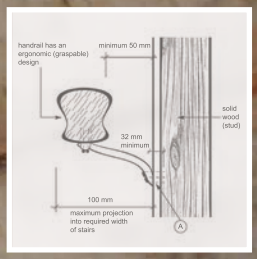
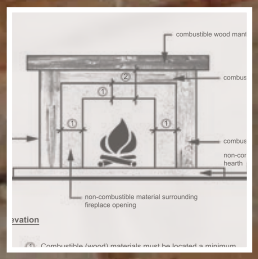
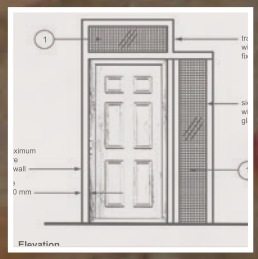
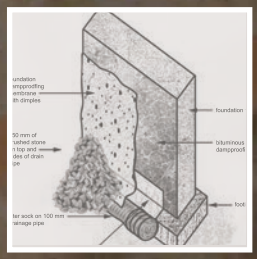
ILLUSTRATED CODE SERIES

# HOME RENOVATOR'S GUIDE TO THE BUILDING CODE

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**Steven Penna**

ORDERLINE

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# INTRODUCTION



The focus of this guide is to assist renovators and designers in achieving compliance with Parts 10 and 11 of the Ontario Building Code (Building Code), concentrating on Part 11 Renovation. When the occupancy of a building or part of a building has a proposed change of use, it could require improvement to off-set the inherent reduction in the performance level caused by the proposed change of use to the existing building or part of the building. Part 10, Change of Use, deals specifically with this condition. Part 11, Renovation, offers guidance for renovators and designers for construction where a building has been in existence for at least five years. Part 11 applies to all construction whether there is a Change of Use or not. Part 11 provides a practical, reasonable and flexible approach to renovation.

The term renovation is not defined by the Building Code, but usually means to include all forms of building alteration, extension, construction and repair for which a building permit is required. The purpose of this guide is to provide renovators and designers with information on how they can apply the requirements of the Building Code to their renovation projects. Renovators are often faced with existing construction that may or may not comply with the requirements of the Building Code. Knowing how to apply the Building Code requirements during renovation can save time and material by avoiding unnecessary change. The acquired knowledge is also a benefit to be able to explain to municipal officials how the existing construction complies with the Building Code.

Renovators need to know their legal obligations under the Building Code and Building Code Act (BCA) to operate their business and for the protection of their clients. This guide will explain the applicable legal requirements of the Building Code and the BCA legislation, such as when are building permits required, what is a material alteration and how to avoid legal action from being commenced by municipalities.

Requesting the prescribed Building Code inspections is often the duty of the renovator. However, some owners will take it upon themselves to request the inspections. Explanations will be provided on the type of inspections to be requested, when they should be requested and how to prepare for the inspections.

A good understanding of Part 10 of the Building Code is important when a renovation involves the creation of additional dwelling units. Creating duplexes and triplexes would require a Change of Use permit as a minimum. This guide will provide information on how the Change of Use permit is applied to the creation of an additional dwelling unit in a building.

Compliance alternatives allow some discretion for renovators and building officials to accept less restrictive compliance requirements. The use of Compliance Alternatives is permitted where it is impractical to apply the requirements of other Parts of the Building Code, such as Part 9. Compliance Alternatives for housing may be used without first satisfying the chief building official that compliance with the Part 9 requirement is impracticable. In other

# ONTARIO BUILDING CODE AND BUILDING CODE ACT LEGISLATION

## GENERAL

## THE BUILDING CODE ACT

## THE ONTARIO BUILDING CODE



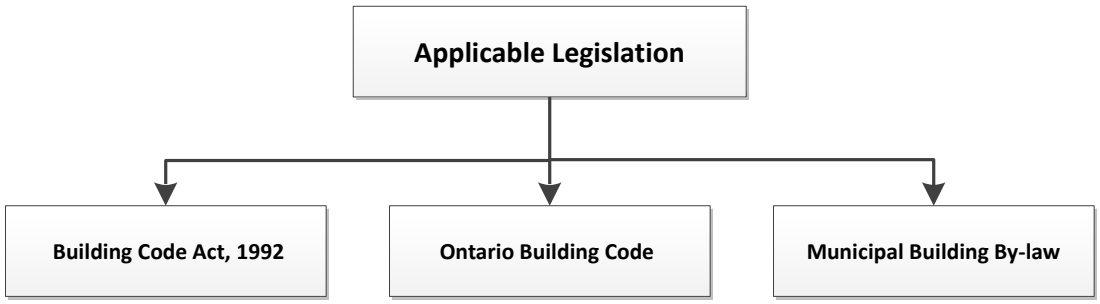
## MUNICIPAL BUILDING BY-LAWS

## GENERAL

It is important to understand how and why construction or renovations must follow certain rules in Ontario. Generally, everything can be linked back to achieving occupant safety. There are three main legislative enactments that renovators are subject to under the Province's regulatory system for construction and renovation. They are;

1) The provincial statue the Building Code Act (BCA)
2) The provincial regulation the Ontario Building Code (Building Code), and
3) Municipal building by-laws.

Each piece of legislation has an effect on the work of a renovator as they serve distinctive purposes within the regulatory system. Refer to flow chart "Applicable Legislation".






## THE BUILDING CODE ACT

The Building Code Act (BCA) is the statute that establishes the legal framework for building, construction and renovation regulation. Renovators are subject to this statute by establishing their duties and rights under the Building Code. It also provides for the enforcement of the Building Code by outlining the municipal official's duties and powers. Under the BCA, municipalities and renovators both have responsibilities or duties to be performed to enforce the Building Code and construct in compliance with the Building Code respectively.

### THE DUTIES OF THE MUNICIPALITY

A municipality has a duty to enforce all aspects of the BCA, including the determination of whether a proposed building or construction complies with the Building Code. Under Section 3 of the BCA, the council of each municipality is responsible for the enforcement of the BCA in the municipality, except where otherwise provided by the BCA. The council of each municipality must also appoint a chief building official and such inspectors as are

# BUILDING CODE TERMS USED IN RENOVATIONS

The Building Code uses specific terms when regulating renovations in Ontario. This section will discuss three important terms renovators should become familiar with; performance level, compliance alternative and alternative solution.

## PERFORMANCE LEVEL

Performance Level is a term that refers to how the building functions before and after the renovation. The performance level of a building is directly related to the safety of the occupants. The following is a list of building elements that if affected by a renovation, the capability of these elements or systems must be maintained;

- Materials that are part of the construction of the building
- Structure to support live loads
- Location of exits
- Function of exits
- Means of egress
- Early warning systems (smoke alarms)
- Lighting
- Emergency lighting
- HVAC system

Where the performance level of any one or more of these elements or systems is affected in a negative fashion the performance level is considered reduced. The Building Code requires the performance level of a building after construction or renovation to be not less than its performance level prior to construction or renovation. For example, for support of live loads, the renovation of an attic space into a living area will increase the live loading of the ceiling joists. The performance level of the structural capability of the ceiling joists would be reduced if the joists were not sized to carry the additional load. Therefore, additional remedies would be required to increase the performance level to equal the safety of the occupants prior to the renovation. In this case, the installation of floor joists would be a solution.

## COMPLIANCE ALTERNATIVES

Compliance alternatives are the backbone of Part 11. They allow discretion by the designer, renovator and building inspector to allow less restrictive compliance with renovation projects as they are a substitute for a requirement in another Part of the Division B of the Building Code. For residential renovations, Table 11.5.1.1. C contains all the residential compliance alternatives that a renovator may utilize. Compliance alternatives for the technical requirements of Part 9 of the Building Code do not require the building inspector's approval for use.

For example, Compliance Alternative C109 permits a reduction of the minimum stair height from 1950 mm for new construction to 1800 mm for a renovation project.

## ALTERNATIVE SOLUTIONS

An alternative solution is a substitute for an acceptable solution in Division B of the Building Code. The acceptable solutions in Division B of the Building Code are the technical requirements contained in the Parts, such as Part 9. Alternative solutions may be used in cases of impracticality or provide substitutes for Part 11 compliance alternatives or any other Building Code requirements. Article 2.1.1.1. of Division C states the documentation that the person proposing the alternative solution must provide to the chief building official:

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 above shall include information about relevant assumptions, limiting or restricting factors, testing procedures, studies or building performance parameters, including any commissioning, operational and maintenance requirements.

# CHANGE OF USE PERMITS - PART 10 OF THE ONTARIO BUILDING CODE

## INTRODUCTION

## EVALUATION OF RENOVATION PROJECT UNDER PART 10 OF THE BUILDING CODE

## INTRODUCTION

Prior to 1993 the change of use of a building was not regulated. The Building Code was applicable only to new construction at that time. Part 10 of Division B was created in July 1993 and applies to existing buildings requiring a permit under section 10 of the BCA. Section 10 (1) of the Building Code Act states:

> *Even though no construction is proposed, no person shall change the use of a building or part of a building or permit the use to be changed if the change would result in an increase in hazard, as determined in accordance with the building code, unless a permit has been issued by the chief building official.*

Part 10 of the Building Code provides an opportunity for the owner to confirm the existing building can safely accommodate the new use. Therefore, not all changes of use will require a permit. Section 10 of the BCA requires a permit only where the change of use would result in an increase in hazard as determined under the Building Code. Generally, under Article 10.3.1.1. of the Building Code, a building or part of a building that is subject to a change in major occupancy, must conform to either one of the following requirements as they apply to the new major occupancy that the building or part of the building it is to support.

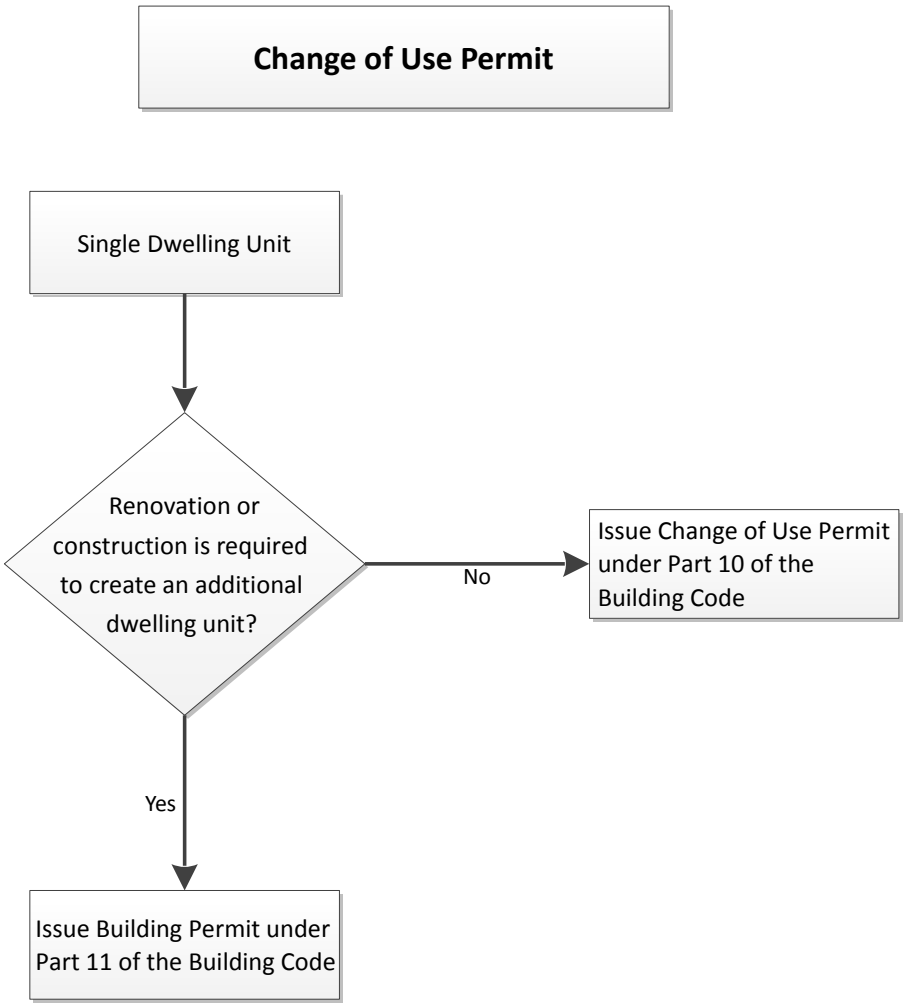
1) Conform to conform to the requirements of Subsection 3.2.6., Sections 3.7., 3.11. and 3.12., Sentences 6.2.2.1.(2), 6.2.3.9.(1) and 6.2.4.7.(1), Subsections 9.5.1. and 9.5.3. to 9.5.10., Sentences 9.6.1.4.(3). (4) and (7) to (9), Article 9.7.2.3., Sentences 9.8.8.1.(5) to (9) and 9.9.10.1.(1) to (7), Subsection 9.10.17., Sections 9.31. and 9.32., and Subsections 9.34.1. to 9.34.3. as they apply to the new major occupancy that the building or part of a building is to support,

   or

2) Use a compliance alternative contained in Table 11.5.1.1.C. of Part 11 as a substitute for any of the requirements in item 1.

Part 10 of the Building Code contains standards that apply to buildings which require a change of use permit to authorize the change of major occupancy of a building. For residential dwelling units, as a minimum, a change of use permit would be required when another dwelling unit or suite is created within the building (converting a dwelling into a duplex or triplex or a duplex to a triplex) and the building or house of any age, but only where no construction is proposed or required. Where construction would be necessary to create another dwelling or suite and is within a building greater than five years old, Part 11 of the Building Code would apply.

Refer to flow chart "Change of Use Permit"


Change of Use Permit
Single Dwelling Unit
Renovation or construction is required to create an additional dwelling unit?
No
Issue Change of Use Permit under Part 10 of the Building Code
Yes
Issue Building Permit under Part 11 of the Building Code

# BUILDING PERMITS - PART 11 OF THE ONTARIO BUILDING CODE



## INTRODUCTION

## RELIEF FROM THE PART 9 REQUIREMENTS OF THE BUILDING CODE

## PROPOSED CONSTRUCTION OR RENOVATION - MATERIAL ALTERATION OR REPAIR OF A BUILDING SYSTEM

## NEW BUILDING SYSTEMS AND EXTENSIONS OF EXISTING BUILDING SYSTEMS

## EXTENSION OF BUILDINGS – PORTION OF EXTENDED BUILDINGS

## TYPES OF RENOVATIONS



## REDUCTION IN PERFORMANCE LEVELS OF A BUILDING UNDER PART 11

# BUILDING PERMITS - PART 11 OF THE ONTARIO BUILDING CODE

## INTRODUCTION

Existing buildings were not necessarily designed and built in conformance with the current edition of the Building Code. Renovators know that homes constructed today are not using wood lath and plaster. Economically it would not be practicable for owners to upgrade their building to current Building Code requirements every time work or a renovation is undertaken. Part 11 of the Building Code allows for some departure from current design and construction requirements if certain life safety systems and building performance criteria are met during the conversion or re-use of an existing building.

Part 11 applies to the design and construction of existing building or parts of existing buildings that have been in existence for at least five years as provided for in Article 1.1.2.6. of Division A. If the building has been in existence for at least five years but includes an addition that has been in existence for less than five years, Part 11 applies to the entire building. In accordance with Articles 11.3.1.1. and 11.3.1.2. of Division A, when new construction or the extension of an existing building system occurs, they must follow Part 9 and other Parts of the Building Code for new construction, respectively.

## RELIEF FROM THE PART 9 REQUIREMENTS OF THE BUILDING CODE

However, some relief from the requirements of Part 9 may be possible through the use of compliance alternatives, alternative measures or match existing construction using Part 11. Also, under Part 10, where an evaluation has determined a reduction in the performance level has occurred because of a change in the major occupancy (creating an additional dwelling unit) and is required to be restored by construction, the provisions of Part 11 "Change of Major Occupancy" would be used.

Please note that if an existing *building* is extended or is subject to material alteration or repair, other Parts of the Building, such as Part 6, 7 and 9 apply only to the design and *construction* of the extensions and those parts of the *building* that are subject to the material alteration or repair.

# COMPENSATING CONSTRUCTION

**GENERAL REQUIREMENTS**

**FIRE SEPARATIONS**

**ACCESS TO EXITS AND EXITS**

**EXISTING BUILDING SYSTEMS**

**STRUCTURAL**

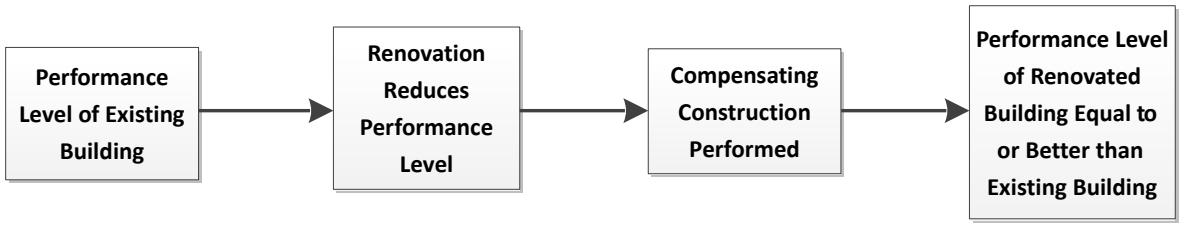
**INCREASE IN OCCUPANT LOAD**

**PLUMBING**

**SEWAGE SYSTEMS**

**CHANGE IN MAJOR OCCUPANCY**

In general terms, the fundamental performance level of a building after renovation must not be less than the performance level of the building prior to renovation. If the proposed construction when renovating a building will reduce the performance level of the existing building, compensating construction must be implemented. Subsection 11.4.2. of Division B is used to determine if a reduction of the performance level has been or will be caused by the renovation. For example, according to Clause 11.4.2.3.(1)(b) of Division B, there will be a reduction in the performance level of a building when it is renovated to convert it from one dwelling unit into a duplex or triplex. Therefore, compensating construction, in accordance with Subsection 11.4.3. of Division B, must be performed in order to restore the performance level of the building.




## GENERAL REQUIREMENTS

Article 11.4.3.1. of Division B provides that compensating construction used to restore the performance level applies to the existing building systems being adversely affected by the proposed construction or renovation. For example, that part of the building being altered as a result of a change of use for the creation of an additional dwelling unit. The areas requiring compensating construction if applicable to the renovation include the following:

## FIRE SEPARATIONS

with the required fire-resistance ratings, separating the part being altered from the floor areas immediately above and below and from the immediate adjacent or adjoining occupancy or areas.

Commentary: Depending on the proposed renovation, the existing floors or walls may require upgrading to provide for the required fire-resistance ratings. Compliance alternatives may be used for the proposed construction in order to meet the fire separation compensating construction requirements.

# CASE STUDY - CREATING A DUPLEX

## INTRODUCTION AND PROJECT PROPOSAL

## EXISTING DWELLING

## PROPOSAL

## EVALUATION IF CHANGE OF USE PERMIT CAN BE ISSUED



## EVALUATION UNDER PART 10 OF THE BUILDING CODE



## EVALUATION UNDER PART 11 OF THE BUILDING CODE



## BUILDING PERMIT ISSUED - SUMMARY

## INTRODUCTION AND PROJECT PROPOSAL

Renovating an existing dwelling by creating an additional dwelling unit is considered to be a significant renovation project. For this reason it has been chosen as a case study that will best demonstrate the information contained in the guide up to this point. Review the case study information as it is presented until the summary.

The proposal is to renovate an existing residential single dwelling unit building to create an additional dwelling unit within the existing basement.

## EXISTING DWELLING

A 70-year old detached, two storey single dwelling unit is located on a street with a municipal (public) sewage system. There are three bedrooms and a four-piece bathroom on the second floor. A kitchen, a dining room, and a living room are located on the first floor. The basement contains a furnace room and laundry facilities. The ceiling of the basement is open to the floor joists. There is a smoke alarm on each floor but they are not interconnected. The basement contains one window measuring 360 mm by 600 mm. There is a side entrance to the dwelling that is proposed to be shared with the entrance for the basement dwelling unit. There is an entrance door on the front of the dwelling on the first floor. The stairway shared by the dwelling units to the side exit is 800 mm wide. The existing ceiling height is 1850 mm from top of slab to underside of the first floor joists.

## PROPOSAL

To create one dwelling unit in the basement of an existing single dwelling building, consisting of the following;

1) one bedroom
2) laundry facilities
3) kitchen, and
4) living/dining room

## EVALUATION IF CHANGE OF USE PERMIT CAN BE ISSUED

When renovating an existing single dwelling to create an additional dwelling unit, section 10 the Building Code Act refers to this as a Change of Use. Specifically, Clause 1.3.1.4.(1)(b) of Division C Part 1 of the Building Code states;

# COMPLIANCE ALTERNATIVE

## COMPENSATING CONSTRUCTION

## COMPLIANCE ALTERNATIVE TEMPLATE



## BUILDING CODE COMPLIANCE ALTERNATIVES

## VENTILATION: COMPLIANCE ALTERNATIVE C89

### INTENT

An adequate supply of outdoor air controls the relative humidity and airborne pollutants within a building. Poor air quality can have a negative effect on persons and lead to health concerns.

### PART 6 REQUIREMENTS FOR NEW CONSTRUCTION

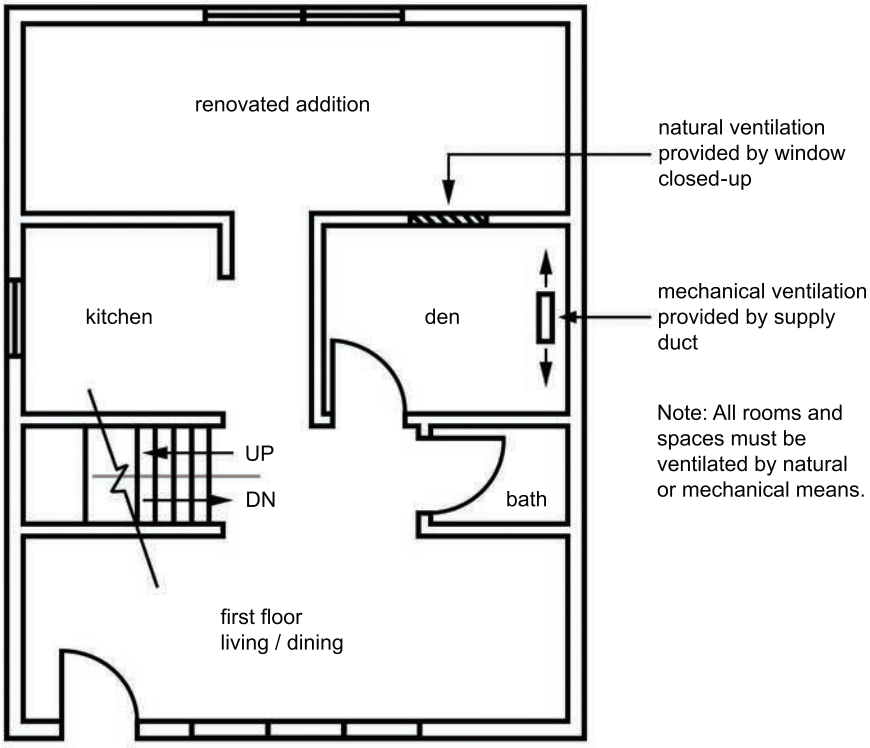
**6.2.2.1. Required Ventilation**
**(2)** Except in storage garages and repair garages covered by Article 6.2.2.3., the rates at which outdoor air is supplied in buildings by ventilation systems shall be not less than the rates required by ANSI/ASHRAE 62.1, "Ventilation for Acceptable Indoor Air Quality".

### TABLE 11.5.1.1.C. COMPLIANCE ALTERNATIVE FOR RESIDENTIAL OCCUPANCIES

**C89:** Required outdoor air rates may be provided by mechanical, natural or combination of natural and mechanical means.

### BOTTOM LINE FOR RENOVATORS

The introduction of outdoor air into a dwelling provides for a healthy environment for the occupants. All new homes require a form of mechanical ventilation system using fans. However, dwellings under renovation may be ventilated by a mechanical or natural system, such as operable windows, or a combination of both. Therefore, where existing windows remain operable compliance is achieved. Replacing operable windows with inoperable windows in a room required to have a window will require the introduction of mechanical ventilation. The installation of a heat recovery ventilator using the simplified method is an excellent method of introducing outdoor air in a controlled manner.




**Plan**

**FIGURE 89-1**

## RETURN-AIR SYSTEM: COMPLIANCE ALTERNATIVE C95

### INTENT

The forced air heating and air-conditioning system circulates the air within a dwelling. However, smoke or fire must not be permitted to circulate or be transferred to other suites or dwelling units or a public corridor within the same building.

### PART 6 REQUIREMENTS FOR NEW CONSTRUCTION

**6.2.4.7. Return-Air System**
**(10)** Return-air from a dwelling unit shall not be recirculated to any other dwelling unit.

### TABLE 11.5.1.1.C. COMPLIANCE ALTERNATIVE FOR RESIDENTIAL OCCUPANCIES

**C95**: In a building containing not more than four dwelling units or residential suites, the existing heating or air-conditioning system may be altered to serve more than one dwelling unit or suite, provided smoke alarms are installed in each dwelling unit or suite and provided a smoke detector is installed in the supply or return air duct system serving the entire building which would turn off the fuel supply and electrical power to the heating system upon activation of such detector.

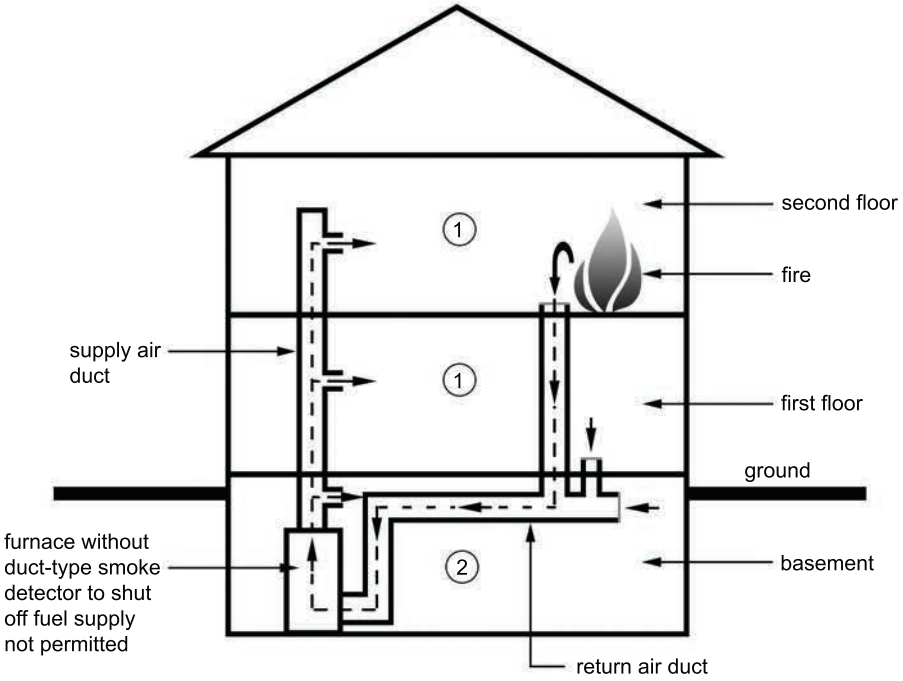
### BOTTOM LINE FOR RENOVATORS

When converting a single dwelling unit to a duplex, triplex or fourplex, the existing forced air heating or air conditioning system may be used to serve all dwelling units. However, the following must be installed by your heating and/or electrical contractor;

1) a duct-type smoke detector in either the supply or return air duct system in the main plenum close to the furnace, and

2) a valve that will automatically shut off the fuel supply (natural gas) and the electrical circuit supplying power to the heating system un activation of the smoke detector.

Smoke that is introduced into the duct system can be distributed throughout the dwelling. Duct-type smoke detectors are used to sense the presence of smoke in the duct, using photoelectric technology for example. This technology samples air passing through the duct allowing for the detection of smoke. When sufficient smoke is sensed, an alarm signal is initiated and the furnace fan and the fuel supply to the furnace are shut off. These three features will notify occupants, prohibit smoke from circulating to another dwelling unit, and halt the supply of fuel to reduce potential other hazards from developing. Another option for renovators is to install a heating system for each dwelling unit so that the air from one unit is not circulated to another dwelling unit. In this manner each person may control the temperature of their dwelling unit. A duct-type smoke detector would not be required in this instance.




**Elevation**

(1) dwelling unit #1

(2) dwelling unit #1

- - - - - - - - denotes smoke from fire being circulated from dwelling unit #1 to dwelling unit #2

**FIGURE 95-1**

## INSULATION AND COVERINGS: COMPLIANCE ALTERNATIVE C96

### INTENT

Insulation and coverings for piping on heating and cooling systems must be able to withstand or resist high temperatures or mould. Deterioration of the insulation will lead to the exposure of the piping.

### PART 6 REQUIREMENTS FOR NEW CONSTRUCTION

**6.2.9.2. Insulation and Coverings**
**(1)** Insulation and coverings on pipes shall be composed of material suitable for the operating temperature of the system to withstand deterioration from softening, melting, mildew and mould.

**(2)** Insulation and coverings on pipes in which the temperature of the fluid exceeds 120°C,

a) shall be made of noncombustible material, or

b) shall not flame, glow, smoulder or smoke when tested in accordance with ASTM C411, "Hot-Surface Performance of High-Temperature Thermal Insulation", at the maximum temperature to which such insulation or covering is to be exposed in service.

**(3)** Except as provided in Sentence (7), where combustible insulation is used on piping in a horizontal or vertical service space, the insulation and coverings on such pipes shall have a flame-spread rating throughout the material of not more than 25 in buildings of noncombustible construction and not more than 75 in buildings of combustible construction.

**(4)** Except as provided in Sentence (7), insulation and coverings on piping located in rooms and spaces other than the service spaces described in Sentence (3) shall have a flame-spread rating of not more than that required for the interior finish for the ceiling of the room or space.

**(5)** Except as provided in Sentence (7), where combustible insulation and covering is used on piping in buildings described in Subsection 3.2.6., they shall have a smoke developed classification of not more than 100.

**(6)** Exposed piping or equipment subject to human contact shall be insulated so that the temperature of the exposed surface does not exceed 70°C.

**(7)** No flame-spread rating or smoke developed classification limitations are required where combustible insulation and coverings are used on piping when such piping is,

a) located within a concealed space in a wall,

b) located in a floor slab, or

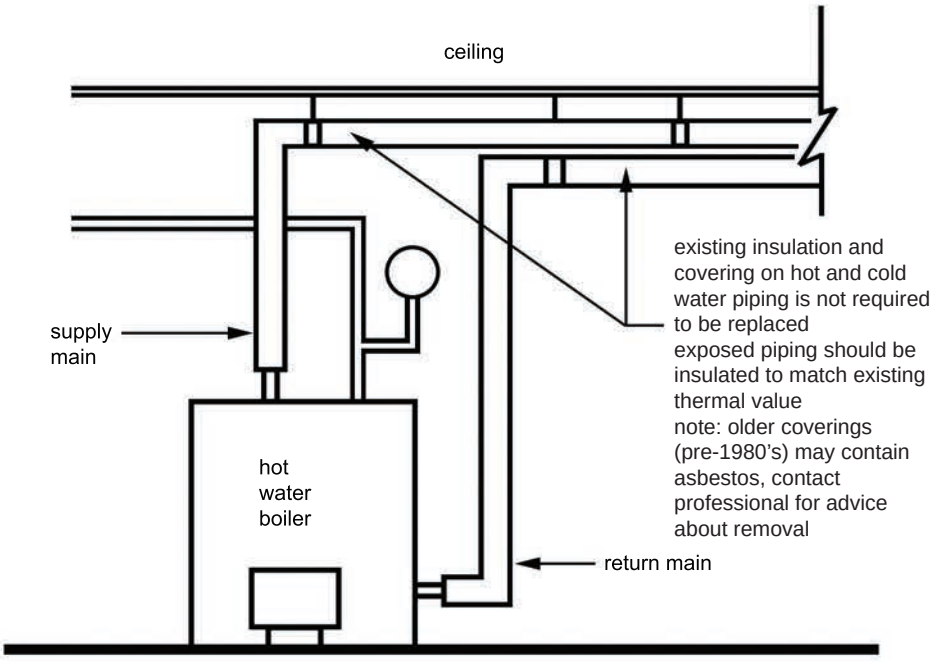
c) enclosed in a noncombustible raceway or conduit.

### TABLE 11.5.1.1.C. COMPLIANCE ALTERNATIVE FOR RESIDENTIAL OCCUPANCIES

**C96:** Existing acceptable.

### BOTTOM LINE FOR RENOVATORS

Insulation or coverings that are in good repair are permitted on existing hot and cold piping. Where the insulation or covering has deteriorated exposing the piping the renovator should repair or replace the material to improve or match existing conditions.




**Elevation**

**FIGURE 96-1**