[INSTRUCTION: Amend as required; delete all Blue Text prior to release]

DASH Projects BIM Requirements

[Project Name]

1. REFERENCE TABLES AND LISTS

1.1 LIST OF TABLES

1.2 TABLE OF CONTENTS

2. PREAMBLE

The DASH initiative is a comprehensive process designed to expedite project delivery of mid-rise buildings by 30-50%. It leverages flexible, data-rich digital models optimized for prefabrication and integrates automated site analysis, compliance, and construction processes. Building Information Modeling (BIM) plays a crucial role as the backbone of DASH, serving as a database that digitally represents the building to enable efficient data processing. BIM requirements are essential to support DASH workflows, ensuring that all data from design to manufacturing is accurate and interconnected. While primarily developed for DASH projects, these BIM requirements can be applied to non-DASH initiatives, providing broad industry value and standardization in digital construction processes.

3. REFERENCE DOCUMENTS AND STANDARDS

3.1 PROJECT-SPECIFIC REFERENCES

3.1.1 BIM REQUIREMENTS AND OTHER BIM REFERENCES

The purpose of the BIM Requirements document is to provide clear and precise requirements for [Developer Name] BIM projects.

Table 1 - References for BIM Requirements

PRECEDENCE	DOCUMENT	DESCRIPTION
1	Contract and technical specifications from Design phase, preliminary plans and specifications	General clauses, properties, risk and reliability, list of deliverables for the Design phase, preliminary plans and specifications
1	Contracts, plans and technical specifications by lot for construction work	General clauses, properties, risk and reliability, list of deliverables for construction work
2	**BIM Requirements**	Organization and general requirements of a BIM project
2	**BIM Requirements - Appendix: Information requirements**	Specific requirements for project information creation and management
3	**BIM Execution Plan (BEP)**	Methods and resources put in place to meet the requirements of [Developer Name]. Produced by the Prime Consultant.

Documents in bold are the BIM Protocol for the project.

4. OBJECTIVES OF THIS DOCUMENT

This document constitutes the BIM Requirements for the [Project Name] project and is an integral part of the project's requirements. It defines:

- The contractual BIM Requirements of [Developer Name] for this project.
- The BIM uses to be implemented on the project.
- The scope and information requirements to include in the Models required for the project.
- BIM-related roles and responsibilities for stakeholders involved in the project.

5. PROJECT OVERVIEW

5.1 CONTEXT

[Add Project Description and Details]

5.2 BIM OBJECTIVES FOR THE PROJECT

- Achieve a high-level of design resolution and coordination to minimize uncertainty in construction. This objective requires well-coordinated three-dimensional models and corresponding two-dimensional Construction Documents.
- Achieve an efficient and straightforward BIM workflow that doesn't require intensive management on the part of [Developer Name] or the Design Team.
- Support the Optimized Design Process in the context of the Level-Up Challenge pilot projects

5.3 TIMELINE AND MILESTONES

All the key milestones defined for the project are explained below. At each milestone, deliverables are expected, for control and monitoring purposes by [Developer Name].

Table 2 - Phases and milestones

PHASE	SUBPHASE	COMMENTS
[Relevant Phase]	[Relevant Subphase]	
	[Relevant Subphase]	
[Relevant Phase]	[Relevant Subphase]	
	[Relevant Subphase]	
[Relevant Phase]	[Relevant Subphase]	
	[Relevant Subphase]	

6. TEAM ORGANIZATION

6.1 ROLES AND RESPONSIBILITIES

6.1.1 SCOPE OF RESPONSIBILITY

The Prime Consultants shall identify a Lead BIM Manager who will be the interface of [Developer Name] for all matters relating to BIM. General responsibilities are described in the technical specifications. All activities related to the responsibilities described below must be carried out in compliance with the requirements defined in the BIM Protocol.

6.1.2 LEAD BIM MANAGER – PRIME CONSULTANT

Table 3 - Lead BIM Manager Responsibilities

CATEGORY	RESPONSIBILITIES
Management	Coach BIM Managers in BIM planning and implementation for the current phase
	Assist BIM Managers in defining their model quality assurance plan throughout the current phase.
	Assist BIM Managers in defining their procedure for checking conformity between the reality built on site and the construction models as work progresses.
	Structuring and coordinating the design BIM processes and usages required for the smooth running of the project
Scheduling	Coordinate the delivery of BIM models and deliverables for each sub-consultant
	Establish, in collaboration with project managers and BIM managers, the schedule for modeling, coordination and design reviews
BIM Protocol	Create and manage the design BIM Execution Plan (BEP) in collaboration with the BIM Managers of each sub-consultant
BIM meetings	Pilot the visualization of the Models at each meeting with [Developer Name]
	Organize and lead BIM management meetings useful for coordinating the process within the design team and take minutes to ensure follow-up
Modeling	Create and update the Master File for the project
	Implement georeferencing on the project, determining the best approach according to the type of project ensuring that all disciplines always share the same coordinates
	Coordinate the placement of premises (including rooms and spaces) between discipline BIM Managers
	Define an intervention sequence with the discipline BIM Managers for space coding for MEP sub-consultants
Coordination	Produce coordination reports at the close of an interdisciplinary 3D coordination cycle by: • Visual inspections. • Automated clash detection.

Quality	Create and manage the quality assurance plan and integrate it into the BIM Execution Plan (BEP)
	Ensure that information requirements are met by sub-consultants
	Ensure that [Developer Name] standards are followed on the project
	Carry out the required quality controls before handing over BIM deliverables
Common Data Environment (CDE)	Set up a collaborative platform for the project, to be approved by [Developer Name]
	For each tool implemented on the project, ensure the maintenance of a documentation structure in line with the standards of the project and communicate this through the BIM Execution Plan (BEP).
	Ensure the relevant participation and use of the CDE by the sub-consultants. This includes: • Organize training sessions as needed, depending on the tools in place • Continuous monitoring and updating of platform information • Monitoring and updating the list of users of these platforms

6.1.3 BIM MANAGERS (SUB-CONSULTANTS)

Table 4 - Responsibilities of the BIM Discipline Manager

CATEGORY	RESPONSIBILITIES
Management	Manages the BIM team of a particular sub-consultant for the project
BIM Protocol	Write and maintain the part of the BIM Execution Plan (BEP) related to the relevant discipline
Collaboration	Ensures models sharing at the defined frequency
	Act as the interface for the relevant discipline with BIM Managers and modelers from other disciplines
Modeling	Control the creation of new models for the discipline
	Identifies the need for shared interdisciplinary parameters
	Manages the creation of BIM content related to its responsibilities
	Ensures that all of [Developer Name] requirements defined in the Appendix - Information requirements are met
Documentation / 2D drawings	Extract all relevant 2D deliverables from design Models
Coordination	Ensures 3D intradisciplinary coordination for your discipline before sharing information with other disciplines and specialties.
	Establish, in conjunction with the Lead BIM Manager, the schedule for coordination reviews
Quality	Ensures intradisciplinary quality control before submission to the project team
	Ensures that the team's models comply with modeling requirements, and that the required information is modeled at the right time.
	Validate with a conformity check that their concept is respected in the construction Models. The required conformity check includes a visual inspection of the superimposition of the Design Models and the Construction Models.
Common Data Environment (CDE)	Ensure that models are classified as required on the CDE
	Ensure the active participation of your team on the CDE used on the project

7. BIM USES

Table 5 - BIM uses

USES	SPECIFIC REQUIREMENTS	RESPONSIBLE
Design Modeling	A process in which 3D modeling software are used to develop information-rich models based on design criteria.	All
Design Coordination	Visual inspections and automated interference detection are necessary to meet quality requirements on the project. Any coordination issues raised must be analyzed, sorted and tracked throughout the project, while documenting the steps taken to resolve them.	All
Production of 2D deliverables extracted from Models	Documentation must be extracted from the models after interdisciplinary coordination (no alterations via another CAD software) and must complement and enhance the modeling, without contradicting or diverging from it.	All

7.1 MODELING

7.1.1 MODELING REQUIREMENT BY DISCIPLINE

The following disciplines are expected to model according to the requirements laid out in Appendix – Information Requirements.

- Architecture
- Structure
- Ventilation, heating, air conditioning
- Plumbing
- Electrical
- Lighting
- Fire Protection
- Communications
- Security

The following disciplines are not expected to model:

- Civil
- Landscape
- Vertical Transportation

7.1.2 MODEL BREAKDOWN

The division of the project into individual models proposed by the parties involved must be specified in the BIM Execution Plan (BEP) and approved by [Developer Name]. BIM Managers are responsible for ensuring that the breakdown complies with the requirements and standards of [Developer Name] requirements and standards defined in the BIM Requirements (e.g. maximum file size, location limits, etc.).

7.1.3 MASTER FILE

This Model is created by the Lead BIM Manager and is specific to the project. It serves as the main source for all the elements useful for positioning and identifying the limits of the project, namely:

- Shared coordinate system (site) and georeferencing
- Reference axes (grids) for the location
- The "NS" (North-South) and "EO" (East-West) orientation axes intersecting the geodetic marker selected as reference for the project
- Levels for the location concerned (all disciplines and/or specialties combined)
- Property limits for the location

7.1.4 GEOREFERENCING

All models must be georeferenced in accordance with the following principles:

- The Canadian NAD83 system must be used
- The Master File should be used as a reference source

Stakeholders involved in the implementation of georeferencing must ensure that the following conditions are met at all times on the project:

- Apart from the inherent project issues, the method used must allow for a global relocation of the project or a change of coordinate system.
- The method used must enable all stakeholders to produce models that are correctly geolocated and aligned with each other, particularly when they are federated or viewed on the platforms set up for the project.

7.1.5 ELEMENTS BREAKDOWN

Elements must be specifically modeled in such a way that they are easily transmitted to other platforms through open BIM formats:

- Walls and structural elements must be split by level
- Walls must be identified by their functional use: Interior, Exterior, Core Circulation, Foundation, Etc.

7.2 DESIGN COORDINATION

Each BIM Manager is responsible for ensuring the coordination of their Design Models.

In addition to continuous visual detection of coordination problems based on Models, automated clash detection between various design will be planned and carried out as the project progresses. To ensure the relevance and effectiveness of these checks, the Models used must first have been validated by each BIM Manager. Here is a summary list of the verifications required:

- The file format complies with project standards
- The level of information need and geometry complies with Appendix 1 of the BIM Requirements
- Models are up to date and contain local modifications made by all users
- The model is correctly georeferenced

7.3 PRODUCTION OF 2D DELIVERABLES EXTRACTED FROM MODELS

Tender and construction drawings must be extracted from the coordinated design models. The specific annotations indicated on these plans must be generated directly from the alphanumeric information attached to the model elements.

8. BIM DELIVERABLES

BIM DELIVERABLES	RESPONSIBLE	FORMAT	NOTES
BIM execution plan	Lead BIM Manager	.pdf	Each design team member will contribute to the BEP by providing their model structure
Master File	Prime Consultant	Native and .ifc (4.X+)	Provided by the Lead BIM Manager
Design Models	Consultants	Native and .ifc (4.X+)	See the modeling requirements (Appendix 1 of the BIM Requirements) to ensure that models contain all the required information. DWG format accepted for civil plans
Issue publication and follow-up	Consultants	Issues on the CDE	By the Consultant during 3D coordination periods during the design phase.
2D Deliverables	Consultants	.pdf	2D deliverables extracted directly from design Models. CAD (dwg) drawings, mainly for architecture, can be requested at 100% preliminary and final stages, by exporting from native authoring software using the default graphics standards.

9. BIM MANAGEMENT PROCESS

9.1 COLLABORATION PROCESS

9.1.1 COMMON DATA ENVIRONMENT (CDE)

9.1.1.1 OBJECTIVES

[Developer Name] mandates the deployment of a project-specific Common Data Environment (CDE) to meet the following objectives:

- Facilitate information exchange and access between stakeholders
- Facilitate project coordination
- Avoid duplication, decentralization of project information and parallel directories
- Standardize project document management

The proposed solution will be selected by the Prime Consultant, to be approved by [Developer Name] following these guidelines:

- The necessary licenses must be provided by each stakeholders requesting access.
- All procedures specific to the use of these platforms by stakeholders external to [Developer Name] must be presented in the BIM Execution Plan (BEP).
- The folder tree must follow standards established by [Developer Name].

9.1.1.2 SUBMISSION MANAGEMENT

Models, plans and specifications (Submissions) must be uploaded in accordance with the principles set out below:

States of files uploaded to the platform:

- "SHARED": This state refers to regular Submissions of Models on the CDE for interdisciplinary collaboration purposes.
- "PUBLISHED": This state refers to the submission of deliverables for official handover of Models on the CDE for evaluation, use and archiving by [Developer Name].

Note: For each Submission on the document management platform, a Submission is also expected on the collaborative platform.

9.1.1.2.1 SHARED STATE

Models must be filed in the "SHARED" folder of the relevant discipline.

Sharing Frequency:

- By each Consultant,
    - In the design phase, preliminary plans and specifications, on a weekly ***basis****.
    - During the construction phase, on a weekly ***basis**** until the last lot has been issued by all the stakeholders involved (Consultant and Contractors-Lot) and on an ad hoc basis for each Change Directive or Change Order or other modifications issued that have an impact on the modeling after the last lot has been issued.

* The day of the week scheduled for these Submissions must be specified in the BIM Execution Plan (BEP). In the specific case where no changes have been made since the previous version was submitted, the new submission may be delayed, provided that [Developer Name]. At any time during the project, a model exchange cycle may not exceed 30 days.

Revision management:
These SHARED Submissions must be made using the revision management functions of the platforms in place, without modifying the file names, in order to facilitate access to the Models and tracking of the Submissions.

9.1.1.2.2 PUBLISHED STATE

Deliverables must be submitted in the sub-folder dedicated to the project milestone (e.g. "Schematic Design"), included in the "DELIVERABLES" folder for the discipline concerned.

Frequency of Submissions:

Models, plans and specifications for "DELIVERABLES" must be submitted in a unique manner according to the key milestones identified for the project.

9.1.1.3 ACCESS MANAGEMENT AND GOVERNANCE

Platform access rights are managed by the Prime Consultant. Any request for access to the platforms making up the CDE must be made by e-mail to the person in charge indicated by the parties involved in the BIM Execution Plan (BEP).

9.1.2 BIM MEETINGS

All BIM meetings must be conducted using the Reference Models for the current phase.

9.1.2.1 KICK-OFF

Objective: define common collaboration principles, the technological ecosystem, the BIM Requirements guidelines and to clarify the teams' vision at the start of the design phase. At this meeting, [Developer Name] will outline its vision, objectives and requirements for the BIM approach to the project.

Table 6 - BIM design kick-off meeting

Manager	Lead BIM Manager
Participants	• Representatives of [Developer Name] • BIM managers • Design project managers
Frequency	Unique

9.1.2.2 BIM MANAGEMENT

Objective: provide a framework for the BIM process, and to communicate and address any problems encountered during the execution of the processes defined in the BIM Protocol.

Table 7 - BIM management meeting

Manager	Lead BIM Manager
Participants	• Representatives of [Developer Name] • BIM Managers • Design project managers as needed
Frequency	As needed every 4 weeks

9.1.2.3 VALIDATION OF DESIGN COORDINATION

Objective: support interdisciplinary coordination during the design phase. The Lead BIM Manager presents current construction issues, so that the consultants can identify possible solutions and assign resolution responsibilities. The Prime Consultant retains responsibility for coordinating the work with the number of coordination workshops they deem appropriate.

Note: Coordination activity is based on Design Models and is recorded in the collaborative platform.

Table 8 - Design phase coordination validation meeting, preliminary plans and specifications

Manager	Lead BIM Manager
Participants	• Representatives of [Developer Name] • BIM discipline managers • Design project managers
Frequency	At the coordination milestone during the preliminary plans and specifications design phase

9.2 DESIGN CHANGE MANAGEMENT

During the construction phase, each Change Order issued must be represented and managed using the Design Models.

10. QUALITY ASSURANCE AND CONTROL

10.1 QUALITY ASSURANCE PLAN

The Lead BIM Manager is responsible for establishing a quality assurance plan to be detailed in the BIM Execution Plan (BEP) in collaboration with the discipline BIM Managers, who must themselves adhere to it and ensure that it is implemented and followed within their respective teams. The respective BIM Managers of each discipline must also establish a quality assurance procedure to validate that the processes for creating and updating information in their discipline adequately meet the requirements and standards defined by [Developer Name]. Each project member is responsible for carrying out quality assurance for the dataset and models before submitting their deliverables.

This quality assurance plan must include, but is not limited to, the following points:

- Modeling guidelines: Ensure that each model is created based on the modeling requirements and standards of [Developer Name].
- Information validation: Ensure that the geometric and alphanumeric information required by [Developer Name] during the various project milestone deliveries complies with BIM Requirements and is properly presented.
- Status of communications and collaboration: Ensure prompt resolution of issues and conflicts in the collaborative platform (communications must be validated by the Lead BIM Manager on an ongoing basis on the project). In addition, collaboration processes (repository management, frequency of Model exchange, timely information updates, etc.) must be periodically audited to ensure efficiency and prevent potential problems. Changes between two versions of the same file must be communicated to the project team.
- Quality control: The Lead BIM Manager must carry out audits of the models, including their state of health, on an ongoing basis and just before the deliverables are handed over.
- Interference checking: In addition to continuous visual detection of coordination problems based on Models, automated detection of collisions between various Design Models must be planned by the Lead BIM Manager in collaboration with their respective Project Managers and carried out as the project progresses. To ensure the relevance and effectiveness of these checks, the Models used must have been validated in advance by the Consultants' BIM Managers.
- Project and model shall be designed with a prefabrication first design approach, ensuring the building can be produced with off-site methods without requiring extensive design changes.

Note: The list of quality control points defined in the Appendix - Information requirements can serve as a reference and starting point for stakeholders to identify potential quality issues and set up their quality assurance plan.

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Appendix: Information Requirements

1. REFERENCE TABLES AND LISTS

1.1 LIST OF TABLES

2. TABLE DES MATIÈRES

3. OBJECTIVES OF THIS DOCUMENT

This document supplements BIM Requirements relating to the information to be delivered for the project [Project Name] and is an integral part of the project requirements. It defines the geometric, alphanumeric and documentation-related information production and management requirements specific to [Developer Name]. They can be adjusted to fit additional BIM Uses depending on the specific project needs.

4. GEOMETRIC INFORMATION

The objective of [Developer Name] is to obtain models with a sufficient level of modeling to support the coordination effort between disciplines.

Geometric information is characterized by all the information relating to the representation of the actual geometry of elements in a 2D or 3D context.

4.1 GENERAL REQUIREMENTS

As a general guideline, any element that could have an influence on interdisciplinary coordination must be modeled. Modelling activities must be focused on the positioning and dimensioning of elements and should:

- Avoid redundancies between disciplines or specialties (e.g. sanitary equipment, equipment modeled on several floors as duplicates rather than as a single element, etc.);
- Avoid floating elements (e.g. electrical pipes floating under a slab);
- IFC classes shall match each component usage.
- Split elements by level, except when specified otherwise.
- Walls must be identified by their function: Exterior, Interior, Core Shaft, Foundation, etc.
- No element shall be hidden by an annotation, avoid filled background annotations.

The geometric information requirements is based upon the Level of Development specification defined by the BIM Forum and are divided by discipline.

4.2 REQUIREMENTS BY DISCIPLINE

In addition to the general requirements and for reference purposes in specifying the needs of [Developer Name] the following is a non-exhaustive list by discipline of points to consider when modeling elements in models at LOD300.

4.2.1 ARCHITECTURE

Specific requirements on the level of development of elements modeled in the discipline of architecture are specified below and remain applicable regardless of material used

- All interior fittings, including:
  - Partitions (fixed, movable, demountable, etc.)
  - Openings required for coordination with vertical and horizontal traffic areas where applicable
  - Supports and frames where these have a significant impact on coordination
  - Elements required for coordination, such as access hatches, recessed elements, etc. (without duplicating electromechanical elements)

- Partitions must be identified as exterior or interior _ This requirement facilitates the transition towards prefab configurators.
- Floors including:
  - Slopes (without duplicating with structural elements)
  - Openings required for coordination with vertical and horizontal traffic areas where applicable
- Ceilings (suspended, gypsum, etc.) including:
  - Elements required for coordination, such as access hatches, ceiling equipment (e.g. lighting fixtures), etc. (without duplicating electromechanical elements).
  - Framing, supports and frames (excluding half-timbering) where these have a significant impact on coordination (e.g. framing thicker than 10 mm).
- Doors and windows (including skylights) including:
  - Supports and frames where these have a significant impact on coordination
  - Operating clearances required for coordination
- Staircases and landings (without duplicating structural elements)
- Equipment for transport systems (vertical and horizontal circulation, such as elevators, hoists, overhead cranes, etc.), considering the following points:
  - Include operating clearance zones required for coordination of moving parts
  - Model these elements as a single element (family) per system (and not one family per floor)

- All envelope and roof elements (without duplicating structural elements), including:
  - Necessary slopes where applicable
  - Openings required for coordination with vertical and horizontal traffic areas (passage of equipment, conduits, people, etc.).
- All curtain wall elements
- All elements for coordinating sanitary equipment (without duplicating electromechanical elements)
- All fixed furniture
- All cabinetry (finishes and integrated furniture), including finishes, baseboards, shelves, lockers, etc.
- All metalwork (handrails, railings, access hatches, stairs, ladders, etc.)
- All decorative elements impacting coordination (decorative walls, nameplates, wall-mounted display cases, etc.).
- All signalling elements (without duplicating electrical elements)
- All parking spaces (without duplicating civil elements)
- All landscaping elements (vegetation, street furniture, etc.) without duplicating civil elements
- All other specific architectural elements required to meet the BIM uses defined for the project (e.g. special installations, special products, garbage chutes, cleanroom accessories, etc.).

4.2.2 STRUCTURE

Structural elements to be modeled are specified below and remain applicable irrespective of the material used (wood, concrete, steel, etc.).

Bolts and anchors do not need to be modeled unless they are in a heavily reinforced zone where coordination is at stake.

- All roof and main structural elements (slabs, columns, beams, girders, insulated and threaded footings, foundation walls, pilasters, inverts, parapets, balconies, railings, etc.), including:
  - Slopes where applicable

  - Openings with an impact on the structural integrity of the asset (shafts, stairwells, elevator shafts, service shafts, etc.) required for coordination with vertical and horizontal circulation zones (passage of equipment, conduits, people, etc.).
  - Structural reinforcements, particularly around roof or floor openings (coordinated with the position of through-members in electromechanical and architectural engineering)
  - Structural lintels
- All load-bearing structures (roof trusses, joists, beams, lintels, etc.) including, where applicable:
  - Members, bracing, etc.
  - Elements required for coordination, such as clearance zones for structural connections where applicable (particularly in the specific case of large connections that may encroach on architectural elements).
- All staircases and landings where applicable (without duplicating architectural elements)
- All slabs/cleaning bases (coordinated with the position of electromechanical and architectural equipment)
- All overhead crane and hoist structures, including their clearance zones during operation

4.2.3 VENTILATION, HEATING, AIR CONDITIONING

Elements to be modeled include:

- All systems, including:
  - Pipes and ducts (including their slope where applicable) which diameter or longest edge ≥ 25mm and all elements which diameter or longest edge < 25mm if grouped and occupying a space greater than 50 mm in diameter
  - Insulation thicknesses where applicable for ductwork
  - System-specific equipment (diffusers, exhaust returns, limit boxes, coils, motors, etc.), including positioning of connections where applicable.
  - Panels (control, distribution, etc.)
  - The connections between the systems, considering their installation (e.g. make sure there are no bends/connections in concrete walls).
  - Clearance zones for pipe connections (minimum dimensions of 1.5 to 2 times the actual outside diameter of the conduit)
  - Elements required for coordination, such as clearance zones for heating elements requiring precise coordination with structural elements (e.g. radiant slab).
- All equipment (water heaters, boilers, chillers, pumps, condensing units, hoods, etc.), including positioning of connections where applicable

4.2.4 PLUMBING AND FIRE PROTECTION

Elements to be modeled include, but are not limited to:

- All systems, including:
  - Pipes and ducts (including their slope where applicable) which diameter or longest edge ≥ 25mm and all elements which diameter or longest edge < 25mm if grouped and occupying a space greater than 50 mm in diameter
  - Insulation thicknesses where applicable for ductwork
  - System-specific accessories (valves, taps, drains, siphons, backflow preventers, tanks, detectors, vents, gutters, probes, etc.) that have a coordination impact

  - The connections between the systems, considering their installation (e.g. make sure there are no bends/connections in concrete walls).
  - Clearance zones for pipe connections (minimum dimensions of 1.5 to 2 times the actual outside diameter of the conduit)
- All equipment (fountains, sinks, showers, urinals, etc.), including positioning of connections where applicable

4.2.5 ELECTRICITY, COMMUNICATIONS, LIGHTING AND SECURITY

Elements to be modeled include, but are not limited to:

- All main and secondary electrical, communication, computer, cable and/or security distribution systems (services), including in particular:
  - Pipes and ducts (including their slope where applicable) which diameter or longest edge ≥ 25mm and all elements which diameter or longest edge < 25mm if grouped and occupying a space greater than 50 mm in diameter
  - The connections between the systems, considering their installation (e.g. make sure there are no bends/connections in concrete walls).
  - Clearance zones for conduit connections (with minimum dimensions of 1.5 to 2 times the actual outside diameter of the conduit)
  - System-specific accessories (sensors, probes, etc.) that have an impact on coordination
- All equipment (transformers, circuit breakers, displays, access controls, computer racks, cable shelves, foundations, troughs, etc.), including the positioning of connections where applicable.
- All power supply panels, including plywood for panel grouping and clearance area (for access during installation, operation and maintenance)
- All cable trays and their clearances (for installation, operation and maintenance)
- All lighting systems and their clearances (for installation, operation and maintenance)
- All electric baseboard heaters and radiators without duplicating heating elements
- All security elements (surveillance cameras, speakers, fire alarms, intruder alarms, other alarm systems, on-call systems, etc.).
- All switches, sockets (electrical, telephone, TV, computer, etc.) including their clearance zones (if applicable, particularly for emergency switches)
- All parking equipment and operation clearance zones (access control, motorized barriers, etc.).
- All electrical connections between systems
- All signage elements (emergency exits, notice boards, etc.) without duplicating architectural elements

5. ALPHANUMERIC INFORMATION

The objective of [Developer Name] is to obtain Models containing the alphanumeric information required for the project to centralize information and make the most of all the data produced during the project phase.

Alphanumeric information is characterized by all the non-geometric and relational information that can be attached to the elements modeled in the plans, in opposition to the "geometric" information characterized in the previous section.

5.1 GENERAL REQUIREMENTS

5.1.1 TEXT ANNOTATIONS

Any identifying information (room or equipment name, number, etc.) included in the models must be integrated as data related to the relevant object. No 2D text identification is accepted on the project.

5.1.2 MINIMUM INFORMATION

Regardless of the tools used to produce the Model, a certain amount of alphanumeric information must be minimally associated with the elements contained in the Models, whatever the discipline/speciality. This includes:

- All information regarding the geometric data associated with the elements (length, width, height, depth, thickness, surface, volume, diameter, etc.).
- All information regarding the relational data associated with the elements (reference level, host element if applicable, system, rooms or spaces, etc.), enabling the identification of interactions between elements of the model. All elements of the model should belong to its actual level and space.
- All information regarding the phase data associated with the elements (new, existing), enabling differentiation between elements newly installed as part of the project and those already in existence.
- All information regarding the physical data associated with the elements (composition and material, specified by sub-elements where applicable)

5.2 ROOMS IDENTIFICATION

Rooms must be identified using the British Columbia Housing Management Commission guidelines. In addition, room identification must be carried out consistently between the Architectural and Electromechanical Models throughout the project. In particular, it must be ensured that “Name" and "Number" are identical in the MEP and architectural models

5.3 EQUIPMENT CODING

Stakeholders must ensure that equipment coding is carried out correctly for all identified equipment. Equipment coding is initiated and completed only after the coding of rooms has been completed. Equipment coding must be used to produce the labels identifying the various equipment and systems on the plans.

5.4 LIST OF QUALITY CONTROL POINTS

The following points must be considered and will be subject to systematic quality control upon delivery of a deliverable. It is expected that the quality component of the BIM Execution Plan (PEB) will be aligned with these requirements.

Note: Some of these control points are identified as specific to the use of Revit software for model production. For these points in particular, and in the event that an alternative authoring software is used on the project, these requirements must be transcribed and adapted by the stakeholders in the BIM Execution Plan (PEB).

5.4.1 MODEL HEALTH

Table 1 - Quality control points for model health (A)

CODE	CONTROL POINT	DESCRIPTION
01	Models (name)	Maintain the same Model name throughout the project, in compliance with applicable standards (Naming Convention)
02	Models (weight)	Keep model weight to a minimum and never exceed 300 MB (**)
03	Families (weight) (*)	Keep family weight to a minimum (700 Ko) and never exceed 2 MB (**)
04	Models (purge)	Purge models of all unused elements and information (worksets, views, sheets, BOMs, etc.). Note: All views (except export views) must be positioned on a sheet.
05	Warnings (quantity) (*)	Keep the number of warnings to a minimum and never exceed 1 warning per 2 MB (depending on model weight).

(*) Specific to Revit software
(**) Subject to modification by [Developer Name] according to project context

5.4.2 REFERENCE ITEMS

Table 2 - Quality control points on reference elements (B)

CODE	CONTROL POINT	DESCRIPTION
01	Site (name of location) (*)	Maintain a single site (location) identical to that of the Master Model
02	Georeferencing	Maintain the georeferenced model according to the single site
03	Topography point (coordinates) (*)	Keep the coordinates of the topography point identical to those of the master model.
04	Project base point (coordinates) (*)	Keep the project base point at its internal origin and at the same location in all models.
05	Orientation	Align the model with the master model according to the orientation of true north
06	Grids	Align the grids of the model with those of the master model and always keep their coordination up to date.
7	Levels	Align the main levels of the model with those of the master model and always keep their coordination (elevation) up to date + validate the relevance of secondary levels

(*) Specific to Revit software and when applicable

5.4.3 CONTENT ORGANIZATION AND MANAGEMENT

Table 3 - Quality control points for the organization and management of Model content (C)

CODE	CONTROL POINT	DESCRIPTION
01	Links (*)	Integrate all links required as the project evolves
02	Links (Room Bounding) (*)	Define architectural and structural model links as Room Bounding
03	Links (phases) (*)	Validate the association of links phases
04	Links (workset) (*)	Validate the association of links worksets (only one workset per link)
05	Worksets (name) (*)	Integrate all worksets required as the project evolves, in compliance with applicable standards (e.g. Naming Convention).
06	Views (sheets) (*)	Position and maintain all views on dedicated sheets, with the exception of export and site views, ensuring their correct configuration.
07	Views (export) (*)	Create and maintain export views, ensuring their correct configuration: • Display all elements required for coordination and ensure that geometric information is complete • Hide links, fictitious elements, demolished elements, temporary elements not required for coordination, etc.
08	Views (site) (*)	Create and maintain a single site view
09	Cover page (*)	Create and maintain a cover page (2D or sheet view) and configure it as the default view when the model is opened. The view shall contain project informations.
10	Titleblock	Create and maintain a Titleblock and configure it in compliance with applicable standards
11	Sheets (*)	Create and prepare all sheets (+ print views) required as the project evolves
12	Sheets (name) (*)	Maintain the same sheet names and numbers throughout the project, in compliance with applicable standards (e.g. Naming Convention)
13	Sheets (Titleblock)	Use and complete the [Developer Name] Titleblock on each sheet
14	Design Options (*)	Do not keep any Design Option unless required (e.g. “safety” Design Option that allows locking elements into place)

(*) Specific to Revit software

5.4.4 GEOMETRIC INFORMATION

Table 4 - Quality control points for geometric information (D)

CODE	CONTROL POINT	DESCRIPTION
01	Level of development (LOD)	Maintain the level of development (LOD) at the required level as the project evolves
02	Rooms and spaces (position)	Validate that all surfaces enclosed by walls, or other "*room* separator" elements, contain a room (architecture) / a space (electromechanical)
03	Elements (non-disciplinary)	Do not keep any elements outside your discipline/speciality except those used temporarily (on a dedicated workset).
04	Items (duplicates)	Do not keep any duplicate elements in your model, or in other models produced as the project evolves.
05	Elements (floating)	Do not keep any floating elements in your model, except in relation to other models produced as the project evolves. No elements should be located outside of the project footprint / volume.

5.4.5 ALPHANUMERIC INFORMATION

Table 5 - Quality control points on alphanumeric information (E)

CODE	CONTROL POINT	DESCRIPTION
01	Elements (phases)	Validate that all elements (new, demolished, retained, etc.) are associated with the right phase as the project evolves.
02	Families (category) (*)	Appropriate re-categorization of all "generic model" or "in-situ" families
03	Rooms and spaces (coding)	Validate the presence and formatting of values associated with room and space coding (e.g. name, number) as the project evolves
04	Coding parameters	Validate completion of required coding parameters in compliance with applicable standards and as the project evolves

(*) Specific to Revit software