



LEED[®] Project Delivery Process Manual Appendices

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Appendices

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Appendix 1: Other Alberta Requirements and Green Building Standards:

A number of documents that detail additional or supporting requirements and standards can be found on Alberta Infrastructure's web site, "Technical Resource Centre".

<http://www.infrastructure.alberta.ca/500.htm>

Note that all referenced documents are updated periodically. Check to ensure that you have downloaded and are using the latest version.

Technical Design Requirements for Alberta Infrastructure Facilities:

Under the *Owned Infrastructure, Guidelines and Standards* link, (<http://www.infrastructure.alberta.ca/992.htm>), the "Technical Design Requirements for Alberta Infrastructure Facilities" contains key minimum design requirements for owned buildings.

	File Name	Document Name
File/Document Name:	TechDesignRequirements.pdf	Technical Design Requirements for Alberta Infrastructure Facilities (current version)
File Link Path:	http://www.infrastructure.alberta.ca/Content/docType486/Production/TechDesignRequirements.pdf	

Appendix 2: Integrated Design Process Tools

Integrative Process Prerequisite and Credit – LEED Reference Guide

The LEED Reference Guide for Building Design and Construction contains a good overview of the Integrated Design Process (IDP), and guidance for how to implement it. There is one prerequisite called the Prerequisite Integrative Project Planning and Design and one credit for Integrative Process.

Roadmap to the Integrated Design Process

The BC Green Buildings Roundtable has produced a "Roadmap" to the IDP process, which it developed to overcome the barriers that it sees as preventing IDP from being widely practiced. The Roadmap sets out what the integrated design process is, how it works, and how to implement such a process. This is a good piece for putting IDP in context with everything else that happens on a project.

File Link Path: <http://www.greenspacencr.org/events/IDPRoadmap.pdf>

DOE Charrette Handbook

The US Department of Energy has produced an excellent detailed guide on how to conduct actual IDP charrettes for green building projects, called "A Handbook for Planning and Conducting Charrettes for High Performance Projects:"

The complete handbook can be downloaded from:

http://apps1.eere.energy.gov/buildings/publications/pdfs/commercial_initiative/33425rep.pdf

Appendix 3: LEED Points Achieved on Alberta Projects

The following documents show the results of 101 Alberta LEED projects. Please use this data as inspiration and guidance for planning future projects.

The two LEED scorecards that show the average credit point achievement per rating system (attached):

- Version NC 1.0 = data from 83 projects – 3 pages
- Version NC 2009 = data from 18 projects – 4 pages

How to read the scorecard data:

- In the left hand, coloured column it expresses the percentage of projects that achieved the credit:

94%	Credit 1	Site Selection
16%	Credit 2	Development Density

Eg: 94% of projects achieved the Site Selection credit, whereas only 16% of projects achieved the Development Density credit

LEED Scorecard Average of Provincial Projects

LEED Canada - Version NC 1.0

(Updated December 2016)

Note:

- Data from **85** LEED-rated provincial projects was gathered.
- The blue-coloured percentages express the percentage of these provincial projects that achieved the respective credit.

Project Totals 70 Possible Points

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-70 points

Average credit achievement for the Province's projects: [37 of 70 possible points](#). (High silver on average)

Sustainable Sites 14 Possible Points

Sustainable Sites average credit achievement for the Province's projects: [6 of 14 possible points](#).

✓	Prereq 1 Erosion and Sedimentation Control	Required
94%	Credit 1 Site Selection	1
15%	Credit 2 Development Density	1
4%	Credit 3 Redevelopment of Contaminated Site	1
48%	Credit 4.1 Alternative Transportation: Public Transportation Access	1
89%	Credit 4.2 Alternative Transportation: Bicycle Storage and Changing Rooms	1
33%	Credit 4.3 Alternative Transportation: Alternative Fuel Vehicles	1
68%	Credit 4.4 Alternative Transportation: Parking Capacity	1
12%	Credit 5.1 Reduced Site Disturbance: Protect or Restore Open Space	1
61%	Credit 5.2 Reduced Site Disturbance: Development Footprint	1
33%	Credit 6.1 Stormwater Management: Rate and Quantity	1
24%	Credit 6.2 Stormwater Management: Treatment	1
21%	Credit 7.1 Heat Island Effect: Non-Roof	1
73%	Credit 7.2 Heat Island Effect: Roof	1
62%	Credit 8 Light Pollution Reduction	1

Water Efficiency 5 Possible Points

Water Efficiency average credit achievement for the Province's projects: [4 of 5 possible points](#).

89%	Credit 1.1 Water Efficient Landscaping: Reduce by 50%	1
86%	Credit 1.2 Water Efficient Landscaping: No Potable Use or No Irrigation	1
15%	Credit 2 Innovative Wastewater Technologies	1
99%	Credit 3.1 Water Use Reduction: 20% Reduction	1
95%	Credit 3.2 Water Use Reduction: 30% Reduction	1

Energy & Atmosphere

17 Points

Energy & Atmosphere average credit achievement for the Province's projects: [8 of 17 possible points](#).

✓	Prereq 1	Fundamental Building Systems Commissioning	Required
✓	Prereq 2	Minimum Energy Performance	Required
✓	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
See breakdown	Credit 1	Optimize Energy Performance	1 to 10
		99%	Improve by 15% over ASHRAE 90.1 (1 point)
		99%	Improve by 20% over ASHRAE 90.1 (+1 point)
		93%	Improve by 25% over ASHRAE 90.1 (+1 point)
		82%	Improve by 30% over ASHRAE 90.1 (+1 point)
		73%	Improve by 35% over ASHRAE 90.1 (+1 point)
		66%	Improve by 40% over ASHRAE 90.1 (+1 point)
		49%	Improve by 45% over ASHRAE 90.1 (+1 point)
		29%	Improve by 50% over ASHRAE 90.1 (+1 point)
		7%	Improve by 55% over ASHRAE 90.1 (+1 point)
		5%	Improve by 60% over ASHRAE 90.1 (+1 point)
1%	Credit 2.1	Renewable Energy: 5%	1
1%	Credit 2.2	Renewable Energy: 10%	1
0%	Credit 2.3	Renewable Energy: 20%	1
41%	Credit 3	Best Practice Commissioning	1
91%	Credit 4	Ozone Protection	1
14%	Credit 5	Measurement and Verification	1
41%	Credit 6	Green Power	1

Materials & Resources

14 Points

Materials & Resources average credit achievement for the Province's projects: [6 of 14 possible points](#).

✓	Prereq 1	Storage and Collection of Recyclables	Required
8%	Credit 1.1	Building Reuse: Maintain 75% of Existing Walls, Floors, and Roof	1
4%	Credit 1.2	Building Reuse: Maintain 95% of Existing Walls, Floors, and Roof	1
2%	Credit 1.3	Building Reuse: Maintain 50% of Interior Non-Structural Elements	1
81%	Credit 2.1	Construction Waste Management: Divert 50% from Landfill	1
62%	Credit 2.2	Construction Waste Management: Divert 75% from Landfill	1
0%	Credit 3.1	Resource Reuse: 5%	1
0%	Credit 3.2	Resource Reuse: 10%	1
100%	Credit 4.1	Recycled Content: 7.5% (post-consumer + ½ post-industrial)	1
85%	Credit 4.2	Recycled Content: 15% (post-consumer + ½ post-industrial)	1
95%	Credit 5.1	Regional Materials: 10% Extracted and Manufactured Regionally	1
75%	Credit 5.2	Regional Materials: 20% Extracted and Manufactured Regionally	1
0%	Credit 6	Rapidly Renewable Materials	1
29%	Credit 7	Certified Wood	1
38%	Credit 8	Durable Building	1

Indoor Environmental Quality

15 Points

Indoor Environmental Quality average credit achievement for the Province's projects: [9 of 15 possible points](#).

✓	Prereq 1	Minimum IAQ Performance	Required
✓	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
19%	Credit 1	Carbon Dioxide (CO₂) Monitoring	1
25%	Credit 2	Ventilation Effectiveness	1
95%	Credit 3.1	Construction IAQ Management Plan: During Construction	1
86%	Credit 3.2	Construction IAQ Management Plan: Testing Before Occupancy	1
93%	Credit 4.1	Low-Emitting Materials: Adhesives and Sealants	1
89%	Credit 4.2	Low-Emitting Materials: Paints and Coating	1
100%	Credit 4.3	Low-Emitting Materials: Carpet	1
76%	Credit 4.4	Low-Emitting Materials: Composite Wood and Laminate Adhesives	1
73%	Credit 5	Indoor Chemical and Pollutant Source Control	1
22%	Credit 6.1	Controllability of Systems: Perimeter Spaces	1
7%	Credit 6.2	Controllability of Systems: Non-Perimeter Spaces	1
96%	Credit 7.1	Thermal Comfort: Compliance	1
72%	Credit 7.2	Thermal Comfort: Monitoring	1
12%	Credit 8.1	Daylight and Views: Daylight 75% of Spaces	1
32%	Credit 8.2	Daylight and Views: Views 90% of Spaces	1

Innovation & Design Process

5 Points

Average Innovation in Design credit achievement for the Province's projects: [4 of 5 possible points](#).

95%	Credit 1.1	Innovation in Design	1
92%	Credit 1.2	Innovation in Design	1
82%	Credit 1.3	Innovation in Design	1
59%	Credit 1.4	Innovation in Design	1
100%	Credit 2	LEED® Accredited Professional	1

LEED Scorecard Average of Provincial Projects

LEED Canada - Version NC 2009

(Updated December 2016)

Note:

- Data from **18** LEED-rated provincial projects was gathered.
- The green-coloured percentages express the percentage of these provincial projects that achieved the respective credit.

Project Totals

110 Possible Points

Certified 40-49 points Silver 50-59 points Gold 60-79 points Platinum 80 points and above

Average credit achievement for the Province's projects: **57 of 110 possible points.** (High silver on average)

Sustainable Sites

26 Possible Points

Sustainable Sites average credit achievement for the Province's projects: **12 of 26 possible points.**

✓	Prereq 1	Construction Activity Pollution Prevention	Required
78%	Credit 1	Site Selection	1
22%	Credit 2	Development Density and Community Connectivity	3 or 5
0%	Credit 3	Brownfield Redevelopment	1
67%	Credit 4.1	Alternative Transportation: Public Transportation Access	3 or 6
94%	Credit 4.2	Alternative Transportation: Bicycle Storage and Changing Rooms	1
39%	Credit 4.3	Alternative Transportation: Low-Emitting and Fuel-Efficient Vehicles	3
67%	Credit 4.4	Alternative Transportation: Parking Capacity	2
6%	Credit 5.1	Site Development: Protect and Restore Habitat	1
78%	Credit 5.2	Site Development: Maximize Open Space	1
11%	Credit 6.1	Stormwater Design: Quantity Control	1
0%	Credit 6.2	Stormwater Design: Quality Control	1
11%	Credit 7.1	Heat Island Effect: Non-Roof	1
100%	Credit 7.2	Heat Island Effect: Roof	1
67%	Credit 8	Light Pollution Reduction	1

Water Efficiency

10 Possible Points

Water Efficiency average credit achievement for the Province's projects: **6 of 10 possible points.**

✓	Prereq 1	Water Use Reduction	Required
See breakdown	Credit 1	Water Efficient Landscaping	2 or 4
		100% Reduce by 50% (2 points)	
		67% No Potable Water Use or Irrigation (+2 points)	
0%	Credit 2	Innovative Wastewater Technologies	2
See breakdown	Credit 3	Water Use Reduction	2 to 4
		100% Reduce by 30% (2 points)	
		44% Reduce by 35% (+1 point)	
		0% Reduce by 40% (+1 point)	

Energy & Atmosphere 35 Points

Energy & Atmosphere average credit achievement for the Province's projects: [17 of 35 possible points.](#)

✓	Prereq 1	Fundamental Commissioning of Building Energy Systems	Required
✓	Prereq 2	Minimum Energy Performance	Required
✓	Prereq 3	Fundamental Refrigerant Management	Required
See breakdown	Credit 1	Optimize Energy Performance	1 to 19
		100% Improve by 12% over ASHRAE 90.1 (1 point)	
		100% Improve by 14% over ASHRAE 90.1 (+1 point)	
		100% Improve by 16% over ASHRAE 90.1 (+1 point)	
		100% Improve by 18% over ASHRAE 90.1 (+1 point)	
		94% Improve by 20% over ASHRAE 90.1 (+1 point)	
		94% Improve by 22% over ASHRAE 90.1 (+1 point)	
		94% Improve by 24% over ASHRAE 90.1 (+1 point)	
		94% Improve by 26% over ASHRAE 90.1 (+1 point)	
		89% Improve by 28% over ASHRAE 90.1 (+1 point)	
		89% Improve by 30% over ASHRAE 90.1 (+1 point)	
		72% Improve by 32% over ASHRAE 90.1 (+1 point)	
		67% Improve by 34% over ASHRAE 90.1 (+1 point)	
		61% Improve by 36% over ASHRAE 90.1 (+1 point)	
		56% Improve by 38% over ASHRAE 90.1 (+1 point)	
		44% Improve by 40% over ASHRAE 90.1 (+1 point)	
		39% Improve by 42% over ASHRAE 90.1 (+1 point)	
		28% Improve by 44% over ASHRAE 90.1 (+1 point)	
		17% Improve by 46% over ASHRAE 90.1 (+1 point)	
		6% Improve by 48%+ over ASHRAE 90.1 (+1 point)	
See breakdown	Credit 2	On-Site Renewable Energy	1 to 7
		0% 1% Renewable Energy (1 point)	
		0% 3% Renewable Energy (+1 point)	
		0% 5% Renewable Energy (+1 point)	
		0% 7% Renewable Energy (+1 point)	
		0% 9% Renewable Energy (+1 point)	
		0% 11% Renewable Energy (+1 point)	
		0% 13% Renewable Energy (+1 point)	
39%	Credit 3	Enhanced Commissioning	2
83%	Credit 4	Enhanced Refrigerant Management	2
22%	Credit 5	Measurement and Verification	3
22%	Credit 6	Green Power	2

Materials & Resources**14 Points**Materials & Resources credit achievement for the Province's projects: [5 of 14 possible points.](#)

✓	Prereq 1	Storage and Collection of Recyclables	Required
See breakdown	Credit 1.1	Building Reuse: Maintain Existing Walls, Floors, and Roof	1 to 3
		0%	Reduce by 30% (1 point)
		0%	Reduce by 35% (+1 point)
		0%	Reduce by 40% (+1 point)
0%	Credit 1.2	Building Reuse: Maintain Interior Non-Structural Elements	1
See breakdown	Credit 2	Construction Waste Management	1 to 2
		94%	Reduce by 35% (1 point)
		56%	Reduce by 40% (+1 point)
See breakdown	Credit 3	Materials Reuse	1 to 2
		0%	Reduce by 35% (1 point)
		0%	Reduce by 40% (+1 point)
See breakdown	Credit 4	Recycled Content	1 to 2
		100%	Reduce by 35% (1 point)
		72%	Reduce by 40% (+1 point)
See breakdown	Credit 5	Regional Materials	1 to 2
		78%	Reduce by 35% (1 point)
		44%	Reduce by 40% (+1 point)
0%	Credit 6	Rapidly Renewable Materials	1
22%	Credit 7	Certified Wood	1

Indoor Environmental Quality**15 Points**Indoor Environmental Quality average credit achievement for the Province's projects: [10 of 15 possible points.](#)

✓	Prereq 1	Minimum Indoor Air Quality Performance	Required
✓	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
72%	Credit 1	Outdoor Air Delivery Monitoring	1
22%	Credit 2	Increased Ventilation	1
100%	Credit 3.1	Construction IAQ Management Plan: During Construction	1
89%	Credit 3.2	Construction IAQ Management Plan: Before Occupancy	1
100%	Credit 4.1	Low-Emitting Materials: Adhesives and Sealants	1
100%	Credit 4.2	Low-Emitting Materials: Paints and Coatings	1
100%	Credit 4.3	Low-Emitting Materials: Flooring Systems	1
100%	Credit 4.4	Low-Emitting Materials: Composite Wood and Agrifibre Products	1
83%	Credit 5	Indoor Chemical and Pollutant Source Control	1
78%	Credit 6.1	Controllability of System: Lighting	1
61%	Credit 6.2	Controllability of System: Thermal Comfort	1
89%	Credit 7.1	Thermal Comfort: Design	1
11%	Credit 7.2	Thermal Comfort: Verification	1
0%	Credit 8.1	Daylight and Views: Daylight	1
33%	Credit 8.2	Daylight and Views: Views	1

Innovation in Design

6 Points

Innovation in Design average credit achievement for the Province's projects: [5 of 6 possible points](#).

100%	Credit 1.1 Innovation in Design	1
100%	Credit 1.2 Innovation in Design	1
78%	Credit 1.3 Innovation in Design	1
44%	Credit 1.4 Innovation in Design	1
28%	Credit 1.5 Innovation in Design	1
100%	Credit 2 LEED® Accredited Professional	1

Regional Priority

4 Points

Regional Priority average credit achievement for the Province's projects: [3 of 4 possible points](#).

17%	Credit 1 Durable Building	1
100%	Credit 2.1 Regional Priority Credit	1
94%	Credit 2.2 Regional Priority Credit	1
67%	Credit 2.3 Regional Priority Credit	1