### 2.4. Material technical review

#### **BIM - Use Description:**

Having a 3D Model following the predefined objects from the template and central library with a list of properties and attributes will allow for smooth review and approval of materials. The materials to be assigned during the production of the Model. In the design stages as well as in the construction stages.

#### **BIM Project Goals:**

- All materials will be assigned to modelled objects concerning its specification, manufacturer, all properties. Moreover, it can be checked visually in place once approved and before procurement or execution.
- To have a record and one repository for the project materials information.
- Consistent modelling with specified materials respecting sizes, buffering zones, tolerance.
- Correct in quantity and coordinated with interfaced elements in the project and in time procurement.

### **2.5. Asset management**

#### **BIM Use Description:**

BIM is utilized to effectively distribute, manage, and track related resources within a facility. A BIM model allows the asset management team and operators to have access to the wealthiest information streams. A combination of detailed data from the construction model and information from real-time sensors will continuously update the Model during operation, which optimize infrastructure asset costs and performance over the entire life cycle of assets.

#### **BIM Project Goals:**

- BIM Model linked operations, maintenance user manuals, and equipment specifications for faster access.
- Define the Asset location, condition, life extension, interventions, asset databases, systems, and performance.
- Perform and analyze facility and equipment condition assessments.

- Maintain up-to-date facility and equipment data, including but not limited to maintenance schedules, warranties, cost data, upgrades, replacements, damages/deterioration, maintenance records, manufacturer's data, and equipment functionality.
- Produce accurate quantity take-offs of current assets, which aids in financial reporting, bidding, and estimating the future cost implications of upgrades or replacements of a particular asset.
- Allow for future updates of the record model to show current building asset information after upgrades, replacements, or maintenance by tracking changes and importing new information into the Model.
- Control lifecycle activities and asset care availability, reliability, dependability, and safety.

### 3. Technical Requirements

This section establishes technical information requirements, including software platform formats, data exchange formats, and level of details.

#### 3.1. Software Platform Formats

The BIM software formats and versions used by Municipality to review, validate, and approve projects.

The lead appointed party to provide software information on all BIM Activities in the pre-appointment BEP.

Each defined scope of works will invariably include multiple delivery disciplines, trades, and areas of expertise.

As a result, various model delivery platforms may be needed to suit the disparate needs of each project team member. The platforms/versions used to produce the design and construction deliverables must be stated within the Appointed party's BEP and prove compatibility to Municipal Infrastructure and Assets Sector required Data Exchange Formats.

BIM Activity	Format	Base Version
Design Authoring	DWG – RVT	2021
Site Utilization Planning	DWG - RVT	2021
Structural Design	RVT	2021
3D coordination	NWC - NWD	2021
3D Control and Planning	DWG	2021
Existing Conditions Modelling	DWG - RVT	2021
4D Planning and Phasing	SP	2021
5D cost Estimation	ESF	2021

Table 02 - Software platforms

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### 3.2. Data Exchange Format

For each Data Drop, the information will be required in the following formats:

- **BIM Model Submission**
  - Native File Format
  - IFC (Industry Foundation Classes)
- **BIM Model Coordination & Collaboration**
  - NWC – ( Each discipline/sub-models)
  - NWD – (The Federated Model)
- **BIM Model 2D Extracted Drawings**
  - PDF
  - DWG
- **BIM 4D**
  - SP
- **BIM 5D**
  - ESF

### 3.3. Coordinates

The software coordinate system to respect the ADM GIS System and, consequently, to be geo-referenced with all other sub-federated models.

Coordinate standards to be defined in the BEP, which must include:

- Datum information
- Units to be used
- Offsets
- Origin rotation
- Shared Coordinates

### 3.4. Level of Development (LOD)

Employer's LOD Matrix specification is mandated to be used across all elements of Infrastructure projects.

Please refer to the LOD matrix documents, for the required specification and guidelines:

- Municipal Infrastructure and Assets Sector LOD Matrix.
- Modelling Element Strategy in the ADM template and central libraries.
- Modelling Asset information attributes.
- Details of individual models and other deliverables aligned to project stages and data drops must be captured within a Master Information Delivery Plan (MIDP) compiled by the lead appointed party.
- Lead appointed parties must generate models strictly following the Employer's LOD Matrix and modelling element strategy.

## 4. Information Management Requirements

This section lists the standards to be used as guidance for the delivery of Infrastructure Projects.

### 4.1. Standards

- Municipal Infrastructure standards hierarchy
  - Modelling Element Strategy Guidelines and LOD matrix.
  - BIM Documentation guidelines for infrastructure.
  - All guidance documents listed in 1.2.

### 4.2. Classification Standard

- CSI Unifomat II – Elemental Classification for Building Specifications, Cost Estimating, and Cost Analysis.

### 4.3. Security

In the case where sensitive security information is to be a part of the project, details of required security standards apply to the information being used on the project.

The federation strategy to respect the secured information and the appointing party (Employer) to decide the production of this secured information to be produced internally or to be assigned at the collaborative production phase to the lead appointed party or another appointed party.

The sensitive security information to be decided to be shared or limited to certain parties.

The Pre-appointment BEP must demonstrate the Lead appointed party's strategy for maintaining data security.

The Project BEP shall set out the Project Team Members agreed on processes and how compliance is monitored and managed.

#### **4.4. System Performance.**

The appointing party file sizes not to exceed (... 150 ... MB) and to be sub-divided if at any time the file exceeded the size.

The lead appointed parties must detail any IT system restrictions and requirements that need to be considered for the details of the project. Project Team Members agreed processes and procedures must be further detailed in the Project BEP.

The following must be addressed, but not limited to:

- Model file size
- Software uses
- Security issues

The above must be populated with appropriate requirements and constraints, indicating where any specific detail is required

#### **4.5. Project Information Model (PIM – As-Built )**

The lead appointed party shall follow the defined process for delivery management to ensure that data at each of the information exchanges is accurate and appropriate to the decisions it is responding to. The PIM is demonstrating the information growth across the project lifecycle and deliverables. Models or any other information issued to establish:

- The fidelity of the information, i.e., the attributes and data contained within the tender have been retained and presented in the PIM.

- The origin points, orientation, levels, and units have been maintained complied with the Employer's GIS system.
- The degree to which the models and files have been developed.
- The Information Exchange Method as per the Employer's protocol.

Lead appointed parties shall share the PIM in compliance with the BIM Information Requirements in native format plus an IFC version. The submission to be submitted through the SmartHub/PMWeb with proper status, Revision and phase code which will be mapped to settle on the right place on the ADM CDE shared folder. The submission should also include the QA-QC checklist.

#### **4.6. Asset Information Delivery Strategy**

Confirmation by the lead appointed party of receiving, understanding, and usage of the ADM template and central library must be recorded in the appointment phase. This approach contributes to having the information exchange complied with the AIM requirements (Asset Information Model). The GIS submission of the asset information will remain as business as usual, with no changes. Please refer to the As-Built data submission on the ADM standards and specifications (Version 1.7.3).

The current systems / databases / information formats in use for the asset management will remain with no change; however, the lead appointed party to use the template and central library to maintain the same Asset information in the AIM. This will allow the usage of the AIM in navigation between different project elements to read the same Asset information.

### **5. Commercial Management Requirements**

This section sets the information requirements, defines purposes for data and the content of key deliverables.

#### **5.1. BIM Submissions and Project Deliverables/ Milestones**

All BIM Submissions will be through (SmartHub / PMWeb) as usual. The submission will be mapped / transferred automatically to the ADM Common Data Environment (CDE) shared folder where the ADM team will review and comment. The (SmartHub / PMWeb) is to be used for collaboration or partial submissions with the defined status codes. The lead appointed party to provide proposals/ plan of submissions, according to what had been



mentioned in section 4.6 (the TIDP and the MIDP). The Master Information Delivery Plan is preferred to be in the form of a Gantt chart aligned with the project milestones, including the below information requirements:

- Schedule of project milestones / stages / phases.
- Alignment of BIM Submissions to the projects' stages.
- Key purposes of the BIM Submission.  
(Submission status code and revision code to be mentioned correctly at each submission)
- Partial submission can be accepted for a specific reason, such as obtaining other stakeholders' approval or for costing.

In addition to models, drawings, and analysis reports, the BIM Submissions may potentially also include all or some of the below project outputs. These outputs must be described in the lead appointed party MIDP.

Cost Model/Estimate/Contract Sum Analysis	Phasing Analysis
Element Project Planning Model	Temporary/Enabling Works/Logistics

### Project milestones

BIM Submission		Phase code	Submission date
M1	Conceptual Design	CD	dd/mm/yyyy
M2	Preliminary Design	PD	dd/mm/yyyy
M3	Detailed Design	DD	dd/mm/yyyy

Sample of submissions through the SmartHub/ PMWeb which will be transferred to the ADM CDE shared folder.

	BIM Submission	Phase code	Status Code	Revision Code
CDE Shared folder	For coordination only	CD	S1	P1
	For Information	DD	S2	P1
	For Internal review & comments	DD	S3	P1
	For Stage approval	DD	S4	Pn
	For PIM authorization	DD	S6	Pn
	For AIM authorization	AIM	S7	Pn
	Costing	PD	D1	Pn
	Tender	FT	D2	Pn
	Obtain utility approval	PD	D3	Pn

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## Bibliography:

- CPIx Post Contract Award Building Information Modelling (BIM) Execution Plan (BEP) Revision R1 March 2013.
- CIC BIM Protocol First Edition 2013 – Construction Industry Council
- BIM Task Group EIR Guidance – Version 7, 2013.
- 2018 Level of Development Specification - author: BIMFORUM [www.bimforum.org/lod/](http://www.bimforum.org/lod/)
- UNIFORMAT II Element Classification for Building Specifications, Cost Estimation, and Cost Analysis - author: Robert P. Charette, Harold E. Marshall. US Department of Commerce NIST
- ISO 19650-1:2018 - Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles
- ISO 19650-2:2018 - Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets
- ISO 16739-1:2018 - Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries — Part 1: Data schema
- BS 1192:2007+A2:2016 - Collaborative production of architectural, engineering, and construction information. Code of practice.
- PAS 1192-2:2013 Specification for information management for the capital/delivery phase of construction projects using building information – author: BIM Task Group <http://www.bimtaskgroup.org/>
- PAS 1192-5:2015 –Specification for security-minded building information modelling, digital building environments, and smart asset management.