

LEED™ Implementation Task Force Report

March 2003

Leadership in
Energy and
Environmental
Design

Prepared by:
The LEED™ Implementation Task Force

Executive Summary

This report presents the work of the LEED™ Implementation Task Force (LITF), which was created in response to the following three motions that APEGBC Council passed at the 2001 Annual General Meeting:

1. *The LEED™ model be the preferred method for building environmental assessment in British Columbia.*
2. *A proactive role be taken in encouraging the Association's members to address sustainability issues such as are identified in the LEED™ model.*
3. *The Association seek input from the Consulting Engineers of BC and the Sustainability Committee on implementing its recommendation to adopt the LEED™ model.*

The Task Force convened monthly to discuss possible issues that Members may face when trying to use the LEED™ framework in practice and to suggest solutions for addressing these issues. This report presents these findings along with an **Action Plan** that the Task Force is putting before Council to consider. This Action Plan clearly outlines actions and responsibilities that APEGBC Staff and Committees can take in helping Members implement the LEED™ framework in practice.

The main recommendations of the LITF are:

- **Choose a Coordinator** to oversee the implementation of the Action Plan.
- Create a **Sustainability Primer on Buildings** that contains an overview of LEED™. A draft document has already been created. The LITF recommends reviewing and editing this draft and including results from this Task Force.
- Create a **LEED™ Information webpage** on both the APEGBC website and the Sustainability Committee website where Members can view relevant documents and find links to more information.
- Become a **member of the US Green Building Council**, (the US Green Building Council is responsible for organizing the LEED™ framework).
- Write **letters of support** to municipalities, provincial and federal ministries, and engineering and geoscience associations demonstrating APEGBC's commitment to sustainability and encouraging the use of building environmental assessments tools like LEED™.
- Write **letter** to the US Green Building Council to express APEGBC's concern that durability is an important component of the LEED™ program.
- **Communicate to APEGBC members** that durability should be considered in addition to the current LEED™ requirements.
- Summarize **cost-benefit research** and compile into either a stand-alone document or as part of the Sustainability Primer on Buildings. Most of the research has already been completed.
- Summarize **liability and risk research** and compile into either a stand-alone document or as part of the Sustainability Primer on Buildings. Most of the research has already been completed.

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Sustainability and Buildings

Engineers and geoscientists offer key value-added services to the design, construction and operation of buildings. Sustainability represents another opportunity for engineers and geoscientists to add value to the services that they provide.

The LEED™ building rating and certification system is intended as a guideline and building performance rating system. It is not intended to be used as a requirement to use untried and untested building systems approaches for new building designs. The sole responsibility for the use of any new building systems, guarantees or design performance warranties resides with the designers and building design and construction professionals. The LEED™ system is not intended or meant to incur or add any further level of design liability to the building professionals.

A sustainable building or green building is often defined as a building with low environmental impacts. An increasingly popular method for measuring the environmental performance of a building is the LEED™ framework, which stands for Leadership in Energy and Environmental Design.

Most professionals who have used LEED™ claim that, despite some weaknesses, it still is one of the easiest yet comprehensive building assessment tools available. It is a voluntary rating system that is organized by the US Green Building Council. A number of jurisdictions, including the City of Seattle, have adopted LEED™ as a standard for all new public buildings. The City of Vancouver is also considering the merits of adopting a minimum LEED™ standard for all new public buildings.

A unique aspect of LEED™ is its marking system, which ranks a building as Uncertified, Certified, Silver, Gold, and Platinum. As an example, the Vancouver Island Technology Park was the first building in Canada to be awarded LEED™ V2.0 Gold. The 'Gold' designation signifies a level of 'environmental performance' as defined by a number of objectives, which are outlined within the LEED™ framework.

At the moment, the US Green Building Council organizes LEED™. The Federal Government is considering creating a Canadian Green Building Council that would likely be responsible for organizing a Canadian version of LEED™. A version for British Columbia, called LEED™ BC, has already been developed and is currently being reviewed by the US Green Building Council.

APEGBC Council Motion

At the 2001 Annual General Meeting, the APEGBC Council passed the following motion regarding the US Green Building Council's LEED™ (Leadership in Energy and Environmental Design) model:

- 1. The LEED™ model be the preferred method for building environmental assessment in British Columbia.*
- 2. A proactive role be taken in encouraging the Association's members to address sustainability issues such as are identified in the LEED™ model.*
- 3. The Association seek input from the Consulting Engineers of BC and the Sustainability Committee on implementing its recommendation to adopt the LEED™ model.*

A LEED™ Implementation Task Force (LITF) was created in January to address these three motions. The LITF Terms of Reference is presented in Appendix 1. The list of LITF members is presented in Appendix 2. A brief overview (FAQ) of LEED™ is presented in Appendix 3.

Purpose and Methodology

The primary purpose of the LITF was to report to Council on how APEGBC can address the issues relevant to the three motions passed by Council at the 2001 Annual General Meeting. In particular, this report presents the Task Force's findings along with an Action Plan for APEGBC to implement (pending Council's approval).

The LITF approached this task by first summarizing potential issues that engineers and geoscientists may face when trying to implement the LEED™ framework in practice. The LITF compiled a list of issues and reduced these down to five major issues. The Task Force then compiled a list of potential solutions, which in turn became Action Items.

Issues

The LITF came up with five major issues or topics that are relevant to both Members and APEGBC.

Issue 1 Coordinated Approach

APEGBC needs to maintain a coordinated approach to implement LEED™.

Issue 2 Education and Awareness

Most APEGBC Members will likely have little understanding or awareness of building environmental assessment tools like LEED™ and how these frameworks are applied in practice.

Issue 3 Commitments and Leadership

APEGBC must actively demonstrate its commitments to promoting the use of building environmental assessment tools like LEED™ and sustainability issues in general.

Issue 4 Costs and Benefits

There is some uncertainty as to what the economic implications of implementing a building environmental assessment tool like LEED™ are – namely how it would affect short and long-term project costs, engineering fees, and consulting time.

Issue 5 Liabilities and Risks

There may be risk and liability implications of designing and constructing a LEED™ building. If there are, what are the potential impacts on engineering fees and liability insurance?

Action Plan

The LITF compiled a list of solutions in response to the list of potential issues. These solutions were summarized into a list of action items presented below. Most of the action items tie in with APEGBC's Sustainability Management System as indicated in the right-hand column of the table.

The primary recommendations are shaded grey within the Action Plan table. These include:

1. **Choose a Coordinator (1.1)** to oversee the implementation of the Action Plan.
2. Create a **Sustainability Primer on Buildings (2.4 & 2.5)** that contains an overview of LEED™. A draft document has already been created. The LITF recommends reviewing and editing this draft and including results from this Task Force.
3. Create a **LEED™ Information webpage (2.7)** on both the APEGBC website and the Sustainability Committee website where Members can view relevant documents and find links to more information.
4. Become a **member of the US Green Building Council (3.1)**. (The US Green Building Council is responsible for organizing the LEED™ framework).
5. Write **letters of support (3.4)** to municipalities, provincial and federal ministries, and engineering and geoscience associations demonstrating APEGBC's commitment to sustainability and encouraging the use of building environmental assessments tools like LEED™.
6. Summarize **cost-benefit research (4.1)** and compile into either a stand-alone document or as part of the Sustainability Primer on Buildings. Most of the research has already been completed.
7. Summarize **liability and risk research (5.1)** and compile into either a stand-alone document or as part of the Sustainability Primer on Buildings. Most of the research has already been completed.
8. Write **letter to the US Green Building Council (3.5)** to express APEGBC's opinion that durability is an important component of the LEED™ program.
9. **Communicate to APEGBC members (2.10)** that durability should be considered in addition to the current LEED™ requirements.

1.0 Coordinator						
Action Item	How	Who	When	Cost	Note	SMS Link
<i>Recommended action items</i>	<i>Suggested method for implementing proposed action.</i>	<i>Coordinator, LITF, ...</i>	<i>Deadline</i>	<i>Budget or time required.</i>	<i>Additional information.</i>	<i>(SMS) Sustainability Management System</i>
1.1 Choose Coordinator	LITF recommends an individual or committee to oversee the LITF action items. This person or committee will ensure that these action items are implemented.	Sustainability Committee	Begin November 2002 following the AGM 2002 and continue until next AGM.	Time for Coordinator to implement action items.	Choosing the Sustainability Committee as the Coordinator makes the most sense since many of these action items tie in with the SMS.	The APEGBC SMS is coordinated by the Sustainability Committee. Many of the following action items coincide with action items in the SMS.

2.0 Awareness & Education

Most APEGBC Members will likely have little understanding or awareness of building environmental assessment tools like LEED™ and how these frameworks are applied in practice. APEGBC can play an active role in building awareness and educating its Members about LEED™. Members will likely have general to specific questions about how, when and where LEED™ is applied.

2.0 Awareness & Education						
Action Item	How	Who	When	Cost	Note	SMS Link
<i>Recommended action items</i>	<i>Suggested method for implementing proposed action.</i>	<i>Coordinator, LITF, ...</i>	<i>Deadline</i>	<i>Budget or time required.</i>	<i>Additional information.</i>	<i>(SMS) Sustainability Management System</i>
Articles						
2.1 <i>Article in Innovation</i>	Encourage Members to submit LEED™ related articles for Innovation. Also, write an article after the 2002 AGM presenting the LITF results. Work with LITF could develop the scope of the article and suggest someone who would be willing to write the article. Communications Dept. will then edit article for Innovation. Another option to write an article after the 2002 AGM to present LITF report.	APEGBC Member(s) writes article; Communications Dept edits & publishes. The Coordinator can help to solicit stories for Innovation and could write an article on the LITF results presented at the 2002 AGM.	Innovation schedule is posted at: www.apeg.bc.ca/innovation/editorial.html . Upcoming issues: Oct (civil/structural), and Nov (environmental). Articles are due 1-month before publication date.	Time for Member(s) to write article. Time for the Coordinator to write article. Time for Editor of Innovation to edit article	Jennifer White, Editor of Innovation, suggests that a case study would be most appropriate. An overview of LEED™ could be built into the case study. Maybe the Van. Isl. Tech Park? <u>READ</u> the editorial guidelines before submitting an article (Guidelines are posted on the website).	SMS 4.1 Communications Plan
2.2 <i>2003 Engineering Week</i>	Collect stories for Communications Department. Companies typically provide the stories and then the Manager of Member & Public Affairs (Glenn Martin) chooses stories, edits them and publishes them in a newspaper-style format. The Coordinator will need to bring stories to the attention of Glenn Martin.	Manager of Member & Public Affairs (Glenn Martin) and the Coordinator	Feb 2003 = Deadline for stories. Stories are typically collected during Jan & Feb.	Time for Coordinator to collect stories and time for Glenn to edit & publish.	These stories are often based on articles published in Innovation during the previous year.	SMS 4.1 Communications Plan
2.3 <i>Local Newspaper</i>	Contact editor of a local newspaper and suggest a story on LEED™. Provide background information and the opportunity for an interview if necessary.	Coordinator.	2003 AGM	Time for the Coordinator to work with newspaper.		SMS 4.1 Communications Plan

Information/FAQ						
2.4 FAQ	Write a brief (1-2 pg) FAQ on LEED™ answering basic questions that Members may have. Base the FAQ on USGBC brochures, City of Vancouver FAQ (by Andrea Wickam), and/or the LEED™ article in the January issue of Sustainability Now (See Appendix 3). Recommend publishing in Innovation after the 2002 AGM along with a report of the LITF results.	Coordinator	November & December 2002	Time for Coordinator to write FAQ.	Whenever possible, use FAQ's from USGBC and/or City of Vancouver. FAQ could be distributed as a 2-page handout, as an electronic document available on the APEGBC website, and/or in Innovation.	SMS 3.1 Sustainability Primer (Buildings Module)
2.5 <i>Sustainability Primer - Building Module</i>	Incorporate LEED™ into the Sustainability Primer Building Module. Also include a green products database or information source for green building information.	Rob Dies has developed a draft Building Module, which includes an FAQ on LEED™.	March 2003	Time for the Coordinator, Members and APEGBC Staff to review and edit module.	This is part of the APEGBC Sustainability Primer initiative. Rob Dies has already created a draft Building module. The module needs to be reviewed and edited by Members who work in the building sector.	SMS 3.1 Sustainability Primer (Buildings Module)
Continuing Education						
2.6 <i>Continuing Education</i>	Work with the Manager of Professional Development (Janet Guscott) to develop LEED™ courses/ presentations for engineers. Options: → APEGBC sponsored course (for example, ask USGBC to develop engineering-specific course on LEED™). → Jointly sponsored APEGBC-AIBC course. → Inform Members of external courses (example: inform Members of AIBC courses by posting information on our PD webpage).	The Coordinator working with the Manager of Professional Development (Janet Guscott).	Continuing education program to run between AGM 2002 and AGM 2003.	Depends on the scope of the course.	Janet needs approximately 2 months in advance to coordinate & advertise a course. External courses, such as those offered by AIBC, can be posted on the APEGBC Professional Development website. Should be up to the Coordinator to inform Janet of external courses. Suggest a brainstorming session with Janet Guscott in November after the AGM.	SMS 3.4 Continuing Education SMS 4.3 Partnerships
Website						
2.7 <i>LEED™ Information on Website</i>	Create a separate LEED™ webpage on the APEGBC website with links to relevant websites and documents,	The Coordinator and the APEGBC Webmaster (Dale Lessoway).	November 2002	Time for Coordinator and Webmaster to create webpage.	Potential content: FAQ, sustainable/green building weblinks, upcoming courses & events, LITF	SMS 3.1 Sustainability Primer (Buildings Module), SMS 4.1

	including a link to the Sustainability Committee website, which will contain more detailed information on LEED™ and green buildings. Also ensure that the APEGBC Events Calendar and Professional Development webpage are periodically updated with LEED™-related activities and courses being offered internally and externally. The Coordinator would work with the APEGBC Webmaster (Dale Lessoway) to create this webpage.				report...	Communications Plan, SMS 4.2 Website
Other						
2.8 <i>Sustainable Building Exhibition and or Award</i>	Recommend continuing with the successful Doors to Sustainability exhibition, which was jointly organized with AIBC. Consider creating a Sustainable Building Award in conjunction with the exhibition.	The Coordinator in conjunction with APEGBC Communications Dept.	Start November 2002 and have ready for AGM 2003 .	Time to organize exhibition in conjunction with AIBC.	The Doors to Sustainability Exhibition, held September 2001 to March 2002, was a success. For more information, visit: www.sustainability.ca/index.cfm?body=SourceView.cfm&ID=86&CFID=307682&CFTOKEN=11713906	SMS 4.1 – Communications Plan

<p>2.9 <i>APEGBC Performance Guidelines</i></p>	<p>Recommend that the APEGBC Performance Guidelines be reviewed to see if there is an opportunity to incorporate new building design and construction methods that are emerging from the green/sustainable building industry. For example, integrated design processes and design charettes are becoming common practice in the design of LEED™ buildings. There is an increased focus on integrating all aspects of building design and construction in order to optimize the overall design of a building. Another option is to create another performance guideline on Integrated Design, covering issues that Members may face when designing as a team.</p> <p>The LEED™ building rating and certification system is intended as a guideline and building performance rating system. It is not intended to be used as a requirement to use untried and untested building systems approaches for new building designs.</p>	<p>The Coordinator in conjunction with representatives from the building industry and possibly with AIBC.</p>	<p>AGM 2003</p>	<p>Time to create guideline(s).</p>	<p>This might be a great project to do jointly with AIBC as architects likely have similar interests in creating guidelines that encourage better communication and integration of design processes.</p>	<p>SMS 1.5 Practice Guidelines</p>
<p>2.10</p>	<p>Communicate to APEGBC members that durability should be considered in addition to the current LEED™ requirements by posting this report on the website.</p>	<p>The Coordinator</p>	<p>Upon Approval of LITF Final Report</p>			

3.0 Commitments and Leadership

APEGBC must actively demonstrate its commitments to promoting the use of building environmental assessment tools like LEED™ and sustainability issues in general.

3.0 Commitments and Leadership						
Action Item	How	Who	When	Cost	Note	SMS Link
<i>Recommended action items</i>	<i>Suggested method for implementing proposed action.</i>	<i>Coordinator, LITF, ...</i>	<i>Deadline</i>	<i>Budget or time required.</i>	<i>Additional information.</i>	<i>(SMS) Sustainability Management System</i>
Commitments						
3.1 <i>Member of USGBC</i>	Become a member of the US Green Building Council. Annual fee = US \$300.	APEGBC	AGM 2003	US \$300		
3.2 <i>Member of the Canadian Green Building Council</i>	Become a member of the Canadian Green Building Council if this council is formed.	APEGBC	As soon as a Canadian Green Building Council is formed and provided the fee is not too high.	To be determined	The Federal Government is currently considering creating a Canadian Green Building Council.	
3.3 <i>LEED™ Accredited Staff Member</i>	Have an APEGBC Staff Member or Committee Member become LEED™ accredited.	Recommend that at least one person on the Sustainability Committee be LEED™ Accredited.	2003 AGM	US \$250 - \$350 member/non-member	The exam consists of 100 multiple-choice questions. Exams are offered in the Vancouver area.	
Leadership						
3.4 <i>Letter of Support</i>	Write a letter to appropriate departments/ministries in the provincial and federal governments, BC municipalities, provincial engineering associations, CCPE, and appropriate APEGBC Committee's stating: 1) APEGBC's position on the use of building environmental assessment tools like LEED™, 2) APEGBC's support for the creation of a Canadian Green Building Council, 3) Encouraging the reinstatement of the Building	Letters from the President with help from the Coordinator.	January 2003	Time to write letters.	The letters would demonstrate APEGBC's commitment to sustainability and specifically, to building environmental assessment tools like LEED™. This letter could also be printed in Innovation.	SMS 4.3 Partnerships

	Standards Branch with a focus on sustainability, and Supporting the continuation of LEED™ BC.					
3.5 Letter of APEGBC position on durability	Write letter to the US Green Building Council to express APEGBC's opinion that durability is an important component of the LEED™ program.	Letters from the President with help from the Coordinator.		Time to write letter.		
Communication						
3.6 USGBC Cascadia Branch, Vancouver Chapter	Have at least one APEGBC Sustainability Committee Member attend the USGBC Cascadia Branch meetings to ensure that APEGBC is represented and kept informed.	The Coordinator or an APEGBC Staff Member.	Ongoing following the 2002 AGM.	Chapter time commitments.	The Vancouver Chapter of the Cascadia Branch of USGBC is probably one of the most active LEED™-related groups in the province.	SMS 4.3 Partnerships

4.0 Costs and Benefits

There is some uncertainty as to what the economic implications of implementing a building environmental assessment tool like LEED™ are – namely how it would affect short and long-term project costs, engineering fees, and consulting time.

4.0 Costs & Benefits						
Action Item	How	Who	When	Cost	Note	SMS Link
<i>Recommended action items</i>	<i>Suggested method for implementing proposed action.</i>	<i>Coordinator, LITF, ...</i>	<i>Deadline</i>	<i>Budget or time required.</i>	<i>Additional information.</i>	<i>(SMS) Sustainability Management System</i>
4.1 Cost-Benefit Literature Review and Publication	Recommend that CEBC take part in this task. Suggest as a product: a concise document on the financial costs and benefits of a LEED™ building in comparison to a standard building. This might best be achieved by summarizing financial costs/benefits of local and international case studies – as collected from a literature review. The results could be published in Innovation, within the Building Module of the Sustainability Primer, or in a separate document.	The Coordinator.	AGM 2003	Time to do research and write report.	The LITF (Geoff McDonell) has already done some research on this subject. Rob Dies has incorporated this information into a first draft of the Primer Building Module. There is room for expanding on this and or creating a stand-alone document. It would be useful to coordinate what has been done to date with CEBC – for their interest sake and feedback. Furthermore, a graduate student at UBC	SMS 3.1 Sustainability Primer (Building Module)

					wrote a paper on the “Costs and Benefits of LEED™ Green Buildings” for the City of Vancouver. A link to this document was put in the Building Module.	
4.2 <i>Engineering Fee Guidelines</i>	Recommend APEGBC consider creating a guideline on fees with a focus on value-added engineering solutions. Recommend adding LEED™ as an additional service item. Also suggest conducting a survey of engineering and geoscience fees.	The Coordinator in conjunction with CEBC and representatives from industry.	AGM 2003.	To be determined	As one example: percentage-based fee contracts often take away the incentive to design more energy efficient buildings.	

5.0 Potential Risks and Liabilities

There may be risk and liability implications of designing and constructing a LEED™ building. If there are, what are the potential impacts on engineering fees and liability insurance?

5.0 Risks and Liabilities						
Action Item	How	Who	When	Cost	Note	
<i>Recommended action items</i>	<i>Suggested method for implementing proposed action.</i>	<i>Coordinator, LITF, ...</i>	<i>Deadline</i>	<i>Budget or time required.</i>	<i>Additional information.</i>	
5.1 <i>Risk & Liability Literature Review</i>	Recommend completing background research on previous or existing liability cases (if any) and or, suggest potential pathways to liability – what are the potential risks, major uncertainties, and potential liabilities. Also look into research on increased worker productivity in healthier buildings. Recommend a short summary report on findings that could be integrated into the Sustainability Primer on Buildings.	The Coordinator.	AGM 2003	Time to do research, compile research, and write document.	Phil Johnson P.Eng., Brian Lee P.Eng., Jamie McKay P.Eng., and Leslie Peer P.Eng. have compiled a list of 12 lessons learned from the leaky condo problem (see Appendix 5). Michel de Spot has some information regarding 2 pending USGBC liability cases. All of this information could be incorporated into the Sustainability Primer Building Module.	SMS 3.1 Sustainability Primer (Building Module)

Appendix 1. LEED™ Implementation Task Force Terms of Reference

NAME	<ul style="list-style-type: none">• LEED™ (Leadership in Energy and Environmental Design) Implementation Task Force
TYPE	<ul style="list-style-type: none">• Task Force reporting to Council.
PURPOSE AND FUNCTION	<ul style="list-style-type: none">• To take action on the Council resolution taken at the 2001 Annual General Meeting stating that:<ol style="list-style-type: none">1. the LEED™ model be the preferred method for building environmental assessment in British Columbia2. a proactive role be taken in encouraging the Association's members to address sustainability issues such as are identified in the LEED™ model3. the Association seek input from the Consulting Engineers of British Columbia and the Sustainability Committee on implementing its recommendation to adopt the LEED™ model.• Examine how to implement the LEED™ Green Building Rating System in the practice of professional engineering in British Columbia where the use of LEED™ as a building environmental assessment tool is applicable and provide recommendations and an implementation plan to Council for consideration and action.• Identify issues related to the implementation of LEED™ and develop recommendations on solutions to address these issues for Council consideration.• Develop and recommend a communications strategy for Council consideration.• Develop and recommend a professional development strategy for Council consideration.• Liaise with groups and organizations involved in the LEED™ development and adoption in British Columbia, Canada and the United States.
MEMBERSHIP	<ul style="list-style-type: none">• Five to ten members who are representatives from the:<ul style="list-style-type: none">• Sustainability Committee;• Consulting Practice Committee;• Building Codes Committee;• Consulting Engineers of British Columbia (CEBC); and• other representatives of the building community.
METHOD OF APPOINTMENT	<ul style="list-style-type: none">• By Council
DURATION OF APPOINTMENT	<ul style="list-style-type: none">• The Task Force will continue to exist until the Association's 2002 Annual General Meeting or until its recommendations are accepted by Council.

SELECTION OF OFFICERS

- The Chair shall be appointed by a majority vote of the members of the Task Force.

QUORUM

- Three members of the Task Force.

FREQUENCY OF MEETINGS

- Meetings will be held once a month with exceptions as directed by the Chair.

MINUTES

- Minutes and other related administrative duties are the responsibility of the Director, Professional Practice and Ethics.

APPROVED BY COUNCIL: January 23, 2002 (Minute # CO 02-26)

Appendix 2. LEED™ Implementation Task Force Members

Michel de Spot, P.Eng., Chair

James Blake, P.Eng.

Rob Dies, E.I.T, Sustainability Researcher

Phil Johnson, P.Eng.

Brian Lee, P.Eng.

Carol Lee, Assistant to the Director, Professional Practice and Ethics

Geoff McDonell P.Eng.

Jamie McKay P.Eng.

Leslie Peer, P.Eng.

Willie Perez, P.Eng.

Ross Rettie, P.Eng., Director, Professional Practice and Ethics

Ian Theaker, P.Eng.

Rod Yeoh, P.Eng.

Appendix 3. Frequently Asked Questions About LEED™

Building assessment tools are used to evaluate the environmental performance of buildings. LEED™, which stands for Leadership in Energy and Environmental Design, is one example of an increasingly popular building assessment tool developed by the US Green Building Council (USGBC – www.usgbc.org). A BC version of LEED™ is currently being developed and a draft copy will be available at: www.greenbuildingsbc.com/new_buildings/docs_for_review.html.

How does LEED™ work?

LEED™ measures and ranks a building's environmental performance in terms of 6 general categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, and Innovation & Design. Points are awarded for achieving specific goals clearly outlined in each category. The total number of points possible is 69. A score of 26-32 points achieves basic certification; 33-38 achieves Silver; 39 – 51 Gold; and 52+ achieves Platinum certification.

How is a building certified?

At the moment, official LEED™ certification is organized through the USGBC. The USGBC LEED™ website (www.usgbc.org/programs/leed.htm) provides a summary of the three steps to certification.

Is LEED™ mandatory?

NO. LEED™ is a voluntary building assessment tool. Some jurisdictions like the City of Seattle; however, have adopted a minimum LEED™ standard for all new public buildings as a matter of policy. The City of Vancouver is currently considering the merits of adopting a minimum LEED™ standard for all new public buildings.

Does LEED™ cost more?

The answer to this will come over time as more case studies are documented. The USGBC took a first stab at the question by issuing a memo in August summarizing a number of case studies. In general, they found initial capital costs to be 1-4% higher than conventional buildings while long-term costs were “significantly lower”.

What types of buildings is LEED™ most applicable to?

LEED™ is most applicable to existing and new commercial, institutional and high-rise residential buildings. The underlying concepts embodying the LEED™ process are also very relevant and useful for smaller residential building design.

Some benefits of LEED™

- Simplicity—final results are summarized on a one-page ‘scorecard’,
- Not overly prescriptive – room for interpretation,
- Potentially significant long-term cost benefits,
- Modifiable – can be modified to local conditions & regulations,
- Marketable – as it becomes more popular, consumers will begin to recognize the LEED™ label as a measure of environmental performance.

Where can I find more information?

US Green Building Council: www.usgbc.org

GreenBuildings BC: www.greenbuildingsbc.com

USGBC Cascadia Chapter Website: <http://www.usgbc.org/cascadia/index.htm>

Sustainable Building Canada: <http://www.greenbuilding.ca/sbc/start/sbc.htm>

Vancouver Island Technology Park (first LEEDTM Version 2.0 Gold building in Canada): <http://www.vitp.ca>

Appendix 4. Cost-Benefit Background Research

Is there a premium or extra costs to use LEED™ Certification for Building Construction?

Review of current studies and anecdotal information by Geoff McDonell, P.Eng, May, 2002

<u>Source:</u>	<u>Design Costs</u>	<u>Construction Costs</u>	<u>Comments</u>
USGBC, August 2001	Up to \$10,000.00 to \$60,000.00 for LEED™ Certification documentation costs depending on points to be sought.	1-4% increase for initial construction costs	Based on a study of seven LEED™ Certified buildings. Source: August 2001 USGBC Staff memo.
Rocky Mountain Institute	Postulates that there would be no additional design costs when integrated design approach is used.	Their research indicates that no additional capital costs would result from an integrated design incorporating sustainable elements	No specific building studies cited. Article at http://www.rmi.org/sitepages/pid198.php
Miriam Landman: Summary of Thesis Findings and Recommendations – Breaking Through the Barriers to Sustainable Building		Study indicates that different costing methods required with life cycle costs used rather than straight capital costs	Full document at: http://www.egret.net/tufts/summaryoffindings.htm
City of Portland Green Building Study	“Some” additional design costs found but not specified, estimated at an add of 0.5% to the initial construction costs	Initial costs for three City buildings reviewed and found that –0.3% to 2.2% cost differences existed.	Limited study for 3 buildings only. Source document at: http://www.newsdata.com/enernet/conweb/conweb56.html

Informal discussions with other local "green" architects	Small additional amount of work required depending on LEED™ rating points being applied for- additional documentation needed- adds up to 300 man-hours.	Initial projects incurred slight premiums (up to 3%-4%) but subsequent designs and project costs showed reduced costs compared to conventional building approaches	Learning curve indicates that after performing LEED™ design on three or more projects, they found reduced design costs to be the same as conventional building approach, and initial construction cost of LEED™ building were equal or less than a conventional building
AIBC Sustainability Committee correspondence	Costs estimated at up to \$50,000.00 for energy simulations and modelling alone for the LEED™ Energy and Atmosphere points 1.1 to 1.5	No added Construction costs.	Energy modelling requiring specific software can be a significant cost. Specialist Energy Modelling consultants are sometimes necessary.

All of the articles and studies indicated that even with additional design and construction costs (which never seemed to exceed 5% over a conventional building), there was a payback of days or months due to energy savings and building occupant/employee productivity increases. Typical energy savings for a LEED™ Certified building range from 25%-50% less than a conventional building, and LEED™ Buildings showed employee productivity gains of between 5% to 10%, with some detailed studies indicating up to 16% gains in employee productivity. All studies indicate that life cycle costing of the construction methods and materials is extremely important, and new information on environmental impact costing is being discussed. Old accounting and costing methods of line-by-line, item by item costing does not result in an integrated design approach. Many LEED™ building designs show more money being spent on some building components to save money and/or energy from other systems (use high performance glazing and skin materials to reduce mechanical system costs and energy costs).

Other sources:

www.usgbc.org/resource/gbr/oct1.htm

www.usgbc.org/resource/articles/demyst.htm

www.ce.cmu.edu/GreenDesign/research/price.html

Journal of Construction Engineering and Management- Nov/Dec 1999 – Article "Selecting Cost-Effective Green Building Products- BEES Approach" by Barbara C. Lippiatt

Appendix 5. Lessons Learned

June 5, 2002

The LEED™ Implementation Task Force members listed below provided their perspective on the following question:

What can be learned from our recent experience coping with building envelope failures in the lower mainland that are transferable to implementation of LEED™ objectives?

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Mr. Brian Lee, P.Eng. (Levelton Engineering Ltd.)

Mr. Jamie McKay, P.Eng. (Morrison Hershfield Ltd.)

Mr. Leslie Peer, P.Eng. (Read Jones Christoffersen Ltd.)

1. Practitioners (design professionals) need to be qualified and experienced in their respective field.
2. Tradesmen and contractors also need to be qualified and experienced.
3. Coordination and sequencing of trades is the Contractor's responsibility to ensure quality control and that the scope of work is completely addressed during construction.
4. Don't blindly adopt any technology that may have worked adequately in the past for a different type of building, or even a similar type of building.
5. Beware of misapplication of building standards.
6. Beware the "Innovator". Do not discourage innovation but consider the experience the designer has with that technology being applied?
7. Interactions of the building systems are important to consider in design and construction.
8. Have at least a basic understanding of the behaviour of building materials in the environment. Many failures considered premature are due to aging or poor use of materials.
9. Beware of lack of detail and clarity in construction documents. This provides the builder a convenient excuse to improvise instead of requesting clarification from the designer.
10. Consumers need to be better informed to enable them to demand quality constructed products. Quality/durability is increasingly becoming an expectation and entrenched in designers' responsibilities.
11. Developers of building projects need to lead good design rather than respond to perceived consumer demands.
12. Building officials and planning departments need to provide an environment (by-laws, bureaucracy) that supports designers and leads to good design.

I trust this information will be useful to the APEGBC LEED™ Implementation Task Force.

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