Sustainable Guidelines for Building Envelope Projects
Toolkit User Guide

1. Introduction

The building envelope plays a significant role in building function, either directly or indirectly in its relationship to other building systems, and is a critical deciding factor in the overall performance and sustainability of the facility. Building envelope rehabilitation projects are an opportunity to improve not only the building envelope's performance, but also that of the entire facility. Design and construction of the envelope is complex and many factors must be evaluated and balanced to ensure desired levels of thermal, acoustic and visual comfort, together with safety, accessibility, aesthetic excellence and sustainability.

The toolkit is intended to support and provide guidance to projects teams for selecting, implementing and advancing sustainable design for Building Envelope Rehabilitation projects within the National Capital Area. Building upon the PSPC National Performance Standard (NPS) for Office Buildings (Draft) and PSPC's Real Property Sustainability Framework (Draft, v. 2015), it was determined that a new tool was required to address rehabilitation projects where LEED/Green Globes or similar rating systems were not applicable or achievable. The toolkit was developed by Morrison Hershfield Ltd. and PSPC's Sustainable Buildings Management COE.

2. Responsibility

In support of PSPC's commitment to achieve a recognized level of high environmental performance on real property projects, the toolkit is a working document that will capture the sustainable ideas, concepts, goals, objectives and strategies for envelope rehabilitation projects. The document will change hands from PSPC to Consultants and Contractors through the stages of the project; however this should be done in circular patterns (multiple revisions), rather than a complete once and pass along approach.

3. Overview of Toolkit

The Toolkit is comprised of three interconnected components:
 A) Customizable Project Sustainability Checklist;
 B) Sustainability Summary Index; and
 C) User Guide.
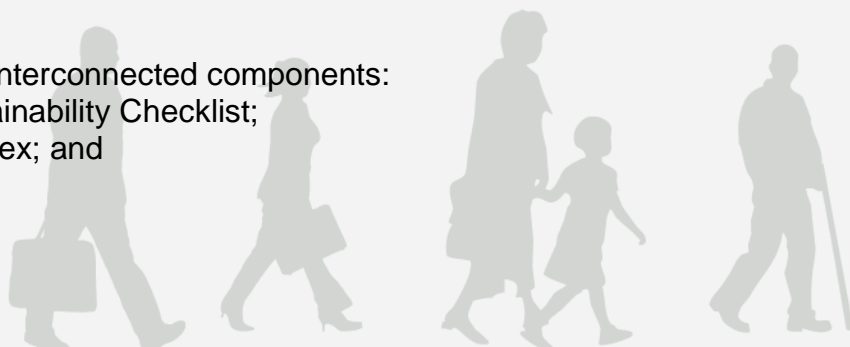
A) Project Sustainability Checklist

The checklist is an interactive and customizable list of sustainable strategies that have been specifically chosen for their applicability to building envelope rehabilitation projects, large and small in the National Capital Area (NCA). The Checklist has drawn upon established and commonly known sustainable strategies from existing documents, such as: PSPC's NPS (Draft), Real Property Sustainability Framework (Draft,v.2015), LEED, Green Globes, the National Institute of Building Science (NIBS) – Guideline 3, Passive House Canada, Living Building Challenge and general sustainable design practices. The framework and strategies selected for this toolkit represents a best fit approach to address the types of projects, occupancy, region, historic buildings, and departmental sustainability goals and targets. The checklist includes three main project stages: Project Identification, Project Delivery and Project Sustainability Report; and is organized by the anticipated scope of rehabilitation work (i.e. sustainability measures applicable to walls, fenestrations, roofing and all projects).

Project Identification

Teams are encouraged to use an Integrated Design Approach and hold multiple design charrettes and workshops to facilitate good decision making and implement and evaluate sustainable design approaches. Teams are also encouraged to conduct required investigative work and evaluation studies to help ensure adequate knowledge is available prior to the concept design phase.

Project Delivery

Each strategy has been tailored to the specific rehabilitation work and divided into one of six main categories; Project Management, Materials, Enhanced Indoor Environment, Energy and Sites. Each category has been further divided into several Performance Impact areas to illustrate the strategy's focus and primary sustainable benefit to the project. Each strategy includes an overarching statement of intent to assist the team with selecting and incorporating the strategy into the project.

To provide flexibility and encourage innovation, each measure is provided with a minimum of four performance target options and an associated scoring number. These targets include (associated scoring in brackets); not applicable (0), recommended minimum (1), best practice (3) and innovative (5, 7). Once a strategy has been chosen, the user can select the strategy as the "Project Target Selection" from the drop down list. The other strategies will remain visible as a reminder and to encourage teams to strive for improvement at each phase of the project. Note that the text in the strategies and performance targets can be edited to better fit the project, in consultation with the PSPC project team, and be updated to reflect new and revised standards as they become available.

Although the tool captures many sustainability strategies, teams are encouraged to investigate and explore additional alternative, innovative strategies. A general innovation measure has been included in the checklist under the Walls, Fenestration and Roofing Sections to award teams pursuing innovative strategies that were not included within the checklist.

Deliverables are required for each strategy, by the Consultant Team and/or Contractor. A tracking and sign-off cell has also been provided to ensure the initial sustainable goals are tracked and achieved for each project. This area of the spreadsheet requires the user(s) to add their comments, notes and sign-off signatures/names once strategies have been implemented and deliverable(s) completed. The deliverables are intended to minimize duplication of paperwork and hence follow, where applicable, the standard design document submittals (e.g., drawings and specifications), and contractor submittal requirements. Teams are encouraged to combine studies and narratives, where possible, to minimize additional paperwork and find synergies between studies.

Project Sustainability Report

The project's sustainability index is intended to allow comparison between projects. The goal is not to achieve a predetermined, specific index, but rather to identify the level of sustainability targeted for the project overall, based on the combination of measures selected (i.e. minimum, best practice or innovative).

Sustainability Summary Index

The Sustainability Summary Index is available as a separate tab on the checklist spreadsheet that auto-populates based on the user's inputs and selections within the checklist. The index provides project teams with a means to confirm, track and verify those sustainability standards to be applied against their project. The summary index has been designed to reflect a concise and summarized representation of a project's overall sustainability strategy, clearly identifying the chosen standards, and their associated performance target, from those not targeted, as well as the status of those measures.

4. Using the Toolkit

The intent of the toolkit is for project teams to use and update the Project Sustainability Checklist throughout the project's life cycle (from planning through to project close). There are many scenarios of how the toolkit can be used, but the following outlines two likely scenarios;

1. Using an integrated design approach, PSPC selects the applicable sections (e.g., wall, fenestration, and/or roof) according to the project scope, reviews the list of applicable strategies, and selects the initial approach based on the project's sustainability goals, objectives and requirements. The outcome of this initial work feeds into the project's contractual documents.

   OR

2. Within the TORs/Project Brief stage, PSPC requires the Consultant Team to review and select the applicable strategies, based on the scope of work and project's sustainability goals, objectives and requirements.

To assist toolkit user(s), a list of Steps (1-8) are provided along the left-hand side of the master spreadsheet that describe the activity in each step. Each is described below:

Step 1: Project Information – this step outlines the Project name, Project Address, Project Number, Project Team and Date *(to be updated and allow tracking of versions).*

Step 2: Project Scope Description – this step outlines the applicable sections of the checklist (e.g., Walls, Fenestration and/or Roof). Three options (drop down menu) are available for the teams: Yes, No or Limited Amounts. The team selects the most applicable option and is directed to the applicable section in the spreadsheet. For "Limited Amounts", the team is required to submit a narrative explaining this selection and where applicable, teams are encouraged to review and select the applicable strategies under the relevant section(s).

Step 3: Project Sustainability Charrette & Studies – this step includes a design charrette promoting integrated design, whereby project teams are encouraged to include building facility managers, project users, subject matter experts and tenants to optimize cross-discipline design and decision

making; as well as investigation & evaluation studies and associated implementation requirements, whereby project teams are encouraged to engage subject matter experts, where applicable, to increase the team knowledge and explore opportunities for the project.

Step 4: Sustainability Measures Applicable to All Projects – this step includes a General Section outlining sustainability strategies that are applicable to all projects. Teams review and select the performance target, which can be updated through the project life.

Step 5: Sustainability Measures Applicable to Wall Projects - this step includes sustainability strategies that are applicable to Wall projects. Teams review and select the performance target, which can be updated through the project life.

Step 6: Sustainability Measures Applicable to Fenestration Projects - this step includes sustainability strategies that are applicable to Fenestration projects. Teams review and select the performance target, which can be updated through the project life.

Step 7: Sustainability Measures Applicable to Roof Projects - this step includes sustainability strategies that are applicable to Roof projects. Teams review and select the performance target, which can be updated through the project life.

Step 8: Sustainability Report – this section includes an overview of the project's sustainability index, based on the targets chosen throughout the checklist. The scores associated with each measure have not been weighted and are not comparable to the scoring of existing rating tools such as LEED. It is provided as a means of viewing, at a high level, the targeted level of environmental performance for the project, based on the sustainable strategies and additional innovative strategies captured by this toolkit.

5. Updating the Toolkit

The current Toolkit is organic and has embedded flexibility to change over time to meet project goals, requirements and specific initiatives. The Toolkit has incorporated and reflects sustainable design strategies from current (2015-2016) versions of third-party rating systems and best practices in sustainable design.   As new rating systems and departmental documents emerge or the focus of sustainable design changes (e.g., energy, health, and environment), the toolkit will need to be modified to ensure its usefulness. Morrison Hershfield recommends that the Toolkit be reevaluated every 3-5 years to ensure it reflects current minimum standards, best practice and innovation.