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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

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Title - Sujet Gérance de construction -Shawinigan	
Solicitation No. - N° de l'invitation EE474-200945/A	**Amendment No. - N° modif.** 006
Client Reference No. - N° de référence du client R.082974.300	**Date** 2019-10-28
GETS Reference No. - N° de référence de SEAG PW-$QCM-039-17755	
File No. - N° de dossier QCM-9-42096 (039)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2019-11-05**	**Time Zone** **Fuseau horaire** Heure Normale du l'Est HNE
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
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Canada

AMENDMENT 006
REQUEST FOR PROPOSAL (RFP)

CONSTRUCTION MANAGEMENT SERVICES - NEW FEDERAL BUILDING
SHAWINIGAN (QUÉBEC)

The objective of Amendment 006 is to modify the RFP.

(1) AT SECTION PD 4.9.1 HEALTH AND SAFETY

Delete: PWGSC recognizes that it is required to safeguard the health and safety of all persons working on government construction projects. It also recognizes that federal government employees and private sector employees are entitled to receive the full protection afforded by OHS regulations.

Insert: PWGSC pays attention to the health and safety of all people working on government construction projects.

(2) AT SECTION RS 3.2 – BIM PROJECT EXECUTION PLAN (PxP)

Delete: The Construction Manager shall comply with the standardized contract documentation principles of the Institute for BIM in Canada, including IBC 100-2014 and IBC 201-2014.

(3) DELETE "ANNEX A2 PRELIMINARY BIM MANAGEMENT PLAN" BY THE ATTACHED "ANNEX A.2 PRELIMINARY BIM MANAGEMENT PLAN (BMP)"

***** All other terms and conditions remain unchanged *****

ANNEX A.2 PRELIMINARY BIM MANAGEMENT PLAN (BMP)

The following BMP is provided for information purposes only. The Senior BIM Manager is responsible for improving it in whole or in part.

1. Preface

Project Context

Public Services and Procurement Canada (PWGSC) is constructing a new Government of Canada building to be occupied by the Canada Revenue Agency (CRA), Employment and Social Development Canada (ESDC) and Health Canada (HC). The project also includes the rental of a temporary parking lot, the deconstruction of the National Verification and Collections Centre (NVCC) and the construction of a new parking lot. This major project, which will take 60 months to complete, will be carried out with a view to sustainable development and compliance with the Federal Sustainable Development Strategy (FSDS).

Primary Objective

Implement an innovative strategy to increase performance in reducing changes during the project.

Implementation

The implementation of the BIM strategy must be included in the tender documents in order to achieve the main objective. A preliminary BIM Management Plan (BMP) must be drawn up to outline the organization's visions for the BIM.

2. Context of the BMP

The BMP is the result of the collaboration of all BIM stakeholders in the Project for deployment and implementation. The BMP serves as a roadmap for all parties involved in the development of BIM models for a Project delivered according to the BIM ("Building Information Model") process, for the duration of the Project.

It includes the methods required to create the various BIM models, the level of development (LOD) required and the content required in these models, the responsibility of each of the parties relative to the models, and the timeframe for delivering the models.

It also defines collaboration standards and techniques, as well as communication strategies and contact points for all Consultants in the Project Team. All stakeholders concerned by the BIM should refer to the BMP to ensure that they comply with all BIM requirements of the Project.

3. Modification and Acceptance Process

This document is intended to be evolving at the same pace as progress is made in implementing the Project and in parallel with the teams working on the Project. However, any changes to this document must be made through the Senior BIM Manager. All requests for changes must be made in writing to the Senior BIM Manager. They must be reviewed and approved by all parties involved in the Project.

All changes to the BMP must be explicitly notified and approved by all Project stakeholders. If, for any reason, requests for changes to this plan should have any impact on the progress and schedule of the Project, these requests must first be reviewed and approved by PWGSC. Notification must be made for all changes to the BMP at the beginning of the document in the grid named “Monitoring of changes to the BMP.”

4. Definitions

Attestation of reliability: Certification by a communicating party of the reliability of a deliverable with respect to authorized uses.

BIM: BIM is a digital representation of the physical and functional characteristics of a facility. A BIM is a shared-knowledge resource for information about a facility forming a reliable basis for decisions during its life cycle. [Definition taken from the National Building Information Modeling Standard (NBIMS)].

Interference detection: Interference detection is an automated analysis performed on federated models that identifies interference between different elements or modelled systems.

Digital data: Any information including, but not limited to, communications, drawings, models, databases, analyses, specifications or other BIM deliverables described in the BMP, as created or hosted for the project in digital form.

Confidential digital data: Digital data containing confidential or business information clearly identified as such and owned exclusively by the communicating party.

BIM Agreement: The agreement signed by the Departmental Representative and some stakeholders involved in the BIM approach, including architectural and engineering service providers, regarding the BMP.

BIM Discipline Manager: The BIM specialist of each of the professionals involved in the BIM approach within the framework of a project and responsible for the application of the BIM by their respective teams in accordance with the rules and terms of the BIM agreement.

Senior BIM Manager: The person responsible for the planning and implementation of a collaborative BIM by all project stakeholders.

Project stakeholder: Any person or team involved in the delivery of the project.

Stakeholder concerned by the BIM approach: Any project stakeholder who creates, consults, analyses or uses the data grouped within the various BIM deliverables.

LOD (Level of Development): Level at which the geometry of an element of a model and the information attached to it are developed according to the progress of the project or according to the needs of the users of the model. The LOD defines the level of reliability that project team members can rely on when using an element of a model.

Design model: Any 3D digital model produced by design professionals during the entire life cycle of the Project.

Federated model: A digital BIM model that gathers, in dead links, all the BIM models produced by the design and construction teams. This model is produced and updated by the BIM experts team (BET) on key dates defined in the coordination schedule. This model will be used for interference detection, design monitoring, visualization and centralization of information for reference.

Integrated model: A digital BIM model that brings together, with a living or dead link, all the BIM models produced by the design and construction teams. This model is created and used by professionals for their internal coordination.

Construction model: During the construction phase, the Construction Manager is responsible for producing construction models from the design models produced by the design professionals.

Federated construction model: A digital BIM model that gathers, in dead links, all the BIM models produced by the construction teams. This model is produced and updated by the Construction Manager. This model will be used for interference detection, construction monitoring, visualization and centralization of information for reference.

Party to the BIM agreement: As the case may be, one or all of the signatories to the BIM agreement.

Communicating party: A party responsible for creating and sharing digital data.

Recipient Party: A stakeholder involved in the BIM approach who receives and processes digital data shared by a communicating party.

BIM Management Plan (BMP): The document that facilitates the planning of the BIM project implementation process by outlining how the BIM will be implemented as part of a project to support the achievement of project objectives. The BMP is developed jointly by all stakeholders involved in the BIM approach. And once adopted and signed by all stakeholders involved in the BIM approach, it becomes the BIM Agreement.

BIM Implementation Plan (BIP): BIM managers in each of the disciplines (architecture, structural, civil, mechanical, electrical and construction) will be responsible for producing a BIP that will include all the modelling elements and principles preferred by their discipline within their respective mandates.

Authorized uses: The uses authorized by a communicating party of the digital data for which it is responsible.

Confidential digital data: Digital data containing confidential information or business information clearly identified as such.

Level of detail (LOD): The LOD defines the level of geometric precision relative to an object in the digital model.

Information Exchange Matrix (IEM): The Senior BIM Manager is responsible for setting up an IEM matrix. This indicates the level of detail and information required to achieve the Project objectives defined in the BMP.

Shared parameters: All parameters created and shared by one or more disciplines. They can be used in several models or families. The creation of shared parameters makes it possible to structure the information contained in the models.

Collaboration platform: A virtual workspace for centralizing all information and activities related to a project or organization. The collaborative platform provides, among other things, efficient document management that is accessible to all stakeholders in a project or organization.

Coordination platform: A virtual workspace for centralizing all information and activities related to the coordination of the project or an organization. The coordination platform provides, among other things, an efficient and accessible "*issue"* management of interferences by all stakeholders in a project or organization.

5. Project Delivery Method

The Project Delivery Method is part of a Construction Management Delivery method. Consequently, the BMP approach must take into account the aspects related to this mode of implementation and be properly planned and managed in order to support the achievement of the project objectives.

6. Project Schedule and Phases

The highlights of project schedule are defined as follows:

The main project execution phases are as follows:

- Awarding of consulting contract: April 2020
- Preliminary design (RS1 to RS3): April 2020 to early December 2020
- Final design and tender (RS4 – RS5): December 2020 to mid-May 2023 (in batches)
- Construction of new building and MES (RS6 &RS8): early November 2021 to end of July 2024 (in batches)
- Move to new building: August-September 2024 (in phases)
- Decontamination and demolition of existing: October 2024 to mid-March 2025 (building and parking lot)
- Construction of new parking lot: mid-March to October 2025 (including site development – in phases)
- Project close-out: October 2025 to March 2026

7. BIM objectives and requirements

As part of the implementation of the BIM/MDB in the project, PWGSC would like to meet various objectives outlined in Table 1 – BIM objectives and uses

Table 1 – BIM objectives and uses

	BIM objectives	BIM uses	Deliverables	Performance indicator	Timeline Period	Respons-ibilities
1	Project documentation	2D documentation 3D modeling	All required drawings at each stage of the project	All drawings are produced directly from the various BIM models	All stages and according to the official emissions schedule	Designer
2	Respect for functional needs of client-departments	• Integration and validation of program data/client needs • Conception review	Comparative report of design areas vs program areas	The design models are an accurate representation of the functional needs of client departments entered in the FTP	All stages and according to the official emissions schedule	PWGSC Designer
3	Respect for the technical requirements of client departments	• Integration and validation of technical requirements • Conception review	Comparative report of requirements vs design	The design models are an accurate or enhanced representation of the client's technical requirements entered in the FTP	All stages and according to the official emissions schedule	PWGSC Designer Manager
4	Accurate modeling of existing conditions	Modeling of existing conditions	• Surveys of existing conditions • Georeferencing	Decrease in the number and value of change orders (COs) on the work site due to existing conditions	Start-up Planning	Designer
5	Develop an optimized implementation hypothesis	Design review Lighting analysis Sunlight, wind and snow analysis Work planning	• Site analysis • Conception review	The selected hypothesis is optimized while taking into account the project functionality and alignment with the built environment.	Start-up Planning	Designer
6	Interdisciplinary and intra-disciplinary coordination	• Viewing • Conception review • Design review • 3D coordination Visual coordination Interference detection	• BIM models in native format, from all disciplines • BIM models in Navisworks format, from all disciplines • Interference detection report	No major or critical interference that could have an impact during the project's construction phase is detected	All stages starting from preliminary stage and according to the official emissions schedule	Designer
7	Cost estimate and analyses	Quantity takeoff (5D) and cost estimate	Bill of materials for building components and systems from the BIM models, based on their state of maturity and the LOD matrix	At each stage of the project, the various professionals refer to the BIM models to ensure the project is on budget.	All stages and according to the official emissions schedule	Designer Manager
8	Understanding of design intentions	• 3D conception • Viewing • Design review	BIM models in native format, from all disciplines; BIM models in Navisworks format, from all disciplines;	Obtain a federated BIM model enabling a review of design intentions and informed decision-making	All stages	Designer

9	Sustainable development	Energy efficiency Lighting analysis Sunlight analysis	List of deliverables required to meet energy performance and certification objectives	Obtained when the criteria are met	All stages	Designer
10	Concept constructability	4D timeline Work planning Model for call for tenders	• Conception review • 3D coordination Timeline planning • Cost monitoring • Statement of quantities • 4D simulation of worksite progress	Respect and optimization of budget envelope costs and timeline	All stages	Manager
11	Design model included in call for tenders	Model for call for tenders	Model for call for tenders	Complete and coordinated model enabling the contractor to bid on and carry out the work based on the design models	Construction	Designer Manager
12	Documents retrievable by the client for qualitative control and operation	Update of the models and the object library	3D models, Object library of the model with their data up to date	Models retrievable for qualitative control and operation	All stages Closing	Designer Manager

8.1. Elaboration on BIM uses

8.1.1.2D documentation

Process by which the various 2D drawings used to document a work are produced directly and solely from various BIM models. The 2D documents generally include plans, elevations, sections, details and various tables, as well as legends.

8.1.2.3D modeling

Process in which 3D modeling software and analysis software are used to develop information-rich BIM models, based on the stated design criteria. The use of this process and various tools enable a design to be developed and to be analyzed and verified through iterations. It also helps communicate design intentions and use the information to extract data on quantities, costs, time frames, etc.

8.1.3.Viewing

Process by which the 3D models are generated or enhanced to communicate the visual, spatial or functional qualities of the project or part of the project through perspectives, renderings, overviews, etc.

The consultant be required to propose an internal and external collaboration platform.

8.1.4.Integration and validation of program data/client needs

Process by which the models are used to ensure that the concept developed complies with the needs expressed in the program.

The information in the data sheets will be integrated by PWGSC into the digital model using an exchange format (.xls) that is compatible with the table of facilities generated in Revit, using a table import and export tool in Revit.

8.1.5. Integration and validation of technical requirements

Process consisting of creating a content library for the technical requirements that is accessible from the model using a plug-in. The validation process will make it possible to compare technical requirements with the proposal of objects created by designers and enriched by various stakeholders (e.g. manager, client, providers, etc.).

PWGSC is currently analyzing various tools for integrating an object library into the model.

The designers and various stakeholders (e.g. manager, client, providers, etc.) will be responsible for populating and updating the object library on the platform based on physical, informational and documentary properties.

8.1.6. Conception/design review

Process consisting of using various BIM models in order to validate the conformity of stated design criteria and enable various stakeholders to provide their feedback on multiple aspects of the design. The aspects may include the aesthetic aspect, constructability validation, compliance with the FTP, etc.

8.1.7. Existing conditions modeling

Existing conditions modeling involves only the land.

Modeling of the building to be demolished for deconstruction remains the choice of the senior consultant.

8.1.8. 3D coordination

Process by which the various BIM models are used to coordinate works for various disciplines involved in the project. May be carried out visually by navigating through various models, or by automating certain tasks as part of coordination meetings.

8.1.9. Interference detection

Process consisting of using BIM models from the various disciplines involved to detect interferences between the works of these disciplines.

8.1.10. Quantity takeoff/Cost estimate

Process consisting of extracting the various cost parameters directly from the BIM models, based on their level of development and the extent of 2D/3D modeling in order to ensure that the project is on budget at all stages of the project’s design. The

extraction of quantities for the detailed estimate may come from the 3D modeling or the 2D plans.

Based on the estimate method required by the client (Uniformat II), the information extracted from the models may include areas, construction systems, equipment, etc. In addition to the validation of the budget, the estimate can also be used to compare different design alternatives.

8.1.11. Energy efficiency

Process by which the various models are used to calculate the project's environmental impact. In cases pertaining to us, calculations are carried out to meet the energy performance targets for the LEED certification.

8.1.12. Lighting analysis

Process by which the model is used to simulate the levels of natural and/or artificial lighting in order to analyze the performance of the building or part of the building.

8.1.13. Sunlight analysis

Process by which the model is used to carried out sunlight/shadow area studies on the building and/or site.

8.1.14. 4D timeline

Process by which the model is used to simulate the main construction work.

8.1.15. Work planning

Process by which the model is used to carry out the sequencing of construction work, include the preparation of the work site, temporary work and any other activity related to the operation of the work site that has an impact on the timeline.

8.1.16. Model for call for tenders

Process by which the model is used to produce the call for tenders documents in 2D. The model is also provided as a reference during calls for tenders. Contractors will be able to use them for a better understanding when submitting their bid.

8.1.17. Update of models

The design models are updated throughout the work to incorporate the COs and contractors' annotated plans.

The construction models are an accurate representation of the real conditions following the work.

9. Duties and Responsibilities

Senior BIM Manager

The Senior BIM Manager is responsible for the development of the BMP for the Project, coordinates the deployment of the BIM approach, and acts in support of the Project teams for its implementation.

Purpose

- Ensure optimal deployment of the BIM approach;
- Ensure that the BIM approach adds value to the various implementation activities, supports the Continuous Design Process (CDP) and that its implementation enables the achievement of the Project objectives;
- Provides quality control to ensure that the work and deliverables of the Project teams comply with the BMP.

Duties and Responsibilities

- Develop (produce and draft) a BMP, in accordance with the BIM objectives and the objectives of the Project, and supervise its overall implementation and updating;
- Develop and define the various modelling strategies with each discipline's BIM managers;
- Coordinate the BIM component of coordination meetings;
- Coordinate the BIM kick-off meeting;
- Coordinate the BIM managers' meetings and draft the minutes of the meetings;
- Coordinate the work of the BIM managers in each discipline;
- Supervise and validate the conformity of the models with the PGB;
- Supervise the choice of BIM tools and ensure the interoperability of all data created and software used by design professionals;
- Monitor the availability and capacity of BIM resources required to achieve the Project objectives;
- Coordinate and monitor the achievement of objectives;
- Act as a main point of contact for BIM issues.

Intermediate BIM Manager

The Intermediate BIM Manager consolidates the discipline models and creates the federated models required for the various analyses. He/she provides support for the Senior BIM Manager and Project Teams for the implementation of the BIM approach.

Purpose

- Ensure optimal integration of the BIM approach into the Project in line with the BIM objectives and uses defined by all Project stakeholders;
- Ensure the sharing, quality control and compliance of the models with the BMP.

Duties and Responsibilities

- At the request of the Senior BIM Manager, attend BIM manager meetings, and start-up and coordination meetings;
- Monitor the sharing of models and the procedure for the transfer and exchange of information between the Project teams;
- Create and provide the federated models required by BIM stakeholders for the various analyses;
- Create and maintain an up-to-date grid of all planned models and ensure their distribution to all professionals;
- Provide the required assistance to project stakeholders concerned by the BIM approach according to their expressed needs (in support of and complementary to the activities of the Senior BIM Manager).

BIM Specialist

The BIM specialist supports the coordination work and communication between the various project stakeholders. He/she is responsible for performing interference detection analyses and monitoring with the Project teams.

Purpose

- Ensure optimal coordination between the Project's stakeholders and adequate support for integrated design based on the use of federated models;
- Ensure that the implementation of the BIM approach enables the achievement of the BIM objectives and that the work of the Project teams is in accordance with the BMP.

Duties and Responsibilities

- Coordinate the implementation of BIM uses (resources required, change management);
- Coordinate the Master model in order to geo-reference locations, as well as underground (partial) and above-ground services;
- Identify the software that will be used to execute the mandate in collaboration with the Senior Manager and the Professional teams;
- Ensure that the choice of software makes it possible to achieve the BIM objectives of the Project;
- Assemble the list of software (including software versions and updates) provided by the discipline managers;
- Coordinate the work and information-sharing between the various Project teams;
- Coordinate and monitor the modelling strategy for the various BIM analyses and uses;
- Draw up the schedule for interference detection reviews and analyses;
- Coordinate the resolution of detected interferences between professionals and ensure follow-up;

BIM Discipline Manager

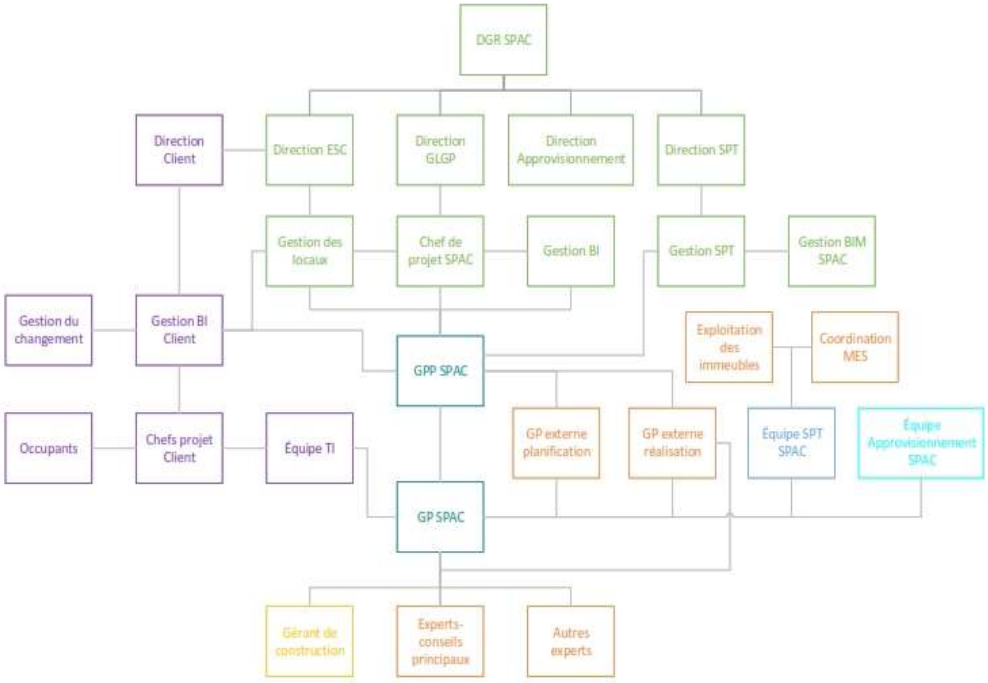
The BIM Discipline Manager will coordinate the execution of the BIM by their respective teams.

Responsibilities

- Act as the main point of contact for his/her discipline for the execution of the BIM;
- Ensure internal quality control of the models and information before sharing them with other Project stakeholders;
- Ensure that the work of own team is in accordance with the BMP and that the models of own discipline adhere to the guiding principles of the Project;
- Participate in BIM manager meetings and coordination meetings;
- Participate in the development of the BMP according to the guiding principles of the Project and supervise its implementation within own team;
- Ensure that own team has the BIM capabilities to comply with the requirements listed in the BMP and upgrade each if necessary;
- Provide technical support to own team in order to meet the objectives and requirements of the BMP;
- Identify the software that will be used by own team (including software versions and updated) and provide the list to the BET;
- Participate in the development of the modelling strategy and supervise its implementation in own team;
- Supervise and coordinate the work of own team regarding the BIM approach;
- Act as the person responsible for the models in own discipline;
- Ensure the sharing of own team's models and the recovery of models from other disciplines to produce the federated model;
- Coordinate the team's models with models from other disciplines.
- Ensure that the modelling is in accordance with the BMP;
- Provide the models to the BET for conformity/quality analyses;
- Supervise and coordinate the updating of the models based on comments generated in the model reviews and interference detection;
- Supervise the updating of the models during the construction phase according to change orders and actual conditions following the work;
- Adhere to the schedule for own team's deliverables;
- Develop a list of planned models for own discipline and submit it to the BET;
- Ensure that the models for own discipline are in accordance with the Level of Development (LOD) Matrix and that the required information is modelled at the required time.

- Enter data and maintain an up-to-date table of functional and area requirements and their characteristics;
- Produce plans by space and the ratio by SILU space category and net/gross ratios.
- This section will be expanded upon by the BIM/MDB manager at a later date.

10. **Project Organization Chart**



From top to bottom and left to right:
1. RDG, PSPC
2. Client Directorate
3. Client Services Team Directorate
4. APM Directorate
5. Procurement Directorate
6. PTS Directorate
7. Accommodation Management
8. PSPC Project Leader
9. RP Management
10. PTS Management
11. PSPC BIM Management
12. Change Management
13. Client RP Management
14. PPM PSPC
15. Building Operations
16. Cx Coordination
17. Occupants
18. Client Project Leaders
19. IT Team
20. External PM–Planning
21. External PM–Delivery
22. PSPC PTS Team
23. PSPC Procurement Team
24. PSPC PM
25. Construction Manager
26. Senior Consultants
27. Other experts

11. Deliverables

Paper deliverables

At each stage of the Project, when plans are officially issued, the various professionals must produce the number of hard copies determined by the Project Manager according to the instructions that are proof of contract documents.

Native Revit format (or equivalent)

At each stage of the Project, when the plans are officially issued, all the models in .rvt format (including federated models) will be retrieved and delivered and archived.

Navisworks format

At each stage of the Project, at the end of the interference detection process, all models in .nwc and .nwf format (including federated models) will be retrieved and delivered and archived.

PDF format

At each stage of the Project, when drawings are officially issued, the various professionals must produce deliverables in.pdf format. Each drawing sheet will be done independently, except for the submission filing, where the filings will have to be attached by discipline.

.dwg format

At each stage of the Project, when drawings are officially issued, the various professionals must produce deliverables (plans, sections and elevations) in .dwg format.

.ifc format

The .ifc format is a standardized file format (ISO 16,739 standard) used by the building industry to exchange and share information between software applications. At the submission stage, professionals will be required to produce a model in .ifc format for a clear understanding of the Project.

Other formats

At each stage of the Project, when drawings are officially issued, the BIM manager of the architectural team must ensure that the database of functional requirements, areas and net/gross ratios, including tables in Excel format, is filed.

12. Timeline for BIM deliverables

This section will be expanded upon by the BIM/MDB manager at a later date.

13. Data Sharing and Intellectual Property Rights

General principle of BIM data access rights

BIM will be the primary collaboration and communications medium for the Project Team. Unless otherwise specifically agreed, the Consultant Team will use the Model to convey design and the CM; associated trades will use the Model to help interpret the design, and construct the Work. BIM provides an opportunity to streamline, optimize, and, in some cases, omit processes in the delivery chain. To achieve this, the Consultant Team and CM must understand the Project comprehensively and have the digital tools and requisite skills necessary to enable all members of the Project Team through BIM. The author of a model element retains copyright to the model element unless otherwise stated. The author of a model element must grant to the Project Team a non-exclusive license to use the Model element and associated content within the scope established by the authorized uses and Model Elements Table as defined in the BIM PxP for the design and construction of the Project and for Canada's operations following the issuance of the Certificate of Substantial Performance. Project Team members may, at their own risk, adapt or make changes to the model or model element(s) for their own use. Notwithstanding the copyright over model elements, PWGSC has, without exception, the ownership of and the right to use all models, files, and facility/operations and maintenance data developed for the Project. Further, PWGSC must have access to these assets at any time during the implementation of the Project.

Advantages:

- Easy access to data;
- Obtain information in real time;
- Better interdisciplinary coordination;
- Enables fast and efficient communication;
- Saves time by working with the latest data;
- Have a single source of information; avoid multiple creation of the same data; and avoid duplication and duplication of information;

Risks

- Work on data that is not validated;
- Assumption that the data is good;
- Losing data or changing data by mistake;
- Resumption of work due to lack of communication and strategy with other disciplines;

Mitigation measures

- Each item of data must have an owner according to the governance model;
- Maintain a record of shared data, including ownership and authorized use;
- Develop collaborative processes;
- Validation, when using data, that they will not be modified in a short period of time;
- Weekly publication process;
- Systems must allow data recovery;
- Systems must provide a history of data;

14. 3D coordination and interference detection

3D Coordination

The 3D coordination process must be a continuous process during all phases of the Project. It consists, among other things, in validating design intentions, carrying out

general coordination between the various disciplines, carrying out spatial coordination between the main systems and modelled elements, etc., using federated models. Design professionals, project managers and BIM discipline managers must be involved on an ongoing basis in this process.

Interference detection

The Senior BIM manager is responsible for creating the federated model in order to perform interference detection analysis, between all disciplines, using the Navisworks Manage software, according to the deliverable schedule. BIM discipline managers are responsible for conducting the intra-disciplinary interference detection analysis, and subsequently collaborate for interdisciplinary coordination according to their methodology described in their work plan. The Senior BIM Manager will review each interference found and determine with the BIM discipline managers the level of impact. Only interference with a real impact will then be considered. BIM discipline managers will be responsible for transmitting interference to their Project Managers, updating the status of conflicts and communicating them to all stakeholders involved. An interference detection report illustrating the major conflicts and their resolution status issued by the Senior BIM manager will be forwarded to the Departmental Representative.

15. Level of development of the models

The level of development of the models described below corresponds to the minimum level of development to be achieved in order to meet the requirements of the various BIM uses described in this document. A “Level of Development Matrix” of the models will be created and updated throughout the Project and will take into account each BIM use to be achieved, in each phase of the Project. Everything is based on the classification format of the Uniformat II standard. The various levels of development listed below are based on the document “LOD Spec 2016 Part I”:

http://www.energymep.it/wordpress/wp-content/uploads/LOD_Spec_2016_Part_I_2016-10-19.pdf

Level 100 (program): The model element can be graphically represented by a symbol or a generic representation, but does not meet the requirements of the LOD200. A preliminary model specifies the size, shape, functional spaces, quantities, materials, systems.

Level 200 (design): The model element is graphically represented as a system, object or generic assembly with approximate quantity, size, shape, location and orientation. Non-graphical information can also be attached to the model element. A design model includes sufficiently precise and coordinated modelled elements for cost estimation and compliance control.

Level 300 (plan): The model element is graphically represented as a specific system, object or assembly with quantity, size, shape, location and orientation. Non-graphical information can also be attached to the model element. A pre-construction model specifies the construction requirements and specific construction elements. This model is suitable for the production of tender documents.

Level 350: The model’s elements are graphically represented as a specific system, object or assembly in terms of quantity, size, shape, location, orientation and interfaces. They interact with other building systems. Non-graphical information can also be attached to the model element.

16. IT Requirements

This section will be expanded upon by the BIM/MDB manager at a later date.