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Publisher's version / Version de l'éditeur:

Canadian Building, 21, 10, pp. 13-20, 1971-10

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PART 9 OF THE NATIONAL BUILDING CODE OF CANADA AND THE CANADIAN CODE FOR RESIDENTIAL CONSTRUCTION

by

A. T. HANSEN

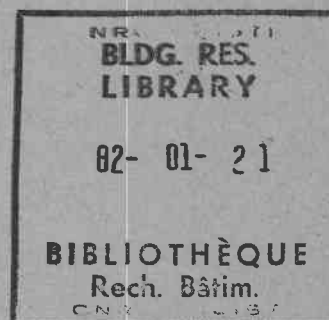
ANALYZED

REPRINTED FROM
CANADIAN BUILDING
VOL. XXI, NO. 10, OCTOBER 1971
p. 13

1067

**TECHNICAL PAPER NO. 350
OF THE
DIVISION OF BUILDING RESEARCH**

**OTTAWA
OCTOBER 1971**



Price 25 cents

NRCC 12151

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**PARTIE 9 DU CODE NATIONAL DU BÂTIMENT DU CANADA
ET
LE CODE CANADIEN POUR LA CONSTRUCTION
RÉSIDENTIELLE**

SOMMAIRE

En 1970, une nouvelle édition du Code national du bâtiment était publiée dans laquelle un nombre assez important de changements étaient introduits à la Partie 9. Cette Partie, rédigée sous forme d'exigences de performance s'appliquait, dans le passé, seulement aux maisons. Les détails se rapportant à la façon dont ces exigences peuvent être rencontrées étaient contenus dans les Normes résidentielles. L'édition 1970 du Code introduisit ces exigences détaillées à la Partie 9 et la portée était élargie pour inclure toutes les destinations, sauf celle des établissements de rassemblement, celle des institutions, et celle des destinations industrielles de risques élevés; la Partie 9 s'applique également aux bâtiments d'une hauteur de trois étages ou moins, ayant une superficie de planchers n'excédant pas 6,000 pi. car. Le nouveau nom des "Normes résidentielles" est maintenant "Code canadien pour la construction résidentielle". Il contient les exigences résidentielles de la Partie 9 ainsi que les exigences additionnelles et les aménités qui ne sont pas relatives à la sécurité et à la santé. La communication donne la description des changements introduits à chaque Section de l'édition 1970 de la Partie 9 en relation des exigences antérieures des Normes résidentielles ainsi que les changements introduits au Code canadien pour la construction résidentielle.



New code for Residential Construction — Major changes you should know about

At the beginning of August, the new Canadian Code for Residential Construction, which regulates all housing and small buildings built under the National Housing Act, became generally available in English. The French version followed. But it is a long and somewhat detailed document and, for your convenience, we list here some of the major changes made in the requirements as compared with the previous Housing Standards which it replaces.

By A. T. HANSEN

The 1970 edition of the National Building Code of Canada published in August 1970, includes a number of significant changes to Part 9. Subsequent to the first printing, it became necessary to issue a number of revisions to Part 9 in July 1971, due principally to recent changes in the standards, grading rules and design stresses for lumber. The Canadian Code for Residential Construction 1970 issued in July 1971 replaces the 1965 edition of Residential Standards. This paper has been prepared to acquaint the user of the National Building Code and the new Residential Standards with the more significant changes resulting from these events.

BACKGROUND

The 1965 edition of Part 9 of the Code applied to houses and apartment buildings up to 6,000 square feet in ground floor area and three storeys in height. It was written as a short performance code (slightly over five pages) and contained little information as to how these requirements could be met except for a reference to the Residential Standards. The Residential Standards in turn had to serve two purposes. It supplemented the performance requirements in Part 9 and, in addition, contained amenity-type requirements which were not basic code provisions, but were necessary for agencies such as Central Mortgage and Housing Corporation who used Residential Standards to regulate construction built under the



MR. HANSEN

who is Head, Technical Section, Codes and Standards Group, Division of Building Research, National Research Council, Ottawa, prepared this article for Canadian Building to describe the changes in Part 9 of the new edition of the National Building Code, and the new Canadian Code for Residential Construction.

National Housing Act. These were distinguished in the document by the use of bold face and light face type. For the 1970 edition of the Code, the Associate Committee on the National Building Code decided to include in Part 9 those detailed provisions from Residential Standards (shown in bold face type) that were necessary for the enforcement of Part 9.

A second major change in the 1970 edition of Part 9 is that of its scope. Although Part 9 in combination with Residential Standards included ade-

quate detail to regulate the construction of houses and small apartments, the remaining parts of the Code did not contain similar specifications for buildings of other occupancies which in many cases are of the same basic construction. This meant that such buildings had to be designed in accordance with the procedures in the design part of the Code which in effect meant a complete structural analysis. The Short Form of the Code on the other hand which is published for smaller municipalities, contained structural requirements which were generally based on Residential Standards. This proved satisfactory as far as the Short Form was concerned since it applied only to small buildings, but it resulted in an inconsistency between the Short Form and the main Code. It was largely because of this situation that the Associate Committee decided to extend the scope of Part 9 to include business and personal services occupancies, mercantile occupancies and low and medium hazard industrial occupancies.

The new "Short Form" of the Code, to be issued later this year, will be identical to Part 9, except for the addition of an administration section and a definitions section based on Parts 1 and 2 of the main Code. This will eliminate any differences between the Short Form and the main Code.

Under the new arrangement, the Canadian Code for Residential Construction will replace the 1965 Residential Standards. Unlike Residential Standards, the Code for Residential Construction will not be a supple-

ment to the NBC even though the requirements affecting health and safety will be identical to those in the main Code. The Code for Residential Construction will include amenity-type requirements similar to those that appeared in the Residential Standards and for this reason, it will be noted on the cover that it is not intended as a municipal bylaw. It will continue to apply only to residential occupancies, with the health and safety requirements in bold face type and the amenity requirements in light type. It is expected that the document will be used by Central Mortgage and Hous-

ing Corporation for construction under the National Housing Act.

In the following explanation of Part 9 and the Canadian Code for Residential Construction, a brief section-by-section description is provided outlining the requirements in the National Building Code and the more significant changes in the 1970 edition as compared with the 1965 edition. The more significant amendment in the July 1971 amendment series are also discussed. It should be noted that the Canadian Code for Residential Construction incorporates all changes included in the July amendment.

It will be noted that Part 9, while largely a specification-type Code, also permits the option of design. Because of the specific nature of the detailed requirements, it is most important that these be kept clearly in mind in applying Part 9.

It should be noted that the following explanations cover only the more significant changes. Where reference is made to particular sections in Part 9, the corresponding section in the Canadian Code for Residential Construction is shown in brackets. When referring to the latter, the abbreviation CCRC is used.

WHAT THE CHANGES AFFECT:

definitions — materials — loads — doors — windows — stairs — egress — fire — drainage — foundations — slabs — columns — masonry — chimneys — wood frame — insulation — roofing — siding — stucco — walls — ceilings — flooring — plumbing — ventilation — heating — electrical — garages — elevators — painting — driveways — sites.

Here's what the major changes mean

Section 9.1 (Section 1): General

Part 9 now applies to all buildings up to three storeys in height and having an area on any floor of not more than 6,000 square feet except those buildings used for assembly, institutional or high hazard industrial occupancies.

The same limit does not apply to CCRC, however. The various parts of the National Building Code refer to Part 9 for certain requirements (e.g. cladding, room heights and areas, and ventilation) and there are certain sections in CCRC covering amenity requirements that apply to all residential buildings regardless of size. Thus there are sections in CCRC that apply to buildings of any size and these sections have clauses that indicate this extended scope. These sections are also indicated in the Table of Contents. The scope of CCRC is limited to residential occupancies and does not cover the various other occupancies now in Part 9.

Section 9.2 (Section 2): Definitions

Generally, there is little change in the definitions except that the definitions for "houses" and "apartments"

are no longer included. There has been considerable confusion in the past by the use of such terms due to the variety of residential designs and concepts.

To overcome the problem of having to decide arbitrarily where the cut-off should be between apartment buildings and houses, the requirements are written in terms of the relationship of dwelling units to each other and the existence of common exits and corridors.

The term "habitable" is also no longer defined since it was impossible to develop a meaningful definition to apply to a variety of requirements which used this term. The requirements are now written in a manner that describes the specific rooms.

Section 9.3 (Section 3): Materials, Systems and Equipment

This section is essentially the same as in Residential Standards except that in the case of exterior concrete steps and carport and garage floors, an air-entrainment of 5 to 7 per cent is specified to reduce damage from de-icing salts.

With regard to the subsection lum-

ber, however, although there are no significant changes in Part 9 as printed, a number of changes have been made in the July revisions to accommodate the recent changes in lumber sizes, lumber grades and design values that have occurred since the 1970 Code was published. Since the "old" lumber and the "new" lumber may both be available on the market for some time the amendments were drafted in a manner which would allow the use of both types. When the stocks of the old lumber are depleted, further changes will be necessary. A new end-use table is provided in the July revisions showing the minimum allowable grades for different end uses that will apply to the new lumber. The table now in Part 9 will continue to apply to the old lumber.

It should be noted that to identify the new framing lumber, (which is somewhat smaller in size than the old lumber), the letters S - GRN or S - DRY must appear on the grade stamp.

Section 9.4 (Section 4): Loads

With regard to residential occupan-

cies, the requirements are the same as those in Residential Standards except that the design load for bedroom floors is now 30 psf for both houses and apartments whereas the Residential Standards required 30 psf for houses and 40 psf for apartments.

Section 9.5 (Section 5): Room and Space Dimensions

These requirements are based on Residential Standards except that the requirements for kitchen counters, cupboards, built-in cabinets, coat closets, linen closets, janitors' closets, tub sizes, bathroom fixture clearances, laundry space and general storage space have been deleted from Part 9, but will appear in CCRC. In this connection, the requirement in CCRC for laundry areas (where automatic washers are not provided) has been reduced from 50 square feet to 35 square feet. Storage requirements are also relaxed for multifamily buildings where there are elevators or where communal storage is provided.

The requirements for bedrooms in Part 9 do not allow for a reduction in area where built-in cabinets are provided as was the case in Residential Standards. The July revision does, however, include such a reduction.

Another important July revision is the one that affects the areas and dimensions of rooms and spaces generally. A new article has been added, 9.5.1.5 (5A(6)) to permit the authority having jurisdiction to allow smaller sizes than those specified where it can be shown that these are adequate. This would apply, for example, where built-in furniture is installed.

A minimum area of 120 square feet is permitted for the living area portion in bachelor units where the living area is combined with a kitchen and dining area. Previously, this reduced area was permitted only if the sleeping area was also in combination with the kitchen, dining and living area.

Section 9.6 (Section 6): Doors

This section, while based on Residential Standards, does not include the requirements for garage doors and door hardware. They will, however, be included in CCRC.

To avoid possible conflict with Part 3 of the Code (Use and Occupancy) the size requirements for doors not located within dwelling units were deleted. The requirements in Section 9.9

for means of egress are the only regulation for such doors. The one exception is the door width to public washrooms. This is now required to be 2 ft - 8 in. rather than 2 ft - 4 in. which was considered inadequate for people in wheel chairs.

A new subsection, 9.6.5. (6E) regulates glass in doors or in openings that could be mistaken for doorways. Glass doors and side lights that could be mistaken for doors are required to be made with safety glass where the door does not have horizontal muntins or is not protected or marked in such a manner as to make the position of the door apparent.

The same rule applies to doors accessible to the public except that the option for safety glass is not provided. In addition, windows in public places that could be mistaken for doors are required to be protected by a handrail or barrier.

Section 9.7 (Section 7): Windows

The requirements are essentially the same as in Residential Standards, except that the requirements for "windows facing courts" and "windows facing buildings on the same property" which appeared in Residential Standards have now been deleted from both Part 9 and CCRC. In addition, the requirement for additional glass area where a window is under a large overhang such as a carport has been deleted.

In the July revisions, the table for glass thickness in relation to glass area has been revised to show increased areas where factory sealed double glazing is provided. Previously a 50 per cent increase in perimeter was permitted where fused glass edge units were used. The revision retains this requirement and it will also permit a 25 per cent increase in perimeter where factory sealed units of other types are used.

Section 9.8 (Section 8): Stairs, Ramps, Handrails and Balustrades

These requirements are essentially the same as in Residential Standards except for the following changes.

The space beneath public stairs must be left entirely open or must be completely enclosed. It is no longer permitted to use this space for water closet rooms except when the stairs are located within a dwelling unit.

Interior main stairs within dwelling units are now permitted to have a

8¼-inch minimum run and a 9¼-inch minimum tread width as compared with the 8½-inch run and 9½-inch tread in the old standards. Separate requirements for service stairs (i.e. stairs for tradesmen) are no longer provided. Where there is a door at the top of a flight of stairs in a dwelling unit, a landing need not be provided between the door and the stair provided the door swings away from the stair. The door must swing over a landing, however.

Only one handrail is now required for exterior stairs with four or more risers regardless of width of the stair where the stair serves a single dwelling unit.

Fire protection is no longer required on the underside of public stairs. The Residential Standards required lath and plaster or gypsum wallboard protection. Head room clearance over landings and stairways has been reduced from 7 feet to 6 feet 9 inches for public stairs. Also, the requirement that exterior stairs be noncombustible when more than 12 feet above grade has been deleted.

In the July revision series, single risers are no longer restricted within dwelling units, and the stairway width for required stairs within dwelling units has been reduced from 36 inches to 34 inches to correspond to the minimum width for hallways.

Section 9.9 (Section 9): Means of Egress

This section has been revised considerably and is based on the requirements in Part 3 of the Code. Since this is one of the most important sections in Part 9 in terms of life safety, it is recommended that this section be examined in detail by Code users. For the most part the requirements relate to public exits and public corridors rather than to means of egress within dwelling units.

The minimum width of a public means of egress is now based on occupant load, whereas in the old standards a table of widths of required exits based on the number of bedrooms served was provided. For the first time the minimum width of a public access to exit is based on occupant load (the absolute minimum width, however, is still required to be 44 inches in the case of public corridors and 36 inches in the case of exit stairs). With regard to the small size of buildings covered in Part 9, the

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minimum widths are sufficient in most cases. Only where the occupant load is relatively high (such as in retail stores and dormitories) and the building size approaches the size limits covered in Part 9 will the occupant load require egress widths greater than the minimum. In computing the required exit width, the width of an exit or public corridor is measured in "units of exit width" whereby 22 inches constitutes one unit. A portion of an exit width can be counted as $\frac{1}{4}$ unit in computing exit width only if the portion is 12 inches or more wide. In the 1965 Code 12 inches or more was considered to provide $\frac{1}{2}$ unit.

Where a building has two or more exit stairways, not more than one can have a wired glass enclosure as the required separation from the building.

Where windows in an exit stairway may be exposed to fire from other parts of the building, the windows must be of wired glass or glass block.

Fuel fired appliances, in addition to not being permitted in public corridors, are not permitted to be within 8 feet horizontally of an exit (except exits serving a single dwelling unit). In addition, high pressure boilers and other equipment subject to possible explosion are not permitted to be located beneath such exits.

Where single exits are permitted from dwelling units (e.g. where the exit is an exterior door at or near grade) the building height is restricted to one and two storeys. The July revision, however, also allows such exits in three-storey buildings such as three-storey row houses. This is the only revision in the July series that applies to this section. Where the exit is not an exterior door at or near grade, the top and bottom level of a multilevel dwelling unit must have separate access to exit.

Dead end corridors no longer have to be as wide as they are long. Although the total length of dead end from the nearest exit is still limited to 20 feet and the number of suite doors one must pass on the way to the exit is limited to two, the width is determined on the same basis as the widths of other public corridors. Suite doors in dead end corridors must be equipped with self-closing devices. In

addition, where any suite door has a self-closing device, the door must be designed not to lock automatically on closing, to prevent persons being locked out in a smoke-filled corridor. Where the travel distance within any suite or dwelling unit to the suite entrance exceeds 75 feet, a second door must be provided to the suite and located so that a fire in the vicinity of one door will not render the second door unusable.

The requirement for signs on exit stairs or ramps that lead to a basement and which could be mistaken as a continuation of the exit route is now required for three-storey buildings but not two-storey buildings.

Section 9.10 (Section 10): Fire Protection

This section has also been considerably expanded over that in the old standards and similar to Section 9.9 is also based on Part 3 of the Code. Since this section is also of great importance in terms of life safety it is recommended that Code users become thoroughly familiar with the new requirements.

A number of new subsections have been added including a subsection on occupancy classification (in Part 9 only, and not CCRC), a subsection explaining the measurement of fire-resistance ratings, and a subsection limiting the permitted openings in ceiling and wall membranes where these form part of a required fire separation. In any fire compartment the only openings permitted in the membranes are those for noncombustible electrical boxes and those into noncombustible ducts. The openings into ducts in ceilings are restricted to those not more than one square foot in area, spaced not less than 7 feet apart and constituting in total area not more than one per cent of the ceiling area. Where openings are more than 20 square inches in area they must be equipped with a damper consisting of 0.0667-inch sheet steel with $\frac{1}{8}$ -inch asbestos on the unexposed side and which operates at a temperature 50 degrees above the maximum temperature in the system. Where the duct itself is protected within the ceiling space this restriction does not apply.

Where noncombustible wall construction is required (depending on the distance to the lot line) thermal insulation is permitted to have a flame-spread rating of 75 rather than 25 provided it is sandwiched between two layers of noncombustible material without an air space. In the subsection, "Fire Resistance in Relation to Occupancy and Height," the required $\frac{3}{4}$ -hour fire resistance for roofs in residential construction has been deleted. In addition, the requirement of one-hour fire resistance, formerly required for loadbearing walls, columns and arches, has been deleted for residential occupancies. However, the requirement that loadbearing elements have a fire resistance at least as great as that required for the supported elements still applies. In addition, there are requirements for exterior wall construction related to the distance from the lot line.

Floors over crawl spaces are not required to have a fire-resistance rating, but in order to qualify as a crawl space the space must not be more than 6 feet in height and must not be used for any occupancy (such as storage) or contain flue pipes or be used as a plenum. These requirements do not apply to a crawl space attached to a single dwelling unit and not shared with another dwelling unit.

In connection with the subsection on "Fire Separations Between Rooms and Spaces within Buildings," ducts, pipes, panel boxes or electrical boxes that penetrate a fire separation are required to be noncombustible except where the assembly has been tested with such combustibles incorporated in the test. Where a concealed space is located above a required fire separation such as a common attic over an apartment or a row house built as rental units, the fire separation must either be carried up through the space or the same fire resistance must be built into the ceiling membrane. Previously, the option of providing the fire resistance in the ceiling membrane applied only to apartments. Where such a fire separation is between individually owned units, the wall is considered to be a common or party wall and the separation must be carried up through the space and can-

not be provided by the ceiling membrane.

In residential occupancies, individually rented rooms or suites must be separated from each other and from other parts of the building by a one-hour separation if the dwelling unit (including basement) has two storeys or more and by a $\frac{3}{4}$ -hour separation if only one storey. Previously, the number of storeys in a dwelling unit was not a consideration.

In the new section on "Service Rooms," furnace rooms, except those in dwelling units, are required to have a one-hour separation. Previously, $1\frac{1}{2}$ to 2 hours was required. Incinerators are not permitted to be located in rooms with other fuel-fired appliances unless permitted by the authority having jurisdiction. Requirements for one-hour separations around laundry rooms, and recreation rooms in apartment buildings have been dropped as has the requirement for separations around commercial kitchens. Commercial cooking equipment, however, must be installed in accordance with Sections 3, 4, 6 and 10 of NFPA 96 to ensure safety at the appliance.

The subsection on "Fire Walls" is also new. Common or party walls on a property line must be constructed as fire walls and in the case of wood-frame construction must extend through the roof to form a parapet at least 36 inches in height in buildings of mercantile occupancies and 6 inches in the case of other occupancies. In residential buildings where there is no dwelling unit above another, such as in row houses or semidetached houses, the party or common wall does not have to be constructed as a fire wall but must extend from the footings to the underside of the roof sheathing and have at least a one-hour rating.

Linen and refuse chutes are now required to be in a two-hour enclosure where the discharge opening is not equipped with a self-latching closure with a fusible link, and one-hour when it is so equipped. The intake opening for such chutes must be enclosed in a room providing a $\frac{3}{4}$ -hour protection.

In the subsection on "Prevention of Fire Spread at Building Exteriors" where a wall of a building projects above a roof surface the openings in the wall must be protected with wired glass or glass block if the part of the

building beneath such roof is in a different fire compartment and the roof has a fire resistance of less than one hour.

In the subsection on "Doors, Dampers and Other Closures in Fire Separations," a masonry sill beneath a door leading from a garage to a dwelling unit is no longer required.

The subsection on "Spatial Separation Between Buildings" now regulates the limiting distance (i.e. distance to the lot line) for houses on the same basis as other buildings. The old standards required that the limiting distance be at least equal to the total width of windows in any one room and ignored windows less than 2 feet in height. The requirements in Part 9 allow three methods of determining spatial separations for all buildings. First, it provides a table listing the maximum percentage of opening that is permitted in a fire compartment for various wall areas and limiting distances. This table is identical to the table in the old Short Form and is an abbreviated version of more extensive tables in Part 3. As a second choice, the more extensive tables in Part 3 may be used. As a third choice the distance to the lot line need not exceed the square root of the total window area for the wall in question in the case of low fire load occupancies and twice the square root in the case of high fire load occupancies and of high fire load occupancies (i.e. mercantile and medium hazard industrial). A fire compartment is considered to be any portion of the building separated by at least $\frac{3}{4}$ -hour fire separations from the remainder of the building in the case of low fire load occupancies and 2-hour separations in the case of high fire load occupancies.

The Residential Standards required the exterior walls of apartment buildings which were over 4 feet but less than 8 feet from the lot line to have at least a one-hour fire resistance and have noncombustible cladding. Walls 8 to 30 feet from the lot line could have combustible cladding but were required to have a $\frac{3}{4}$ -hour fire resistance; over 30 feet there was no requirement. In Part 9, the type of construction is regulated by the percentage of openings permitted in the wall. If, according to the table on spatial separations, the limiting distance is such as to permit 25 per cent window area, a one-hour wall with noncombustible cladding is required in the case of low fire load occupancies such

as residential occupancies. If openings of 26 to 99 per cent are permitted the wall can be a $\frac{3}{4}$ -hour combustible wall with combustible cladding. Where 100 per cent openings are permitted, there is no requirement. When high fire load occupancies are considered the requirements are more restrictive. This is the same procedure as has been followed in Part 3 of the National Building Code. In the case of walls up to 4 feet from the lot line, the requirements are the same as in the Residential Standards for low fire load occupancies. In the case of residential buildings such as row houses and semidetached houses where there is no dwelling unit above another the requirements are the same as were previously required for houses, and are less stringent than for other buildings.

In the subsection on "Fire Stopping," concealed spaces such as attic or roof spaces are required to be separated into draft tight compartments, not exceeding 3,000 square feet, by material such as gypsum board or plywood. In addition, the lower portion of mansard style roofs must also be fire stopped at the ends of a fire separation to prevent the spread of fire along the space across such separations.

Changes in the subsection on "Interior Finish Flame Spread Limits" include new requirements limiting the flame-spread ratings on electric light diffusers.

A new subsection on access for fire fighting purposes has been added. These access provisions include access wall panels (or windows) on the second and third storeys, and in basements (except those serving a single dwelling unit) having a length or width exceeding 75 feet.

In the July revisions, the requirement from Part 7 restricting the passage of plastic piping through fire separations has been added to Part 9. In addition, plastic electrical conduits are now subject to the same restriction.

Most of the other July revisions affect fire dampers and are included to bring Part 9 into agreement with Part 3.

Section 9.11 (Section 11). Sound Control

This section is the same as in Residential Standards.

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Section 9.12 (Section 12): Excavation

This section is the same as in Residential Standards.

Section 9.13 (Section 13): Waterproofing and Dampproofing

This section is the same as in Residential Standards.

Section 9.14 (Section 14): Drainage

This section is the same as in Residential Standards except that surface drainage requirements have been added which were previously included in the section in Residential Standards on "Site Improvement."

Section 9.15 (Section 15): Footings and Foundations

The scope of this section is limited to foundations on average stable soil. Where very weak or unstable soils are encountered the foundation must be designed for the existing conditions. In addition, the section applies only to loadbearing masonry or wood frame buildings and not to concrete or steel frame buildings.

A new table of footing sizes has been introduced with the footing sizes being related to the number of storeys and the type of construction (masonry or wood). The column footing sizes have been slightly increased from those in the Residential Standards and apply only where the column spacing does not exceed 8 feet. Although unreinforced footings are not permitted to extend more than their thickness beyond the wall, the minimum thickness of footings is now permitted to be 4 inches instead of 6 inches.

With regard to foundation wall thickness, provision is made for walls made with 3,000 psi concrete. In effect, this will permit 6-in. concrete walls made from such concrete to extend 6 feet below grade instead of 5 feet.

The exterior surface of concrete block foundation walls above grade need not be parged if the joints are tooled. The requirement for finishing the exposed portion of concrete walls has been deleted.

Section 9.16 (Section 16): Slabs on Ground

This section is essentially the same as in Residential Standards.

Section 9.17 (Section 17): Columns

This section is essentially the same as in Residential Standards except that the scope has been restricted to columns supporting up to two floors of wood frame construction where the length of joists does not exceed 16 feet and the floor load does not exceed 50 psf.

Steel column plates are no longer required at the top where the column is welded to the beam. In all other cases column plates, top and bottom, can now be 4 by 4 inches by 1/4 inch.

Section 9.18 (Section 18): Crawl Spaces

This section is essentially the same as in Residential Standards.

Section 9.19 (Section 19): Roof Spaces

This section is essentially the same as in Residential Standards.

Section 9.20 (Section 20): Above-Grade Masonry

This section is essentially the same as in Residential Standards except that the scope is limited to walls that do not support concrete floors. The thickness of masonry veneer can be reduced to 3 inches when the veneer has unraked joints. Previously, 3-inch veneer was permitted only on one-storey buildings. The subsection on chases and recesses has been completely revised to conform with the masonry design standard in Supplement No. 4 to the Code and is generally more restrictive than in the Residential Standards.

In the table on mortar mixes, requirements for mortar mixes for parapet walls and chimneys have been upgraded to a stronger mix. All stack bonded walls must now be reinforced with horizontal steel bars at vertical intervals not exceeding 18 inches. Previously, this was not required in certain non-loadbearing walls and veneer.

Section 9.21 (Section 21): Chimneys and Flues

This section is now restricted to chimneys up to 40 feet high having a flue area of not more than 126 square inches and where the heating appliance does not exceed 400,000 Btu/hr capacity.

Editorial changes have been made to clarify that metal gas vents are to conform to CSA Standard B149 and that dampers and draft regulators for oil-fired units must conform to CSA B139. Otherwise, the requirements in this section take precedence over other requirements such as those for masonry chimneys in referenced standards.

Fuel-burning appliances are now allowed to be connected to the chimney flue on different floor levels provided adequate draft is maintained. A new table of allowable flue areas is provided based on the total rated Btu/hr input of the appliance or appliances. Although Part 9 requires these sizes for masonry chimneys, the July revision extends this to include metal chimneys. Smaller flues are permitted than those listed in the table if these can be justified on the basis of design. The new allowable sizes are a relaxation from the requirements in Residential Standards which required that the flue size be at least equal to the sum of the areas of the connected flue pipes. A reduced clearance (9 inches) is now permitted between flue pipes and combustible construction where the flue gas temperature does not exceed 750° F.

Section 9.22 (Section 22): Fireplaces

This section is essentially the same as in Residential Standards.

Section 9.23 (Section 23): Wood Frame Construction

The most significant change to this section is that regarding the requirements for sheathing thickness. Previously, where sheathing was required, there was no differentiation made between applications on 16-inch and 24-inch framing spacing. A new table has been provided showing reduced thicknesses for the 16-inch spacing. These include 3/8 inch for fibreboard and gypsum board and 1/4 inch for particleboard and plywood.

Plywood roof sheathing need no longer be applied with staggered joints.

Where loadbearing walls are supported at right angles to the floor joists they must be within 3 feet of the joist support where the wall does not support a floor, and 2 feet where the wall supports one or more floors.

Previously, the wall location was restricted to within the end $\frac{1}{4}$ of the joist span.

Although the changes to this section in Part 9 were not extensive, a number of revisions were necessary, as noted in the July series, as a result of the introduction of new lumber sizes and grading rules.

Since the span tables calculated for the old lumber sizes and grades were no longer applicable to the new lumber, new span tables were prepared with the assistance of the Forest Products Laboratory, Ottawa. These tables are reproduced under the auspices of the Associate Committee in NRCC 11862 published by the National Research Council and available from the Secretary of the Associate Committee on the National Building Code. These tables are not included in Part 9, but are included in the CCRC and in the Short Form of the NBC to be published later this year.

In the July revisions, spans of lintels made with the new lumber must be reduced one inch per foot of span from those shown in the existing table concerning lintels where they are used in exterior walls. The table of lintel spans will now be applicable only to residential buildings where the span of the supported members does not exceed 16 feet in the case of traditional framing and 32 feet in the case of trusses.

With regard to roof trusses, the strength and stiffness criteria shown for roof trusses which are evaluated by testing will be applicable only to trusses of up to 40-foot span and spaced up to 2 feet on centres. Other trusses must be designed in accordance with good engineering practice. The truss criteria in the Code were originally developed for residential-type roof trusses and since Part 9 now covers a wider variety of buildings, it was decided to restrict the application of these criteria to 40-foot trusses at relatively close spacings.

Section 9.24 (Section 24): Post, Beam and Plank Construction

This section is the same as in Residential Standards. The July revisions mentioned in relation to Section 9.23 for the new lumber apply to this section as well.

Section 9.25 (Section 25): Plank Frame Wall Construction

This section is essentially the same as in Residential Standards except

that plank walls supporting a roof and one floor may be 2 inches thick instead of 3 inches. The July revisions mentioned in relation to Section 9.23 for the new lumber apply to this section also.

Section 9.26 (Section 26): Thermal Insulation and Vapour Barriers

Although this section is based on Residential Standards the requirements specifying the amount of thermal resistance have been deleted from Part 9 since it was considered that this did not affect health or safety. The requirements will appear in CCRC. The requirements for oil- and gas-heated buildings based on different costs of fuel have been dropped from CCRC with the deletion of the category for the cheaper fuels. The table of minimum "R" values will now specify requirements for electrically heated buildings and buildings heated with oil or gas. In addition, the table will now apply to wood frame apartment buildings as well as houses.

Plastic foam insulation is now permitted to be installed on concrete or masonry walls in Part 9 without a vapour barrier provided it has a permeance of not more than 4 perm-inches and is installed in continuous contact with the concrete or masonry.

Vapour barriers on ceilings are now required to be installed so that they cover the space between the wall plate and the ceiling insulation. This is similar to the existing requirement for walls.

Section 9.27 (Section 27): Roofing

This section is generally the same as in Residential Standards except that the requirements affecting eaves-troughs and downspouts have been deleted and will only appear in CCRC. The minimum roof slope for built-up roofs and sheet metal roofs is now $\frac{1}{4}$ inch in 12 inches to allow for adequate drainage. Asphalt shingles must be self sealing or must have tabs cemented down for all areas in Canada to prevent wind damage. Previously, this was required only in high wind areas.

Section 9.28 (Section 28): Siding

This section is essentially the same as in Residential Standards except that the requirements for exterior soffits and trim have been deleted and will appear only in CCRC.

A new section has been added on the attachment of siding. This was done to clarify existing requirements, particularly in regard to metal sidings. The only other significant change is the inclusion of a new standard for aluminum siding (CGSB 93-GP-2) which has recently been issued.

The July revisions include an additional standard for steel siding (CGSB 93-GP-4) and one for hardboard (CGSB 11-GP-3a).

Metal siding no longer must be applied over sheathing.

Section 9.29 (Section 29): Stucco

This section is essentially the same as in Residential Standards except that stucco can now be applied without sheathing provided 18-gauge horizontal reinforcing wires 6 inches on centres are attached to the framing in addition to the stucco reinforcing or where approved paper backed stucco reinforcing designed for this purpose is used. This is essentially the same requirement that appears in the U.S. model codes.

Section 9.30 (Section 30): Interior Wall and Ceiling Finishes

This section is essentially the same as in Residential Standards except that the requirements for trim have been deleted and will only appear in CCRC. Requirements have been added for paper backed welded wire lath for the first time.

A new table has also been added specifying minimum fastener length for gypsum wallboard attached to wooden members where the wall or ceiling is required to provide fire resistance. This is to ensure that the nail will not char out of the wood for the duration of time required for the fire resistance.

Provision for the use of bonding agents for applying plaster to concrete has been made in the July revisions.

Section 9.31 (Section 31): Flooring

This section is essentially the same as in Residential Standards except that the specifications for carpets and carpet pads have been deleted and will appear only in CCRC. The minimum grades for wood strip flooring have also been dropped, and replaced with a requirement that the floor be sanded so that the surface is smooth, even, and free from roughness or

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open defects. The flooring grades will not appear in CCRC.

In addition, the thickness requirements for resilient flooring have been deleted and do not appear in CCRC. The minimum thicknesses that apply will be those specified in the reference standards.

Section 9.32 (Section 32): Plumbing

The requirements in this section are essentially the same as in Residential Standards except that the requirements for plumbing fixtures, hose bibs, washing machines, dryers and the requirements relating to domestic hot water tank size and recovery capacity have been deleted from Part 9. These requirements are covered in CCRC with certain changes. Hot water tank sizes and capacities for multi-family buildings have all been recalculated.

In the July revision series the subsection on "Sewage Disposal" has been dropped to avoid repeating the requirements in the plumbing part of the Code.

Section 9.33 (Section 33): Ventilation

The scope of this section is limited to residential occupancies and where the fan capacity of the ventilation system does not exceed 4,000 cfm.

A new table is included showing required ventilation for rooms within dwelling units as well as other rooms and spaces in residential buildings. Living rooms are now required to be ventilated and where this is by natural ventilation, at least 3 square feet of openable area must be provided. Such ventilation may be provided by an exterior door opening directly off the living room or through a vestibule directly off the living room. Previously, no ventilation was required.

Section 9.34 (Section 34): Heating and Air Conditioning

The scope of the heating section in Residential Standards has been broadened to include air conditioning. The section only applies to heating systems where the heat input does not exceed 400,000 Btu/hr and air conditioning units where the fan capacity does not exceed 4,000 cfm.

Unfinished basements and cellars

are now required to have heating facilities to maintain a temperature of at least 65° F.

Supply and return ducts in attic spaces were required to have at least 2 inches of insulation in Residential Standards. The requirement in Part 9 calls for three units of thermal resistance (roughly equivalent to one inch of mineral wool). This was a typographical error which was corrected in the July amendments to 7 units of thermal resistance.

Section 9.35 (Section 35): Electrical

This section is essentially the same as in Residential Standards except that the requirement for service entrance capacity has been deleted and replaced with a cross reference to the Canadian Electrical Code.

The requirement which permitted the measurement between receptacles to be diagonally across corners has been dropped to conform to the Canadian Electrical Code.

Section 9.36 (Section 36): Garages and Carports

This section applies to garages and carports serving a single dwelling unit and is essentially the same as in Residential Standards except that the requirement for minimum sizes has been dropped. The sizes will still be shown in CCRC, however.

Tables

Tables I-A to I-C are essentially the same as in Residential Standards except that no sound impact ratings are provided since these were only included previously for information purposes. A typographical error has been noted in Item 35, in Table IA, which was not caught in time for the July revision. This item should read "Same as 34" and not "Same as 31."

Tables II-A to II-L are the same as in Residential Standards. A new series of span tables is provided in CCRC along with the "old" tables to accommodate the old and new lumber.

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Four additional sections are in-

cluded in CCRC which do not appear in Part 9. These are as follows:

Section 37: Elevators

This section is essentially the same as in Residential Standards except that where there are less than four dwelling units on the seventh and on each higher floor only one elevator need be provided.

Section 38: Painting

This section is essentially the same as in Residential Standards.

Section 39: Walkways, Driveways and Parking Areas

This section is essentially the same as in Residential Standards except that a new table has been provided for walkway widths. These widths are based on the number of dwelling units served rather than on the type of building.

Section 40: Site Improvement

This section is the same as in Residential Standards except that the requirement for site drainage has been transferred to the section on "Drainage" which also appears in Part 9.