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Special Edition - Clarifying Common Misinterpretations of Stormwater Management Credits

Like all LEED credits, Sustainable Sites (SS) credits 6.1 (Stormwater Management, Rate and Quantity) and SSc6.2 (Stormwater Management, Quality) are intended to award projects for design and construction strategies which achieve significant environmental benefit that exceeds standard practice. The requirements of these two credits are commonly misinterpreted by project

teams and consequently can lead to requests for additional documentation during the review process. This technical bulletin introduces six new Credit Interpretation Requests (CIRs) published by the Canada Green Building Council (CaGBC) in an effort to clarify the most common misinterpretations of the requirements and provide guidance to design teams on what is expected to support the achievement of these credits.

The most common misinterpretations are summarized in the table below. Information and links to relevant CIRs are included. Each of the CIRs referred to in this bulletin is available in the [online database](#) and is also provided in full within this bulletin, so that they may more easily be provided to the professionals responsible for meeting the requirements of SSc6 and thus better ensure the requirements are understood in their entirety.

Interested in knowing more?
[Register now](#) to join the Stormwater Management webinar March 4th from 1-2:30pm.

Misinterpretation	Guidance
Projects pursuing LEED Canada for New	Applicants should make every effort to document

<p>Construction (NC) and Core & Shell (CS) 2009 often attempt SSc6.1 or SSc6.2 using the Special Allowance Pathway to document project specific circumstances. Often, adequate documentation is not provided to support why this pathway has been used.</p>	<p>the project's compliance strategy using the tables provided in the LEED letter template. Where the project is not accurately represented in the LEED letter template, the Special Allowance Pathway may be used; however, adequate justification must be provided, including a narrative and calculations. All projects declaring special circumstances for SSc6.1, for example, must provide reasoning why the requirements of Case 1 or Case 2 are not applicable to their project.</p>
<p>Documentation is sometimes provided to support how the first 5mm of rainfall is treated instead of treating the runoff from 90% of average annual rainfall. This is often done because the municipal SWM requirements require treatment of the first 5mm of rainfall; however this is not adequate for LEED Canada NC/CS 2009 SSc6.2.</p>	<p>As per the clarification in CIR 1196, the treatment systems used within the Stormwater Management (SWM) Plan must have the capacity to handle the amount of rainfall (over a 24 hour period) that is identified in Table 1 of the LEED Canada Reference Guide for Green Building Design and Construction 2009 (e.g. if the site is in a humid watershed, the treatment system must be designed to handle 25mm of water over a 24 hour period).</p>
<p>Under LEED Canada NC/CS 2009 SSc6.2, applicants sometimes fail to demonstrate how 100% of the site (or area within the SWM plan) meets the credit requirements. For example, they may only provide information and calculations for runoff water produced by the parking lot area.</p>	<p>As per the clarification in CIR 1196, the applicant must demonstrate that all the area within the LPSA or SWM plan (including roofs, landscaping and sidewalks) is included in the credit calculations.</p>
<p>As per the LEED Canada Reference Guide for Green Building Design and Construction 2009, SSc6.2 requirements state: "capture and treat stormwater runoff from 90% of the average annual rainfall using acceptable best management practices (BMPs)". This is sometimes misinterpreted to mean that the project team only needs to treat runoff collected from 90% of the site area.</p>	<p>CIR 1196 clarifies that managing 90% of the average annual rainfall, per the SSc6.2-Stormwater Management, Quality, credit requirement, is equivalent to treating the runoff from the precipitation amounts listed in Table 1: Runoff Treatment Equivalents in the LEED Canada Reference Guide for Green Building Design and Construction 2009.</p>
<p>The responsible parties sometimes submit the SWM documentation provided to the municipality for permit to support SSc6 under either LEED Canada NC/CS 1.0 or 2009. In many instances the SWM plan submitted for permit does not address the LEED requirements. For example, the SWM plan may support how the first 5mm of rainfall is treated (demonstrating how they meet the municipality's SWM requirements), instead of treating the runoff from 90% of average annual rainfall (LEED Canada NC/CS 2009 SSc6.2 requirements).</p>	<p>As per the clarification in CIR 1197, the responsible party's Stormwater Management Report must be submitted to support the credit requirements, including (but not limited to) the following information:</p> <ul style="list-style-type: none"> ● SSc6.1, LEED Canada NC/CS 1.0 and 2009: Pre-development and post-development imperviousness. ● SSc6.1, LEED Canada NC/CS 1.0 and 2009: Pre-development and post-development rate and quantity data. ● SSc6.2, LEED Canada NC/CS 2009: Documentation to support the precipitation depth used to demonstrate capture and treatment of stormwater runoff from 90% of the average annual rainfall. Please refer to CIR 1196 for further clarification.

	<ul style="list-style-type: none"> SSc6.2, LEED Canada NC/CS 1.0 and 2009: Information about each BMP to justify TSS removal efficiency. Please refer to CIR 1198 for further clarification.
For SSc6.2 under LEED Canada NC/CS 2009, applicants sometimes declare the TSS removal efficiency listed in Table 2 of the LEED Canada Reference Guide for Green Building Design and Construction 2009 without providing any explanation of the factors impacting the performance of the BMP(s) implemented onsite to support their claim.	As per the clarification in CIR 1198 , for LEED Canada NC/CS 2009 projects the removal efficiencies listed in Table 2 of the LEED Canada Reference Guide for Green Building Design and Construction 2009 may be used however the removal efficiency must be justified by providing an explanation of the factors impacting the performance of the BMP(s) implemented onsite. The responsible party can refer to the "Factors to Consider" column of Table 2 and provide information about the BMP design factors to support their TSS removal efficiency claim, including the design parameters and assumptions made.
For LEED Canada NC/CS 1.0 projects, for SSc6.2, applicants sometimes declare TSS removal efficiencies for BMPs implemented onsite however the Civil Drawings or landscaping drawings do not support how the TSS removal efficiency is achieved.	As per the clarification in CIR 1198 , for audit of SSc6.2 under LEED Canada NC/CS 1.0, the responsible party must be able to justify the TSS removal efficiency by providing design parameters and assumptions made to support the BMP(s) design implemented onsite.
Applicants sometimes believe that LEED Canada NC/CS 2009 projects registered prior to CIR 1075 do not need to adhere to the clarification provided in this CIR.	As per the clarification in CIR 1199 , CIR 1075 is applicable to all projects not yet certified.
For SSc6.2 under LEED Canada NC/CS 2009, manufacturer documentation that specifies TARP II testing results for oil grit separators (OGSs) or manufactured treatment devices (MTDs) is sometimes provided to support how the OGS/MTDs meet the credit requirements.	As per the clarification in CIR 1200 , field performance monitoring data (e.g. TARP II Field Testing Results) issued by the manufacturer are only acceptable to support TSS removal efficiency of manufactured treatment devices where CIR 1075 has been followed and the applicant has provided certified documentation from the project civil engineer confirming that the results are appropriate for the project site.
For SSc6.1 under both versions of the LEED Canada NC/CS Rating Systems, applicants are sometimes unclear which best management practices meet the LEED requirements to detain storm water onsite to reduce the 24-hour peak rate and total quantity.	As per the clarification in CIR 1201 , provided that performance on peak discharge and quantity of stormwater is met within the 24 hour period, SSc6.1 – Stormwater Management, Rate and Quantity, can be achieved by detaining stormwater using a cistern, roof, parking lot or other infrastructure that controls discharge to the receiving infrastructure or water body.

CIR 1196: Clarification of SSc6.2 Credit Requirements

Credit: SSc6.2

Rating System: LEED Canada NC/CS 2009

Summary Question

Please clarify the SSc6.2 – Stormwater Management, Quality, requirement: "capture and treat stormwater runoff from 90% of the average annual rainfall using acceptable best management practices (BMPs)" under LEED Canada NC/CS 2009.

Final Ruling

As per the LEED Canada Reference Guide for Green Building Design and Construction 2009, SSc6.2 requirements state: "capture and treat stormwater runoff from 90% of the average annual rainfall using acceptable best management practices (BMPs). BMPs used to treat runoff must be capable of removing 80% of the average annual post-development TSS load".

As per the Implementation section of the Reference Guide, managing 90% of the average annual rainfall is equivalent to treating the runoff from the 24 hour precipitation amounts listed in Table 1: Runoff Treatment Equivalents in the LEED Canada Reference Guide for Green Building Design and Construction 2009. That is, the treatment systems used within the Stormwater Management (SWM) Plan must have the capacity to handle the amount of rainfall (over a 24 hour period) that is identified in Table 1 (e.g. if the site is in a humid watershed, the treatment system must be designed to handle 25mm of water per 24 hour period).

To clarify:

- The applicant must demonstrate that all the area within the LPSA or SWM plan (including roofs, landscaping and sidewalks) is included in the credit calculations. Providing information and calculations for runoff water produced by the parking lot area exclusively, for example, is not sufficient to demonstrate credit compliance.
- Submitting documentation that supports how the first 5mm of rainfall is treated is not sufficient to demonstrate compliance with the credit requirements.
- Treating rainwater that lands upon 90% of the LEED Project Site Area (LPSA) is not equivalent to capturing and treating stormwater runoff from 90% of the average annual rainfall, as required by the credit.
- The responsible party must be able to justify how landscaped areas can infiltrate water at a rate and quantity sufficient to absorb at least 90% of the annual rainfall volume, while also meeting the requirement to remove 80% of the average annual post-development TSS load. For example, the responsible party must be able to provide information about the soil type and slope of the landscaped area to support how this area was designed to have 80% TSS removal for 90% of the average annual rainfall.

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CIR 1197: Clarification of Documentation to Support Credit Compliance for SSc6 – Stormwater Management

Credit: SSc6.1 and SSc6.2

Rating System: LEED Canada NC/CS 1.0 and 2009

Summary Question

What required documentation and information is most often missing from submittal documentation for SSc6.1 and SSc6.2 under LEED Canada NC/CS 1.0 and 2009?

Final Ruling

For documenting SSc6.1 and SSc6.2, project teams often provide the Stormwater Management (SWM) documentation that was provided to the municipality for local approval or permit. In many cases, this documentation is not sufficient to support credit compliance. In this event, the applicant must provide a revised SWM report that includes all information listed below, or documentation from the responsible

party to demonstrate that each LEED requirement has been met.

In all cases, the LEED letter template and documentation submitted should include the following information:

- SSc6.1, LEED Canada NC/CS 1.0 and 2009: Pre-development and post-development imperviousness. Pre-development imperviousness must be included in the documentation submitted, not just post-development imperviousness. This supports the choice of compliance pathways.
- SSc6.1, LEED Canada NC/CS 1.0 and 2009: Pre-development and post-development rate and quantity data. Often only the post-development rate and quantity data is submitted; however, pre-development rate and quantity data must also be provided.
- SSc6.1, LEED Canada NC/CS 1.0 and 2009: Calculations to demonstrate how the quantity requirements are met. The documentation provided must support how the quantity (in addition to rate) requirements are met, including pre-development and post-development quantity calculations.
- SSc6.2, LEED Canada NC/CS 2009: Documentation to support the precipitation depth used to demonstrate capture and treatment of stormwater runoff from 90% of the average annual rainfall. Please refer to CIR 1196 for further clarification.
- SSc6.2, LEED Canada NC/CS 1.0 and 2009: Information about each Best Management Practice (BMP) to justify TSS removal efficiency. Please refer to CIR 1198 for further clarification.

Under LEED Canada NC/CS 2009, as per the Implementation section of the LEED Canada Reference Guide for Green Building Design and Construction 2009, BMPs that qualify for SSc6.2 can be designed in accordance with standards and specifications from a provincial or local program (if that program has adopted the 80% TSS removal standard). The responsible party must be prepared to justify how the BMP(s) implemented meet this standard/specification.

If the SWM plan provided claims compliance with local requirements that align with the LEED requirements, then the applicant must provide a copy of the local requirements. Where local requirements are not the same as the LEED requirements then the applicant must ensure the submittals articulate how each LEED requirement has been met.

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CIR 1198: TSS Removal Efficiencies

Credit: SSc6.2

Rating System: LEED Canada NC/CS 1.0 and 2009

Summary Question

What information is required to support the total suspended solid (TSS) removal efficiency for the Best Management Practice(s) (BMPs) used to comply with the credit requirements?

Final Ruling

For LEED Canada NC/CS 2009 projects, as per the Implementation section of the LEED Canada Reference Guide for Green Building Design and Construction 2009, Table 2 provides sample documentation of TSS removal effectiveness for various BMPs. The TSS removal efficiencies listed in this table may be used; however, the removal efficiency must be justified by providing an explanation of the factors impacting the performance of the BMP(s) implemented onsite (the 'design factors').

The responsible party can refer to the "Factors to Consider" column of Table 2 and provide information about the BMP design factors to support their TSS removal efficiency claim, including the design parameters and assumptions made. The responsible party may either refer to the design factors listed in Table 2 under the column entitled 'Factors to consider', or provide information to support design factors

listed in the referenced Provincial or local program, or national or regional source standard used. For manufactured treatment devices (e.g. oil grit separators), refer to CIR 1075.

For LEED Canada NC/CS 1.0 projects, TSS removal efficiencies for BMPs implemented onsite must be included in the Stormwater Management (SWM) plan and/or the Civil Drawings/Landscaping drawings to support how the TSS removal efficiency is achieved. If audited, the responsible party must be able to justify the TSS removal efficiency by providing design parameters and assumptions made to support the BMP design implemented onsite.

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CIR 1199: Applying CIR 1075 for Projects Registered Before the Date of Final Ruling

Credit: SSc6.2

Rating System: LEED Canada NC/CS 2009

Summary Question

Does CIR 1075 (final ruling date of 2013/10/01) apply to my project registered prior to the final ruling date of CIR 1075?

Context and Arguments

As per the Requirements and Implementation section of the LEED Canada Reference Guide for Green Building Design and Construction 2009, best management practices must either be in accordance with (1) standards and specifications from provincial, territorial or local programs or (2) have field performance monitoring data from an accepted protocol.

Manufactured treatment devices can be used towards credit achievement; however, the applicant must demonstrate performance based on appropriate testing.

Final Ruling

Yes, CIR 1075 is applicable to all projects not yet certified. CIRs are clarifications, not new requirements; therefore they apply to all projects that are not yet certified. The CaGBC does not impose new requirements through the CIR process, and neither credit language nor achievement thresholds can be changed through the CIR process.

CIR 1075 (which supersedes CIR 707, applicable to both LEED Canada NC/CS 1.0 and 2009 projects), clarifies that the efficiency of a TSS Manufactured Treatment Device (MTD) should be based on testing that utilizes a wide grain size distribution (GSD), such as the New Jersey Department of Environmental Protection (NJDEP) protocol. If the TSS MTD (including oil grit separators) does not meet the NJDEP 80% removal efficiency then the applicant must provide certified documentation from the project civil engineer (e.g. a sealed memorandum or letter) confirming that the alternative standard is appropriate for the project site. In all cases manufacturer's documentation must be provided that demonstrates performance achieved and the standard of testing used.

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CIR 1200: TARP II Field Testing to Support SSc6.2

Credit: SSc6.2

Rating System: LEED Canada NC/CS 2009

Summary Question

Are field performance testing results (e.g. TARP II) sufficient to support the TSS removal efficiency claimed for a manufactured treatment device that contributes to SSc6.2 – Stormwater Management,

Quality?

Final Ruling

Yes; provided that CIR 1075 has been followed, field performance monitoring data, such as TARP II Field Testing results issued by the manufacturer, is acceptable to support the TSS removal efficiency claimed for a manufactured treatment device that contributes to SSc6.2 – Stormwater Management, Quality.

As per CIR 1075, the applicant must provide certified documentation from the project civil engineer (e.g. a sealed memorandum or letter) confirming that the field performance testing results are appropriate for the project site. In all cases manufacturer's documentation must be provided that demonstrates performance achieved and the standard of testing used.

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CIR 1201: Detaining Water to Comply with Credit Requirements

Credit: SSc6.1

Rating System: LEED Canada NC/CS 1.0 and LEED Canada NC/CS 2009

Summary Question

Provided that performance requirements for peak discharge and quantity of stormwater within a 24 hour period are met, can SSc6.1 – Stormwater Management, Rate and Quantity, be achieved by detaining stormwater using a cistern, roof, parking lot or other infrastructure that controls discharge to the receiving infrastructure or water body?

Final Ruling

Yes; provided that performance on peak discharge and quantity of stormwater is met within the 24 hour period, SSc6.1 – Stormwater Management, Rate and Quantity, can be achieved by detaining stormwater using a cistern, roof, parking lot or other infrastructure that controls discharge to the receiving infrastructure or water body. This is consistent with CIR 328 (written for LEED Canada NC/CS 1.0 projects) and the Interpretations section of the LEED Canada Reference Guide for Green Building Design and Construction 2009.

Note that the applicant must demonstrate that both the rate and quantity requirements are met. That is, the responsible party must be able to demonstrate that both the rate and volume of water that leaves the storage area (or entire area included in the Stormwater Management plan, where applicable) over a 24 hour period complies with the credit requirements. For instance, in the case of a cistern, it should be demonstrated that the cistern will be holding the stormwater long enough to reduce the 24-hour peak discharge and total quantity.

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