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Introduction

The Canadian Solar Industries Association ("CanSIA") is a national trade association representing more than 300 solar energy companies, the majority of which are located in Ontario. Our mission is to develop a strong, efficient, ethical and professional Canadian solar industry that is able to provide innovative solar energy solutions and play a major role as the world transitions to a sustainable future.

On February 23rd 2009, the Ontario Government introduced Bill 150 – The Green Energy Act. Its vision is to make Ontario a global leader in the development of clean, green energy; creating jobs, economic prosperity and energy security. The Green Energy Act requires a series of coordinated actions on the part of several ministries.

The Ontario Ministry of Municipal Affairs and Housing ("MMAH") invited CanSIA to discuss changes to the Ontario Business Code Act and Ontario Reg. 350/06 (Ontario Building Code ("OBC")) that will enhance solar panel installation and help to generate more renewable energy and economic growth in Ontario. CanSIA presented an initial proposal to MMAH, with other stakeholders in attendance on March 27, 2009, which resulted in a number of further discussions related to CanSIA's recommendations. As a result of these discussions, CanSIA has prepared an updated submission to MMAH outlining recommendations which now consider many of the March 27 meeting points, regarding both the solar thermal ("ST") and photovoltaic ("PV") sectors.

Item	Issue	Technology	Recommendation(s)
A	**Backflow Prevention**	**ST**	**1 – 3**
B	**Solar Panel Collector as a Designated Structure**	**ST/PV**	**4**
C	**PV Standards and ESA Certification**	**PV**	**5**
D	**CSA Solar Energy Standards**	**ST/PV**	**6**

A. Backflow Prevention

Solar Thermal Issue

In this submission CanSIA provides two options to address the issue of backflow prevention. It is CanSIA's view that the first approach, encompassing recommendations # 1 and # 2, is the most effective way to resolve the confusion surrounding backflow prevention, however, recommendation # 3 is provided as an alternative approach.

1. CanSIA understands that MMAH is developing a *Code Advisory Notice* that intends to provide clarification on the matter of SDHW systems as related to direct connection and its impacts on backflow prevention requirements.

> ***Recommendation # 1***: In a Code Advisory Notice (or Statement of Interpretation), explicitly state:
>
> *"No backflow prevention device is required on solar domestic hot water ("SDHW") systems where there is no direct connection between the building potable water supply and the solar heat transfer fluid loop."*
>
> Note: As shown in Figure 1. A) as opposed to Figure 1. B), see Appendix A.

Rational: More guidance is required from the Ontario Building Code. Ontario municipalities and townships are starting to develop, or have developed, very different policies with regards to backflow prevention and Solar Domestic Hot Water ("SDHW") systems.

Some jurisdictions recognize that SDHW systems have no direct connection between potable water supply and heat-transfer fluid loop and do not require backflow protection. Other jurisdictions, relying on the OBC for guidance, are applying specifications for backflow protection *from fire protection systems* which suggests both area and premise backflow protection. This places private residences with SDHW systems (conforming to CAN/CSA F379) in the same hazard category of morgues, plating and chemical factories, sewage treatment facilities and radioactive material processing plants.

2. Much of the language pertaining to "Connection of Systems" and "Back Siphonage" is ambiguous and is creating confusion among building code officials.

> ***Recommendation # 2***: To compliment the Code Advisory Notice (or Statement of Interpretation), changes to the OBC should also provide new language that defines *7.6.2.1 Connection of Systems* more explicitly.
>
> Note: See Language Recommendation 2-A and 2-B in following section recommendations.

Language Recommendation 2-A

Existing Language:

7.6.2.1. Connection of Systems

(1) Connections to *potable water systems* shall be designed and installed so that non-*potable* water of substances that may render the water non-*potable* cannot enter the system.

CanSIA Proposed Language:

7.6.2.1. Connection of Systems

(1) DIRECT connections to potable water systems shall be designed and installed so that non-potable water of substances that may render the water non-potable cannot enter the system.

Rationale: The term "connection" is ambiguous and therefore creates confusion. The term "connection" may be interpreted as a direct connection (i.e. cross-connection, such as for make-up water).

Language Recommendation 2-B

Existing Language:

7.6.2.2. Back Siphonage (See Appendix A.)

(2) Where a *potable* water supply is connected to a boiler, tank, cooling jacket, lawn sprinkler system or other device where a non-*potable* fluid may be under pressure that is above atmospheric or the water outlet may be submerged in the non-*potable* fluid, the water supply shall be protected against *backflow* by a *backflow preventer*.

(3) Where a hose bibb is installed outside a *building*, inside a garage, or where there is an identifiable risk of contamination, the *potable water system* shall be protected against *backflow* by a *backflow preventer*.

CanSIA Proposed Language:

7.6.2.2. Back Siphonage

(2) Where a potable water supply is DIRECTLY connected to a boiler, tank, cooling jacket, lawn sprinkler system or other device where a non-potable fluid may be under pressure that is above atmospheric or the water outlet may be submerged in the non-potable fluid, the water supply shall be protected against backflow by a backflow preventer as directed by CAN/CSA B64.10 Selection and Installation of Backflow Preventers.

(3) Where a hose bibb is installed outside a building, inside a garage, or where there is an identifiable risk of contamination FROM A HOSE BIBB (or FROM BACK SIPHONAGE), the potable water system shall be protected against backflow by a backflow preventer as directed by CAN/CSA B64.10 Selection and Installation of Backflow Preventers.

Rationale: The term "connection" is ambiguous and therefore creates confusion. The term "connection" may be interpreted as a direct connection (i.e. cross-connection, such as for make-up water). Examples provided in section (2) (e.g. boiler, tank, cooling jacket, sprinkler) suggest direct connection. No description of the required backflow prevention device is stated or whether it is an area or premise isolation, or both.

In section (3) the term "identifiable risk of contamination" creates confusion as it is not clear whether the term refers to only bibb situations, back siphonage situations or in any situation. Again, no description of required backflow prevention device is stated or whether it is an area or premise isolation, or both. In addition, no appendix actually exists for section 7.6.2.2.

3. CanSIA believes the two (2) recommendations outlined above are the most effective approaches to resolving the confusion surrounding backflow prevention as it applies to Solar Domestic Hot Water Systems in Ontario.

   However, if these recommendations are not adopted, CanSIA subsequently reiterates our original backflow prevention proposal as presented to MMAH on March 27, 2009, and is stated again as follows:

Recommendation # 3: Amend the Ontario Building Code to add a section specific to backflow protection for SDHW Systems as outline below:

7.6.2 Protection from Contamination

7.6.2.5 Backflow from Residential Building with a Solar Domestic Hot Water System (New)

(1) Except as permitted in Sentence (3), a backflow preventer shall be required for solar hot water systems that are connected to the potable water supply of buildings for residential occupancy within the scope of Part 9.

(2) Except as permitted in Sentence (3), backflow preventers shall be selected, installed and tested in conformance with CAN/CSA-B64.10, "Manual for the Selection and Installation of Backflow Prevention Devices".

(3) Solar hot water systems that are connected to the potable water supply of buildings for residential occupancy within the scope of Part 9 and which conform to CAN/CSA-F379, "Packaged Solar Domestic Hot Water Systems" shall have their backflow prevention devices selected and installed in conformance with Table 7.6.2.5.

Table 7.6.2.5: Backflow Prevention Devices for Solar Domestic Hot Water Systems

Type of System	Degree of hazard	CSA Standard Number	Type of Device
Solar Hot Water Systems (direct flow-through heating of water supply)	Minor	Not applicable	None required
Solar Hot Water Systems (residential, indirect with single-wall heat exchanger and process water heat-transfer fluid with no chemical additives)	Minor to Moderate	B64.3	DCAP
Solar Hot Water Systems (residential, indirect, with single-wall heat exchanger and non-toxic heat-transfer fluid)	Minor to Moderate	B64.3	DCAP
Solar Hot Water Systems (residential, indirect, with single-wall heat exchanger and toxic heat-transfer fluid)	Severe	B64.4	RP
Solar Hot Water Systems (residential with double-walled, vented heat exchanger)	Minor	Not applicable	None required

B. Solar panel collector as a designated structure

Joint Solar Photovoltaics and Solar Thermal Issue

Under the OBC, a "*solar collector that is mounted on a building and has a face area equal to or greater than 5 m²*" is a designated structure (see below).

1.3.1.1. Designated Structures

(1) The following structures are designated for the purposes of clause (d) of the definition of building in subsection 1(1) of the Act:

(f) A solar collector that is mounted on a building and has a face area equal to or greater than 5 m^2.

As a designated structure, it is essentially a building that requires a building permit and is subject to the entire building code regulatory framework, including comprehensive structural specifications and inspections. This designation presents a significant obstacle to routine solar thermal and solar photovoltaic system installation.

Recommendation # 4: Amend the Ontario Building Code to exempt specific building and ground mounted solar collectors as designated structures as outlined below:

1.3.1.1. Designated Structures

(1) The following structures are not designated for the purposes of clause (d) of the definition of building in subsection 1(1) of the Act:

(f) A solar collector ***array or installation (including racking)*** *that is mounted on a building or on the ground.*

Rationale: Solar collector arrays and racking vary greatly in design, as do the surfaces they are mounted on (i.e. roofs, walls, ground, etc.). Requiring a building permit would impose a significant and unnecessary burden on the building code officials and the industry. Furthermore, solar collectors should be treated comparably to other similar non-designated structures (i.e. ground or roof mounted satellite dishes, flag poles, etc) which are not subject to building code requirements.

In addition, height and setback requirements are expected to be addressed through municipal bylaws and planning acts as well as the Green Energy Act proposed Renewable Energy Approval Process, therefore, eliminating the need to have solar collectors subject to building code requirements.

There are a number of documents which support the position to exempt solar collectors from the building code. Please see a list of supporting documents in Appendix B which also include some international best practices. These documents have also been attached to this CanSIA submission to MMAH.

CanSIA has strengthened and continues to strengthen the capacity of the solar industry in addition to informing consumers and building officials about solar installations and building code considerations. For further information on CanSIA's efforts please see *CanSIA: Industry Capacity and Best Practices* in Appendix C. Some of CanSIA's efforts include;

- Installer Training and Certification
- Building Inspector Workshops
- Commercial Insurance
- Best Practices Documents

CanSIA will continue to work with MMAH, municipalities and townships, building officials and inspectors, solar professionals and trades professionals and the solar industry to further develop best practices documents and information.

C. PV Standards and ESA Certification

Solar Photovoltaic Issue

> ***Recommendation # 5***: Eliminate the requirement for electrical drawings to be reviewed by the permit process.

Rationale: Requiring electrical drawings to be reviewed during the permitting process is a redundant step as all electrical installations are certified by the local distribution company ("LDC") and the Electrical Safety Authority ("ESA").

D. CSA Solar Energy Standards

Solar Thermal Issue

The current version of the Ontario Building Code does references solar standards CAN/CSA F379.1-88 and CAN/CSA F383-87. These standards have since been updated by CSA.

> ***Recommendation # 6***: Update the Ontario Building Code to remove CAN/CSA F379.1-88 and CAN/CSA F383-87 and replace them with the latest standards being CAN/CSA F379-09 and CAN/CSA F383-08, respectively.
>
> Furthermore, an alternative approach could see the Ontario Building Code not reference specific solar standard versions by year, with the understanding that the most recent update is applicable.

Rational: Significant changes have been made to the CSA solar standards and these changes should be reflected in the new Ontario Building Code. For example, systems that are certified to the new CAN/CSA-F379-09 standard however are not recognized by the current Ontario Building Code.

Closing

CanSIA appreciates this opportunity to provide input regarding the Ontario Building Code. We realize that further discussions will be required before making any final decisions however we would like to express our interest in continuing to work cooperatively with the Ministry of Municipal Affairs and Housing on these and other matters.

Appendix A

Figure 1. A)

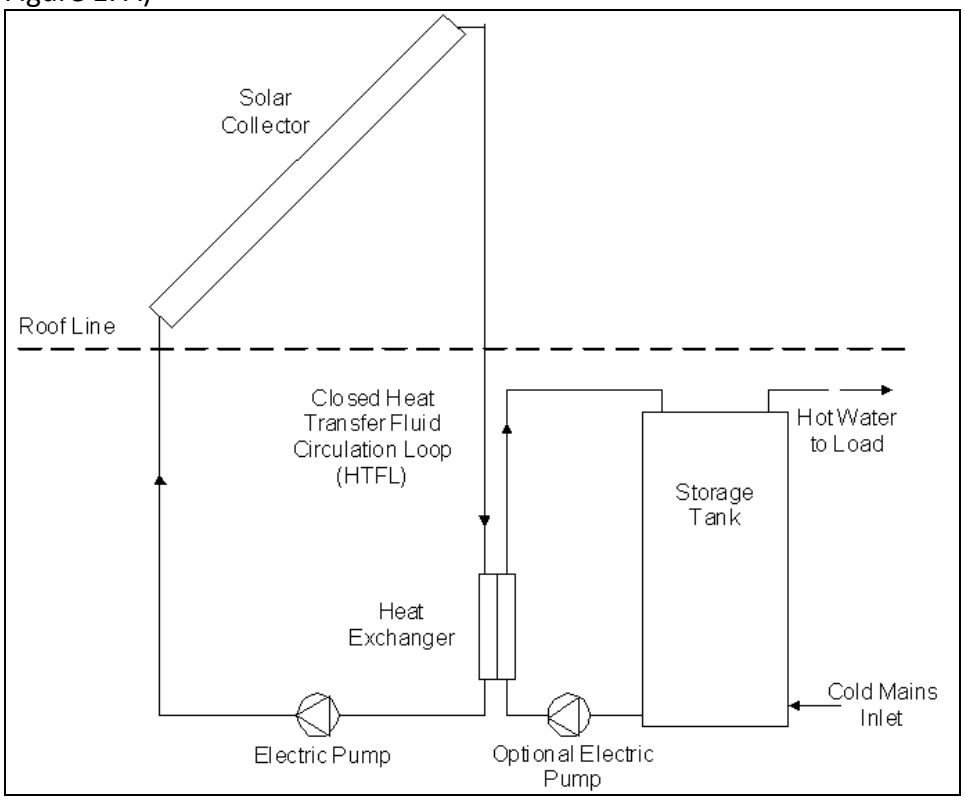
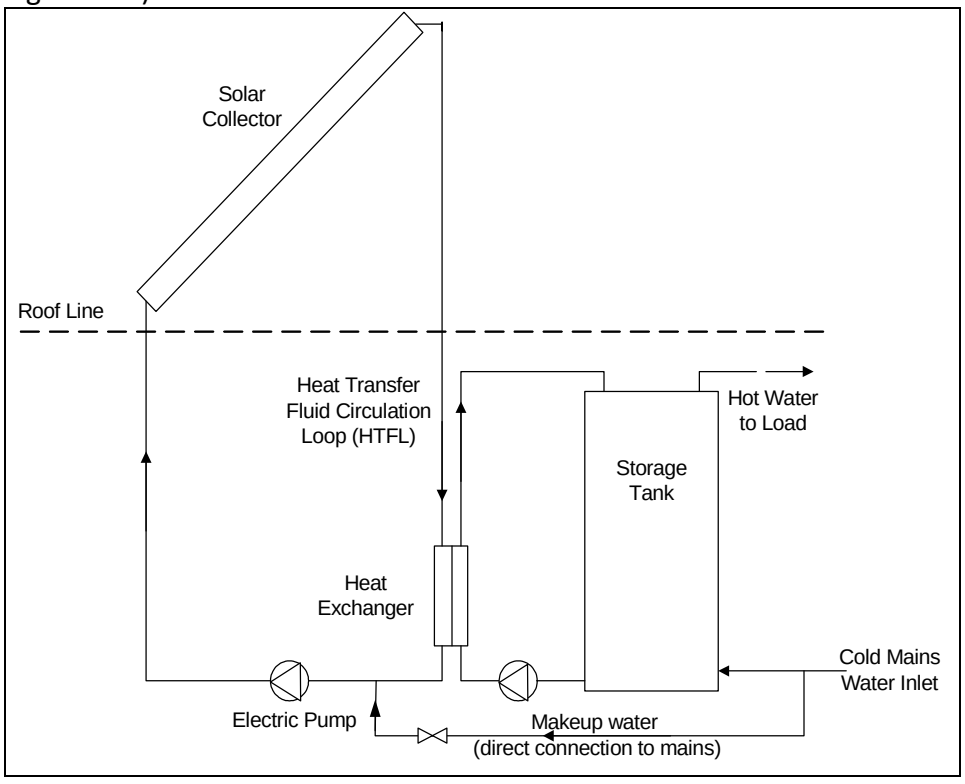


Figure 1. B)



Appendix B – Supporting Documents

Building America: Best Practises Series – Solar Thermal and Photovoltaic Systems. U.S. Department of Energy. June 4, 2007. (Attached)

Code of Practice for Manufacture and Installation of Solar Water Heating Systems in New Zealand. Solar Industries Association of New Zealand & New Zealand Energy Efficiency and Conservation Authority. May 2004. (Attached)

Energy efficiency of buildings: Consultation on energy efficiency revisions to the New Zealand Building Code and Compliance Documents New Zealand Department of Building and Housing. November 2006. www.dbh.govt.nz. (Attached)

New Zealand Building Code for Structures; Manual for Structural Assessment for Installation of Solar Water Heating in Domestic Dwellings; NZS 3604:1999 Timber Framed Buildings; and Code of Practice, Section 5.4. (Attached)

Solar Water Heater Exempt Development [building permit exemption]
Planning & Economic Development, City of Albury, New South Wales, Australia.
www.alburycity.nsw.gov.au. (Attached)

Solar Water Heating Guidebook: A technical guide for building industry professionals. New Zealand Energy Efficiency and Conservation Authority. October 2006. (Attached)

Appendix C – CanSIA: Industry Capacity and Best Practices

CanSIA has strengthened and continues to strengthen the capacity of the solar industry, in addition to informing consumers and building officials about solar technology, installations and building code considerations.

Installer Training and Certification:
Currently CanSIA has a number of training programs in place (see http://www.cansia.ca/Default.aspx?pageId=139831). The CanSIA Solar Hot Water System Installer Workshop, developed with support from the Government of Canada, has seen almost 400 Ontario participants over the past 2 years while the association expects to train another 200 by the end of 2009. There is now over 25 CanSIA Certified Solar Hot Water System Installers in Ontario and this number continues to grow quickly. Also in place is the Photovoltaic Technician Program which is a distance learning course offered by Seneca College in partnership with CanSIA. This course consists of 3 levels, with the final level offering a 4 day practical installation workshop. In 2008 the program saw 75 students enter the program, an increase of approximately 25 percent from the previous year.

In addition to the present solar training programs, CanSIA, in partnership with Natural Resources Canada and the Association of Canadian Community Colleges, is developing a national curriculum for solar thermal and solar photovoltaic installers. This curriculum is expected to be rolled out in fall 2009 and will be available to all community colleges in Ontario and throughout Canada. This program will be designed for inexperienced solar installers. Besides initiative CanSIA is also upgrading its Solar Hot Water System Installer workshop for experienced installers. Northern Lights College in British Columbia has developed this updated national training workshop in partnership with CanSIA and is currently performing a pilot program in BC. It is expected to be rolled out in Ontario community colleges in 2010. CanSIA expects to develop a Solar Photovoltaics Installer workshop for experienced installers by the end of 2009 with a Canadian community college.

Currently CanSIA has developed a Solar Hot Water System Installer Certification program which now sees a growing number of recognized Ontario installers. CanSIA is also working to develop a Solar Photovoltaics Installer Certification Program. The CanSIA installer certification programs will provide consumers with an opportunity to choose an experienced installer from the list of CanSIA Certified Installers (see http://www.cansia.ca/Default.aspx?pageId=143754) to help ensure quality installations.

Solar System Building Inspector Workshops:
CanSIA offers a Solar System Building Inspectors workshop. This program helps to education building officials about solar installations regarding technology, safety and standards. This course is offered at our annual conference in Toronto however CanSIA expects to further develop this workshop and to distribute it more broadly to building officials and inspectors throughout Ontario.

Commercial Insurance:
CanSIA has surveyed a number of our solar installer members who operate in Ontario. It is a requirement that all registered installation companies have commercial insurance in order to do business in this sector. If there was a situation where the installation was not performed properly and resulted in damage, the work would be insured.

Furthermore, CanSIA has partnered with an underwriter to offer commercial insurance to CanSIA members in the solar installation business.

Best Practices Documents and Information:
CanSIA, along with community partners, has developed a number of best practice documents for municipalities and consumers while continuing to work on the development of further best practices. These publications are available on our website and have been attached. They include:

- CanSIA Industry Directory 2009
- Solar PV Community Action Manual. CanSIA / Ontario Sustainable Energy Association. 2008.
- Solar Thermal Community Action Manual. CanSIA / Ontario Sustainable Energy Association. 2008.

In Appendix B a number of other examples of international best practices are available which CanSIA is using as a guideline for additional best practices documents. CanSIA intends to create a solar thermal and solar photovoltaics installation best practices guide for building officials and municipalities, while updating our consumer best practices manual.

CanSIA will continue to work with MMAH, municipalities and townships, building officials and inspectors, solar professionals and trades professionals and the solar industry to further develop best practices documents and information.