



CSA
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Canadian Electrical Code, Part I

Safety Standard for Electrical Installations

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2012

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On the occasion of Annie Pereira's retirement in January 2012, CSA gratefully acknowledges her outstanding contribution to the development and publication of the *Canadian Electrical Code, Part I*. In her 37 years with CSA, Annie has worked on eight editions of the *Code*. Her organizational expertise, attention to detail, and infinite patience have been key elements in their success.

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Section 0 — Object, scope, and definitions

G. Lobay (<i>Chair</i>)	CANMET, Natural Resources Canada, Kars, Ontario
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J. Côté	Hydro-Québec, Montréal, Québec
R.C. Gilmour	Ancaster, Ontario
D.J. Heron	Electrical Safety Authority, Sudbury, Ontario
G. Montminy	Régie du bâtiment du Québec, Québec, Québec
S. Paulsen	CSA International, Toronto, Ontario
M.K. Shea	City of Victoria, British Columbia (Representing International Association of Electrical Inspectors)
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia

Section 2 — General Rules

S.W. Douglas (<i>Chair</i>)	International Association of Electrical Inspectors, Toronto, Ontario
M. Smith (<i>Vice-Chair</i>)	Rockwell Automation Canada Inc. Control Systems, Cambridge, Ontario
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
G. Jones	Assiniboine Community College, Brandon, Manitoba
R.J. Kelly	Government of Nunavut Community & Government Services, Iqaluit, Nunavut
D.G. Morlidge	Fluor Canada Ltd., Calgary, Alberta
S. Paulsen	CSA International, Toronto, Ontario
D.T. Roberts	Schneider Electric Canada, Inc., Mississauga, Ontario
R. Tuttle	City of Vancouver, British Columbia (Representing International Association of Electrical Inspectors)

Section 4 — Conductors

B.F. O'Connell (<i>Chair</i>)	Tyco Thermal Controls (Canada) Ltd., Trenton, Ontario
L. Asselin	Laval, Québec (Representing International Association of Electrical Inspectors)
G.R. Beer	Jay Electric & Enerscan Controls, Brampton, Ontario
G.H. Brunt	F.C. O'Neill Scriven & Associates, Halifax, Nova Scotia
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
C. Hunter	Alcan Cable, Las Vegas, Nevada, USA
R. Kummer	Southwire Company, Carrollton, Georgia, USA
I. Muller	Nexans Canada Inc., Markham, Ontario
R.A. Nelson	Canadian Standards Association, Mississauga, Ontario
S. Paulsen	CSA International, Toronto, Ontario
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia

Section 6 — Services and service equipment

R.J. Kelly (<i>Chair</i>)	Government of Nunavut Community & Government Services, Iqaluit, Nunavut
P. Liberatore (<i>Vice-Chair</i>)	Corporation des maîtres électriciens du Québec, Montréal, Québec
W.J. Burr	Burr and Associates, Campbell River, British Columbia
J. Côté	Hydro-Québec, Montréal, Québec
J.G. Gamble	C. Gamble Electric (1982) Ltd., Winnipeg, Manitoba
D. Letcher	Don Letcher (E.S.C.O.) Enterprises, Sherwood Park, Alberta (Representing International Association of Electrical Inspectors)
S. Paulsen	CSA International, Toronto, Ontario
E.J. Power	Stanhope, Prince Edward Island
J. Thomson	Electrical Safety Authority, Kitchener, Ontario
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia
V. Yu	Code Instructor Association of B.C., Burnaby, British Columbia

Section 8 — Circuit loading and demand factors

R.J. Kelly (<i>Chair</i>)	Government of Nunavut Community & Government Services, Iqaluit, Nunavut
S.W. Douglas (<i>Vice-Chair</i>)	International Association of Electrical Inspectors, Toronto, Ontario
Y. Boodram	Schneider Electric Canada, Inc., Mississauga, Ontario
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
J.W. Fotheringham	Warren, Manitoba
R.C. Gilmour	Ancaster, Ontario
K. Harrison	Northern Alberta Institute of Technology, Edmonton, Alberta
R. Moberg	DeBray Solutions, North Gower, Ontario
S. Paulsen	CSA International, Toronto, Ontario
L. Schultz	Manitoba Hydro, Radisson Training Center, Gillam, Manitoba
D. Singh	Scarborough, Ontario
J. Thomson	Electrical Safety Authority, Kitchener, Ontario
J.E. White	J.E.C. White Consulting, Burlington, Ontario
V. Yu	Code Instructor Association of B.C., Burnaby, British Columbia

Section 10 — Grounding and bonding

R. Leduc (<i>Chair</i>)	Marex Canada Limited, Calgary, Alberta
K.D. McLennan (<i>Vice-Chair</i>)	Islay, Alberta
K.B. Almon	Dartmouth, Nova Scotia
S.C. Bygrave	Michelin North America (Canada), CAO Facility, New Glasgow, Nova Scotia
T. Dinic	Electrical Safety Authority, Mississauga, Ontario
J.W. Fotheringham	Warren, Manitoba
N. LeForte	City of Surrey Planning Development Department, Surrey, British Columbia
C. LeGrandeur	ConocoPhillips Canada Ltd., Calgary, Alberta
G. Montminy	Régie du bâtiment du Québec, Québec, Québec
D.G. Morlidge	Fluor Canada Ltd., Calgary, Alberta
S. Paulsen	CSA International, Toronto, Ontario
M.K. Shea	City of Victoria, British Columbia (<i>Representing International Association of Electrical Inspectors</i>)
I.B. Simpson	Ground-it.com Consulting Ltd., North Vancouver, British Columbia

Section 12 — Wiring methods

S.W. Douglas (<i>Chair</i>)	International Association of Electrical Inspectors, Toronto, Ontario
M.S. Anderson	SaskPower, Regina, Saskatchewan
D.J. Andrews	DJA Engineering Services, Calgary, Alberta
L. Baker	Arcon Electric Ltd., London, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
J.B. Biollo	John's Enterprises Ltd., Leduc, Alberta
J. Courteau	Alcan Cable, Division of Alcan Inc., St-Laurent, Québec
J. LeBlanc	Department of Public Safety, Moncton, New Brunswick
I. Muller	Nexans Canada Inc., Markham, Ontario
S. Paulsen	CSA International, Toronto, Ontario
A. Pottier	Nova Scotia Power Inc., Halifax, Nova Scotia
P.M. Schmaltz	Electrical Contractors Association of Alberta (ECAA), Calgary, Alberta
E. Thompson	Atkore International (Allied Tube and Conduit Corporation), Harvey, Illinois, USA

Section 14 — Protection and control

R.P. de Lhorbe (<i>Chair</i>)	Schneider Electric Canada, Inc., Richmond, British Columbia
T. Branch	PDR Technologies Inc., Oakville, Ontario
S.C. Bygrave	Michelin North America (Canada), CAO Facility, New Glasgow, Nova Scotia
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
S.G. Davies	KD Projects, DeWinton, Alberta
T. Evans	CSA International, Toronto, Ontario
G.T. Gingara	Mosaic Potash Esterhazy K1 Plant, Esterhazy, Saskatchewan
D.J. Heron	Electrical Safety Authority, Sudbury, Ontario
K.E. Morris	Morris Electric Ltd., Spruce Grove, Alberta
M. Pullan	Bright Electric Limited, Jacbar Holdings Inc., Toronto, Ontario
W.C. Rossmann	Calgary, Alberta
L.G. Silecky	Mersen Canada Toronto Inc., Toronto, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
D. Singh	Scarborough, Ontario
C. Thwaites	Mersen Canada Toronto Inc., Toronto, Ontario

Section 16 — Class 1 and Class 2 circuits

T. Simmons (<i>Chair</i>)	British Columbia Institute of Technology, Burnaby, British Columbia
J.B. Biollo	John's Enterprises Ltd., Leduc, Alberta (<i>Representing International Association of Electrical Inspectors</i>)
R.J. Kelly	Government of Nunavut Community & Government Services, Iqaluit, Nunavut
D. Littlejohn	Vancouver Island University, Nanaimo, British Columbia
A. Milne	21 st Olympiad Sales, Burlington, Ontario
S. Paulsen	CSA International, Toronto, Ontario
W. Saworski	Humboldt Electric Limited, Saskatoon, Saskatchewan
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia

Section 18 — Hazardous locations

V.G. Rowe (<i>Chair</i>)	Marex Canada Limited, Nanaimo, British Columbia
G. Lobay (<i>Vice-Chair</i>)	CANMET, Natural Resources Canada, Kars, Ontario
D.S. Adams	QPS Evaluation Services Inc., Calgary, Alberta
A. Bozek	EngWorks Inc., Calgary, Alberta
M.Y. Cole	Hubbell Canada LP, Pickering, Ontario
J.H. Dymond	Hammonds Plains, Nova Scotia
D.J. Heron	Electrical Safety Authority, Sudbury, Ontario
B. Keane	Crouse-Hinds, Division of Cooper Industries (Canada) Inc., Mississauga, Ontario
W.G. Lawrence	FM Approvals, LLC, Norwood, Massachusetts, USA
R. Leduc	Marex Canada Limited, Calgary, Alberta
G. Montminy	Régie du bâtiment du Québec, Québec, Québec
D.G. Morlidge	Fluor Canada Ltd., Calgary, Alberta
J.H. Morrison	QPS Evaluation Services Inc., Toronto, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
B. Schneider	UL International (UK) Ltd., Warrington, United Kingdom
D. Stochitoui	CSA International, Toronto, Ontario
M. Throckmorton	Shell Canada Limited, Shell Upstream Americas, Calgary, Alberta

Section 20 — Flammable liquid and gas dispensing and service stations, garages, bulk storage plants, finishing processes, and aircraft hangars

M.K. Shea (<i>Chair</i>)	City of Victoria, British Columbia
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
G.J. Drew	ConocoPhillips Canada Ltd., Calgary, Alberta
G. Lobay	CANMET, Natural Resources Canada, Kars, Ontario
A. Milivojevic	QPS Evaluation Services Inc., Toronto, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
S. Misyk	The Inspections Group Inc., Edmonton, Alberta
E.J. Power	Stanhope, Prince Edward Island
V.G. Rowe	Marex Canada Limited, Nanaimo, British Columbia
J. Thomson	Electrical Safety Authority, Kitchener, Ontario

Section 22 — Locations in which corrosive liquids, vapours, or excessive moisture are likely to be present

R.J. Kelly (<i>Chair</i>)	Government of Nunavut Community & Government Services, Iqaluit, Nunavut
L. Baker	Arcon Electrical Ltd., London, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
G.T. Gingara	Mosaic Potash Esterhazy K1 Plant, Esterhazy, Saskatchewan
M. Khalid	R.V. Anderson Associates Limited, Toronto, Ontario
S. Paulsen	CSA International, Toronto, Ontario
G.T. Walker	Emery Electric, Shawnigan Lake, British Columbia
D. Wilson	Accredited Testing Services, Brandon, Manitoba

Section 24 — Patient care areas

L. Ferchoff (<i>Chair</i>)	Manitoba Hydro, Winnipeg, Manitoba
A.Z. Tsisserev (<i>Vice-Chair</i>)	Stantec Consulting Ltd., Vancouver, British Columbia
M.S. Anderson	SaskPower, Regina, Saskatchewan
M. Brossoit	CSA International, Pointe-Claire, Québec
C. Brown	SMS Engineering Ltd., Winnipeg, Manitoba
R. Dodds	Vancouver General Hospital, Vancouver, British Columbia
A.M. Dolan	University of Toronto, Toronto, Ontario
P.M. Gelinus	Hôpital du Sacré-Cœur de Montréal, Montréal, Québec
N. Hanna	Electrical Safety Authority, Mississauga, Ontario
P.E. Paasche	New Maryland, New Brunswick
D.T. Roberts	Schneider Electric Canada, Inc., Mississauga, Ontario
E. Smeltzer	Nova Scotia Power Inc., Lower Sackville, Nova Scotia (<i>Representing International Association of Electrical Inspectors</i>)

Section 26 — Installation of electrical equipment

T. Simmons (<i>Chair</i>)	British Columbia Institute of Technology, Burnaby, British Columbia
R. Leduc (<i>Vice-Chair</i>)	Marex Canada Limited, Calgary, Alberta
K. Budau	Electrical Safety Authority, Merrickville, Ontario
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
P. Desilets	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
M.W. Earley	National Fire Protection Association, Quincy, Massachusetts, USA
V.V. Gagachev	Eaton, Burlington, Ontario
R.C. Gilmour	Ancaster, Ontario

D. Johnston	Canadian Home Builders' Association, Ottawa, Ontario
P. Liberatore	Corporation des maîtres électriciens du Québec, Montréal, Québec
R.A. Nelson	Canadian Standards Association, Mississauga, Ontario
S. Paulsen	CSA International, Toronto, Ontario
T.R. Titus	Electrical Safety Authority, New Hamburg, Ontario (Representing International Association of Electrical Inspectors)
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia

Section 28 — Motors and generators

M. Smith (<i>Chair</i>)	Rockwell Automation Canada Inc. Control Systems, Cambridge, Ontario
M.S. Anderson	SaskPower, Regina, Saskatchewan
P. Baltazart	CIMA+, Edmonton, Alberta
J.P. Boivin	CSA International, Pointe-Claire, Québec
T. Branch	PDR Technologies, Oakville, Ontario
S.G. Davies	KD Projects, DeWinton, Alberta
S. Finnagan	Algonquin College, Ottawa, Ontario
E.J. Friesen	E.J. Friesen and Associates Incorporated, Calgary, Alberta
B.J. Mead	KeepRite Refrigeration, Division of National Refrigeration & Air Conditioning Canada Corp., Brantford, Ontario
L.G. Silecky	Mersen Canada Toronto Inc., Toronto, Ontario (Representing International Association of Electrical Inspectors)
D. Singh	Scarborough, Ontario

Section 30 — Installation of lighting equipment

P. Desilets (<i>Chair</i>)	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
J.A. Davidson	Manitoba Hydro, Virden, Manitoba (Representing International Association of Electrical Inspectors)
T. Dinic	Electrical Safety Authority, Mississauga, Ontario
D. Lenasi	CSA International, Richmond, British Columbia
Q. Li	Stantec Consulting Ltd., Vancouver, British Columbia
S. Michaud	Thomas & Betts Fabrication Inc./Thomas & Betts Manufacturing Inc., Dorval, Québec
A. Milne	21 st Olympiad Sales, Burlington, Ontario
D. Rittenhouse	Maple Ridge, British Columbia

Section 32 — Fire alarm systems, fire pumps, and carbon monoxide alarms

M.S. Anderson (<i>Chair</i>)	SaskPower, Regina, Saskatchewan
S. Bent	Nova Scotia Power Inc., Kingston, Nova Scotia (Representing International Association of Electrical Inspectors)
A.N. Cavers	Underwriters Laboratories of Canada, Scarborough, Ontario
R. Dodds	Vancouver General Hospital, Vancouver, British Columbia
R. Florio	Tyco Thermal Controls — Pyrotenax, Toronto, Ontario
D. Gendebien	TornaTech Inc., St-Laurent, Québec
N. Hanna	Electrical Safety Authority, Mississauga, Ontario
R. MacKenzie	CSA International, Toronto, Ontario
P. Rizcallah	National Research Council Canada, Canadian Codes Centre, Ottawa, Ontario
V.R. Rochon	Rochon Engineering Inc., Concord, Ontario

A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia
D. Weber	Canadian Fire Alarm Association, Markham, Ontario

Section 34 — Signs and outline lighting

R. Pack (<i>Chair</i>)	SaskPower, Saskatoon, Saskatchewan
L. Catton	Acme Design Service Ltd., Tecumseh, Ontario
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
F. Dabiet	Allanson International Inc., Toronto, Ontario
J.A. Davidson	Manitoba Hydro, Virden, Manitoba (<i>Representing International Association of Electrical Inspectors</i>)
K. Devine	Electra Sign Ltd., Winnipeg, Manitoba
D. Lenasi	CSA International, Richmond, British Columbia
C. Mak	Teksign Inc., Brantford, Ontario
E.J. Power	Stanhope, Prince Edward Island
S. Scarrow	ProSign Manufacturing, Division of Pelican Signs & Decals Inc., Saskatoon, Saskatchewan

Section 36 — High-voltage installations

F.L. Kaempffer (<i>Chair</i>)	BC Hydro, Burnaby, British Columbia
R.M. Bartholomew	Electric Power Equipment Limited, Vancouver, British Columbia
J. Côté	Hydro-Québec, Montréal, Québec
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
E.P. Dick	Electric Power Diagnostics, Toronto, Ontario
T. Evans	CSA International, Toronto, Ontario
B.R. Hamilton	Bruce Hamilton Engineering Inc., Calgary, Alberta
R. Head	Electrical Safety Authority, Cambridge, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
D.J. Heron	Electrical Safety Authority, Sudbury, Ontario
A. Lawrence	Scarborough, Ontario
B. Lipson	Stantec Consulting Ltd., Vancouver, British Columbia
A.N. Sunley	Voltech Engineering Ltd., Calgary, Alberta

Section 38 — Elevators, dumbwaiters, material lifts, escalators, moving walks, lifts for persons with physical disabilities, and similar equipment

D. McColl (<i>Chair</i>)	Otis Canada Inc., Mississauga, Ontario
D.C. Balmer	Accessibility Equipment Manufacturers Association, Brampton, Ontario
B. Blackaby	OTIS, Farmington, Connecticut, USA
A.D. Byram	Department of Public Safety, Saint John, New Brunswick
K. Cheong	Applied Engineering Solutions Ltd., Vancouver, British Columbia
A. Juhasz	KONE Inc., Moline, Illinois, USA
R.M. Kennedy	Department of Labour and Advanced Education, Halifax, Nova Scotia
R. MacKenzie	CSA International, Toronto, Ontario
D. McLellan	Technical Standards & Safety Authority, Toronto, Ontario
S. Mercier	Régie du bâtiment du Québec, Montréal, Québec
M. Mihai	Technical Standards & Safety Authority, Toronto, Ontario
R. Mitchell	Electrical Safety Authority, Central Region, Meaford, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
M. Pedram	ThyssenKrupp Northern Elevator Corp., Scarborough, Ontario
I. Pye	British Columbia Safety Authority (BCSA), New Westminster, British Columbia
A. Rehman	Schindler Elevator Corporation, Morristown, New Jersey, USA

Section 40 — Electric cranes and hoists

M.S. Anderson (<i>Chair</i>)	SaskPower, Regina, Saskatchewan
B.A. Biglow	WINELCON, Edmonton, Alberta
S. Bollito	RUETGERS Canada Inc., Hamilton, Ontario
M. Chumkovski	QPS Evaluation Services Inc., Toronto, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
S.W. Douglas	International Association of Electrical Inspectors, Toronto, Ontario
R. MacKenzie	CSA International, Toronto, Ontario
L. McQuerry	Demag Cranes & Components Corp., Cleveland, Ohio, USA
J. Salisbury	ArcelorMittal Dofasco, Hamilton, Ontario
L. Uruski	Manitoba Labour, Winnipeg, Manitoba

Section 42 — Electric welders

J.B. Salmon (<i>Chair</i>)	A.R. Milne Industrial Electric Ltd., Waterloo, Ontario
P. Liberatore (<i>Vice-Chair</i>)	Corporation des maîtres électriciens du Québec, Montréal, Québec
J.P. Boivin	CSA International, Pointe-Claire, Québec
F. Hegholz	Rostec Enterprises Inc., Rosalind, Alberta
D.A. Hisey	D&R Enterprises, Fort Saskatchewan, Alberta
R. May	Richmond, British Columbia
L.G. Silecky	Mersen Canada Toronto Inc., Toronto, Ontario (<i>Representing International Association of Electrical Inspectors</i>)

Section 44 — Theatre installations

G. Montminy (<i>Chair</i>)	Régie du bâtiment du Québec, Québec, Québec
B. Bennett	Living Arts Centre, Mississauga, Ontario
D. Lenasi	CSA International, Richmond, British Columbia
T. Olechna	Electrical Safety Authority, Mississauga, Ontario
R. Ouellette	Electrical Inspector, Edmundston Region, Edmundston, New Brunswick (<i>Representing International Association of Electrical Inspectors</i>)
M. Perreault	Division immobilière de Radio-Canada, Montréal, Québec
G. Rose	Toronto, Ontario
K.E. Vannice	Leviton Manufacturing Co. Inc., Tualatin, Oregon, USA

Section 46 — Emergency power supply, unit equipment, exit signs, and life safety systems

A.Z. Tsisserev (<i>Chair</i>)	Stantec Consulting Ltd., Vancouver, British Columbia
M.S. Anderson	SaskPower, Regina, Saskatchewan
S. Aspinwall	Smith & Andersen Consulting Engineering, Toronto, Ontario
R.M. Bartholomew	Electric Power Equipment Limited, Vancouver, British Columbia
S.C. Bygrave	Michelin North America (Canada), CAO Facility, New Glasgow, Nova Scotia
P. Corby	City of Victoria, British Columbia (<i>Representing International Association of Electrical Inspectors</i>)
T. Fazzari	Mohawk College, Stoney Creek, Ontario
E. Fernando	CSA International, Toronto, Ontario
N. Hanna	Electrical Safety Authority, Mississauga, Ontario
W.L. McAllister	City of Camrose, Alberta
R.A. Nelson	Canadian Standards Association, Mississauga, Ontario
B. Parent	Cummins Est du Canada SEC, Cummins Eastern Canada LP, Candiac, Québec

M. Rendulic	Winnipeg School Division, Winnipeg, Manitoba
P. Rizcallah	National Research Council Canada, Canadian Codes Centre, Ottawa, Ontario

Section 50 — Solar photovoltaic systems

S.W. Douglas (<i>Chair</i>)	International Association of Electrical Inspectors, Toronto, Ontario
L. Cantelo	Northern Alberta Institute of Technology, Edmonton, Alberta
P.M. Cusack	S.A. Armstrong Limited, Toronto, Ontario
S. Eng	Enviro-Energy Technologies Inc., Markham, Ontario
N. Hanna	Electrical Safety Authority, Mississauga, Ontario
S. Paulsen	CSA International, Toronto, Ontario
D.B. Pollock	Electrical Safety Authority, Ilderton, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
J.B. Salmon	A.R. Milne Industrial Electric Ltd., Waterloo, Ontario
E. Smiley	PWE Consulting, Nanaimo, British Columbia

Section 52 — Diagnostic imaging installations

D.R.A. MacLeod (<i>Chair</i>)	Department of Labour and Advanced Education, Halifax, Nova Scotia
M.B. Raber (<i>Vice-Chair</i>)	Winnipeg, Manitoba
M. Brossoit	CSA International, Pointe-Claire, Québec
J.C. Einarson	Whitehorse, Yukon
W. Wetmore	QPS Evaluation Services Inc., Toronto, Ontario (<i>Representing International Association of Electrical Inspectors</i>)

Section 54 — Community antenna distribution and radio and television installations

E.S. Alfonso (<i>Chair</i>)	TELUS, Burnaby, British Columbia
E. Chantigny	General Electric Canada, Pointe-Claire, Québec
P. Olders	Terra Communications, Inc., Scarborough, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
D. Schultz	TELUS Access Technologies & Outside Plant Support, Edmonton, Alberta
S. Turcot	Bell Canada, Montréal, Québec
E. Yap	CSA International, Richmond, British Columbia

Section 56 — Optical fiber cables

E.S. Alfonso (<i>Chair</i>)	TELUS, Burnaby, British Columbia
C.B. Chan	Coquitlam, British Columbia
S. Finnagan	Algonquin College, Ottawa, Ontario
T. Hamden	CSA International, Toronto, Ontario
P. Olders	Terra Communications, Inc., Scarborough, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
V.G. Rowe	Marex Canada Limited, Nanaimo, British Columbia
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia
S. Turcot	Bell Canada, Montréal, Québec

Section 58 — Passenger ropeways and similar equipment

W. Sparks (<i>Chair</i>)	Doppelmayr CTEC Ltd., Kelowna, British Columbia
A.N. Griffin (<i>Vice-Chair</i>)	Alberta Municipal Affairs, Edmonton, Alberta
L. Brown	Whistler & Blackcomb Mountain Resorts Limited, Whistler, British Columbia
L. Burk	Pilz Automation Safety LP, Canton, Michigan, USA

M. Chumkovski	QPS Evaluation Services Inc., Toronto, Ontario (Representing International Association of Electrical Inspectors)
P. McDermott	Technical Standards & Safety Authority, Toronto, Ontario
S. Paulsen	CSA International, Toronto, Ontario

Section 60 — Electrical communication systems

E.S. Alfonso (<i>Chair</i>)	TELUS, Burnaby, British Columbia
D.J. Andrews	DJA Engineering Services, Calgary, Alberta
S. Bent	Nova Scotia Power Inc., Kingston, Nova Scotia (Representing International Association of Electrical Inspectors)
C.B. Chan	Coquitlam, British Columbia
E. Chantigny	General Electric Canada, Pointe-Claire, Québec
P. Desilets	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
S. Finnagan	Algonquin College, Ottawa, Ontario
E.S. Guevara	Industry Canada, Ottawa, Ontario
B. Lowe	CSA International, Richmond, British Columbia
D. Schultz	TELUS Access Technologies & Outside Plant Support, Edmonton, Alberta
R.S. Smith	Bell Aliant Cabling Solutions, Moncton, New Brunswick
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia
S. Turcot	Bell Canada, Montréal, Québec

Section 62 — Fixed electric space and surface heating systems

T.S. Driscoll (<i>Chair</i>)	OBIEC Consulting Ltd., Calgary, Alberta
J. Turner (<i>Vice-Chair</i>)	Swansea Consulting, Toronto, Ontario
R. Barth	Thermon Manufacturing Company, San Marcos, Texas, USA
T. De Francesco	Aeromation Inc., Vancouver, British Columbia
P. den Bakker	Shell Global Solutions Canada, Calgary, Alberta
D.G. Lee	CSA International, Toronto, Ontario
R. Loiselle	Suncor Energy Inc., Calgary, Alberta
R. Pack	SaskPower, Saskatoon, Saskatchewan (Representing International Association of Electrical Inspectors)
V.G. Rowe	Marex Canada Limited, Nanaimo, British Columbia
R. Stromer	Imperial Oil Resources, Calgary, Alberta
J. Thomson	Electrical Safety Authority, Kitchener, Ontario
W.A. Williams	Tyco Thermal Controls, Menlo Park, California, USA

Section 64 — Renewable energy systems

T. Simmons (<i>Chair</i>)	British Columbia Institute of Technology, Burnaby, British Columbia
D. Vandermeer (<i>Vice-Chair</i>)	ReDriven Power Inc., Prescott, Ontario
L. Bassim	BC Hydro, Vancouver, British Columbia
G. Blagojevic	City of Vancouver National Works Yard, Vancouver, British Columbia
T. Buchal	Intertek, Cortland, New York, USA
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
T. Daye	Green Power Labs Inc., Dartmouth, Nova Scotia
S.W. Douglas	International Association of Electrical Inspectors, Toronto, Ontario
J.C. Einarson	Whitehorse, Yukon
M.S. Gardner	Alberta Municipal Affairs, Electrical Safety, Edmonton, Alberta
V. Ginter	New Energy Corp. Inc., Calgary, Alberta

N. Hanna	Electrical Safety Authority, Mississauga, Ontario
B. Knaggs	Ballard Power Systems Inc., Burnaby, British Columbia
H. Nasrat	Primax Technologies Inc., Dorval, Québec
S. Paulsen	CSA International, Toronto, Ontario
J. Pinter	BluEarth Renewables Inc., Calgary, Alberta
D.B. Pollock	Electrical Safety Authority, Ilderton, Ontario (Representing International Association of Electrical Inspectors)
A. Pottier	Nova Scotia Power Inc., Halifax, Nova Scotia
G. Ranjitkar	Natural Resources Canada, Ottawa, Ontario
J. Rostek	GE Energy, Greenville, South Carolina, USA
M. Vale	Hydrogenics Corporation, Mississauga, Ontario

Section 66 — Amusement parks, midways, carnivals, film and TV sets, TV remote broadcasting locations, and travelling shows

G. Montminy (<i>Chair</i>)	Régie du bâtiment du Québec, Québec, Québec
S. Mercier	Régie du bâtiment du Québec, Montréal, Québec
T. Olechna	Electrical Safety Authority, Mississauga, Ontario
R. Ouellette	Electrical Inspector, Edmundston Region, Edmundston, New Brunswick (Representing International Association of Electrical Inspectors)
S. Paulsen	CSA International, Toronto, Ontario
M. Perreault	Division immobilière de Radio-Canada, Montréal, Québec
A. Wanuch	Humber Centre for Trades and Technology, Toronto, Ontario
W. White	City of Vancouver Community Service Administration, Vancouver, British Columbia

Section 68 — Pools, tubs, and spas

M.S. Anderson (<i>Chair</i>)	SaskPower, Regina, Saskatchewan
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
T. Dinic	Electrical Safety Authority, Mississauga, Ontario
S.W. Douglas	International Association of Electrical Inspectors, Toronto, Ontario
R. Lachance	Hayward Pool Products Canada Inc., Oakville, Ontario
D. Lenasi	CSA International, Richmond, British Columbia
D. Letcher	Don Letcher (E.S.C.O.) Enterprises, Sherwood Park, Alberta (Representing International Association of Electrical Inspectors)
T. Minna	EPI Electrical Contractors, Brampton, Ontario
L.B. Ross	Newmarket, Ontario
D.K. Stuebing	Solon Enterprises Ltd., Peace River, Alberta
W.R. Wood	Pool & Hot Tub Council of Canada, Brampton, Ontario

Section 70 — Electrical requirements for factory-built relocatable structures and non-relocatable structures

J. LeBlanc (<i>Chair</i>)	Department of Public Safety, Moncton, New Brunswick
M.S. Anderson	SaskPower, Regina, Saskatchewan
B. Barker	Quality Auditing Institute Ltd., Coquitlam, British Columbia
J.C. Einarson	Whitehorse, Yukon
K. Maynard	Canadian Manufactured Housing Institute, Ottawa, Ontario
R.W. Morin	Grafton, Ontario (Representing International Association of Electrical Inspectors)
I. Pye	British Columbia Safety Authority (BCSA), New Westminster, British Columbia

Section 72 — Mobile home and recreational vehicle parks

D. Hallock (<i>Chair</i>)	City of Winnipeg, Manitoba
M.S. Anderson	SaskPower, Regina, Saskatchewan
J. Baker	OPCA, Embro, Ontario
B. Barker	Quality Auditing Institute Ltd., Coquitlam, British Columbia
L. Coulombe	Régie du bâtiment du Québec, Québec, Québec
J.C. Einarson	Whitehorse, Yukon
D. Letcher	Don Letcher (E.S.C.O.) Enterprises, Sherwood Park, Alberta (<i>Representing International Association of Electrical Inspectors</i>)
T. Olechna	Electrical Safety Authority, Mississauga, Ontario
I. Pye	British Columbia Safety Authority (BCSA), New Westminster, British Columbia

Section 74 — Airport installations

D. Hallock (<i>Chair</i>)	City of Winnipeg, Manitoba
E.J. Alf	Transport Canada — AARTAE, Ottawa, Ontario
G.W. Bradbury	B.T.E. Engineering Technology Services, St. Petersburg, Florida, USA (<i>Representing International Association of Electrical Inspectors</i>)
R. Chernish	National Defence, Winnipeg, Manitoba
G.T. Gingara	Mosaic Potash Esterhazy K1 Plant, Esterhazy, Saskatchewan
R. Kowalik	Alberta Transportation, Sherwood Park, Alberta
R. Larivée	Avia Rupta Solutions Inc., Boisbriand, Québec
I. Pye	British Columbia Safety Authority (BCSA), New Westminster, British Columbia

Section 76 — Temporary wiring

D.R.A. MacLeod (<i>Chair</i>)	Department of Labour and Advanced Education, Halifax, Nova Scotia
S.W. Douglas (<i>Vice-Chair</i>)	International Association of Electrical Inspectors, Toronto, Ontario
J.B. Biollo	John's Enterprises Ltd., Leduc, Alberta
J. Calabrese	Electrical Safety Authority, Scarborough, Ontario
B. Doan	Sumner Electric London Ltd., Komoka, Ontario
S. Hinde	British Columbia Safety Authority (BCSA), Nanaimo, British Columbia
T.K. Kjartanson	Manitoba Hydro, Winnipeg, Manitoba
S. Nair	WorkSafe BC, Richmond, British Columbia
B. O'Donnell	AC Powerline Construction, Pickering, Ontario
S. Paulsen	CSA International, Toronto, Ontario

Section 78 — Marinas, yacht clubs, marine wharves, structures, and fishing harbours

J. LeBlanc (<i>Chair</i>)	Department of Public Safety, Moncton, New Brunswick
R.M. Branch	Department of Public Safety, Bathurst, New Brunswick
W.J. Burr	Burr and Associates, Campbell River, British Columbia
A. Donaldson	Ontario Marine Operators Association, Penetanguishene, Ontario
K. McCormick	Electrical Safety Authority, Cobourg, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
M. Mosher	Government of Newfoundland and Labrador, St. John's, Newfoundland and Labrador
M. Vollmer	Michael Vollmer Yacht Design Inc., Burlington, Ontario

Section 80 — Cathodic protection

D.R.A. MacLeod (<i>Chair</i>)	Department of Labour and Advanced Education, Halifax, Nova Scotia
R.J. Maynard	Aurora Corrosion Control, Calgary, Alberta
W.G. McMullan	Winnipeg, Manitoba
S. Paulsen	CSA International, Toronto, Ontario
D. Schill	SaskPower, Yorkton, Saskatchewan (<i>Representing International Association of Electrical Inspectors</i>)
R. Stromer	Imperial Oil Resources, Calgary, Alberta
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia
R.G. Wakelin	Gull River Engineering Inc., Brooklin, Ontario

Section 82 — Closed-loop and pre-closed-loop power distribution

J. Zulak (<i>Chair</i>)	National Defence Headquarters, Ottawa, Ontario
P. Desilets	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
D. Juden	C.C.G., Ottawa, Ontario
S. Paulsen	CSA International, Toronto, Ontario
D. Pilon	SaskPower Electrical Inspections, Saskatoon, Saskatchewan (<i>Representing International Association of Electrical Inspectors</i>)

Section 84 — Interconnection of electric power production sources

F.L. Kaempffer (<i>Chair</i>)	BC Hydro, Burnaby, British Columbia
M.S. Anderson	SaskPower, Regina, Saskatchewan
D. Desrosiers	CYME International T&D, Saint-Bruno, Québec
E.P. Dick	Electric Power Diagnostics, Toronto, Ontario
D.J. Heron	Electrical Safety Authority, Sudbury, Ontario
B. Lipson	Stantec Consulting Ltd., Vancouver, British Columbia
A. Mak	WorleyParsons Canada, Edmonton, Alberta
S. Martel	Natural Resources Canada, Varennes, Québec
D. Mascarenhas	Brampton, Ontario
S. Paulsen	CSA International, Toronto, Ontario
J.C. Potts	QPS Evaluation Services Inc., Ottawa, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
V.G. Rowe	Marex Canada Limited, Nanaimo, British Columbia
T. Simmons	British Columbia Institute of Technology, Burnaby, British Columbia

Section 86 — Electric vehicle charging systems

T.W. Odell (<i>Chair</i>)	Toronto Hydro–Electric System Limited, Toronto, Ontario
P. Desilets (<i>Vice-Chair</i>)	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
D. Chandler	Vancouver Electric Vehicle Association, Vancouver, British Columbia
S. Dallas	Toronto Electric — Electric Mobility Canada, Toronto, Ontario
P. Hinse	University of Ontario Institute of Technology, Oshawa, Ontario
D. Mascarenhas	Brampton, Ontario
T. Olechna	Electrical Safety Authority, Mississauga, Ontario
S. Paulsen	CSA International, Toronto, Ontario
J.C. Potts	QPS Evaluation Services Inc., Ottawa, Ontario (<i>Representing International Association of Electrical Inspectors</i>)
C. Schlotzhauer	General Motors of Canada Limited, Oshawa, Ontario
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia

Appendix C

A.Z. Tsisserev (<i>Chair</i>)	Stantec Consulting Ltd., Vancouver, British Columbia
S.W. Douglas (<i>Vice-Chair</i>)	International Association of Electrical Inspectors, Toronto, Ontario
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F.L. Kaempffer	BC Hydro, Burnaby, British Columbia
G. Montminy	Régie du bâtiment du Québec, Québec, Québec
T. Simmons	British Columbia Institute of Technology, Burnaby, British Columbia
M. Smith	Rockwell Automation Canada Inc. Control Systems, Cambridge, Ontario

Appendix D

B.F. O'Connell (<i>Chair</i>)	Tyco Thermal Controls (Canada) Ltd., Trenton, Ontario
S.W. Douglas	International Association of Electrical Inspectors, Toronto, Ontario
S. Paulsen	CSA International, Toronto, Ontario
A.Z. Tsisserev	Stantec Consulting Ltd., Vancouver, British Columbia

Appendix E

V.G. Rowe (<i>Chair</i>)	Marex Canada Limited, Nanaimo, British Columbia
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Appendix F

V.G. Rowe (<i>Chair</i>)	Marex Canada Limited, Nanaimo, British Columbia
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Appendix G

A.Z. Tsisserev (<i>Chair</i>)	Stantec Consulting Ltd., Vancouver, British Columbia
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Appendix H

V.G. Rowe (<i>Chair</i>)	Marex Canada Limited, Nanaimo, British Columbia
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Appendix J

Annex J18

V.G. Rowe (<i>Chair</i>)	Marex Canada Limited, Nanaimo, British Columbia
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Annex J20

M.K. Shea (<i>Chair</i>)	City of Victoria, British Columbia
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Preface

This twenty-second edition of the *Canadian Electrical Code, Part I*, was approved by the Committee on the *Canadian Electrical Code, Part I*, and by the Regulatory Authority Committee at their June 2011 meetings in Victoria, British Columbia. This twenty-second edition supersedes the previous editions, published in 2009, 2006, 2002, 1998, 1994, 1990, 1986, 1982, 1978, 1975, 1972, 1969, 1966, 1962, 1958, 1953, 1947, 1939, 1935, 1930, and 1927.

A new Section 64 has been added to cover requirements for renewable energy systems, and major updates have been made to Section 50 on solar photovoltaic systems. Section 48 has been deleted, and some of its requirements have been transferred to Section 26.

Several new conductor types and wiring methods have been recognized, and there are significant changes in the Rules and Tables governing ampacity calculations. Grounding and bonding requirements have been revised, and new requirements have been added for tamper-resistant receptacles and receptacles exposed to the weather.

In several sections, Rules applicable to electric vehicle charging infrastructure have been added or revised. Substantial changes have also been made to requirements for hazardous locations and electric heating.

General arrangement

The Code is divided into numbered Sections, each covering some main division of the work. Sections 0 to 16 and 26 are considered general Sections, and the other Sections supplement or amend the general Sections. The Sections are divided into numbered Rules, with captions for easy reference, as follows:

- (a) **Numbering system** — With the exception of Section 38, even numbers have been used throughout to identify Sections and Rules. Rule numbers consist of the Section number separated by a hyphen from the 3- or 4-digit figure. The intention in general is that odd numbers may be used for new Rules required by interim revisions. Due to the introduction of some new Rules and the deletion of some existing Rules during the revision of each edition, the Rule numbers for any particular requirement are not always the same in successive editions.
- (b) **Subdivision of Rules** — Rules are subdivided in the manner illustrated by Rules 8-204 and 8-206, and the subdivisions are identified as follows:

00-000	Rule
(1)	Subrule
(a)	Item
(i)	Item
(A)	Item

- (c) **Reference to other Rules, etc.** — Where reference is made to two or more Rules (e.g., Rules 10-200 to 10-206), the first and last Rules mentioned are included in the reference. Where reference is made to a Subrule or Item in the same Rule, only the Subrule number and/or Item letter and the word “Subrule” or “Item” need be mentioned. If the reference is to another Rule or Section, then the Rule number and the word “Rule” shall be stated (e.g., “Rule 10-200(3)” and not “Subrule (3) of Rule 10-200”).

The principal changes that have been made between the 2009 edition of the *Canadian Electrical Code, Part I*, and this new edition published in 2012 are marked in the text of the Code by the symbol delta (Δ) in the margin. Users of the Code are advised that the change markers in the text are not intended to be all-inclusive and are provided as a convenience only; such markers cannot constitute a comprehensive guide to the reorganization or revision of the Code. Care must therefore be taken not to rely on the change markers to determine the current requirements of the Code. As always, users of the Code must consider the entire Code and any local amendments.

Acknowledgement

The use of material contained in the *National Electrical Code* is acknowledged.

The history and operation of the *Canadian Electrical Code, Part I*

The preliminary work in preparing the Canadian Electrical Code began in 1920 when a special committee, appointed by the main Committee of the Canadian Engineering Standards Association, recommended its development. A third meeting of this Committee was held in June 1927 with representatives from Nova Scotia,