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

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