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CHANGES TO THE NATIONAL BUILDING CODE OF CANADA WITH RESPECT TO TREATED WOOD

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Summary

This paper discusses some of the changes to the National Building Code of Canada (NBCC) as to where they might impact the uses of treated wood in both residential and commercial construction markets. It examines the transition to objective-based codes as well as some of the current issues with the treated wood industry.

1. Introduction

The National Building Code of Canada (NBCC) is a document produced by the National Research Council. Its origins date back to 1937, when the federal Department of Finance mandated the NRC to develop a model code that would be applicable to all municipalities in order to create uniformity across the country. The thought was that this uniformity would encourage construction. The first edition of the National Building Code (NBC) was published in 1941. Its intent is to provide minimum guidelines for health, life safety and structural sufficiency in new structures.

The group responsible for the upkeep of the NBCC is the Canadian Commission on Building and Fire Code (CCBFC). It's a group made up of professionals in the building sectors: engineers, architects, fire officials, researchers, regulators, builders and list goes on. The CCBFC oversees seven subcommittees that can mandate task forces to investigate specific issues. These people are all volunteers.

Theoretically, twice every five year code cycle, a list of changes that the subcommittees have agreed upon are published and open for public review, so anyone can submit comments. The intent is that the system should be as objective and as consensus based as possible.

2. Code Structure

The current version of the Code has 9 parts.

- **Part 1** covers the scope and definitions.
- **Part 2** covers general requirements such as structural equivalencies. This is the part where material standards are referenced.
- **Part 3** covers with requirements for fire safety.
- **Part 4** of the Code is where the structural loadings are defined. Loading conditions like wind, rain, and snow loads for a particular structure will be specified. This part of the code is performance based, which means that whatever solution put forth has to meet the minimum requirement set by the Code. In

comparison, Part 9, which also deals with loads but for small buildings, tends to be less conservative than what is established through Part 4.

- **Part 5** covers environmental separation- the control of condensation, the transfer of eat, air moisture through building elements and interface
- **Part 6** is the section that applies to equipment for heating, air conditioning and ventilation.
- **Part 7** covers the scope of the plumbing sections and refers either to the National Plumbing Code or other section of the Code that deal with the subject.
- **Part 8** covers safety measures at construction and demolition sites.
- **Part 9** is the part that deals with small buildings that are three storeys or less in height or 600 m2 in building area. Occupancy will also have something to do with whether or not a building can be considered a Part 9 building. This is also the prescriptive part of the code, which means that it tells the user what to do instead of the user having to develop a performance-based solution to meet the code requirements.

3. Code changes

Objective- based Codes[1]

The Code currently has both prescriptive and performance-based requirements. It is perceived that prescriptive requirements are too restrictive to innovations. That's one of the reasons why the Code commission decided to move towards this type of performance based code. Rather than defining measurable performance criteria (very hard to do for all cases that the code covers), the Code Commission evolved the concept of using prescriptive and performance based criteria and provided more information on the interpretation to help users evaluate alternative solutions. With this system, the Code Commission hopes to overcome some of the policy issues that could come up in certain areas and therefore increase adoption.

The objectives are written more clearly so that the user can understand the intent. There will be both an objective statement and a functional statement. The objective statement states what should not happen; for example, failure (limit the probability of). There are also a series of functional statements that provide guidance on how to achieve this.

This is an example of an objective statement.
OS2 Structural Safety
Limit the probability that, as a result of the design or construction of the building, a person in or adjacent to the building will be exposed to an unacceptable risk of injury due to structural failure. The risks of injury due to structural failure addressed in this Code are those caused by-

- OS2.1 loads bearing on the building elements that exceed their load-bearing capacity;

[1] This discussion is based largely on a presentation entitled Code Development System and Objective-Based Codes available on the National Research Council website at http://www.nationalcodes.ca/consult/obc/obc_ppt_e.ppt

- OS2.3 damage to or deterioration of building elements.

On the other hand, the functional statement tries to describe ways to avoid the situation discussed in the objective.

- To resist deterioration resulting from expected service conditions;
- To minimize the risk of malfunction, interference, damage, tampering, lack of use or misuse.

The new code will have three parts:

Division A contains all the compliance, objectives and functional statements- it's a policy level division that is not expected to change too often. So for example, if a user wants to look at a novel solution, he or she will look at objectives and functional statement for the particular application and it will be up to him or her to demonstrate that the solution meets the objective.

Division B will essentially be the Building Code in its current form. It will be the working part of the Code with both prescriptive and some performance based solutions. This part of the code is expected to change more frequently.

Division C includes administrative provisions. It makes it easy to exclude provinces that do not use the model national code but there are many provinces that like to use the national administrative provisions.

The objective-based code is intended to provide more flexibility in the building of structures, especially during renovations where novel solutions are often sought. A user will have the choice to either use prescribed solutions in the Code or propose a new solution that meets the intent of the Code. The local authorities will evaluate the solution and make the final decision as to whether or not it is acceptable. If new products are proposed or introduced, they will have to go through the same kind of process that has always been, either an evaluation by a competent recognised lab or by CCMC.

Code Changes Specific to Treated Wood

The following changes can be obtained at the NRC website at http://www.nationalcodes.ca/consult/tc/consultation_e.shtml

Subsection 5.1.4 – Resistance to Environmental Loads

Currently, Part 4 of the Building Code recognizes structural components that support loads but it does not clearly recognize elements in a system that play a role in preserving the integrity of the system and that are also be susceptible to loads. The new provision basically recognises the fact that those other elements in the system actually contribute to the environmental load bearing capacity of the system as well as to the overall durability. As such, these elements will need to be designed accordingly.

This is in light of a new Rain Class Index that the National Research Council is developing, which is based on the amount of precipitation in a particular area and the extra protection required in the system. So the type of rain protection mechanism employed will depend on the amount of rainfall and on the solutions that have been tested. However, the Code will have provisions to recognise the past performance of systems that been used successfully in a particular geographic areas over at least thirty years. This is important because it allows certain solutions to be used locally without necessitating expensive testing.

A reference to CSA standard S478 may help to provide some guidance in reducing the likelihood of premature failure. However, there are some issues with referencing that particular standard. Although it may help some users, the information it contains is not prescriptive enough, which may make it difficult to enforce.

Article 9.3.2.9 Termite and decay Protection

Article 9.3.2.9 contains many changes that could affect the use of pressure treated wood. Some of the provisions have been clarified. For example, it states that structural wood members be pressure treated when they are closer than 150 mm of the finished ground surface.

The article specifies that 450 mm be provided under the framing for an inspector to verify that there are no termite shelter tubes or other signs of termite attack on the framing at or near the foundation. Should the foundation be insulated or otherwise finished so as to potentially conceal a termite attack, then there should be a metal or plastic barrier through the insulation and other separation materials above finished ground in order to provide a separation and force the termite shelter tubes around it, thus making it more obvious and easier to treat.

The Code is also moving towards the adoption of a labelling program where pressure treated wood used in code compliant construction will require a label identifying the compliance to the appropriate Standard for wood treatment.

There is a new provision specifying the use of pressure treated wood when the structural wood components are not protected from the elements, the configuration is conducive to water accumulation and/or in an area with a relatively high moisture load. So the condition to use treated wood does not necessarily have to be near or at ground contact. Beam protruding beyond roof decks, junctions between deck members, and connections between balcony guards, among others will require pressure treated wood.

The appendix notes will have a map of termite prone areas across Canada. It loosely defines those geographic areas, so it can be assumed that municipalities will determine whether or not they belong in an area at risk for termites.

A new provision has been added, which states that in critical cribbing applications, pressure treated wood will be required. The appendix note attached describes how to identify critical application. Basically, cribbing that holds 1.2 m of soil is considered a critical application. Also, if the elevation angle between the bottom of the cribbing and a structure's footing is more than 45 degrees, then the cribbing application is critical and necessitates the use of certified pressure treated wood.

A reference to CSA Standard O80.34 has been added, which relates to pressure treatment with borates. The Code also specifies that borate treated wood uses must be above ground and protected from the moisture during and after construction, and separated by a moisture barrier when it is closer than 150mm from the ground.

4. Current Issues

Following are some of the current issues with respect to treated.

Acceptance of non-incised treated wood

A new CSA standard (CSA O80.36) has been developed for thinner pieces of wood that are not incised before treatment. The types of products that are targeted include decking, railing, mouldings, fence boards. However, the new standard is not yet referenced in the upcoming edition of the Code, which may create difficulties in specifying these treated products.

Marking of treated wood and applications

The new requirement for treated wood labels brought a series of issues. For instance, the uses for the current alternatives to CCA (Copper Azole and Alkaline Copper Quaternary) have not been clearly specified in non-residential applications. In comparison, the US labels specify the type of application. In order for Canadian producers to more easily export their products to US market, the label should reflect closely what is used there but the uses in Canada need to be clearly defined before this can happen.

Green Building Issues

As environmental issues are gaining ground in the design and architecture communities, it becomes increasingly important to make sure that wood products treated with chemicals, whether preservative or fire retardant, be considered as environmentally friendly solutions. In some instances, the prevailing philosophy is that anything treated with chemicals is not sustainable and as such must be avoided. This school of thought will impede on future uses of treated wood. It is important to make sure that information on treated wood emphasizes the virtues of long-life and less volume of wood products used over time.

5. Conclusion

The new changes to the NBCC are intended to make its adoption easier across the country. The series of objectives retain the intent of the Code while providing enough flexibility for new, innovative building solutions to be tried out. As such, this shift towards objective-based codes may have a potential positive impact on the uses of treated wood.

Some of the changes that affect treated wood have a direct positive impact on its use. However, other changes, especially as they relate to policy issues such as labelling, will require work in order to tune the industry with the changes.