# Brookfield Global Integrated Solutions — Requirements Document

INSPIRING BETTER BUSINESS PERFORMANCE

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|---|---|---|---|---|---|
| Project Number | GOC375580 | Building ID | GOC01142 | Portfolio ID | 47 |
| Project Name | Install Drain Systems in 2 Indoor Garages | Building Name | 221 Archibald St., N | Portfolio Name | ON |
| | | Project Type | 01-Capital Project | Project Description | Refer to Objectives of the Project below. |
| | | Project Priority | B2-System Integrity/Operational Efficiency | | |

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|---|---|---|---|
| Document Date | Aug.18/2016 | Revision # | |

**Overall Project Schedule**

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|---|---|---|---|
| Project Start | Aug.1/2016 | Substantial Completion | Jan.26/2017 |
| Final Work Auth. | Nov.18/2016 | Total Completion | March.31/2017 |

**Additional Document Requirements "as requested" by PWGSC** (review PWGSC guidelines and check any boxes for documents required)**:**

| | | | | |
|---|---|---|---|---|
| Statement of Requirements | x | Environmental Assessment | | **Comments?** |
| Preliminary Project Plan | | Risk Assessment | | |
| Project Charter | | Heritage Review | | |
| Feasibility Study | | ***N/A - no additional documents requested*** | | |

**Objectives of the Project**

Install Drain Systems in 2 Indoor Garages

**Justification / Reason for the Project**

There are no floor drains in the 2 indoor garages and during the winter months, snow and ice melt from the vehicles melts and pool in areas.

| | |
|---|---|
| **1.0** | **Operational Requirements** |
| 1.1 | **Requirements For Facility Operations & Maintenance Personnel:** |
| | · O&M Manual, sections as applicable. 2 hard copies and soft copy - USB is required |
| | · Final copy of As Built drawings to remain at site, or within O&M Manual |
| | · Notification prior to impacting facility systems, services, or clients operations |
| | · As required, Consultant to review, Contractor or Installer to coordinate, and oversee training. |
| | |
| 1.2 | **Requirements during Implementation:** |
| | · Minimum 7 days written notice required for client prior to commencing work. Indicate area consultant or contractor requires access to. |
| | · Removal of any ACM will need to be performed outside of clients operational hours; Disposal verification required. |
| | · Preparation, submittal and acceptance of permits including permit to work as necessary prior to related activities. |
| | · Any Waste Removal unless otherwise specified shall become the contractor's property and shall be taken from site. No construction waste is to be discarded in the building waste removal system(s). |
| | |
| 1.3 | **Tenant Impact:** |
| | · Client operations cannot be disrupted without written stakeholder approval. |
| | · Work cannot block, or impede emergency egress areas, or staff entrances or use of space |
| | · WHMIS data sheets for products used during the project require review by the Brookfield GIS- HS & E Coordinator and the local tenant OSH Committee prior to the product being brought to the site. |
| | |
| **2.0** | **Regulatory Requirements** |
| | **It is incumbent on the consultant to verify that their designs, plans and contract documents meet the requirements of all relevant regulatory bodies associated with the project. This includes but not limited to:** |
| 2.1 | **Applicable Codes and Standards, Policies, Guidelines, Design and Construction Documents Requirements** |
| | |
| | · Canada Labour Code Part II – Occupational Health and Safety. |

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|---|---|
| | · Canada Occupational Health and Safety Regulations |
| | · Brookfield Global Integrated Solutions Health & Safety Policies and Procedures |
| | · Provincial Occupational Health and Safety Act |
| | · Provincial Safety Code for the Construction Industry |
| | · All applicable Provincial regulations respecting health and safety. |
| | · National Building Code of Canada (NBCC). |
| | · Provincial Construction Code |
| | · National Fire Code of Canada (NFCC). |
| | · National Fire Protection Association (NFPA) |
| | · TSSA-Technical Standards & Safety Authority Act or provincial equivalent |
| | · ESA-Electrical Safety Authority or provincial equivalent |
| | · Canadian Environmental Protection Act (CEPA) |
| | · Federal Halocarbon Regulations |
| | · Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations |
| | · Canadian Environmental Assessment Act (CEAA) |
| 2.2 | **Workplace Emergency Evacuation Plans (specific requirements)** |
| | · PWGSC Departmental Policy DP 078 – Workplace Emergency Evacuation Plans and Procedures. |
| | · Canada Occupational Health and Safety Regulations (COSHR) Part XVII – Safe Occupancy of the Workplace. |
| | |
| 2.3 | **Tenant service and or fit-up projects** |
| | · Statement of Requirements |
| | · Public Work and Government Services Canada (PWGSC) Fit-Up Standard. |
| | http://www.tpsgc-pwgsc.gc.ca/biens-property/amng-ftp/index-eng.html |
| | |
| 2.4 | **National Accessibility Standard** |
| | |
| | CAN/CSA-B651-04 – A National Standard of Canada – Accessible design for the built environment |
| | This standard to be used in conjunction with the National Building Code of Canada and Provincial Building Codes |
| | |
| 2.5 | **Federal Halocarbon Regulations** |
| | |
| | Decommissioning: |
| | All halocarbons shall be recovered by certified personnel into approved containers prior to decommissioning / dismantling / disposal of the system. |
| | Prior to dismantling, decommissioning or disposal of a system, a decommissioning notice / tag shall be affixed to the system. |
| | A record of the notice / tag shall be maintained at the site. |
| | Ensure all Inventory updates are coordinated with, and/or reference to, the Computerized Maintenance Management System (CMMS). |
| | Ensure service logs are updated with the appropriate information and kept for a 5 years period |
| | |
| | Installation: |
| | Ensure Federal Halocarbon Regulations are adhered to and the equipment inventory is updated. |
| | · Ensure all Inventory updates are coordinated with, and/or reference to, the Computerized Maintenance Management System (CMMS). |
| | Forward required information to Environment Coordinator and/or Environment Manager when updates are made. |
| | Ensure that a service log is created and the first leak testing information entered in the service log. |
| | |
| | **References:** |
| | ENV 216 00 RP1 Halocarbon Management |
| | Federal Halocarbon Regulation. |
| | http://www.ec.gc.ca/ozone/default.asp?lang=En&n=E06A6B0D-1 |
| | Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems. |
| | http://ec.gc.ca/ozone/127A4F77-AFD3-404B-A4E5-96A4BD3737F2/fluoro_cop.pdf |
| | _ |
| | |
| 2.6 | **MECHANICAL SYSTEM WITH POTENTIAL OF LEGIONELLA PROLIFERATION** |
| | Ensure that all conception or work on mechanical system are made in respect to MD15161 (including associated addendums) – Control of *Legionella* in Mechanical System from PWGSC. |
| | **References:** |
| | · MD15161 – Control of Legionella in Mechanical Systems |
| | · ENV 218 00 RP1 Legionella Bacteria Control Management |
| | |
| 2.7 | **PWGSC National CADD Standard and applicable supplements** |
| | For all new construction and renovation work done for or by PWGSC, the project CADD files must adhere to the standardized set of criteria's set out in the PWGSC National CADD standard. |
| | When regions have developed a supplemental standard, this standard must be read in conjunction with, and complement the National CADD Standard. |
| | PWGSC has jurisdiction on all drafting related aspects of the final drawings and all drawings must be completed to the satisfaction of PWGSC. |
| | PWGSC National CADD Standard. |
| | http://www.tpsgc-pwgsc.gc.ca/biens-property/cdao-cadd/index-eng.html |
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| 2.8 | **PWGSC Departmental Policy DP039 - Use of the National Master Specification (NMS)** |

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|---|---|
| | The most current version of the NMS should be used as the base document for the production of the construction specifications component of the project manuals for all new construction and renovation work done for or by PWGSC. |
| | When preparing the construction project manual, use the latest release of the National Master Specification (NMS) to the maximum extent to which it is applicable in accordance with the Departmental Policy, subject to the consultant's overriding responsibility for the content of the construction project specification. Edit, amend and supplement the NMS as required to produce a project manual that is appropriate to the circumstances of the project and free from conflict and ambiguity. |
| | The consultant is responsible for obtaining from an authorized supplier, the NMS User's Guide and an updated version of the NMS specification sections required to prepare the project specification. The NMS User's Guide is also available through the office of the NMS Secretariat. |
| | |
| 2.90 | **Project including Asbestos Containing Materials (ACMs)** |
| | · PWGSC Departmental Policy DP 057 - Asbestos Management. |
| | · ENV 207 00 Asbestos Management |
| | |
| 2.10 | **Project including the Modification / Installation / Withdrawal of Petroleum or Allied Petroleum Products** |
| | · Coordination required with Environmental Group |
| | · Canadian Environmental Protection Act / Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations |
| | · Canadian Standard Association - Installation Code for Oil-Burning Equipment (CSA B139). |
| | · Canadian Council of Ministers of the Environment - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME PN1326). |
| | · Ensure that the following documents are available on site for fuel tank modification or installation projects (where a federally registered tank is involved – see ENV 209 00 for applicability): |
| | · A record establishing that the storage tank system was modified or installed by an approved person or supervised by a professional engineer |
| | · Design plans, drawings and specifications of the tank system with the stamp AND signature of a professional engineer |
| | · As-built drawings, bearing the stamp and signature of a professional engineer, that show: the outline of all tanks, centreline of the piping, centreline of underground electrical power and monitor sensor circuits, building foundation outlines, property lines and secondary containment systems. |
| | · Ensure a site specific Environmental Emergency Response Plan (EERP) has been updated (or developed if not currently on site) and available at the site of the specific storage tank system. The HSE Manager will assist the Facility Manager in the development of the EERP (refer to ENV 209 00 RP1 for requirements). |
| | · Ensure that all required employees have been trained on the EERP. The HSE Manager will be responsible for providing the training. |
| | · Ensure an identification number from Environment Canada is on the tank and display it in a readily visible location near the tank system (remember – all before filling the tank) |
| | · HSE Manager will communicate the installation or modifications to the regional PWGSC environmental representative (and BJCC Director Environment, RP1) to have Tank Registered or modify the existing registration information |
| | · PWGSC environmental representative will register the tank in *FIRSTS* and communicate the number back SNC Regional Environmental Representative |
| | · If the storage tank system was temporarily withdrawn from service for modifications then the Withdrawal from Service Form must be completed and on site. Contact the HSE Manager for a copy of the form |
| | · All tank modification and decommissioning projects must have applicable forms completed in full as part of project requirements (HSE Manager to provide forms). |
| | |
| 2.11 | **Project including Boilers, Pressure Vessels and Pressure Piping** |
| | · COSHR; Canada Occupational Safety and Health Regulations (SOR/86-304) – Part V. |
| | · CSA B51; Boiler, Pressure Vessel, and Pressure Piping Code – Part1, Clause 8. |
| | · ASME B31.1; ASME Code for Pressure Piping, Power Piping – Chapter VI. |
| | · PWGSC Mechanical Design Guidelines - MD15300 Inspection of Above Ground Pressure Piping, Guidelines for Building Owners, Design Professionals and Maintenance Personnel. |
| | · PWGSC Position Paper on Scheduled Inspection of Pressure Piping Systems |
| | · ASTM; American Society for Testing and Materials. |
| | |
| 2.12 | **Project including IAQ and Thermal Conditions** |
| | · American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy. |
| | · American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality. |
| | · American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE Standard 52.2 and all addendums, *Minimum Efficiency Reporting Value (MERV) Parameters)* |
| | · ENV 203 00 RP1 Indoor Air Quality |
| 2.13 | **Project including Mechanical Modifications, Additions, and Deletions** |
| | · Update Standard Operating Procedures Manual (SOP) |
| | |
| 2.14 | **Project including Elevating Devices** |
| | · CSA B44 Safety Code for Elevators and Escalators |
| | |
| 2.16 | **FHBRO Heritage Guidelines** |
| | · The building was given a 'Classified' heritage building designation from the Federal Heritage Building Review Office (FHBRO). |
| | OR |
| | · The building was given a 'Recognized' heritage building designation from the Federal Heritage Building Review Office (FHBRO). |
| | · Protection of the Heritage Character Statement is a FHBRO requirement. |

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|---|---|---|
| | · Modifications or alterations to the building will require FHBRO's approval and shall respect FHBRO's standards and guidelines. | |
| | | |
| | Federal Heritage Buildings Review Office (FHBRO) | |
| | http://www.pc.gc.ca/progs/beefp-fhbro/index_e.asp | |
| | | |
| 2.17 | **SDS Project Requirements** | |
| | The consultant will be responsible for fully investigating and capturing all available incentive, subsidy and rebate programs from utility companies, and federal and provincial governments. The consultant will also be responsible for filling out all required documents. The consultant must meet all conditions and requirements pertaining to any incentive, subsidy and rebate requests. In this absence, the consultant will be responsible for subcontracting its obligations with a qualified firm. Furthermore, the hired consultant will be responsible for calculating the anticipated energy savings for each of the proposed options and for verifying the actual energy consumption (Payback) and the greenhouse gases (GHG) reduction realized by the project. | |
| | | |
| 2.18 | **Electrical Single-Line Diagrams and As-Built** | |
| | | |
| | Electrical As-Built Drawings; | |
| | · The specification shall hold the contractor responsible for indicating all change information on project drawings. | |
| | · The consultant is responsible for reviewing and verifying the contractor as-built drawings for completeness and accuracy. | |
| | The consultant is responsible for transferring any marked-up modifications from the contractor as-built to electronic version record drawings adhering to the standardized set of criteria set out in the PWGSC National CADD standard. | |
| | | |
| | Electrical Single-Line Diagrams; | |
| | · After completion of work, the consultant is responsible for promptly updating the Electrical Single-Line Diagrams in an electronic format consistent with PWGSC standards. | |
| | · Following the update, the consultant shall provide a hard and software copy of Electrical Single-Line Diagrams to Brookfield Global Integrated Solutions for posting in the main electrical room(s) or where required by the users. | |
| | Electrical Single-Line Diagrams (SLDs) shall clearly indicate how power is distributed from the source, to the feeders, sub-distribution panel board level, major loads and equipment. | |
| | | |
| | Electrical Single-Line Diagrams (SLDs) shall be kept current in accordance with PWGSC Departmental Policy DP058 Electrical Safety | |
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| 2.19 | **Elevator Modernization** | |
| | Contact Elevator Specialist for any input required on elevator projects | |
| | | |
| 2.20 | **ACM - Asbestos containing Materials** | |
| | Effective April 1, 2016, a new departmental ban was issued on the use of asbestos-containing materials (ACMs) in all new construction and renovation projects. | |
| | | |
| **3.0** | **Functional Requirements** | |
| 3.1 | **Location of the project:** | |
| | | |
| 3.2 | **Why this project is needed:** | |
| | | |
| 3.3 | **Constraints for this project:** | |
| | Client impact, space impact, comfort impact, etc. | |
| | Seasonal aspects, budget, etc… | |
| | | |
| 3.4 | **The acceptance criteria for this project (but not limited to):** | |
| | · Completion of all applicable permits, installation, testing, and verifications as dictated by: | |
| | · Provide Occupancy permit | |
| | · Regulatory agency approval | |
| | · Consultant sign off | |
| | · Stakeholder signoff, | |
| | · Client signoff, etc. | |
| | · Plans and Specifications (Minimum Submittals of 90% and tender Ready). | |
| | · Performance Verification - template provision and Contractor Reports | |
| | · Operations and Maintenance Manual | |
| | **· As-built drawings and Record drawings** | |
| | · Warranty documentation | |
| | · Provision of completed USB(s) as Required - for softcopies of submittals | |
| | · Waste Disposal verification | |
| | | |
| 3.5 | **Preliminary Risk Identification** | |
| | Complete, maintain, and update Risk Log in stakeholder approved format (Template will be provided) | |
| | | |
| **4.0** | **Health and Safety Requirements (in addition to those inherent to other criteria)** | |
| 4.1 | Review with Brookfield GIS HS&E Coordinator for additional information | |
| 4.2 | Provide all Health & Safety submittals as required by applicable authority having jurisdiction, including Brookfield GIS HS&E Coordinator | |
| 4.3 | MSDS must be valid and current, within 3 years or approved industry standard | |
| 4.4 | Specific Method Operating Procedure to be written and provided for approval as necessary | |
| | | |
| **5.0** | **Stakeholder Requirements - *Add other stakeholders according to RACI and allowance for others.*** | **Stakeholder Group** |
| 5.1 | Please ensure proper grading of the parking lot to eliminate pooling water. | Brookfield GIS-Property Manager and / or Associate |
| 5.2 | No Comments | Brookfield GIS-Project Manager |

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|---|---|---|
| 5.3 | Consultant/Contractor shall provide all applicable:<br>• Safe Work Permits,<br>• Job hazard analyses,<br>• Proof of safety related training (valid first aid, fall arrest training, etc.),<br>• List of equipment to be used onsite,<br>• Equipment inspection records,<br>• Valid WISB Clearance Certificate,<br>• MOL Notice of Project (Form 0175) If applicable<br>• Proof of supervisory competency,<br>• Signed BGIS Contractor Handbook (should also be part of tender documents)<br>• Completion of BGIS ComplyWorks orientation<br>• Proof of applicable trade licenses,<br>• Site specific safety plan,<br>• Risk assessment<br>• ONTARIO REGULATION 213/91 should be abided by consultant/contractor.<br>• Signed Form 1000 (Registration of Constructors and Employers Engaged in Construction)<br>Notes:<br>• BGIS shall provide Designated Substances Survey (DSS) and Occupational Health and Safety (OHS) Plan to consultant and contractor.<br>• GC appointed for each individual project occurring will be assuming the role of the Primary Contractor and will be in charge of their respective sub-trades. HS & E Coordinator will have oversight on their OHS Policies and procedures and once the work permits are received and reviewed, our OHS team will have a better understanding of the work at hand and the permits the contractors will require. | Brookfield GIS- HS & E Coordinator |
| 5.4 | The design consultant is required to commission this project as per attached scope of commissioning. | Brookfield GIS- Commissioning Oversight Specialist |
| 5.5 | No Comments | Brookfield GIS- Maintenance Team Lead |
| 5.6 | Consultant and contractor to ensure compliance with all applicable Federal, Provincial, and Municipal laws and regulations. | Brookfield GIS- Environmental Manager |
| 5.7 | No Comments | Brookfield GIS-Energy Manager |
| **6.0** | **Sustainability / Environmental Requirements** | |
| 6.1 | · PWGSC has committed starting in 2011-2012, all PWGSC Custodial Crown-owned and Lease-purchase office buildings over 1,000 m2 in floor area will | |
| 6.2 | · This Facility is committed to industry best practices with respect to sustainable development of Reduce, Reuse and Recycle. Consultant and Contractor | |
| 6.3 | · Any Waste Removal unless otherwise specified shall become the contractor's property and shall be taken from site. No construction waste is to be | |
| 6.4 | · Inform Brookfield GIS (Brookfield Global Integrated Solutions) Environmental Specialist of materials to be recycled | |
| 6.5 | · Use of green materials where possible, and as instructed in construction ; low VOC emitting, & recycled materials, etc. | |
| | | |
| **7.0** | **General Requirements** | |
| 7.1 | **Planning Phase:** | |
| | · Review project requirements, Review available information, Review physical component where Required, prepare reports as directed or outlined | |
| | · Identify the need for specialty testing to the Project Manager. | |
| | · Review the extent of commissioning with the Commissioning Oversight Specialist. | |
| | · Work in conjunction with Stakeholders during preparation of corrective options. | |
| | · IAR required (Template will be provided) | |
| | | |
| 7.2 | **Design Phase:** | |
| | · Review Operation & Maintenance issues that should be included in the design concept. | |
| | · Generate Plans and specifications in client acceptable format | |
| | · Provide, and update an estimated project budget including changes. | |
| | · Review O&M Manual's requirements with stakeholders. | |
| | · Lockout Tag out written procedures are to be requested in the specification document from the contractor. | |
| | · Review stakeholder training requirements, oversee as necessary | |
| | · Develop testing forms (Pre-Functional & Performance Verification) to be included in the Tender Documents | |
| | · Review requirements for service contracts during the warranty period with the Stakeholders | |
| | · Include client specific, specification sections in contract documents where directed | |
| | · Create Commissioning Plan, (if required) and review with the Commissioning Oversight Specialist | |
| | | |
| 7.3 | **Implementation Phase:** | |
| | · Construction Activity and related services as outlined within contract and tender documents. | |
| | | |
| 7.4 | **Acceptance Commissioning** | |
| | · Review commissioning activities, including, but not limited to: | |
| | · Review progress of work (inspections) in conjunction with the Commissioning Oversight Specialist. | |
| | · Review start-up procedures of all components in conjunction with the Commissioning Oversight Specialist. | |
| | · Prepare a 'post start-up' deficiency list in conjunction with the Commissioning Oversight Specialist. | |
| | · Confirm that systems start-up reports are completed and that systems are ready for performance verification testing. | |
| | · Witness commissioning of all equipment and, or, systems testing and certify results meet with contract documents. | |
| | · Identify post-commissioning deficiencies for which the contractor can be held responsible. | |
| | · Review training agenda in conjunction with the Commissioning Oversight Specialist provided by the contractor. | |
| | · Review final O&M Manuals. | |
| | · Participate in the training of the O&M personnel to explain the design of the project. Schedule for one site visit. | |
| | · Identify requirements for any deferred commissioning specific to seasonal or occupancy conditions. | |
| 7.5 | **Close-out Phase:** | |
| | · Schedule one site visit for 11th month warranty review. | |
| | | |
| **8.0** | **Tenant-Driven Requirements** | |
| 8.1 | Review work with impacted tenants well in advance of occurrence to ensure all tenant specific requirements are captured | |
| | | |

**Internal STAKEHOLDER CONSENSUS CONFIRMED in RealDocument**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Name:** | **Michael Chan** | **Title:** | **Project Manager** | **Signature:** | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Name:** | **Mitch St-Onge** | **Title:** | **Associate Property Manager** | **Signature:** | | |
| **Name:** | **Andrei Pacurariu** | **Title:** | **HS&E Coordinator** | **Signature:** | | |
| **Name:** | **Ravi Pathak** | **Title:** | **Commissioning Oversight Specialist** | **Signature:** | | |
| **Name:** | **Alexandra Lepp** | **Title:** | **Environmental Manager** | **Signature:** | | |
| **Name:** | **Leo Dipaola** | **Title:** | **Energy Manager** | **Signature:** | | |
| **Name:** | **Steven Maticic** | **Title:** | **Maintenance Team Lead** | **Signature:** | | |
| **External Stakeholder Consensus** | | | | | | |
| **Name:** | | **Title:** | | **Signature:** | | |
| **Name:** | | **Title:** | | **Signature:** | | |
| **Name:** | | **Title:** | | **Signature:** | | |
| **Name** | | **Title** | | **Signature** | | |

| Portfolio | Portfolio Name | Date |
|---|---|---|
| 47 | On | September 21, 2016 |
| **Building ID** | **Building Name** | |
| GOC01142 | 221 Archibald St, Thunderbay, On | |
| **Project #** | **Project Name** | |
| GOC375580 | Install Drain Systems in 2 Indoor Garages | |

This document provides a record of the Commissioning Requirements for the above mentioned project.

The role of the **Consultant** for commissioning during the overall design phase is to develop detailed commissioning specifications using this form.

Commissioning will be provided by a **Commissioning Agent**.
The **Commissioning Agent** may be either the **Consultant** or a **Third Party Commissioning Agent** based on project requirements.

During construction, the **Commissioning Agent** develops and coordinates the execution of a testing plan, which includes observing and documenting all systems' performance to ensure that the systems are functioning in accordance with the owner's Design Intent (DI) requirements and the contract documents.

The **Commissioning Agent's** role is not responsible for general construction scheduling, cost estimating, or construction management, but may assist with problem-solving or resolving non-conformance issues or deficiencies.

| **Project Description** |
|---|
| Same as objective below |
| **Objectives of the Project** |
| Install Drain Systems in 2 Indoor Garages |

## Justification / Reason for the Project

There are no floor drains in the 2 indoor garages and during the winter months, snow and ice melt from the vehicles melts and pool in areas.

## Operation Requirements

Requirements For Facility Operations & Maintenance Personnel:
· O&M Manual, sections as applicable. 2 hard copies and soft copy - USB is required

· Final copy of As Built drawings to remain at site, or within O&M Manual
· Notification prior to impacting facility systems, services, or clients operations
· As required, Consultant to review, Contractor or Installer to coordinate, and oversee training.

Requirements during Implementation:
· Minimum 7 days written notice required for client prior to commencing work. Indicate area consultant or contractor requires access to.
· Removal of any ACM will need to be performed outside of clients operational hours; Disposal verification required.

· Preparation, submittal and acceptance of permits including permit to work as necessary prior to related activities.

· Any Waste Removal unless otherwise specified shall become the contractor's property and shall be taken from site. No construction waste is to be discarded in the building waste removal system(s).

Tenant Impact:
· Client operations cannot be disrupted without written stakeholder approval.
· Work cannot block, or impede emergency egress areas, or staff entrances or use of space

· WHMIS data sheets for products used during the project require review by the Brookfield GIS- HS & E Coordinator and the local tenant OSH Committee prior to the product being brought to the site.

## Regulatory Requirements

**The commissioning program shall adhere to the following codes and standards as appropriate for the scope of work.**

Specifications in NMS Format – PWGSC Commissioning Manual CP-1,
CSA Z320 Building Commissioning Standards and Check Sheets,

**<u>Applicable Codes and Standards, Policies, Guidelines, Design and Construction Documents Requirements</u>**

- Canada Labour Code Part II – Occupational Health and Safety.
- Canada Occupational Health and Safety Regulations
- Brookfield Global Integrated Solutions Health & Safety Policies and Procedures
- Provincial Occupational Health and Safety Act

- Provincial Safety Code for the Construction Industry
- All applicable Provincial regulations respecting health and safety.
- National Building Code of Canada (NBCC).
- Provincial Construction Code
- National Fire Code of Canada (NFCC).
- National Fire Protection Association (NFPA)
- TSSA-Technical Standards & Safety Authority Act or provincial equivalent
- ESA-Electrical Safety Authority or provincial equivalent
- Canadian Environmental Protection Act (CEPA)
- Federal Halocarbon Regulations
- Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations
- Canadian Environmental Assessment Act (CEAA)
- Canadian Electrical Code (2015)
- C282-15 Emergency Power Supply for Buildings

**Workplace Emergency Evacuation Plans (specific requirements)**

- PWGSC Departmental Policy DP 078 – Workplace Emergency Evacuation Plans and Procedures.
- Canada Occupational Health and Safety Regulations (COSHR) Part XVII – Safe Occupancy of the Workplace.

**Tenant service and or fit-up projects**

- Statement of Requirements
- Public Work and Government Services Canada (PWGSC) Fit-Up Standard.

http://www.tpsgc-pwgsc.gc.ca/biens-property/amng-ftp/index-eng.html

**National Accessibility Standard**

CAN/CSA-B651-04 – A National Standard of Canada – Accessible design for the built environment

- This standard to be used in conjunction with the National Building Code of Canada and Provincial Building Codes

**Federal Halocarbon Regulations**

Decommissioning:

- All halocarbons shall be recovered by certified personnel into approved containers prior to decommissioning / dismantling / disposal of the system.
- Prior to dismantling, decommissioning or disposal of a system, a decommissioning notice / tag shall be affixed to the system.
- A record of the notice / tag shall be maintained at the site.
- Ensure all Inventory updates are coordinated with, and/or reference to, the Computerized Maintenance Management System (CMMS).
- Ensure service logs are updated with the appropriate information and kept for a 5 years period

Installation:

- Ensure Federal Halocarbon Regulations are adhered to and the equipment inventory is updated.
- Ensure all Inventory updates are coordinated with, and/or reference to, the Computerized Maintenance Management System (CMMS).
- Forward required information to Environment Coordinator and/or Environment Manager when updates are made.
- Ensure that a service log is created and the first leak testing information entered in the service log.

**References:**

- ENV 216 00 RP1 Halocarbon Management

- Federal Halocarbon Regulation.

http://www.ec.gc.ca/ozone/default.asp?lang=En&n=E06A6B0D-1

- Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

http://ec.gc.ca/ozone/127A4F77-AFD3-404B-A4E5-96A4BD3737F2/fluoro_cop.pdf

**MECHANICAL SYSTEM WITH POTENTIAL OF LEGIONELLA PROLIFERATION**

- Ensure that all conception or work on mechanical system are made in respect to MD15161 (including associated addendums) – Control of *Legionella* in Mechanical System from PWGSC.
- **References:**
- MD15161 – Control of Legionella in Mechanical Systems
- ENV 218 00 RP1 Legionella Bacteria Control Management

**PWGSC National CADD Standard and applicable suppléments**

- For all new construction and renovation work done for or by PWGSC, the project CADD files must adhere to the standardized set of criteria's set out in the PWGSC National CADD standard.
- When regions have developed a supplemental standard, this standard must be read in conjunction with, and complement the National CADD Standard.
- PWGSC has jurisdiction on all drafting related aspects of the final drawings and all drawings must be completed to the satisfaction of PWGSC.

PWGSC National CADD Standard.
http://www.tpsgc-pwgsc.gc.ca/biens-property/cdao-cadd/index-eng.html

**PWGSC Departmental Policy DP039 - Use of the National Master Specification (NMS)**

- The most current version of the NMS should be used as the base document for the production of the construction specifications component of the project manuals for all new construction and renovation work done for or by PWGSC.
- When preparing the construction project manual, use the latest release of the National Master Specification (NMS) to the maximum extent to which it is applicable in accordance with the Departmental Policy, subject to the consultant's overriding responsibility for the content of the construction project specification. Edit, amend and supplement the NMS as required to produce a project manual that is appropriate to the circumstances of the project and free from conflict and ambiguity.
- The consultant is responsible for obtaining from an authorized supplier, the NMS User's Guide and an updated version of the NMS specification sections required to prepare the project specification. The NMS User's Guide is also available through the office of the NMS Secretariat.

**Project including Asbestos Containing Materials (ACMs)**

- PWGSC Departmental Policy DP 057 - Asbestos Management.
- ENV 207 00 Asbestos Management

**Project including the Modification / Installation / Withdrawal of Petroleum or Allied Petroleum Products**

- Coordination required with Environmental Group
- Canadian Environmental Protection Act / Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations
- Canadian Standard Association - Installation Code for Oil-Burning Equipment (CSA B139).
- Canadian Council of Ministers of the Environment - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME PN1326).

- Ensure that the following documents are available on site for fuel tank modification or installation projects (where a federally registered tank is involved – see ENV 209 00 for applicability):

- A record establishing that the storage tank system was modified or installed by an approved person or supervised by a professional engineer
- Design plans, drawings and specifications of the tank system with the stamp AND signature of a professional engineer
- As-built drawings, bearing the stamp and signature of a professional engineer, that show: the outline of all tanks, centreline of the piping, centreline of underground electrical power and monitor sensor circuits, building foundation outlines, property lines and secondary containment systems.

- Ensure a site specific Environmental Emergency Response Plan (EERP) has been updated (or developed if not currently on site) and available at the site of the specific storage tank system. The HSE Manager will assist the Facility Manager in the development of the EERP (refer to ENV 209 00 RP1 for requirements).
- Ensure that all required employees have been trained on the EERP. The HSE Manager will be responsible for providing the training.
- Ensure an identification number from Environment Canada is on the tank and display it in a readily visible location near the tank system (remember – all before filling the tank)
  - HSE Manager will communicate the installation or modifications to the regional PWGSC environmental representative (and BJCC Director Environment, RP1) to have Tank Registered or modify the existing registration information
  - PWGSC environmental representative will register the tank in *FIRSTS* and communicate the number back SNC Regional Environmental Representative
- If the storage tank system was temporarily withdrawn from service for modifications then the Withdrawal from Service Form must be completed and on site. Contact the HSE Manager for a copy of the form
- All tank modification and decommissioning projects must have applicable forms completed in full as part of project requirements (HSE Manager to provide forms).

**Project including Boilers, Pressure Vessels and Pressure Piping**

- COSHR; Canada Occupational Safety and Health Regulations (SOR/86-304) – Part V.
- CSA B51; Boiler, Pressure Vessel, and Pressure Piping Code – Part1, Clause 8.
- ASME B31.1; ASME Code for Pressure Piping, Power Piping – Chapter VI.
- PWGSC Mechanical Design Guidelines - MD15300 Inspection of Above Ground Pressure Piping, Guidelines for Building Owners, Design Professionals and Maintenance Personnel.
- PWGSC Position Paper on Scheduled Inspection of Pressure Piping Systems
- ASTM; American Society for Testing and Materials.

**Project including IAQ and Thermal Conditions**

- American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy.
- American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality.
- American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE Standard 52.2 and all addendums, *Minimum Efficiency Reporting Value (MERV) Parameters)*
- ENV 203 00 RP1 Indoor Air Quality

**Project including Mechanical Modifications, Additions, and Deletions**

- Update Standard Operating Procedures Manual (SOP)

**Project including Elevating Devices**

- CSA B44 Safety Code for Elevators and Escalators

**FHBRO Heritage Guidelines**

- The building was given a 'Classified' heritage building designation from the Federal Heritage Building Review Office (FHBRO).

OR

- The building was given a 'Recognized' heritage building designation from the Federal Heritage Building Review Office (FHBRO).
- Protection of the Heritage Character Statement is a FHBRO requirement.
- Modifications or alterations to the building will require FHBRO's approval and shall respect FHBRO's standards and guidelines.

Federal Heritage Buildings Review Office (FHBRO)
http://www.pc.gc.ca/progs/beefp-fhbro/index_e.asp

**Electrical Single-Line Diagrams and As-Built**

Electrical As-Built Drawings;

- The specification shall hold the contractor responsible for indicating all change information on project drawings.
- The consultant is responsible for reviewing and verifying the contractor as-built drawings for completeness and accuracy.
- The consultant is responsible for transferring any marked-up modifications from the contractor as-built to electronic version record drawings adhering to the standardized set of criteria set out in the PWGSC National CADD standard.

Electrical Single-Line Diagrams;

- After completion of work, the consultant is responsible for promptly updating the Electrical Single-Line Diagrams in an electronic format consistent with PWGSC standards.
- Following the update, the consultant shall provide a hard and software copy of Electrical Single-Line Diagrams to Brookfield Johnson Controls for posting in the main electrical room(s) or where required by the users.
- Electrical Single-Line Diagrams (SLDs) shall clearly indicate how power is distributed from the source, to the feeders, sub-distribution panel board level, major loads and equipment.

Electrical Single-Line Diagrams (SLDs) shall be kept current in accordance with PWGSC Departmental Policy DP058 Electrical Safety

**Elevator Modernization**

Contact Elevator Specialist for any input required on elevator projects

## Commissioning Agent Scope of Work with Deliverables

The Commissioning Agent (CA) shall be responsible for carrying out the following tasks. The CA is free to suggest changes and improvements to the following task list. For this proposal, it is assumed by the owner representative that all of these tasks will be completed, unless any proposed changes to the following task list are "clearly" highlighted and noted in the respondent's proposal. For this proposal; Phase 1 – Initiation / Start-up, Phase 2 - Design Phase, Phase 3 - Construction Phase, Phase 4 - Close-Out Phase services are requested.

### Phase 1 – Initiation / Start-up

1. Assemble commissioning team, hold a scoping meeting and identify responsibilities.
2. Develop a draft design-phase commissioning plan.
3. Attend commissioning meetings as needed with project manager and design team.

### Phase 2 - Design Phase

1. Coordinate the commissioning work during design.
2. Develop or update the design phase commissioning plan.
3. Perform focused reviews of the design, drawings and specifications at various stages of development (during schematic design, design development and contract document phases).

4. Assist and review the development and updating of the Design Record documentation by design team members (Design Intent, Design Narrative; Design Basis).
5. Develop a draft construction phase commissioning plan using an Owner Representative -approved outline.
6. Develop full commissioning specifications for all commissioned equipment. Coordinate this with the consultant, architect or engineers and integrate the commissioning specifications into the overall project specification package. One or more of the following documents can be used as a guide for content, rigor and format: PWGSC Commissioning Guidelines CP-1, CSA Z320 Building Commissioning Standards and Check Sheets, Building Commissioning Association (BCA) Resources.

   The commissioning specification will include a detailed description of the responsibilities of all parties, details of the commissioning process; reporting and documentation requirements, including formats; alerts to coordination issues, deficiency resolution; construction checklist and startup requirements; the functional testing process; specific functional test requirements, including testing conditions and acceptance criteria for each piece of equipment being commissioned.

7. Attend pre-bid meeting to answer commissioning related questions.

**Phase 3 – Construction Phase**

**1.** Perform the tasks and functions in the specifications ascribed to the commissioning agent.

**2.** Coordinate and direct the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.

**3.** Coordinate the commissioning work with the contractor and construction manager, to ensure that commissioning activities are being incorporated into the master schedule.

**4.** Revise, as necessary, the construction phase commissioning plan developed during design, including scope and schedule.

**5.** Plan and conduct commissioning meetings as needed and distribute minutes.

**6.** Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures. Before startup, gather and review the current control sequences and interlocks and work with contractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.

**7.** Review normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the A/E reviews.

**8.** Review requests for information and change orders for impact on commissioning and owner's objectives.

**9.** Review coordination drawings to ensure that trades are making a reasonable effort to coordinate.

**10.** Write and distribute construction checklists for commissioned equipment.

**11.** Develop an enhanced start-up and initial systems checkout plan with contractors for selected equipment.

**12.** Perform site visits, as necessary, to observe component and system installations. Attend selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

**13.** With necessary assistance and review from installing contractors, write the functional performance test procedures for equipment and systems. This will include manual functional testing, energy management control system trending and may include stand-alone data logger monitoring.

**14.** Coordinate, witness and document manual functional performance tests performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved. The functional testing shall include operating the system and

components through each of the written sequences of operation, and other significant modes and sequences, including startup, shutdown, unoccupied mode, manual mode, staging, miscellaneous alarms, power failure, security alarm when impacted and interlocks with other systems or equipment. Sensors and actuators shall be calibrated during construction check listing by the installing contractors, and spot-checked by the commissioning provider during functional testing. Analyze functional performance trend logs and monitoring data to verify performance.

**15.** Prepare test plans for, assist with execution of, and document tests of commissioned equipment overseen by regulatory authorities and ensure that such tests meet the testing rigor desired by the Owner.

**16.** Maintain a master issues log and a separate record of functional testing. Report all issues as they occur directly to the Owner's Representative. Provide directly to the Owner's Representative written progress reports and test results with recommended actions.

**17.** Review equipment warranties to ensure that the Owner's responsibilities are clearly defined.

**18.** Oversee and review the training of the Owner's operating personnel.

a. Review the preparation of the O&M manuals for commissioned equipment.

**19.** Compile a Commissioning Record, which shall include:

a. A brief summary report that includes a list of participants and roles, brief building description, overview of commissioning and testing scope, and a general description of testing and verification methods. For each piece of commissioned equipment, the report should contain the disposition of the commissioning provider regarding the adequacy of the equipment, documentation and training meeting the contract documents in the following areas:

*i.* Equipment meeting the equipment specifications,

*ii.* Equipment installation,

*iii.* Functional performance and efficiency,

*iv.* Equipment documentation, and

b. All outstanding non-compliance items shall be specifically listed. Recommendations for improvement to equipment or operations, future actions, commissioning process changes, etc. shall also be listed. Each non-compliance issue shall be referenced to the specific functional test, inspection, trend log, etc. where the deficiency is documented.

c. Also included in the Commissioning Record shall be the issues log, commissioning plan, progress reports, submittal and O&M manual reviews, training record, test schedules, construction checklists, start-up reports, functional tests, and trend log analysis.

**20.** Compile a Systems Manual that consists of the following: Owner's Project Requirements (by owner); Design Narrative and Basis of Design (by designer); Performance Metrics, if completed during design; space and use descriptions, single line drawings and schematics for major systems (by designer); control drawings, sequences of control (by contractor); and a table of all set points and implications when changing them, schedules, instructions for operation of each piece of equipment for emergencies, seasonal adjustment, startup and shutdown, instructions for energy savings operations and descriptions of the energy savings strategies in the facility, recommendations for re-commissioning frequency by equipment type, energy tracking recommendations, and recommended standard trend logs with a brief description of what to look for in them (all by commissioning provider).

**Phase 4 Close-Out Phase:**

**1.** CMMS Data Sheets: All equipment which is to be deleted, removed, added or replaced from site is to have a CMMS inventory sheet completed and included in the O&M manual. If this equipment is a pressure vessel and is included in the annual inspect with TSSA the orange tag that is attached to the equipment must be removed prior to demolition and forwarded to the commissioning manager.

**2.** A signed letter, indicating whether the Project included a system or modification to system susceptible to Legionella and whether the Facility Legionella Binder as per MD-15161 was updated in particular the Facility Checklist LBCMP-1, Contact List LBCMP-2 and Schematic Drawings, and whether the update was completed.

Note: to consultant, cx agent and contractor

Consultant to prepare and include NMS commissioning specifications in the construction document to meet the requirements of PWGSC and CSA-Z320-11 standards.
Consultant to develop NMS Cx plan and follow the Cx process as per scope of work included in this document.
Cx Agent to provide full commissioning as per the commissioning plan and specifications.
Consultant to provide design and construction documents for review at 33, 66, 99 and 100 % completion stages.
Consultant to coordinate with MTL in updating CMMS data.
Cx Agent to prepare and submit final commissioning report for approval.
Contractors to follow the commissioning plan and specifications to meet the commissioning requirements.
Contractor to provide the closeout manuals, consultant to review and comment on the manuals.

| Brookfield GIS Commissioning Oversight Manager/Specialist | Signature | Date |
|---|---|---|
| **Ravi Pathak** | | |