



*This chapter is an excerpt from the forthcoming book, **Essential Sustainable Home Design**, by Chris Magwood (New Society Publishers).*

## Building permits

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Despite the long list of potential regulatory hurdles to be crossed, we will focus here on the building permit because of its direct affect on the selection of materials and systems according to your Criteria Matrix.

### **Don't dread the code!**

There is commonly a sense of dread that hopeful homebuilders have in regard to building codes and obtaining permits. Everybody has heard a horror story too about permit denials and protracted struggles to get a building permit. While these cases do sometimes happen, it is not typical and even builders using alternative types of materials and systems are able to obtain their permits with relative ease. Hopefully this chapter will help you to prepare adequately for your own permit application.

Despite plenty of anecdotal evidence to the contrary, there is no legal justification in any North American building code for denying a permit because of the use of viable methods and materials. At the same time, it is highly unlikely that any building department that will respond to a general inquiry about whether or not they will permit the use of a particular alternative with a general answer of "yes." Permits are not granted or denied on the basis of a single material choice, but for meeting a complete set of requirements that demonstrate the viability and safety of the entire structure.

## Model codes and local codes

Both the International Residential Code (IRC) in the U.S. and the National Building Code (NBC) in Canada are *model codes*. They are written to cover a broad range of conventional practices and solutions applicable across each country. These model codes are then adopted by state, provincial and/or county authorities, and these levels of government can adopt and modify the model code to suit local needs. The first step in working with the building code is to be sure to understand which code you will be working from, and use the most up-to-date version of that code document in your jurisdiction. If you are intending on playing any key role in your own design team, it is well worth your while to obtain a copy of the code for your jurisdiction and become familiar with how the code is structured and how to find the information you need to make informed decisions.

## Approved or accepted solutions

Model codes are an accumulation of “accepted solutions” that prescribe how buildings can be designed and constructed in order to meet minimum standards of occupant and community safety. A building permit will be issued if a set of plans meets all of the prescriptions in the relevant sections of the code.

If you selected “1-Fully Code Compliant” in your Criteria Matrix, then you will want to ensure that that all of your design, material and systems decisions are in conformance with the prescriptive language of the code. There are multiple options and pathways embedded within the code’s prescriptions, and you and your design team can work through these prescriptive options and find the ones that best match the rest of your criteria choices. It is important to understand that it may be possible to meet high goals in each category of the Criteria Matrix using fully code compliant prescriptions.

## Alternative solutions

Given that sustainable building criteria are a relatively new consideration in the building industry, a lot of options that meet high sustainability goals may not be directly recognized in the prescriptive language of the buildings codes.

Every building code has a mechanism for consideration of non-conforming materials and approaches. If you have identified that some elements of your design cannot be supported via code prescriptions, it is incumbent on you to understand the exact procedures used in your code jurisdiction to handle alternative compliance. While the paperwork requirements may vary (and additional permit fees may apply), all such alternative compliance pathways operate on the assumption that the applicant will provide proof that the alternative proposal meets or exceeds the provisions of the prescriptive code requirements. Any performance parameter (structural capacity, fire resistance, thermal performance, etc.) that exists for a building component in the prescriptive section of the code must be demonstrably met or exceeded by the proposed alternative. Each of these performance parameters must be fully supported and documented.

The chart below includes the alternative compliance language from both model codes, which share much in common. From these excerpts, you can determine the type of proof of equivalency required to meet alternative compliance expectations:

USA – International Residential Code (IRC-2000 edition)	Canada – National Building Code (NBC-2012 edition)
<a href="#">Provisions for Alternative materials, design and methods of construction and equipment</a>	<a href="#">Alternative Solutions 2.1.1. Documentation of Alternative Solutions</a>

**R104.11 Alternative materials, design and methods of construction and equipment.**

The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code. Compliance with the specific performance-based provisions of the International Code Council (ICC) codes in lieu of specific requirements of this code shall also be permitted as an alternate.

**R104.11.1 Tests.** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirement of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

**2.1.1.1. Documentation**

(1) The person proposing the use of an alternative solution shall provide documentation to the chief building official or registered code agency that,

(a) identifies applicable objectives, functional statements and acceptable solutions, and

(b) establishes on the basis of past performance, tests described in Article 2.1.1.2. or other evaluation that the proposed alternative solution will achieve the level of performance required under Article 1.2.1.1. of Division A.

(2) The documentation described in Sentence (1) shall include information about relevant assumptions, limiting or restricting factors, testing procedures, studies or building performance parameters, including any commissioning, operational and maintenance requirements.

**2.1.1.2. Tests**

(1) Where no published test method to establish the suitability of an alternative solution proposed under Article 2.1.1.1. exists, then the tests used for the purposes of that Article shall be designed to simulate or exceed anticipated service conditions or shall be designed to compare the performance of the material or system with a similar material or system that is known to be acceptable.

(2) The results of tests or evaluations based on test standards other than as described in this Code may be used for the purposes of Sentence (1) if the alternate test standards provide comparable results.

In both codes, several options exist for demonstrating that an alternative solution meets or exceeds code requirements:

- **Testing data** – Both codes specify a preference for tests that are done to a code-recognized standard, such as ASTM, ANSI or CSA. If the tests are not performed to the standard used by the code, you will be required to show how the testing varies from these standards and how the results may be interpreted to show equivalency. For example, if you are using tests performed to European standards you will need to show that these standards meet the intent of North American tests and account for any differences in testing methodology and results.
- **Referenced standards** – Some materials and assemblies are not directly recognized as accepted solutions within the code, but an independent standard may exist that is referenced by the code. In these cases, a product manufacturer or trade association will have hired a standards

organization (such as ASTM, CSA, CCMC or others) to create a standard that can be followed by a designer and/or builder.

- **Past performance** – An applicant can cite prior examples of the same or similar approach used successfully in the jurisdiction. Be sure to have adequate documentation of past performance to ensure that the approach was similar to what you are proposing, and to be sure that it was indeed a successful approach. Past performance or case studies from other jurisdictions or other countries may not be viewed as conclusive evidence, especially if the climates are different. The quality of documentation will be examined carefully, and if it doesn't stand up, it may not be recognized as proof of equivalency.
- Professional seal – Though not directly referenced in the code excerpts above, a licensed architect and/or engineer can often provide code equivalency assurance to the building department by applying their seal to the drawings and so ensure that to the best of their professional ability the alternative approach meets the intent of the code.

It may be that all of these approaches are employed on an alternative compliance application. It is entirely up to you as the applicant to provide documentation and any supporting interpretation to the building department. For better or for worse, building departments are reactive, not proactive. They are under no obligation to assist you with your documentation or ensure that it is complete. They are only obliged to respond to what has been provided in the application.

Code consultants are professionals that may be hired to assist an applicant with understanding the code and all the parameters that need to be addressed in order to put forward a complete application.

## Rejections and appeals

It is important to know that a permit cannot be denied for any reasons other than code infractions or incomplete submissions. Every building code prescribes the manner in which a denial is presented to the applicant. In most code jurisdictions the procedure for a permit refusal involves a written response explaining the code infractions that caused the permit to be denied. This is intended to give the applicant a full understanding of where the application was found to be lacking and provide a blueprint for resolving the issues in a resubmission. If all of the code issues are fully addressed in a subsequent submission, then a permit should be issued. In many cases, there can be several rounds of rejection and resubmission. While this may be frustrating and time consuming, getting a building permit can be compared to taking a test where you must score 100%. Building departments cannot let any infractions they detect slip through without being addressed, so it is best to consider the application to be a multi-step affair. Forming and maintaining a good working relationship with the plan reviewer is very helpful. At best, the plan reviewer will be acting as an advocate and will be assisting you with understanding where the plans fall short of meeting the code and making suggestions regarding how the deficiencies can be corrected. At worst, they are obliged to make your mistakes known to you, and you will have to figure out how to correct them.

Building codes cover a wide range of issues and topics, and there are many areas in which a set of building plans may not conform to the code that have nothing at all to do with alternative compliance issues. In the author's experience as a consultant, the majority of permit denials for projects proposing "alternative" materials have to do with issues that are unrelated to these specific material choices but are more likely to be related to zoning issues (lot lines and setbacks, overall height, grading, parking allocation), space allocation (minimum room sizes, means of egress, staircases and railings, window size and placement) and services (well/water, sewer/septic, HVAC) that have nothing to do with

alternative materials or assemblies. These are common problems experienced by conventional and alternative proposals alike. Addressing them requires an understanding of the codes, but does not directly influence the use of alternative approaches.

Should there be a disagreement about code compliance, every code jurisdiction has an established route for appeals. Often, this involves taking the dispute to the Chief Building Official. Should this fail to resolve the issue, there will be a higher regional, state or provincial authority that will hear appeals, and the pathway to accessing the appeal should be provided to you. Many appeal processes are quasi-judicial and involve a hearing where both the applicant and the building department put forth their arguments and a panel renders a decision.

The appeal process can add time and cost to a project, but it also tends to resolve matters in favor of a reasonable application. Many building departments will take a matter to appeal not to prevent the building project from going forward, but to receive a directive ruling from a higher authority. This can help to deflect potential liability issues for the municipality and clarify the local building department's interpretation of the code.

### **Preparation and patience are invaluable**

Any application to a building department involving an alternative compliance element should be made well in advance of needing the permit to allow the process to go through a few rounds of back-and-forth. Expecting or, worse, demanding a fast turnaround for an alternative compliance application is to invite frustration and delays.

Any applicant willing to put the time and effort into making a viable and complete initial submission and diligent enough to follow through with any requests for changes or more information can expect to be rewarded with a building permit.