

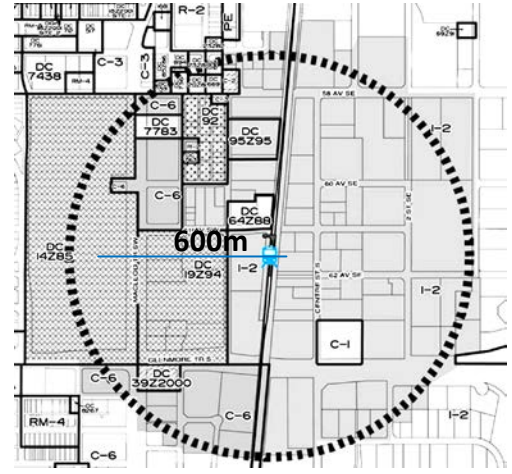
**INTRODUCTION**

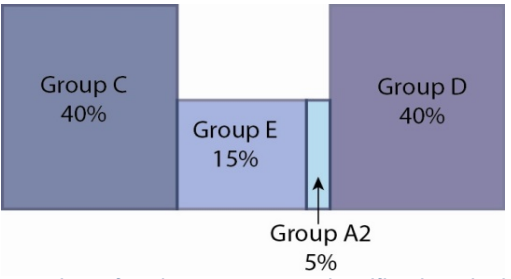
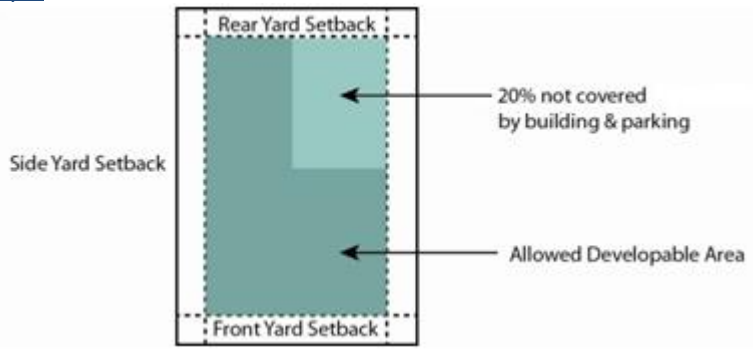
The Sustainable Development Inventory (SDI) User's Guide is a companion to the [Sustainable Development Inventory \(SDI\)](#) form that you submit to the City of Calgary with your Building Permit. The SDI User's Guide is a reference to help explain the policy background, metrics, and calculations that might be required to complete the SDI accurately. As such, it is only a guideline and not required to be submitted with the SDI at time of Building Permit. The table below explains the content of each column and metric found on the SDI, along with sample calculations.

If additional clarity is required, please do not hesitate to contact:

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Sustainability Directive (what is to be addressed)	Policy Directive (MDP)	Metric Appropriate for Checkbox (YES/NO OR NUMERIC METRIC)	Notes to Compare Metrics	Explanatory notes and examples for metrics.
<p><b>PURPOSE:</b> This column identifies the sustainability feature addressed in the Sustainable Development Inventory.</p>	<p><b>PURPOSE:</b> This column outlines sustainability goals of the Municipal Development Plan (MDP). This helps users understand the link between policy directives and the Sustainable Development Inventory.</p>	<p><b>PURPOSE:</b> The Sustainable Development Inventory (SDI) is not intended to serve as an evaluation checklist for approvals, but as a data collection tool to inventory current sustainability practice. To ensure this is the case, the relevant information will be collected at the time of Building Permit application (which requires an Approved DP to be in place in order to apply). To fulfill the data collection task, some form of metric and quantification is needed;</p> <p><b>METRIC: Is a quantifiable sustainability feature that can be identified as fulfilling the objective of the policy directive. In this column, the metrics are worded to be a simple pass/fail query suitable to 'checkbox' format</b></p>	<p><b>PURPOSE:</b> In order to get a 'feel' for the metrics and how they compare, we have provided both Green Rating system analogues (typically LEED New Construction (NC) 2009 and Green Globes), as well as examples from other requirements and initiatives from leading municipalities in North America. These should serve as useful discussion points for comparison.</p>	<p><b>PURPOSE:</b> This section provides additional information related to the metric, and may include;</p> <ul style="list-style-type: none"> <li>• <b>Illustrations</b></li> <li>• <b>Equations</b></li> <li>• <b>Examples</b></li> <li>• <b>Definitions</b></li> <li>• <b>Notes/References</b></li> </ul>

LEED CERTIFICATION		NOTE: If a rating system other than LEED is used (FOR EXAMPLE, BREAM, Green Globes, etc.), record it in the "OTHER FEATURES" section		
Land	<p><b>2.6.2</b></p> <p><b>Objective:</b> Minimize the amount of land that is taken from undeveloped areas and places in permanent use for residential, commercial, industrial, transportation, or utility corridors</p>	<ul style="list-style-type: none"> <li><b>Transit Oriented Development</b> (including demonstration that all development is within 600m of a NAC (neighbourhood activity centres), CAC (community activity centres), or MAC (major activity centres) and within 400m of a main transit stop): METRIC; Transit Oriented Development metrics               <ul style="list-style-type: none"> <li>Development is within 600m of a LRT station /BRT stop OR within 400m of a Primary Transit Network stop.</li> </ul> </li> </ul> <p>(refer to the <a href="#">Calgary Transportation Plan</a> for additional information).</p>	<p><b>Green Rating System Analogues</b> LEED 2009, SS Credit 4.1:</p> <ul style="list-style-type: none"> <li>800m to LRT/Subway stop</li> <li>400m to transit stop w/ frequent service.</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>50 points awarded if project is 500 yards (450 m) from transit stop</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>Chicago: ¼ mile (400m) to transit</li> <li>Portland: ½ mile (800m) to commuter rail, ¼ mile (400m) to 2 or more bus stops</li> <li>Kelowna: Maximum points awarded to developments within 400m of transit</li> </ul>	<ul style="list-style-type: none"> <li><b>Primary Transit Network:</b> Service operates every 10 minutes or less over an extended operating period, seven days a week.</li> <li><b>The 600m radius circle is centred upon the LRT platform or BRT stop and measured to the main building entrance.</b></li> </ul> <p><i>Example:</i></p>  <p>600m around Chinook LRT Station</p>
		<ul style="list-style-type: none"> <li><b>Density:</b> METRIC; Establish applicable quantitative minimum density guidelines.               <ul style="list-style-type: none"> <li>Additional density (as measured in Floor Area Ratio (FAR) applied for _____).</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, SS Credit 2:</p> <ul style="list-style-type: none"> <li>Development to attain minimum site density of 13,800 m<sup>2</sup>/hectare (NOTE: this is zoning independent)</li> </ul> <p><b>Other Municipal Examples</b> None</p>	<p>Metric: In areas where applicable density bonusing applies, the development builds to the maximum density allowed under the land use bylaw <u>AND</u> utilizes density bonusing options.</p> <p><b>Total Density = FAR (LUB) + FAR (Bonusing)</b></p> <p><i>Example:</i> A building has built to the maximum FAR of 5.0 for the site, according to the LUB. In return for creating a mixed-use building and providing a green roof, the applicant has applied for a density bonus of 3.0 FAR. Therefore, the 3 FAR is the number reported in the metric.</p>

		<ul style="list-style-type: none"> <li><b>Mixed Use:</b> METRIC; Establish a useful definition and quantification of 'Mixed Use' for individual sites   <input type="checkbox"/> The number of major occupancy classifications in the project as defined in the Alberta Building Code _____.</li> </ul>	<p><b>Green Rating System Analogues</b> None</p> <p><b>Other Municipal Examples</b> None</p>	<ul style="list-style-type: none"> <li>Mixed Use applies only to individual building/site.</li> <li>Each use (occupancy classification) must be at least 10% of floor area to be considered in calculation in accordance with Major Occupancy type classifications in Alberta Building Code (ABC).</li> </ul> <p><i>Example:</i></p>  <p><i>In this building, the number of major occupancy classifications is three. Group A2 is not included because it contains less than 10% of the floor area.</i></p>
		<ul style="list-style-type: none"> <li><b>Open Space:</b> METRIC; % of allowable site coverage maintained for vegetated, open space   <input type="checkbox"/> _____ % of allowed developable area dedicated as open area.</li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, SS Credit 5.2:</p> <ul style="list-style-type: none"> <li>Provide open, vegetated space equal to 20% of the project site area</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>20 points awarded for naturalized landscape using native trees, shrub and ground cover with minimal lawn</li> </ul> <p><b>Other Municipal Examples</b> None</p>	<p><b>Definition:</b> Open space is vegetated site area free from parking or building footprint. Open space area may be left in a natural state or landscaped.</p> <p><b>Calculation:</b></p> $\% \text{ Open Space} = \frac{[\text{Area not occupied by building \& surface parking, etc.}] \times 100\%}{\text{Total allowed developable area}}$ <p><i>Example:</i></p> 

		<ul style="list-style-type: none"> <li>• <b>Brownfield Site:</b> METRIC: map / site history verification/Soils Engineering report <ul style="list-style-type: none"> <li><input type="checkbox"/> 1. Confirms that the site is or was previously contaminated; AND</li> <li>2. Demonstrates that the site will be remediated to a standard suitable for the proposed use</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, SS Credit 3:</p> <ul style="list-style-type: none"> <li>- Development on a site defined as Brownfield by local, provincial or federal agency.</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 20 points awarded for site that is a rehabilitated, previously contaminated site</li> </ul>	<p>Brownfield Site</p> <ul style="list-style-type: none"> <li>• Metric aimed at recognizing sites that are contaminated, and have been rehabilitated as part of the development</li> </ul>
Energy	<p><b>2.6.5</b></p> <p><b>Objective</b> Reduce the demand for non-renewable energy resources.</p>	<ul style="list-style-type: none"> <li>• <b>Building Energy Efficiency:</b> METRIC; % improvement on building energy efficiency <ul style="list-style-type: none"> <li><input type="checkbox"/> How much (% of design energy consumption) has the development improved over NECB 2011?</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, EA Prerequisite 2:</p> <ul style="list-style-type: none"> <li>- % improvement over NECB 2011 (LEED Canada interpretive credit)</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- Input the value of projected energy savings as a percentage of compared to the reference building</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Vancouver: All Part 3 buildings must meet ASHRAE 90.1-2007 or NECB 2011</li> <li>- San Francisco: Buildings must demonstrate a 15% improvement over ASHRAE 90.1-2007</li> </ul>	<p>NOTE: Projects using the ASHRAE 90.1 Energy Efficiency Standard should record this in "OTHER FEATURES" section.</p>
		<ul style="list-style-type: none"> <li>• <b>Combined Heat and Power (CHP) or District Energy (DE) Connection:</b> METRIC; Define distance to DE source or note CHP capability in project:</li> </ul> <p>The development is serviced by :</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Building service loads (heating, DHW needs) provided by District Energy (DE).</li> <li><input type="checkbox"/> Building service loads (heating, DHW, electrical: ekWh) provided by On-site Combined Heat and Power (CHP) equipment.</li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, EA Credit 2:</p> <ul style="list-style-type: none"> <li>- 1-13% of building total energy produced by on-site renewable energy</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 20 points awarded for 0-10% of building total energy use provided by on-site energy</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Vancouver: CHP /DE compatible design required if available</li> </ul>	

		<ul style="list-style-type: none"> <li>• <b>On-Site Renewable Energy Generation:</b> METRIC; indication on drawings of source and location of on-site renewable energy production equipment  The development contains any of the following: <ul style="list-style-type: none"> <li><input type="checkbox"/> Solar Thermal Air: ___ GJ equivalent</li> <li><input type="checkbox"/> Solar Thermal - Space Heating: ___ GJ equivalent</li> <li><input type="checkbox"/> Solar Thermal - Domestic Use: ___ GJ equivalent</li> <li><input type="checkbox"/> Photovoltaics: ___ kW rated output</li> <li><input type="checkbox"/> Geexchange: ___ GJ equivalent</li> <li><input type="checkbox"/> Wind Turbine ___ kW rated output</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, EA Credit 2:</p> <ul style="list-style-type: none"> <li>- 1-13% of building total energy produced by on-site renewables</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 20 points awarded for 0-10% of building total energy use provided for by on-site renewables</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Chicago: Minimum 1% of total annual energy consumption of a building must be provided by on-site renewable (Green Permit menu item)</li> <li>- San Francisco: Minimum 1% of total energy consumption must be provided by renewable energy</li> </ul>	<p><u>Solar Thermal Air Preheat:</u> Minimum 10% of solar exposed wall or roof area is equipped with solar thermal air preheating system.</p> <p><u>Solar Hot Water- Space Heating:</u> Building is equipped with an approved solar thermal water system connected to domestic hot water supply or (for industrial users) process hot water supply system(s).</p> <p><u>Solar Hot Water- Potable Use:</u> Building is equipped with an approved solar thermal water system connected to hydronic space heating system.</p> <p><u>Photovoltaics:</u> Building has approved photovoltaic array installed and connected to electrical system. Minimum array size to qualify must be 2 kW rated capacity.</p> <p><u>Geoexchange System:</u> Building employs Geoexchange system to supply service heat and/or air conditioning.</p> <p><u>Wind Turbines:</u> Building has approved wind turbine installed on-site and connected to electrical system. Minimum turbine size to qualify must be 2 kW rated capacity.</p>
		<ul style="list-style-type: none"> <li>• <b>Bicycle Parking:</b> METRIC; Number of secure, weather protected bicycle parking stalls provided  <input type="checkbox"/> ___ % increase of secure, weather protected bicycle stalls, in excess of LUB requirements.</li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, SS Credit 4.2:</p> <ul style="list-style-type: none"> <li>- Secure, weather protected bike storage for 5% of building Full Time Equivalent (FTE) occupants</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 10 points awarded for secure, covered bicycle storage</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Vancouver: &gt;1 bike stall / 500m<sup>2</sup> gross floor area (GFA)</li> <li>- Chicago: # bike stalls to be 30% of residential occupants, 10% of commercial building occupants</li> </ul>	<p>Metric: provide percent increase in secure, weather protected bicycle stalls over amount required by LUB, expressed as a percent</p> <p><u>Example:</u> For an office building of 25,000 square metres of gross usable floor area having 32 secure, weather protected bicycle stalls;</p> <p>LUB Requirement: [(1.0 stall/1,000 sq. m.) * 25,000 sq. m.] *1.25 = 25 stalls required by LUB</p> <p>To calculate percent increase; <b>% increase = (# bike stalls provided - # of bike stalls required by LUB) X 100% / # bike stalls required by LUB</b></p> <p>% increase = (32-25)/25 = 28%</p>
<p><b>Water</b></p>	<p><b>2.6.3</b>  <b>Objective</b> Protect, conserve and enhance water quality and</p>	<ul style="list-style-type: none"> <li>• <b>Green Roof:</b> METRIC; indication on drawings of green roof extent  <input type="checkbox"/> ___ % of building footprint covered by a green roof.</li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, EA Credit 2:</p> <ul style="list-style-type: none"> <li>- Several references to green roofs in Sustainable Sites and Earth and Atmosphere credits</li> </ul>	<p><u>Green Roof:</u> Approved Intensive or Extensive green roof system (at least 75 mm growing medium depth) supporting vegetation.</p>

<p>quantity by creating a land use and transportation framework that protects the watershed.</p>		<p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Toronto: Green Roof Bylaw; all residential institutional and commercial buildings over 2000 m<sup>2</sup> in footprint to have 20-60% green roofs depending on building type</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Low Water Landscaping:</b> METRIC; species and design certified by registered landscape architect (?): <ul style="list-style-type: none"> <li><input type="checkbox"/> Landscaped area is professionally designed xeriscaping or employs approved water efficient species.</li> <li><input type="checkbox"/> No irrigation system installed <u>OR</u> if irrigation system is installed, the system is a low water irrigation system.</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, WE Credit 1:</p> <ul style="list-style-type: none"> <li>- 50% or 100% reduction in potable water used for irrigation</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 10 points awarded for water efficient irrigation</li> <li>- 5 points awarded for xeriscaping</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Toronto: Minimum 50% of plant material used must be low-water species</li> <li>- Kelowna: Points awarded for Xeriscaping/ low-water irrigation</li> </ul>	<p>Low-water irrigation systems include those featuring rain sensors or ground moisture sensors, and subsurface drip style systems.</p> <p>NOTE: Tables on Low Water Trees and Shrubs is located on pages 365-367 of the LUB 1P2007.</p>
	<ul style="list-style-type: none"> <li>• Stormwater Management and Building Re-Use: <ul style="list-style-type: none"> <li><input type="checkbox"/> Project is equipped with <b>cistern(s)</b> to collect and store rainwater</li> <li><input type="checkbox"/> Project equipped with National Plumbing Code compliant plumbing system designed to for <b>rainwater re-use</b> as non-potable water source within the building.</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, WE Credit 1:</p> <ul style="list-style-type: none"> <li>- 50% or 100% reduction in potable water used for irrigation</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 5 points awarded if using reclaimed water for irrigation</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- See above</li> </ul>	<p>NOTE: The City of Calgary has published a Rainwater Harvesting Handbook to clarify uses and technical requirements for rainwater systems including building services. This includes toilet flushing, irrigation and some wash facilities.</p>

		<ul style="list-style-type: none"> <li>• <b>Permeable Area:</b> METRIC; % of site coverage in approved permeable surface: <ul style="list-style-type: none"> <li>□ _____% of site area (including roofs) designed with permeable materials capable of absorbing a minimum 15 mm of precipitation over 24 hours without release to downstream system.</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, Several credits in Sustainable Sites refer to site permeability as options for compliance</p> <p>Green Globes</p> <p>Indicate pre and post development site imperviousness (%)</p> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Kelowna: 50% of area outside permitted site coverage is permeable</li> </ul>	<p>Examples of Permeable Surfaces:</p> <ul style="list-style-type: none"> <li>• Green roofs</li> <li>• Rain gardens</li> <li>• Bioswales</li> <li>• Wetponds</li> <li>• Dryponds</li> </ul>
Waste	<p><b>2.6.6</b></p> <p><b>Objective:</b> Support the City's goals for waste reduction</p>	<ul style="list-style-type: none"> <li>• <b>On-Site Storage of Recyclables:</b> <ul style="list-style-type: none"> <li>□ The building has provided a dedicated, enclosed recycling facility on-site.</li> </ul> </li> </ul>	<p><b>Green Rating System Analogues</b> LEED 2009, MR Prerequisite 1:</p> <ul style="list-style-type: none"> <li>- Development must have recycling facility for; paper, cardboard, glass, plastics, and metals</li> <li>-</li> </ul> <p>Green Globes</p> <ul style="list-style-type: none"> <li>- 5 points awarded for inclusion of recycling and composting facilities</li> </ul> <p><b>Other Municipal Examples</b></p> <ul style="list-style-type: none"> <li>- Toronto: Recycling and Organic waste handling areas must be within or attached to the building</li> </ul>	<ul style="list-style-type: none"> <li>• Plans must show dedicated recycling facilities on plans c/w approved site access for collection</li> </ul>

<p><b>Other Feature</b></p> <p>Those features that are <u>NOT</u> currently captured in the checklist that the applicant is undertaking</p>	<p><b>Innovative Features</b></p> <p>Innovative sustainability features not described above that the applicant has designed into the project</p>	<ul style="list-style-type: none"> <li>Inventory of innovative features not described above. Applicant to list</li> </ul>	<p><b>Other Feature</b></p> <p>Those features that are <u>NOT</u> currently captured in the checklist that the applicant is undertaking</p>	<p><b>Innovative Features</b></p> <p>Innovative sustainability features not described above that the applicant has designed into the project</p>	<ul style="list-style-type: none"> <li>Inventory of innovative features not described above. Applicant to list</li> </ul>
<p><b>Other Features Considered &amp; REMOVED DURING THE APPROVALS PROCESS:</b></p> <p>Those features that were removed from the project as a result of slow and/or onerous processes</p>	<p><b>Barriers for Removal</b></p> <p>Capture those sustainability features that were removed from a project due to perceptual or real barriers encountered during the approvals process</p>	<ul style="list-style-type: none"> <li>Inventory of features that were removed from the project; applicant to indicate what triggered removal and reasons for removal</li> </ul>	<p><b>Other Features Considered &amp; REMOVED DURING THE APPROVALS PROCESS:</b> Those features that were removed from the project as a result of slow and/or onerous processes</p>	<p><b>Barriers for Removal</b></p> <p>Capture those sustainability features that were removed from a project due to perceptual or real barriers encountered during the approvals process</p>	<ul style="list-style-type: none"> <li>Inventory of features that were removed from the project; applicant to indicate what triggered removal and reasons for removal</li> </ul>
<p><b>Other Features Considered &amp; REMOVED BY THE DESIGN TEAM FOR COST OR TECHNICAL REASONS:</b></p> <p>Those features that were considered in the initial project design but were removed from the project prior to submission</p>	<p><b>Technology Challenges</b></p> <p>Capture those sustainability features that were removed from the project for cost or technical reasons.</p>	<ul style="list-style-type: none"> <li>Inventory of features that were removed from the project; applicant to indicate what triggered removal and reasons for removal</li> </ul>	<p><b>Other Features Considered &amp; REMOVED BY THE DESIGN TEAM FOR COST OR TECHNICAL REASONS:</b> Those features that were considered in the initial project design but were removed from the project prior to submission</p>	<p><b>Incentives Required</b></p> <p>Capture those sustainability features that were removed from the project for cost or technical reasons.</p>	<ul style="list-style-type: none"> <li>Inventory of features that were removed from the project; applicant to indicate what triggered removal and reasons for removal</li> </ul>