

ORDINANCE No.

117922

Council Bill No.

110767

The City

AN ORDINANCE relating to the Seattle Mechanical Code, repealing Section 22.400.010 (Ordinance 116011 as amended by Ordinance 116656), and adding a new Section 22.400.010 to adopt Chapters 2 through 11 and Chapters 14 and 16 of the 1994 Uniform Mechanical Code; the Uniform Mechanical Code Standards contained in Appendix A of the 1994 Uniform Mechanical Code, Chapter 13 contained in Appendix B of the 1994 Uniform Mechanical Code; amending the adopted Uniform Mechanical Code by: adding a new Chapter 1 related to administration, permitting and enforcement; amending Chapter 2, Definitions; amending certain provisions of Chapter 3 related to general requirements for heating, ventilating and cooling equipment, amending certain provisions of Chapter 4 related to ventilation air supply; amending certain provisions of Chapter 5 related to exhaust systems; amending certain provisions of Chapter 6 related to duct systems; amending certain provisions of Chapter 7 related to combustion air; amending certain provisions of Chapter 8 related to chimneys and vents; amending certain provisions of Chapter 9 related to special fuel-burning equipment; amending certain provisions of Chapter 11 related to refrigeration; amending certain provisions in Chapter 13 related to fuel gas piping; and adding a new Chapter 3.1, establishing minimum ventilation standards as required by State law.

COMPTROLLER FILE No.

Introduced: 6-26-95	By: HARRIS
Referred: 6-26-95	To: HCDUE
Referred:	To:
Referred:	To:
Reported: JUL 24 1995	Second Reading: JUL 24 1995
Third Reading:	Signed: JUL 24 1995
Preserved to Mayor: JUL 24 1995	Approved: JUL 26 1995
Returned to City Clerk: JUL 27 1995	Published: F1
Vetoes by Mayor:	Veto Published:
Passed over Veto:	Veto Sustained:

Honorable President:

Your Committee on

to which was referred the within Council Bill report that we have considered the

Do pass by a

Full

OK

Bill No.

10767

Law Department

The City of Seattle--Legislative Department

Date Reported
and Adopted

REPORT OF COMMITTEE

President:

Committee on _____

was referred the within Council Bill No. _____

that we have considered the same and respectfully recommend that the same:

Pass by a vote of ⁽⁹⁻²⁻¹⁾ 7/13

Full Council Vote 8-0

Shirley D. Adams

Committee Chair

1 **Section 3.** The 1994 Uniform Mechanical Code is amended by adding Chapter 1
2 as follows:

3 **Chapter 1**
4 **ADMINISTRATION**
5 **Part I—General**

6 **SECTION 101 — TITLE**

7 These regulations shall be known as the “Seattle Mechanical Code,” may be cited as such,
8 and will be referred to herein as “this code.”

9 **SECTION 102 — PURPOSE**

10 The purpose of this code is to provide minimum standards to safeguard life or limb, health,
11 property and public welfare by regulating and controlling the design, construction,
12 installation, quality of materials, location, operation, and maintenance or use of heating,
13 ventilating, cooling, refrigeration systems, incinerators and other miscellaneous heat-
14 producing appliances within the City.

15 The purpose of this code is to provide for and promote the health, safety and welfare of the
16 general public, and not to create or otherwise establish or designate any particular class or
17 group of persons who will or should be especially protected or benefited by the terms of this
18 code.

19 **SECTION 103 — SCOPE**

20 **103.1 Applicability.** The provisions of this code shall apply to the erection, installation,
21 alteration, repair, relocation, replacement, addition to, use or maintenance of any heating,
22 ventilating, cooling, refrigeration systems, incinerators or other miscellaneous heat-
23 producing appliances within the City. The design and testing of equipment regulated by this
24 code shall be subject to the approval of the building official.

25 **103.2 Alterations.** Additions, alterations, repairs and replacement of equipment or systems
26 shall comply with the provisions for new equipment and systems except as otherwise
27 provided in Section 104 of this code.

28 **103.3 Most Restrictive.** Where, in any specific case, different sections of this code specify
29 different materials, methods of construction or other requirements, the most restrictive shall
30 govern. Where there is a conflict between a general requirement and a specific requirement,
31 the specific requirement shall be applicable.

32 **103.4 Appendix A.** The Uniform Mechanical Code Standards in Appendix A shall be
33 considered as part of this code.

34 **103.5 Appendix C.** Appendix C contains gas-venting tables and is intended to serve only as
35 a guide.

1 **SECTION 104 — APPLICATION TO EXISTING MECHANICAL SYSTEMS**

2 **104.1 Additions, Alterations or Repairs.** Additions, alterations, renovations or repairs may
3 be made to any mechanical system without requiring the existing mechanical system to
4 comply with all the requirements of this code, provided the addition, alteration, renovation
5 or repair conforms to that required for a new mechanical system. Additions, alterations,
6 renovations or repairs shall not cause an existing system to become unsafe, unhealthy or
7 overloaded.

8 Minor additions, alterations, renovations, and repairs to existing mechanical systems may
9 be installed in accordance with the law in effect at the time the original installation was
10 made, when approved by the building official.

11 **104.2 Existing Installations.** Mechanical systems lawfully in existence at the time of the
12 adoption of this code may have their use, maintenance or repair, conversion of fuel, or
13 component replacement continued if the use, maintenance, repair, conversion of fuel, or
14 component replacement is in accordance with the basic original design and location, and no
15 hazard to life, health or property has been created by such mechanical system.

16 **104.3 Changes in Building Occupancy.** Mechanical systems which are a part of any
17 building or structure undergoing a change in use or occupancy, as defined in the Building
18 Code, shall comply with all requirements of this code which may be applicable to the new
19 use or occupancy.

20 **104.4 Maintenance.** All mechanical systems, materials and appurtenances, both existing
21 and new, and all parts thereof shall be maintained in proper operating condition in
22 accordance with the original design and in a safe and hazard-free condition. All devices or
23 safeguards which are required by this code shall be maintained in conformance with the
24 code edition under which installed. The owner or the owner's designated agent shall be
25 responsible for maintenance of mechanical systems and equipment. To determine
26 compliance with this subsection, the building official may cause a mechanical system or
27 equipment to be reinspected.

28 The Fire Chief and the building official shall each have authority to obtain compliance
29 with the requirements of this subsection.

30 **EXCEPTION:** The building official may modify the requirements of this section
31 where all or a portion of the building is unoccupied.

32 **104.5 Moved Buildings.** Building or structures moved into or within the City shall comply
33 with standards adopted by the building official. No building shall be moved into or within
34 the City unless, prior to moving, the building official has inspected the building for
35 compliance with this code and the permit holder has agreed to correct all deficiencies found
36 and has been issued a building permit for the work. A bond or cash deposit in an amount
37 sufficient to abate or demolish the building shall be posted prior to issuance of a permit. See
38 Section 116 for information required on plans. Any moved building that is not in complete
39 compliance with standards for moved buildings within eighteen months from the date of
40 permit issuance and is found to be a public nuisance may be abated.

41 **104.6 Historic Buildings and Structures.** The building official may modify the specific
42 requirements of this code as it applies to buildings and structures designated as landmarks of
43 historical or cultural importance and require in lieu thereof alternate requirements which, in
44 the opinion of the building official, will result in a reasonable degree of safety to the public
45 and the occupants of those buildings.

46 A historic building or structure is one which has been designated for preservation by City
47 Council or the State of Washington, has been listed, or has been determined eligible to be
48 listed, on the National Register of Historic Places, has been officially nominated for such

1 status, or is a structure contributing to the character of a designated landmark or historic
2 district.

3 **SECTION 105 — ALTERNATE MATERIALS AND METHODS OF**
4 **CONSTRUCTION**

5 This code does not prevent the use of any material, design or method of construction not
6 specifically allowed or prohibited by this code, provided the alternate has been approved and
7 its use authorized by the building official.
8

9 The building official may approve an alternate, provided he/she finds that the proposed
10 alternate complies with the provisions of this code and that the alternate, when considered
11 together with other safety features of the building or other relevant circumstances, will
12 provide at least an equivalent level of strength, effectiveness, fire resistance, durability,
13 safety and sanitation.
14

15 The building official may require that sufficient evidence or proof be submitted to
16 reasonably substantiate any claims regarding the use or suitability of the alternate. The
17 building official may, but is not required to, record the approval of modifications and any
18 relevant information in the files of the building official or on the approved permit plans.
19

20 **SECTION 106 — MODIFICATIONS**

21 The building official may approve modifications for individual cases, provided the building
22 official finds: (1) there are practical difficulties involved in carrying out the provisions of
23 this code; (2) the modification is in conformity with the intent and purpose of this code; and
24 (3) the modification will provide a reasonable level of fire protection and structural integrity
25 when considered together with other safety features of the building or other relevant
26 circumstances. The building official may, but is not required to, record the approval of
27 modifications and any relevant information in the files of the building official or on the
28 approved permit plans.
29

30 **SECTION 107 — TESTS**

31 Whenever there is insufficient evidence of compliance with the provisions of this code, or
32 evidence that any material or method of construction does not conform to the requirements
33 of this code, the building official may require tests as proof of compliance to be made at no
34 expense to the City.

35 Test methods shall be as specified in this code or by other recognized test standards. If
36 there are no recognized and accepted test methods for the proposed alternate, the building
37 official shall determine the test procedures.

38 All tests shall be made by an approved agency. Reports of such tests shall be retained by
39 the building official.

40 **SECTION 108 — JURISDICTION - POWERS AND DUTIES OF BUILDING**
41 **OFFICIAL**

42 **108.1 Jurisdiction.** The Department of Construction and Land Use shall be the code
43 enforcement agency in the City of Seattle for this code. The Department shall be under the

1 administration and operational control of the Director of the Department of Construction and
2 Land Use who shall be the building official.

3 **108.2. General.** The building official is authorized and directed to enforce this code, except
4 that enforcement of Chapter 13 shall be the primary responsibility of the Director of Public
5 Health, and enforcement authority as provided in this code to the building official shall also
6 be vested in the Director of Public Health or the Fire Chief. Compliance with the
7 requirements of this code shall be the obligation of the owner of the building, structure or
8 premises, the duly authorized agent of the owner, or other person responsible for the
9 condition or work, and not of the City or any of its officers or employees.

10 **108.3 Deputies.** The building official may appoint such officers and inspectors and other
11 employees as shall be authorized from time to time. The building official may deputize such
12 inspectors or employees as may be necessary to carry out the functions of the Department of
13 Construction and Land Use.

14 **108.4 Right of Entry.** With the consent of the owner or occupier of a building or premises,
15 or pursuant to a lawfully issued warrant, the building official may enter a building or
16 premises at any reasonable time to perform the duties imposed by this code.

17 **108.5 Stop Orders.** Whenever any work is being done contrary to the provisions of this
18 code, or in the event of dangerous or unsafe conditions related to construction or demolition,
19 the building official may order the affected work stopped by a notice describing the
20 violation in writing, posted on the premises or served on any person responsible for the
21 condition or work. It shall be unlawful for any person to engage in or to cause such work to
22 be done until authorization from the building official is received.

23 **108.6 Authority to Disconnect Utilities in Emergencies.** The building official shall have
24 the authority to disconnect fuel-gas utility service or energy supplies to a building, structure,
25 premises or equipment regulated by this code in case of emergency where necessary to
26 eliminate an immediate hazard to life or property. The building official may enter any
27 building or premises to disconnect utility service. The building official shall, whenever
28 possible, notify the serving utility, the owner and occupant of the building, structure or
29 premises of the decision to disconnect prior to taking such action, and shall notify such
30 serving utility, owner and occupant of the building, structure or premises in writing of such
31 disconnection immediately thereafter.

32 **108.7 Authority to Condemn Equipment.** Whenever the building official ascertains that
33 any equipment, or portion thereof, regulated by this code has become hazardous to life,
34 health or property, the building official shall order in writing that such equipment may either
35 be removed or restored to a safe or sanitary condition, as appropriate. The written notice
36 itself shall fix a time limit for compliance with such order. It shall be unlawful for any
37 person to use or maintain defective equipment after receiving such notice.

38 When such equipment or installation is to be disconnected, written notice of such
39 disconnection and causes therefor shall be given within 24 hours to the serving utility, the
40 owner and occupant of the building, structure or premises. When any equipment is
41 maintained in violation of this code, and in violation of a notice issued pursuant to the
42 provisions of this section, the building official shall institute any appropriate action to
43 prevent, restrain, correct or abate the violation.

44 **108.8 Connection after Order to Disconnect.** No person shall make connections from any
45 energy, fuel or power supply nor supply energy or fuel to any equipment regulated by this
46 mechanical code which has been disconnected or ordered to be disconnected by the building
47 official, or the use of which has been ordered to be discontinued by the building official until
48 the building official authorizes the reconnection and use of such equipment.

1 **108.9 Liability.** Nothing contained in this code is intended to be nor shall be construed to
2 create or form the basis for any liability on the part of the City, or its officers, employees or
3 agents, for any injury or damage resulting from the failure of equipment to conform to the
4 provisions of this code, or by reason or in consequence of any inspection, notice, order,
5 certificate, permission or approval authorized or issued or done in connection with the
6 implementation or enforcement of this code, or by reason of any action or inaction on the
7 part of the City related in any manner to the enforcement of this code by its officers,
8 employees or agents.

9 This code shall not be construed to relieve from or lessen the responsibility of any person
10 owning, operating or controlling any building or structure for any damages to persons or
11 property caused by defects, nor shall the Department of Construction and Land Use or the
12 City of Seattle be held as assuming any such liability by reason of the inspections authorized
13 by this code or any permits or certificates issued under this code.

14 **108.10 Cooperation of Other Officials and Officers.** The building official may request,
15 and shall receive so far as is required in the discharge of the building official's duties, the
16 assistance and cooperation of other officials of the City of Seattle.

17 **SECTION 109 — UNSAFE EQUIPMENT AND HAZARD CORRECTION ORDER**

18 **109.1 Unsafe Equipment.** Any equipment regulated by this code which constitutes a fire or
19 health hazard or is otherwise dangerous to human life is, for the purpose of this section,
20 unsafe. Any use of equipment regulated by this code constituting a hazard to safety, health
21 or public welfare by reason of inadequate maintenance, dilapidation, obsolescence, fire
22 hazard, disaster, damage or abandonment is, for the purpose of this section, an unsafe use.
23 Any such unsafe equipment is hereby declared to be a public nuisance and may be abated.

24 **109.2 Hazard Correction Order.** Whenever the building official finds that unsafe
25 equipment exists, the building official may issue a hazard correction order specifying the
26 conditions causing the equipment to be unsafe and directing the owner or other person
27 responsible for the unsafe equipment to correct the condition. In lieu of correction, the
28 owner may submit a report or analysis to the building official analyzing said conditions and
29 establishing that the equipment is, in fact, safe. The building official may require that the
30 report or analysis be prepared by a licensed engineer. It shall be unlawful for any person to
31 fail to comply with a hazard correction order as specified in this subsection.

32 **SECTION 110 — APPEALS**

33 Appeals from decisions or actions pertaining to the administration and enforcement of this
34 code shall be addressed to the building official. The appellant may request a review by three
35 or more members of the Construction Codes Advisory Board, convened by the Chair. The
36 issue of the appeal shall be taken into account by the Chair when selecting members to hear
37 an appeal. The results of this appeal shall be advisory only.

38 **SECTION 111 — VIOLATIONS AND PENALTIES**

39 **111.1 Violations.** It shall be a violation of this code for any person, firm or corporation to
40 install, erect, construct, enlarge, alter, repair, replace, remodel, move, improve, remove,
41 convert or demolish, equip, occupy, use or maintain any mechanical systems or equipment
42 or cause or permit the same to be done in the City, contrary to or in violation of any of the
43 provisions of this code.

1 It shall be a violation of this code for any person, firm or corporation to use any material
2 or to install any device, appliance or equipment which does not comply with the applicable
3 standards of this code or which has not been approved by the building official.

4 **111.2 Notice of Violation.** If, after investigation, the building official determines that
5 standards or requirements of this code have been violated, the building official may serve a
6 notice of violation upon the owner or other person responsible for the action or condition.
7 The notice of violation shall state the standards or requirements violated, shall state what
8 corrective action, if any, is necessary to comply with the standards or requirements, and
9 shall set a reasonable time for compliance. The notice shall be served upon the owner or
10 other responsible person by personal service, registered mail or certified mail with return
11 receipt requested, addressed to the last known address of such person. The notice of
12 violation shall be considered an order of the building official. Nothing in this subsection
13 shall be deemed to limit or preclude any action or proceeding pursuant to Sections 108 or
14 109 of this code, and nothing in this section shall be deemed to obligate or require the
15 building official to issue a notice of violation prior to the imposition of civil or criminal
16 penalties in this section.

17 **111.3 Civil Penalties.** Any person, firm or corporation failing to comply with the
18 provisions of this code shall be subject to a cumulative civil penalty in an amount not to
19 exceed \$500 per day for each violation from the date the violation occurs or begins until
20 compliance is achieved. In cases where the building official has issued a notice of violation,
21 the violation will be deemed to begin, for purposes of determining the number of days of
22 violation, on the date compliance is required by the notice of violation.

23 **111.4 Criminal Penalty.** Anyone who violates or fails to comply with any order issued by
24 the building official pursuant to this code or who removes, mutilates, destroys or conceals a
25 notice issued or posted by the building official shall, upon conviction thereof, be punished
26 by a fine of not more than \$1,000 or by imprisonment for not more than 360 days, or by
27 both such fines and imprisonment. Each day's violation or failure to comply shall constitute
28 a separate offense.

29 Anyone violating or failing to comply with any of the provisions of this code and who
30 within the past five years has a judgment against them pursuant to Section 111.3, shall upon
31 conviction thereof, be punished by a fine in a sum not to exceed \$500 or imprisonment for
32 not more than 180 days, or by both such fine and imprisonment. Each day's violation or
33 failure to comply shall constitute a separate offense.

34 **111.5 Additional Relief.** The building official may seek legal or equitable relief to enjoin
35 any acts or practices and abate any condition which constitutes a violation of this code when
36 civil or criminal penalties are inadequate to effect compliance.

37 SECTION 112 — NOTICES

38 It shall be unlawful for any person to remove, mutilate, destroy or conceal any notice issued
39 or posted by the building official pursuant to the provisions of this code or any notice issued
40 or posted by the building official in response to a natural disaster or other emergency.

41 The building official may record a copy of any order or notice with the Department of
42 Records and Elections of King County.

43 The building official may record with the Department of Records and Elections of King
44 County a notification that a permit has expired without a final inspection after reasonable
45 efforts have been made to provide a final inspection.

1 **SECTION 113 — RULES OF THE BUILDING OFFICIAL**

2 **113.1 Authority.** The building official shall have the power to render interpretations of this
3 code and to adopt and enforce rules and regulations supplemental to this code as may be
4 deemed necessary in order to clarify the application of the provisions of this code. Such
5 interpretations, rules and regulations shall be in conformity with the intent and purpose of
6 this code. The building official is authorized to promulgate, adopt and issue the following
7 rules:

- 8 1. "Building Construction Standards" to promulgate standards which are acceptable as a
9 method or as an alternative design for meeting code required performance criteria, to
10 recognize new technical data affecting code requirements, and to eliminate conflicts
11 among code requirements.
- 12 2. "Code Interpretations" to interpret and clarify conditions or language expressed in this
13 code.
- 14 3. Any other rule necessary for the administration of the purpose and intent of this code.

15 **113.2 Procedure for Adoption of Rules.** The building official shall promulgate, adopt and
16 issue rules according to the procedures as specified in Chapter 3.02 of the Administrative
17 Code, Seattle Municipal Code.

18 **SECTION 114 — CONSTRUCTION CODES ADVISORY BOARD**

19 A committee of the Construction Codes Advisory Board may examine proposed
20 administrative rules, appeals and amendments relating to this code and related provisions of
21 other codes and make recommendations to the building official and to the City Council for
22 changes in this code. The committee will be called on an as-needed basis by the
23 Construction Codes Advisory Board.

24 **SECTION 115 — PERMITS**

25 **115.1 Permits Required.** It shall be unlawful to make any installation, alteration, repair,
26 replacement or remodel any mechanical system regulated by this code except as permitted in
27 Section 115.2 of this code, or allow the same to be done without first obtaining a separate
28 mechanical permit for each separate building or structure. All work shall comply with this
29 code, even where no permit is required.

30 **115.2 Exempt Work.**

31 **115.2.1 Mechanical.** A mechanical permit shall not be required for the following:

32 1. Any portable heating appliance, portable ventilating equipment, or portable cooling unit,
33 provided that the total capacity of these portable appliances shall not exceed 40 percent of
34 the cumulative heating, cooling or ventilating requirements of a building or dwelling unit
35 and shall not exceed 3 Kw or 10,000 Btu input.

36 2. Any closed system of steam, hot or chilled water piping within heating or cooling
37 equipment regulated by this code.

38 3. Minor work or the replacement of any component part of a mechanical system which
39 does not alter its original approval and complies with other applicable requirements of this
40 code.

1 **115.2.2 Refrigeration.** A refrigeration permit shall not be required for the following:

- 2 1. Any self-contained refrigerating equipment for which an operating permit is not
3 required.
- 4 2. Any unit refrigeration system which does not exceed three horsepower rating.

5 Exemption from the permit requirements of this code shall not be deemed to grant
6 authorization for any work to be done in any manner in violation of the provisions of this
7 code or any other laws or ordinances of the City.

8 **115.3 Flood Hazard Areas.** In addition to the permit required by this section, all work to be
9 performed in areas of special flood hazard, as identified in the report entitled "Flood
10 Insurance Study for King County, Washington and Incorporated Areas" and the
11 accompanying Flood Insurance Rate Maps and filed in C.F. 295948, is subject to additional
12 standards and requirements, including floodplain development approval or a Floodplain
13 Development License, as set forth in Chapter 25.06, the Seattle Floodplain Development
14 Ordinance.

15 **115.4 Emergency Repairs.** In the case of an emergency, the installation, alteration or repair
16 of any refrigeration system or equipment may be made without a permit, provided that
17 application for a permit shall be made within twenty-four hours or within one working day
18 from the time when the emergency work was started.

19 **SECTION 116 — APPLICATION FOR PERMIT AND INFORMATION ON PLANS**
20 **AND SPECIFICATIONS**

21 **116.1 Application.** To obtain a permit, the applicant shall first file an application in writing
22 on a form furnished by the Department of Construction and Land Use for that purpose.
23 Every such application shall:

- 24 1. Identify and describe the work to be covered by the permit for which application is
25 made.
- 26 2. Describe the land on which the proposed work is to be done by legal description,
27 property address or similar description that will readily identify and definitely locate the
28 proposed building or work.
- 29 3. Provide contractor's state license number (required if permit is to be issued to the
30 contractor).
- 31 4. Be accompanied by plans, diagrams, computations and specifications, equipment
32 schedule and other data as required in Sections 116.2 and 116.3.
- 33 5. State the valuation of the mechanical work to be done. The value or valuation of the
34 mechanical work shall be the estimated current value of all labor and material, whether
35 actually paid for or not, for which the permit is issued.
- 36 6. Be signed by the owner of the property or building, or his/her authorized agent, who
37 may be required to submit evidence to indicate such authority.
- 38 7. Give such other data and information as may be required by the building official.
- 39 8. Indicate the name of the owner and contractor and the name, address and phone number
40 of a contact person.

1 **116.2 Plans and Specifications.** Plans, engineering calculations, diagrams and other data
2 shall be submitted in one or more sets with each application for a permit. The building
3 official may require plans, computations and specifications to be prepared and designed by
4 an engineer or architect licensed by the state to practice as such. Projects having a total
5 mechanical valuation of \$30,000 or larger shall require a mechanical engineering stamp and
6 signature on each sheet.

7 **EXCEPTION:** The building official may waive the requirements for a mechanical
8 engineers stamp or submission of plans, calculations or other data if the building
9 official finds that the nature of the work applied for is such that the reviewing of plans
10 is not necessary to obtain compliance with this code.

11 **116.3 Information on Plans and Specifications.**

12 **116.3.1 Clarity of plans.** Plans shall be drawn to a clearly indicated and commonly accepted
13 scale upon substantial paper such as blueprint quality or standard drafting paper. Tissue
14 paper, posterboard or cardboard will not be accepted. The plans shall be of microfilm
15 quality and limited to a minimum size of 18 inches by 18 inches and a maximum size of 41
16 inches by 54 inches.

17 **116.3.2 Fire-resistive notes.** The building official may require that plans for buildings more
18 than two stories in height of other than Group R, Division 3 and Group U Occupancies
19 indicate how required structural and fire-resistive integrity will be maintained where a
20 penetration will be made for electrical, mechanical, plumbing and communication conduits,
21 pipes and similar systems.

22 **116.3.3 Information required on plans.** The plans or specifications shall show the
23 following:

- 24 1. Layout for each floor with dimensions of all working spaces and a legend of all
25 symbols used.
- 26 2. Location, size and material of all piping.
- 27 3. Location, size and materials of all air ducts, air inlets and air outlets.
- 28 4. Location of all fans, warm-air furnaces, boilers, absorption units, refrigerant
29 compressors and condensers and the weight of all pieces of such equipment weighing
30 200 pounds or more.
- 31 5. Rated capacity or horsepower and efficiency rating of all boilers, warm-air furnaces,
32 heat exchangers, blower fans, refrigerant compressors and absorption units. See also
33 the Seattle Energy Code.
- 34 6. Location, size and material of all combustion products vents and chimneys.
- 35 7. Location and area of all ventilation and combustion air openings and ducts.
- 36 8. Location of all air dampers and fire shutters.
- 37 9. The first sheet of each set of plans and specifications shall show the address of the
38 proposed work and the name and address of the owner or lessee of the premises.
- 39 10. Plans and specifications shall be of sufficient clarity to show that the proposed
40 installation will conform to the provisions of this code and to the provisions of all
41 applicable laws, ordinances, rules, regulations and orders.

1 11. Architectural drawings, typical envelope cross sections and other drawings or data may
2 be required to support system sizing calculations or other thermal requirements of this
3 code or the Seattle Energy Code.

4 SECTION 117 — PERMIT ISSUANCE

5 117.1 Issuance.

6 **117.1.1 General.** The application, plans, specifications, and other data filed by an applicant
7 for permit shall be reviewed by the building official. Such plans may be reviewed by other
8 departments of the City to check compliance with the laws and ordinances under their
9 jurisdiction. If the building official finds that the work as described in an application for a
10 permit and the plans, specifications and other data filed therewith substantially conforms to
11 the requirements of this code and other pertinent laws and ordinances and that the fees
12 specified in the Permit Fee Subtitle have been paid, the building official shall issue a permit
13 therefor to the applicant who becomes the permit holder or authorized agent.

14 **EXCEPTION:** The building official may issue a permit for the construction of part of
15 a building or structure before complete plans for the whole building or structure have
16 been submitted or approved, provided that the proposed project complies with the State
17 Environmental Policy Act as adopted by the City (Chapter 25.05 Seattle Municipal
18 Code) and as amended and the Land Use Code as amended; and provided further that
19 adequate information and plans have been filed and checked to assure compliance with
20 all pertinent requirements of this and other pertinent codes. The holder of such a permit
21 shall proceed at his/her own risk without assurance that the permit for the entire
22 building or structure will be granted.

23 **117.1.2 Compliance with Approved Plans and Permit.** When the building official issues a
24 permit, the building official shall endorse the permit in writing and endorse in writing or
25 stamp the plans "APPROVED." Such approved plans and permit shall not be changed,
26 modified or altered without authorization from the building official, and all work shall be
27 done in accordance with the approved plans and permit except as the building official may
28 require during field inspection to correct errors or omissions.

29 **117.1.3 Amendments to the Permit.** When substitutions or changes are made during
30 construction, approval shall be secured prior to execution, however, the building inspector
31 may approve minor modifications for work not reducing the structural strength and fire and
32 life safety of the structure. The building inspector shall determine if it is necessary to revise
33 the approved plans. These substitutions and changes shall conform to the requirements of
34 this code and other pertinent laws and ordinances. Minor substitutions or changes shall be
35 documented, but shall not incur additional fees if these substitutions and/or changes do not
36 (1) add to the general scope of work;(2) change the basic design concept; (3) involve major
37 relocation of equipment, ducts, or pipes;(4) substantially alter approved equipment size; (5)
38 require extensive re-review of the plans and specifications.

39 All other changes, substitutions, or clarifications shall be shown on two sets of plans which
40 shall be submitted to and approved by the building official prior to execution or occupancy.
41 These submittals shall be accompanied by appropriate fees as specified in the Permit Fee
42 Subtitle prior to issuance of the Certificate of Occupancy.

43 **117.1.4 Cancellation of Permit Application.** An application shall be deemed abandoned
44 and void if a permit is not issued after a period of sixty days from the date of notice of
45 approval for issuance or if corrections are not received after a period of sixty days from the
46 date of notification of required corrections; provided that the building official may extend
47 the period for issuance or submission of corrections if it is determined that there are good
48 reasons for the delay, such as litigation or appeals or if a different schedule is agreed upon in
49 writing before the end of the sixty day period. If the permit application is canceled, the site

1 may be inspected to verify that no work has taken place. The application and any
2 accompanying plans and specifications shall be destroyed. If the application is being
3 reviewed concurrently with a master use permit application, and is for a project vested to a
4 prior Land Use Code or Zoning Ordinance provisions, and the project does not conform with
5 the codes in effect while it is being reviewed, cancellation of the building permit application
6 under the provisions of this section shall cause the concurrent cancellation of the Master Use
7 Permit application.

8 **117.2 Retention of Plans.** One set of approved plans, which may be on microfilm, shall be
9 retained by the building official. One set of approved plans shall be returned to the
10 applicant, and shall be kept at the site of the building or work at all times during which the
11 work authorized is in progress for use by the inspection personnel.

12 **117.3 Validity of permit.** The issuance or granting of a permit or approval of plans shall not
13 be construed to be a permit for, or an approval of, any violation of any of the provisions of
14 this code or other pertinent laws and ordinances. No permit presuming to give authority to
15 violate or cancel the provisions of this code shall be valid, except insofar as the work or use
16 which it authorizes is lawful.

17 The issuance of a permit based upon plans shall not prevent the building official from
18 thereafter requiring the correction of errors in said plans, or from preventing building
19 operations being carried on thereunder when in violation of this code or of other pertinent
20 laws and ordinances of the City.

21 The issuance of a mechanical permit shall not prevent the building official from requiring
22 correction of conditions found to be in violation of this code or other pertinent laws of the
23 City, nor shall the period of time for which any such permit is issued be construed to extend
24 or otherwise affect any period of time for compliance specified in any notice or order issued
25 by the building official or other administrative authority requiring the correction of any such
26 conditions.

27 **117.4 Permit Expiration and Renewal.**

28 **117.4.1 Expiration.** Permits and renewed permits shall expire eighteen months from the
29 date of issuance.

30 **EXCEPTIONS:** 1. Initial permits for major construction projects that require more
31 than eighteen months to complete, according to a construction schedule submitted by
32 the applicant, may be issued for a period that provides reasonable time to complete the
33 work but in no case longer than three years.

34 2. Permits which expire in less than eighteen months may be issued where the building
35 official determines a shorter period is appropriate.

36 **117.4.2 Renewal.** Permits may be renewed and renewed permits may be further renewed by
37 the building official, provided the following conditions are met:

- 38 1. Application for renewal shall be made within the thirty-day period immediately
39 preceding the date of expiration of the permit;
- 40 2. The work authorized by the permit has been started and is progressing at a rate approved
41 by the building official. Progress justifying renewal of a permit, except as specified by
42 Item 3, shall include, but is not limited to, requesting of a required inspection, the
43 arranging of financing, selection of contractors and subcontractors, securing other
44 necessary permits and licenses, site preparation such as demolition, clearing and
45 excavation, soils investigation and work done to overcome unusual construction
46 difficulties;

1 3. If an application for renewal is made either more than eighteen months after the date of
2 mandatory compliance with a new or revised edition of this code or after the effective
3 date of an amendment to applicable provisions of the Land Use or Zoning Codes, the
4 permit shall not be renewed unless:

5 (i) The building official determines by plans examination that the permit
6 complies, or is modified to comply, with the code or codes in effect on the date of
7 application renewal; or

8 (ii) The work authorized by the permit is substantially underway and progressing
9 at a rate approved by the building official. Progress justifying renewal of the permit shall be
10 evidenced by notification by the permit holder that a construction step is ready for an
11 inspection required by Section 119.4 of this code.

12 Permits may also be renewed where commencement or completion of the work
13 authorized by the permit is delayed by litigation, appeals, strikes or other causes related to
14 the work authorized by the permit, beyond the permit holder's control.

15 **117.4.3 Re-establishment.** A new permit shall be required to complete work where a permit
16 has expired and was not renewed.

17 **EXCEPTION:** A permit which has been expired for less than one year may be
18 reestablished upon approval of the building official provided it complies with Items 2
19 and 3 of Section 117.4.2

20 **117.5 Suspension or Revocation.** The building official may, by written order, suspend or
21 revoke a permit issued under the provisions of this code whenever the permit is issued in
22 error or on the basis of incorrect information supplied, or in violation of any ordinance or
23 regulation or any provisions of this code.

24 SECTION 118 — FEES

25 A fee for each mechanical permit and for other activities related to the enforcement of this
26 code shall be paid as set forth in the Permit Fee Subtitle.

27 SECTION 119 — INSPECTIONS

28 **119.1 General.** All construction or work for which a permit is required shall be subject to
29 inspection by the building official, and certain types of construction shall have special
30 inspections by registered special inspectors as specified in Section 1701 of the Seattle
31 Building Code.

32 **119.2 Inspection Requests.** It shall be the duty of the owner of the property or the owner's
33 authorized agent, or the person designated by the owner/agent to do the work authorized by
34 a permit, to notify the building official that work requiring inspection as specified in this
35 section and Section 120 is ready for inspection.

36 It shall be the duty of the person requesting any inspections required by this code to
37 provide access to and means for proper inspection of such work. It shall be the duty of the
38 permit holder to cause the work to be accessible and exposed for inspection purposes until
39 approved by the building official. Neither the building official nor the City shall be liable
40 for expense entailed in the required removal or replacement of any material to allow
41 inspection.

42 **119.3 Inspection Record.** Work requiring a mechanical permit shall not be commenced
43 until the permit holder or agent has posted an inspection record in a conspicuous place on

1 the premises and in a position which allows the building official to conveniently make the
2 required entries thereon regarding inspection of the work. This record shall be maintained in
3 such a position by the permit holder until final approval has been granted by the building
4 official.

5 **119.4 Approvals Required.** No work shall be done on any part of the building or structure
6 beyond the point indicated in each successive inspection without first obtaining the written
7 approval of the building official. Such written approval shall be given only after an
8 inspection has been made of each successive step in the construction as indicated by each of
9 the inspections required in this section.

10 All mechanical systems for which a permit is required by this code shall be inspected by
11 the building official. No portion of any mechanical system intended to be concealed shall be
12 concealed until inspected and approved. Neither the building official nor the City shall be
13 liable for expense entailed in the removal or replacement of material required to permit
14 inspection. When the installation of a mechanical system is complete, an additional and
15 final inspection shall be made.

16 Approval as a result of an inspection shall not be construed to be an approval of a
17 violation of the provisions of this code or of other pertinent laws and ordinances of the City.
18 Inspections presuming to give authority to violate or cancel the provisions of this code or of
19 other pertinent laws and ordinances of the City shall not be valid.

20 **119.5 Operation of Mechanical Equipment.** The requirements of this section shall not be
21 considered to prohibit the operation of any mechanical systems installed to replace existing
22 equipment or fixtures serving an occupied portion of the building in the event a request for
23 inspection of such equipment or fixture has been filed with the building official more than
24 48 hours after such replacement work is completed, and before any portion of such
25 mechanical system is concealed by any permanent portion of the building.

26 **119.6 Testing of Equipment and Systems.** Refrigeration equipment regulated by this code
27 shall be tested and approved as required by Section 1122 of this code.

28 When applicable (see Section 103.5), fuel-gas piping shall be tested and approved as
29 required by Section 1306 of this code.

30 **119.7 Other Inspections.** In addition to the called inspections required by this code, the
31 building official may make or require any other inspections of any mechanical work to
32 ascertain compliance with the provisions of this code and other laws and ordinances which
33 are enforced by the building official.

34 Where work for which any permit or approval is required is commenced or performed
35 prior to making formal application and receiving the building official's permission to
36 proceed, the building official may make a special investigation inspection before a permit
37 may be issued for such work. Where a special investigation is made, a special investigation
38 fee may be assessed in accordance with the Permit Fee Subtitle.

39 **119.8 Reinspections.** The building official may require a reinspection when work for which
40 inspection is called is not complete, corrections called for are not made, the inspection
41 record is not properly posted on the work site, the approved plans are not readily available to
42 the inspector, for failure to provide access on the date for which inspection is requested, or
43 when deviations from plans which require the approval of the building official have been
44 made without proper approval.

45 For the purpose of determining compliance with Section 104.4, Maintenance, the building
46 official or the Fire Chief may cause any structure to be reinspected.

1 The building official may assess a reinspection fee as set forth in the Permit Fee Subtitle for
2 any action listed above for which reinspection may be required, whether or not a
3 reinspection is actually performed. A reinspection fee shall not be assessed the first time the
4 work subject to inspection is rejected for failure to comply with the requirements of this
5 code.

6 In instances where reinspection fees have been assessed, no additional inspection of the
7 work shall be performed until the required fees have been paid.

8 **SECTION 120 — CONNECTION APPROVAL**

9 **120.1 Energy Connections.** No person shall make connections from a source of energy fuel
10 to a mechanical system or equipment regulated by this code and for which a permit is
11 required until approved by the building official.

12 **120.2 Temporary Connections.** The building official may authorize temporary connection
13 of the mechanical equipment to the source of energy fuel for the purpose of testing the
14 equipment, or for use under a temporary certificate of occupancy.

15 **SECTION 121 — REFRIGERATION LICENSES**

16 No one shall perform any of the services or activities related to refrigeration systems as
17 regulated by Chapter 11 without a license as required by Chapter 6.82 of the Seattle
18 Municipal Code, or under the direct supervision of a person, firm, associates or corporation
19 holding a required license.

20 **Section 4.** Chapter 2 of the 1994 Uniform Mechanical Code is amended as
21 follows:

22 **Chapter 2** 23 **DEFINITIONS** 24

25 **SECTION 201 — GENERAL**

26 For the purpose of this code, certain abbreviations, terms, phrases, words and their
27 derivatives shall be construed as specified in this chapter. Words used in the singular include
28 the plural and the plural the singular. Words used in the masculine gender include the
29 feminine, and the feminine the masculine.

30 **SECTION 202 — ACCEPTED MEANINGS**

31 Except as defined in this chapter or elsewhere in this code, the interpretation of words used
32 in this code shall be in accordance with the meanings defined in the Building Code and
33 *Webster's Third New International Dictionary of the English Language, Unabridged,*
34 copyright 1986.
35

1 **SECTION 203 — A**

2 **ABSORBER (ADSORBER)** is that part of the low side of an absorption system used for
3 absorbing (adsorbing) vapor refrigerant.

4 **ABSORPTION UNIT** is an absorption refrigeration system which has been factory
5 assembled and tested prior to its installation.

6 **ACCESSIBLE** is having access to but which first may require the removal of an access
7 panel, door or similar obstruction covering the item described.

8 **ACCESSIBLE, READILY**, means capable of being reached safely and quickly for
9 operation, repair or inspection without requiring those to whom ready access is requisite to
10 climb over or remove obstacles, or to resort to the use of portable access equipment.

11 **AIR, COMBUSTION.** See "combustion air," Section 205.

12 **AIR, CONDITIONED**, is air which has been treated to achieve a desired level of
13 temperature, humidity or cleanliness.

14 **AIR, EXHAUST**, is air being removed from any space or piece of equipment and
15 conveyed directly to the atmosphere by means of openings or ducts.

16 **AIR-HANDLING UNIT** is a blower or fan used for the purpose of distributing supply air
17 to a room, space or area.

18 **AIR, MAKEUP**, is air which is provided to replace air being exhausted.

19 **AIR-MOVING SYSTEM** is a system designed to provide heating, cooling or ventilation
20 in which one or more air-handling units are used to supply air to a common space or to draw
21 air from a common plenum or space.

22 **AIR, OUTSIDE**, is air from outside the building intentionally conveyed by openings or
23 ducts to rooms or to conditioning equipment.

24 **AIR, RETURN**, is air from the conditioned area that is returned to the conditioning
25 equipment for reconditioning.

26 **AIR, SUPPLY**, is air being conveyed to a conditioned area through ducts or plenums from
27 a heat exchanger of a heating, cooling, absorption or evaporative cooling system.

28 **APPLIANCE** is a device which utilizes fuel or other forms of energy to produce light,
29 heat, power, refrigeration or air conditioning. This definition also shall include a vented
30 decorative appliance.

31 **APPROVED**, as to materials, equipment and method of construction, refers to approval
32 by the building official as the result of investigation and tests by the building official, or by
33 reason of accepted principles or tests by national authorities, technical or scientific
34 organizations.

35 **APPROVED AGENCY** is an established and recognized agency regularly engaged in
36 conducting tests or furnishing inspection services, when such agency has been approved by
37 the building official.

38 **ASSEMBLY BUILDING** is a building or a portion of a building used for the gathering
39 together of 50 or more persons for such purposes as deliberation, education, instruction,
40 worship, entertainment, amusement, drinking or dining or awaiting transportation.

41 **AZEOTROPE** is a refrigerant blend comprising multiple components of different
42 volatilities that, when used in refrigeration cycles, do not change volumetric composition or
43 saturation temperature as they evaporate or condense at constant pressure.

1 **SECTION 204 — B**

2 **BACK-DRAFT DAMPER** is a damper installed to restrict introduction of unconditioned
3 air from an unconditioned space to a conditioned space.

4 **BAROMETRIC DAMPER** is any listed non-manual device that freely allows the flow of
5 air in one direction, but does not allow conditioned air to escape. Any installed combustion
6 air damper shall meet the installation requirements of the manufacturer.

7 **BOILER CODE** is the Seattle Boiler Code.

8 **BOILER, HIGH PRESSURE**, is a boiler furnishing steam at pressures in excess of 15
9 pounds per square inch (103 kPa) or hot water at temperatures in excess of 250°F. (121°C.)
10 or at pressures in excess of 160 pounds per square inch (1100 kPa).

11 **BOILER ROOM** is any room containing a ~~steam or hot-water~~ boiler.

12 **BREECHING** is a metal connector for medium- and high-heat appliances. Breechings
13 should have a thimble or liner of tile or heavy steel, at least 24 gage.

14 **BRINE** is a liquid used for the transmission of heat without a change in its state, having no
15 flash point or a flash point above 150°F. (65.5°C.), as determined by the requirements of the
16 Fire Code. See U.F.C. Standard 2-2.

17 **Btu/h** is the listed maximum capacity of an appliance, absorption unit or burner expressed
18 in British thermal units input per hour, unless otherwise noted.

19 **BUILDING CODE** is the ~~((Uniform Building Code promulgated by the International~~
20 ~~Conference of Building Officials, as adopted by this jurisdiction.)) Seattle Building Code.~~

21 **BUILDING OFFICIAL** is the ~~((officer charged with the administration and enforcement~~
22 ~~of this code, or a regularly authorized deputy)) Director of the Department of Construction~~
23 ~~and Land Use. As used in this code, the term includes authorized representatives of the~~
24 ~~Director of the Department of Construction and Land Use.~~

25 **SECTION 205 — C**

26 **CAS NUMBER** is the Chemical Abstract System registry number.

27 **CENTRAL HEATING PLANT** or **HEATING PLANT** is environmental heating
28 equipment installed in a manner to supply heat by means of ducts or pipes to areas other than
29 the room or space in which the equipment is located.

30 **CHIMNEY** is a vertical shaft enclosing one or more flues for conveying flue gases to the
31 outside atmosphere.

32 **Factory-built Chimney** is a listed chimney.

33 **Masonry Chimney** is a chimney of solid masonry units, bricks, stones, listed masonry
34 units or reinforced concrete, lined with suitable flue liners.

35 **Metal Chimney** is a chimney constructed of metal with a minimum thickness not less than
36 0.127-inch (No. 10 manufacturer's standard gage) (3.2 mm) steel sheet.

37 **CHIMNEY CLASSIFICATIONS:**

38 **Chimney, High-heat Appliance-type**, is a factory-built, masonry or metal chimney
39 suitable for removing the products of combustion from fuel-burning high-heat appliances
40 producing combustion gases exceeding 2,000°F. (1093°C.) measured at the appliance flue
41 outlet.

1 **Chimney, Low-heat Appliance-type**, is a factory-built, masonry or metal chimney
2 suitable for removing the products of combustion from fuel-burning low-heat appliances
3 producing combustion gases not exceeding 1,000°F. (538°C.) under normal operating
4 conditions but capable of producing combustion gases of 1,400°F. (759°C.) during
5 intermittent forced firing for periods up to one hour. All temperatures are measured at the
6 appliance flue outlet.

7 **Chimney, Medium-heat Appliance-type**, is a factory-built, masonry or metal chimney
8 suitable for removing the products of combustion from fuel-burning medium-heat
9 appliances producing combustion gases not exceeding 2,000°F. (1093°C.) measured at the
10 appliance flue outlet.

11 **Chimney, Residential Appliance-type**, is a factory-built or masonry chimney suitable
12 for removing products of combustion from residential-type appliances producing
13 combustion gases not exceeding 1,000°F. (538°C.), measured at the appliance flue outlet.
14 Factory-built Type H.T. chimneys have high-temperature thermal shock resistance.

15 **CHIMNEY CONNECTOR** is the pipe which connects a fuel-burning appliance to a
16 chimney.

17 **CLOSED COMBUSTION SOLID-FUEL-BURNING APPLIANCE** is a heat-
18 producing appliance that employs a combustion chamber that has no openings other than the
19 flue collar, fuel charging door and adjustable openings provided to control the amount of
20 combustion air that enters the combustion chamber.

21 **CLOSET.** See "confined space."

22 **COMBUSTIBLE MATERIAL** is any material not meeting the definition of
23 noncombustible material, including material made of or surfaced with wood, compressed
24 paper, plant fibers, plastics, or other material that will ignite and burn, whether flameproofed
25 or not, or whether plastered or unplastered.

26 **COMBUSTION AIR** is the total amount of air provided to the space which contains fuel-
27 burning equipment; it includes air for fuel combustion, for draft hood dilution and for
28 ventilation of the equipment enclosure.

29 **COMPANION OR BLOCK VALVES.** See "valves, companion or block." See Section
30 224.

31 **COMPRESSOR, POSITIVE DISPLACEMENT**, is a compressor in which increase in
32 pressure is attained by changing the internal volume of the compression chamber.

33 **COMPRESSOR, REFRIGERANT**, is a machine, with or without accessories, for
34 compressing a refrigerant vapor.

35 **CONDENSER** is that part of the system designed to liquefy refrigerant vapor by removal
36 of heat.

37 **CONDENSING APPLIANCE** is an appliance which condenses part of the water vapor
38 generated by the burning of hydrogen in fuels.

39 **CONDENSING UNIT** is a mechanical refrigeration system, consisting of one or more
40 power-driven compressors, condensers, liquid receivers, if provided, and the regularly
41 furnished accessories which have been factory assembled and tested prior to its installation.

42 **CONDITIONED SPACE** is an area, room or space normally occupied and being heated
43 or cooled by any equipment for human habitation.

1 **CONFINED SPACE** is a room or space having a volume less than 50 cubic feet per 1,000
2 Btu/h (4.83 L/W) of the aggregate input rating of all fuel-burning appliances installed in
3 that space.

4 **CONTAINER (REFRIGERANT)** is a cylinder for the transportation of refrigerant.

5 **COOLING** is air cooling to provide room or space temperatures of 68°F. (20°C.) or
6 above.

7 **COOLING SYSTEM** is all of that equipment, including associated refrigeration, intended
8 or installed for the purpose of cooling air by mechanical means and discharging such air into
9 any room or space. This definition shall not include an evaporative cooler.

10 **COOLING UNIT** is a self-contained refrigeration system which has been factory
11 assembled and tested, installed with or without conditioned air ducts and without connecting
12 any refrigerant-containing parts. This definition shall not include a portable cooling unit or
13 an absorption unit.

14 **CRITICAL PRESSURE, CRITICAL TEMPERATURE AND CRITICAL VOLUME**
15 **are the terms given to the state points of a substance at which liquid and vapor have identical**
16 **properties. Above the critical pressure or critical temperature there is no line of demarcation**
17 **between liquid and gaseous phases.**

18 **SECTION 206 — D**

19 **DAMPERS** shall be defined as follows:

20 **Ceiling Damper** is an automatic-closing assembly complying with UL Standard 555C.

21 **Chimney Damper** is a movable valve or plate within the chimney connector for
22 controlling the draft or flow of combustion gases.

23 **Fire Damper** is an automatic-closing metal assembly of one or more louvers, blades, slats
24 or vanes complying with recognized standards.

25 **Leakage Rated Damper.** See "smoke damper."

26 **Smoke Damper** is a damper arranged to seal off airflow automatically through a part of an
27 air-duct system so as to restrict the passage of smoke.

28 **Volume Damper** is a device which, when installed, will restrict, retard or direct the flow
29 of air in a duct, or the products of combustion in a heat-producing equipment, its vent
30 connector, vent or chimney therefrom.

31 **DIRECT GAS-FIRED MAKEUP AIR HEATER** is a heater in which all the products
32 of combustion generated by the gas-burning device are released into the outside airstream
33 being heated.

34 **DIRECT-VENT APPLIANCES** are appliances which are constructed and installed so
35 that all air for combustion is derived from the outside atmosphere and all flue gases are
36 discharged to the outside atmosphere.

37 **DISTRICT HEATING PLANT** is a power boiler plant designed to distribute hot water
38 or steam to users located off the premises.

39 **DRAFT HOOD** is a device built into an appliance or made a part of the vent connector
40 from an appliance, which is designed to:

41 1. Assure the ready escape of the flue gases in the event of no draft, backdraft or stoppage
42 beyond the draft hood.

1 2. Prevent a back draft from entering the appliance.

2 3. Neutralize the effect of stack action of the chimney or gas vent upon the operation of the
3 appliance.

4 **DUCT** is a tube or conduit for transmission of air. This definition shall not include:

5 1. A vent, a vent connector or a chimney connector.

6 2. A tube or conduit wherein the pressure of the air exceeds 1 pound per square inch (6.9
7 Pa).

8 3. The air passages of listed self-contained systems.

9 **DUCT FURNACE** is a warm-air furnace normally installed in an air-distribution duct to
10 supply warm air for heating. This definition shall apply only to a warm-air heating appliance
11 which depends for air circulation on a blower not furnished as part of the furnace.

12 **DUCT SYSTEMS** are all ducts, duct fittings, plenums and fans assembled to form a
13 continuous passageway for the distribution of air.

14 **DWELLING** is a building or portion thereof which contains not more than two dwelling
15 units.

16 **DWELLING UNIT** is a building or portion thereof which contains living facilities,
17 including provisions for sleeping, eating, cooking and sanitation, as required by this code,
18 for not more than one family, or a congregate residence for 10 or less persons.

19 **SECTION 207 — E**

20 **ELECTRIC HEATING APPLIANCE** is a device which produces heat energy to create
21 a warm environment by the application of electric power to resistance elements, refrigerant
22 compressors or dissimilar material junctions.

23 **ELECTRICAL CODE** is the ~~((National Electrical Code promulgated by the National~~
24 ~~Fire Protection Association, as adopted by this jurisdiction)). Seattle Electrical Code.~~

25 **ENERGY CODE** is the Washington State Energy Code with Seattle Supplement.

26 **EQUIPMENT** is a general term including materials, fittings, devices, appliances and
27 apparatus used as part of or in connection with installations regulated by this code.

28 **EVAPORATIVE COOLER** is a device used for reducing the sensible heat of air for
29 cooling by the process of evaporation of water into an airstream.

30 **EVAPORATIVE COOLING SYSTEM** is all of that equipment intended or installed for
31 the purpose of environmental cooling by an evaporative cooler from which the conditioned
32 air is distributed through ducts or plenums to the conditioned area.

33 **EVAPORATOR** is that part of a refrigeration system in which liquid refrigerant is
34 vaporized to produce refrigeration.

35 **SECTION 208 — F**

36 **FIRE CODE** is the ~~((Uniform Fire Code promulgated by the International Fire Code~~
37 ~~Institute, as adopted by this jurisdiction)). Seattle Fire Code.~~

38 **FIREPLACE STOVE** is a chimney-connected, solid-fuel-burning stove (appliance)
39 having part of its fire chamber open to the room.

1 **FIRE-RESISTIVE CONSTRUCTION** is construction complying with the requirements
2 of the Building Code for the time period specified.

3 **FLOOR FURNACE** is a completely self-contained furnace suspended from the floor of
4 the space being heated, taking air for combustion from outside such space and with means
5 for observing flames and lighting the appliance from such space.

6 **FLUE** is the general term for a passage through which flue gases pass from the
7 combustion chamber to the outer air.

8 **FORCED-AIR-TYPE CENTRAL FURNACE** is a central furnace equipped with a fan
9 or blower which provides the primary means for circulation of air.

10 **Downflow-type Central Furnace** is a furnace designed with airflow essentially in a
11 vertical path, discharging air at or near the bottom of the furnace.

12 **Enclosed Furnace** is a specific heating or heating and ventilating furnace incorporating an
13 integral total enclosure and using only outside air for combustion.

14 **Horizontal-type Central Furnace** is a furnace designed for low headroom installations
15 with airflow through the appliance in a horizontal path.

16 **Upflow-type Central Furnace** is a furnace designed with airflow essentially in a vertical
17 path, discharging air at or near the top of the furnace.

18 **FRACTIONATION** is a change in composition of a blend by preferential evaporation of
19 the more volatile component or condensation of the less-volatile component.

20 **FUSIBLE PLUG** is a device arranged to relieve pressure by operation of a fusible
21 member at a predetermined temperature.

22 **SECTION 209 — G**

23 **GALVANIZED STEEL** is a steel conforming to the requirements of U.M.C. Standard 2-
24 2.

25 **GENERATOR** is a device equipped with a means of heating used in an absorption system
26 to drive refrigerant out of solution.

27 **GRAVITY HEATING SYSTEM** is a heating system consisting of a gravity-type warm-
28 air furnace together with air ducts or pipes and accessory apparatus installed in connection
29 therewith.

30 **GRAVITY-TYPE WARM-AIR FURNACE** is a warm-air furnace depending primarily
31 on circulation of air through the furnace by gravity.

32 This definition also shall include any furnace approved with a booster-type fan which does
33 not materially restrict free circulation of air through the furnace when the fan is not in
34 operation.

35 **SECTION 210 — H**

36 **HAZARDOUS LOCATION** is an area or space where combustible dust, ignitable fibers
37 or flammable, volatile liquids, gases, vapors or mixtures are or may be present in the air in
38 quantities sufficient to produce explosive or ignitable mixtures.

39 **HEATING DEGREE DAY** is a unit, based on temperature difference and time, used in
40 estimating fuel consumption and specifying nominal annual heating load of a building. For
41 any one day when the mean temperature is less than 65°F. (18°C.), there exist as many
42 degree days as there are Fahrenheit degrees difference in temperature between mean
43 temperature for the day and 65°F. (18°C.).

1 **HEATING EQUIPMENT.** Includes all warm-air furnaces, warm-air heaters,
2 combustion products vents, heating air-distribution ducts and fans, all steam and hot-water
3 piping together with all control devices and accessories installed as part of, or in connection
4 with, any environmental heating system or appliance regulated by this code.

5 **HEATING SYSTEM** is a warm-air heating plant consisting of a heat exchanger enclosed
6 in a casing, from which the heated air is distributed through ducts to various rooms and
7 areas. A heating system includes the outside-air, return-air and supply-air system and all
8 accessory apparatus and equipment installed in connection therewith.

9 **HEAT PUMP** is a refrigeration system that extracts heat from one substance and transfers
10 it to another portion of the same substance or to a second substance at a higher temperature
11 for a beneficial purpose.

12 **HIGH SIDE** is the portion of a refrigeration system subjected to approximately condenser
13 pressure.

14 **HOOD** is an air-intake device connected to a mechanical exhaust system for collecting
15 vapors, fumes, smoke, dust, steam, heat or odors from, at or near the equipment, place or
16 area where generated, produced or released.

17 **SECTION 211 — I**

18 **IDLH** (immediately dangerous to life and health) is a concentration of airborne
19 contaminants, normally expressed in parts per million (ppm) or milligrams per cubic meter
20 (mg/m^3), which represents the maximum level from which one could escape within 30
21 minutes without any escape-impairing symptoms or irreversible health effects. This level is
22 established by the National Institute of Occupational Safety and Health (NIOSH).

23 **INDUSTRIAL HEATING EQUIPMENT** is an appliance, device for equipment used, or
24 intended to be used, in an industrial, manufacturing or commercial occupancy for applying
25 heat to any material being processed, but shall not include water heaters, boilers or portable
26 equipment used by artisans in pursuit of a trade.

27 **INSANITARY LOCATION** is an area, a space or a room where the air is unfit or
28 undesirable for circulation to occupied parts of a building.

29 **SECTION 212 — J**

30 **JOINT, BRAZED,** is a joint obtained by joining of metal parts with alloys which melt at
31 temperatures higher than 800°F. (427°C.) but lower than the melting temperature of the parts
32 being joined.

33 **JOINT, COMPRESSION,** is a multipiece joint with cup-shaped threaded nuts which,
34 when tightened, compress tapered sleeves so that they form a tight joint on the periphery of
35 the tubing they connect.

36 **JOINT, FLANGED,** is one made by bolting together a pair of flanged ends.

37 **JOINT, FLARED,** is a metal-to-metal compression joint in which a conical spread is
38 made on the end of a tube that is compressed by a flare nut against a mating flare.

39 **JOINT, MECHANICAL,** is a general form of gas-tight joint obtained by the joining of
40 metal parts through a positive holding mechanical construction (such as flanged joint,
41 screwed joint, flared joint).

42 **JOINT, WELDED,** is a gas-tight joint obtained by the joining of metal parts in molten
43 state.

44 **SECTION 213 — K**

1 No definitions.

2 **SECTION 214 — L**

3 **LEL** (lower explosive limit). See "LFL."

4 **LFL** (lower flammable limit or lower limit of flammability) is the minimum concentration
5 of a combustible substance that is capable of propagating a flame through homogeneous
6 mixture of the combustible and a gaseous oxidizer under the specified condition of test. The
7 LFL is sometimes referred to as LEL (lower explosive limit); for the purposes of this
8 definition, LFL and LEL are identical.

9 **LIMITED CHARGE SYSTEM** is a system in which, with the compressor idle, the
10 internal volume and total refrigerant charge are such that the design pressure will not be
11 exceeded by complete evaporation of the refrigerant charge.

12 **LINE CONTACT INSTALLATION** is where a furnace is installed so that building
13 joists, studs or framing is contacted by the furnace jacket upon the lines formed by the
14 intersection of the jacket sides with the top surface.

15 **LIQUEFIED PETROLEUM GAS** or **LPG (LP-gas)** shall mean and include a material
16 composed predominantly of any of the following hydrocarbons or mixtures of them:
17 propane, propylene, butanes (normal butane or isobutane) and butylenes.

18 When reference is made to liquefied petroleum gas in this code, it shall refer to liquefied
19 petroleum gases in either the liquid or gaseous state.

20 **LISTED** and **LISTING** are terms referring to equipment or materials included in a list
21 published by an approved testing laboratory, inspection agency or other organization
22 concerned with product evaluation that maintains periodic inspection of current productions
23 of listing equipment or materials and which listing states that the material or equipment
24 complies with approved nationally recognized codes, standards or tests and has been tested
25 or evaluated and found suitable for use in a specific manner.

26 **LOW-PRESSURE HOT-WATER-HEATING BOILER** is a boiler furnishing hot
27 water at pressures not exceeding 160 pounds per square inch (1100 kPa) and at temperatures
28 not exceeding 250°F. (121°C.).

29 **LOW-PRESSURE STEAM-HEATING BOILER** is a boiler furnishing steam at
30 pressures not exceeding 15 pounds per square inch (103 kPa).

31 **LOW SIDE** is the portion of a refrigeration system subjected to approximate evaporator
32 pressure.

33 **SECTION 215 — M**

34 **MACHINERY** is the refrigeration equipment forming a part of the refrigeration system,
35 including, but not limited to, a compressor, a condenser, a liquid receiver, an evaporator and
36 connecting piping.

37 **MANUFACTURER** is the company or organization which evidences its responsibility by
38 affixing its name, trademark or trade name to equipment or devices.

39 **MANUFACTURER'S INSTALLATION INSTRUCTIONS** are printed instructions
40 included with equipment or devices for the purpose of information regarding safe and proper
41 installation whether or not as part of the conditions of listing.

42 **SECTION 216 — N**

43 **NONCOMBUSTIBLE**, as applied to building construction material, means a material
44 which, in the form in which it is used, is either one of the following:

1 1. Material of which no part will ignite and burn when subjected to fire. Any material
2 conforming to U.B.C. Standard 2-1 shall be considered noncombustible within the meaning
3 of this section.

4 2. Material having a structural base of noncombustible material as defined in Item 1 above,
5 with a surfacing material not exceeding $\frac{1}{8}$ inch (3.2 mm) thick which has a flame-spread
6 index not higher than 50.

7 "Noncombustible" does not apply to surface finish materials. Material required to be
8 noncombustible for reduced clearances to flues, heating appliances or other sources of high
9 temperature shall refer to material conforming to Item 1. No material shall be classed as
10 noncombustible which is subject to increase in combustibility or flame-spread index beyond
11 the limits herein established, through the effects of age, moisture or other atmospheric
12 condition.

13 Flame-spread index as used herein refers to results obtained according to tests conducted
14 as specified in U.B.C. Standard 8-1.

15 SECTION 217 — O

16 **OCCUPANCY** is the purpose for which a building or part thereof is used or intended to
17 be used.

18 **OCCUPANCY CLASSIFICATION.** For the purpose of this code, certain occupancies
19 are defined as follows:

20 **Group A Occupancies:**

21 Group A Occupancies include the use of a building or structure, or a portion thereof, for
22 the gathering together of 50 or more persons for purposes such as civic, social or religious
23 functions, recreation, education or instruction, food or drink consumption, or awaiting
24 transportation. A room or space used for assembly purposes by less than 50 persons and
25 accessory to another occupancy shall be included as a part of that major occupancy.
26 Assembly occupancies shall include the following:

27 **Division 1.** A building or portion of a building having an assembly room with an occupant
28 load of 1,000 or more and a legitimate stage.

29 **Division 2.** A building or portion of a building having an assembly room with an occupant
30 load of less than 1,000 and a legitimate stage.

31 **Division 2.1** A building or portion of a building having an assembly room with an
32 occupant load of 300 or more without a legitimate stage, including such buildings used for
33 educational purposes and not classed as a Group B or E Occupancy.

34 **Division 3.** A building or portion of a building having an assembly room with an occupant
35 load of less than 300 without a legitimate stage, including such buildings used for
36 educational purposes and not classed as a Group B or E Occupancy.

37 **Division 4.** Stadiums, reviewing stands and amusement park structures not included within
38 other Group A Occupancies. Specific and general requirements for grandstands, bleachers
39 and reviewing stands are to be found in Chapter 10 of the Building Code.

40 **EXCEPTION:** Amusement buildings or portions thereof which are without walls or a
41 roof and constructed to prevent the accumulation of smoke in assembly areas.

42 **Group B Occupancies:**

43 Group B Occupancies shall include buildings, structures, or portions thereof, for office,
44 professional or service-type transactions, which are not classified as Group H Occupancies.

1 Such occupancies include occupancies for the storage of records and accounts, and eating
2 and drinking establishments with an occupant load of less than 50.

3 **Group E Occupancies:**

4 **Division 1.** Any building used for educational purposes through the 12th grade by 50 or
5 more persons for more than 12 hours per week or four hours in any one day.

6 **Division 2.** Any building used for educational purposes through the 12th grade by less
7 than 50 persons for more than 12 hours per week or four hours in any one day.

8 **Division 3.** (~~Any building or portion thereof used for day care purposes for more than six~~
9 ~~persons~~). Day care centers, preschools, and day treatment centers.

10 **EXCEPTION:** Family child day-care homes shall be considered Group R, Division 3
11 occupancies.

12 **Group F Occupancies:**

13 Group F Occupancies shall include the use of a building or structure, or a portion thereof,
14 for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or
15 processing operations that are not classified as Group H Occupancies.

16 **Division 1.** Moderate-hazard factory and industrial occupancies shall include factory and
17 industrial uses which are not classified as Group F, Division 2 Occupancies.

18 **Division 2.** Low-hazard factory and industrial occupancies shall include facilities
19 producing noncombustible or nonexplosive materials which, during finishing, packing or
20 processing, do not involve a significant fire hazard.

21 **Group H Occupancies:**

22 Group H Occupancies shall include buildings or structures, or portions thereof, that
23 involve the manufacturing, processing, generation or storage of materials that constitute a
24 high fire, explosion or health hazard. For definitions, identification and control of hazardous
25 materials and pesticides, and the display of nonflammable solid and nonflammable or
26 noncombustible liquid hazardous materials in Group B, F, M or S Occupancies, see the Fire
27 Code.

28 **Division 1.** Occupancies with a quantity of material in the building in excess of those
29 listed in Table 3-D of the Building Code, which present a high explosion hazard.

30 **Division 2.** Occupancies where combustible dust is manufactured, used or generated in
31 such a manner that concentrations and conditions create a fire or explosion potential;
32 occupancies with a quantity of material in the building in excess of those listed in Table 3-D
33 of the Building Code, which present a moderate explosion hazard or a hazard from
34 accelerated burning.

35 **Division 3.** Occupancies where flammable solids, other than combustible dust, are
36 manufactured, used or generated.

37 **Division 4.** Repair garages and body shops not classified as Group S, Division 3
38 Occupancies.

39 **Division 5.** Aircraft repair hangars and heliports not classified as Group S, Division 5
40 Occupancies.

41 **Division 6.** Semiconductor fabrication facilities and comparable research and development
42 areas in which hazardous production materials (HPM) are used and the aggregate quantity of
43 materials are in excess of those listed in Table 3-D or 3-E of the Building Code.

1 **Division 7.** Occupancies having quantities of materials in excess of those listed in Table
2 3-E of the Building Code that are health hazards.

3 **Group I Occupancies:**

4 **Division 1.1** Nurseries for the full-time care of children under the age of six (each
5 accommodating more than five children).

6 Hospitals, (~~sanitariums~~) psychiatric hospitals, nursing homes with nonambulatory or
7 mobile nonambulatory patients and similar buildings (~~each accommodating more than five~~
8 ~~patients~~)).

9 **Division 1.2.** Health-care centers for ambulatory patients receiving outpatient medical care
10 which may render the patient incapable of unassisted self-preservation (each tenant space
11 accommodating more than five such patients).

12 **Division 2.** Nursing homes for ambulatory patients, (~~homes for children six years of age~~
13 ~~or over (each accommodating more than five patients or children)~~)).

14 **Division 3.**(~~Mental~~) Psychiatric hospitals, mental sanitariums, jails, prisons,
15 reformatories and buildings where personal liberties of inmates or patients are similarly
16 restrained.

17 **Group M Occupancies:**

18 Group M Occupancies shall include buildings, structures, or a portions thereof, used for
19 the display and sale of merchandise, and involving stocks of goods, wares or merchandise,
20 incidental to such purposes and accessible to the public.

21 **Group R Occupancies:**

22 **Division 1.** Hotels and apartment houses.

23 Congregate residences (each accommodating more than 10 persons).

24 **Division 2.** Not used.

25 **Division 3.** (~~Dwellings and~~) Lodging houses and detached one- and two-family
26 dwellings.

27 Family child day care homes.

28 Congregate residences (each accommodating 10 persons or less).

29 **Group S Occupancies:**

30 Group S Occupancies shall include the use of a building or structure, or a portion thereof,
31 for storage not classified as a hazardous occupancy.

32 **Division 1.** Moderate hazard storage occupancies shall include buildings or portions of
33 buildings used for storage of combustible materials that are not classified as a Group S,
34 Division 2 or as a Group H Occupancy.

35 **Division 2.** Low-hazard storage occupancies shall include buildings, structures, or
36 portions thereof, used for storage of noncombustible materials such as products on wood
37 pallets or in paper cartons with or without single-thickness divisions, or in paper wrappings
38 and shall include ice plants, power plants and pumping plants.

39 **Division 3.** Division 3 Occupancies shall include repair garages where work is limited to
40 exchange of parts and maintenance requiring no open flame or welding, motor vehicle fuel-

1 dispensing stations, and parking garages not classed as Group S, Division 4 open parking
2 garages or Group U private garages.

3 **Division 4.** Open parking garages; boat moorage.

4 **Division 5.** Aircraft hangars where work is limited to exchange of parts and maintenance
5 requiring no open flame or welding and helistops.

6 **Group U Occupancies:**

7 **Division 1.** Private garages, carports, sheds and agricultural buildings.

8 **Division 2.** Fences over 6 feet (1829 mm) high, tanks and towers.

9 **SECTION 218 — P**

10 **PEL** (Permissible Exposure Limit) is the maximum permitted eight-hour time-weighted
11 average concentration of an airborne contaminant. The maximum permitted time-weighted
12 average exposures to be utilized are those published in 29 C.F.R. 1910.1000.

13 **PIPING** is the pipe or tube mains for interconnecting the various parts of a system. Piping
14 includes pipe, tube, flanges, bolting, gaskets, valves, fittings, the pressure-containing parts
15 of other components such as expansion joints, strainers and devices which serve such
16 purposes as mixing, separating, snubbing, distributing, metering or controlling flow, pipe-
17 supporting fixtures and structural attachments.

18 **PLENUM** is an air compartment or chamber, including uninhabited crawl spaces, areas
19 above a ceiling or below a floor, including air spaces below raised floors of computer/data
20 processing centers, or attic spaces, to which one or more ducts are connected and which
21 forms part of either the supply-air, return-air or exhaust-air system, other than the occupied
22 space being conditioned.

23 **PLUMBING CODE** is the Seattle Plumbing Code as adopted by this jurisdiction.

24 **PORTABLE COOLING UNIT** is a self-contained refrigerating system, not over three
25 horsepower rating, which has been factory assembled and tested, installed without supply-
26 air ducts and without connecting any refrigerant-containing parts. This definition shall not
27 include an absorption unit.

28 **PORTABLE EVAPORATIVE COOLER** is an evaporative cooler which discharges the
29 conditioned air directly into the conditioned area without the use of ducts and can be readily
30 transported from place to place without dismantling any portion thereof.

31 **PORTABLE HEATING APPLIANCE** is a heating appliance designed for
32 environmental heating which may have a self-contained fuel supply and is not secured or
33 attached to a building by any means other than by a factory-installed power-supply cord.

34 **PORTABLE VENTILATING EQUIPMENT** is ventilating equipment that can be
35 readily transported from place to place without dismantling a portion thereof and which is
36 not connected to a duct.

37 **POSITIVE DISPLACEMENT COMPRESSOR** is a compressor in which increase in
38 pressure is attained by changing the internal volume of the compression chamber.

39 **POWER BOILER PLANT** is one or more power steam boilers or power hot-water
40 boilers and connecting piping and vessels within the same premises.

41 **PRESSURE, DESIGN**, is the maximum working pressure for which a specific part of a
42 refrigeration system is designed.

43 **PRESSURE, FIELD TEST**, is a test performed in the field to prove system tightness.

1 **PRESSURE-IMPOSING ELEMENT** is a device or portion of the equipment used for
2 the purpose of increasing the pressure of the refrigerant vapor.

3 **PRESSURE-LIMITING DEVICE** is a pressure-responsive mechanism designed to
4 automatically stop the operation of the pressure-imposing element at a predetermined
5 pressure.

6 **PRESSURE-RELIEF DEVICE** is a pressure-actuated valve or rupture member or
7 fusible plug designed to automatically relieve excessive pressure.

8 **PRESSURE VESSEL-REFRIGERANT** is a refrigerant-containing receptacle which is
9 a portion of a refrigeration system, but shall not include evaporators, headers or piping of
10 certain limited size and capacity.

11 **PRESSURE TEST** is the minimum gage pressure to which a specific system component
12 is subjected under test condition.

13 **SECTION 219 — Q**

14 No definitions.

15 **SECTION 220 — R**

16 **RADIANT HEATER** is a heater designed to transfer heat primarily by direct radiation.

17 **RECEIVER, LIQUID**, is a vessel permanently connected to a refrigeration system by
18 inlet and outlet pipes for storage of liquid refrigerant.

19 **REFRIGERATED ROOM or SPACE** is a room or space in which an evaporator or
20 brine coil is located for the purpose of reducing or controlling the temperature within the
21 room or space to below 68°F. (20°C.).

22 **REFRIGERATION CAPACITY RATING** expressed as one horsepower, one ton or
23 12,000 Btu/h (3.52 kW) shall all mean the same quantity.

24 **REFRIGERATION MACHINERY ROOM** is a space that is designed to safely house
25 compressors and pressure vessels.

26 **REFRIGERATION SYSTEM, ABSORPTION**, is a heat-operated, closed refrigeration
27 cycle in which a secondary fluid, the absorbent, absorbs a primary fluid, the refrigerant, that
28 has been vaporized in the evaporator.

29 **REFRIGERATION SYSTEM, DIRECT** is one in which the refrigerant evaporator is in
30 direct contact with the material or space to be refrigerated or is located in air-circulating
31 passages communicating with such spaces. (See Figure 2-1.)

32 **REFRIGERATION SYSTEM, DOUBLE DIRECT** is one in which an evaporative
33 refrigerant is used in a secondary circuit to condense or cool a refrigerant in a primary
34 circuit. For the purpose of this code, each system enclosing a separate body of an
35 evaporative refrigerant shall be considered as a separate direct system. (See Figure 2-2)

36 **REFRIGERATION SYSTEM, INDIRECT** is one in which a fluid cooled by a
37 refrigerating system is circulated to the material or space to be refrigerated or is used to cool
38 air so circulated. (See Figure 2-3). Indirect systems which are distinguished by the type or
39 method of application are as given in the following paragraphs:

40 **Indirect Open-Spray System** is one in which a brine cooled by an evaporator located in
41 an enclosure external to a cooling chamber is circulated to such cooling chamber and is
42 sprayed therein.

1 **Indirect Closed-Surface System** is one in which a brine cooled by an evaporator located
2 in an enclosure external to a cooling chamber is circulated to and through such a cooling
3 chamber in pipes or other closed circuits.

4 **Indirect Vented Closed-Surface System** is one in which a brine cooled by an evaporator
5 located in a vented enclosure external to a cooling chamber, is circulated to and through such
6 cooling chamber in pipes or other closed circuits.

7 **Double Indirect Vented Open-Spray System** is one in which a brine cooled by an
8 evaporator located in a vented enclosure is circulated through a closed circuit to a second
9 enclosure where it cools another supply of a brine and this liquid in turn is circulated to a
10 cooling chamber and is sprayed therein.

11 **REFRIGERATION SYSTEM, MECHANICAL**, is a combination of interconnected
12 refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant
13 is circulated for the purpose of extracting heat and in which a compressor is used for
14 compressing the refrigerant vapor.

15 **REFRIGERATION SYSTEM, SELF-CONTAINED**, is a complete factory-assembled
16 and tested system that is shipped in one or more sections and has no refrigerant-containing
17 parts that are joined in the field by other than companion or block valves.

18 **RESIDENTIAL BUILDING** is a building or portion thereof designed or used for human
19 habitation.

20 **RISER HEAT PIPE** is a duct which extends at an angle of more than 45 degrees from the
21 horizontal. This definition shall not include any boot connection.

22 **ROOM HEATER** is a freestanding, nonrecessed, environmental heating appliance
23 installed in the space being heated and not connected to ducts.

24 **ROOM LARGE IN COMPARISON WITH SIZE OF EQUIPMENT** is one having a
25 volume of at least 12 times the total volume of a furnace or air-conditioning appliance and
26 at least 16 times the total volume of a boiler. Total volume of the appliance is determined
27 from exterior dimensions and includes fan compartments and burner vestibules when used.
28 When the actual ceiling height of a room is greater than 8 feet (2438 mm), the volume of the
29 room is figured on the basis of a ceiling height of 8 feet (2438 mm).

30 **RUPTURE MEMBER** is a pressure-relief device that operates by the rupture of a
31 diaphragm within the device on a rise to a predetermined pressure.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

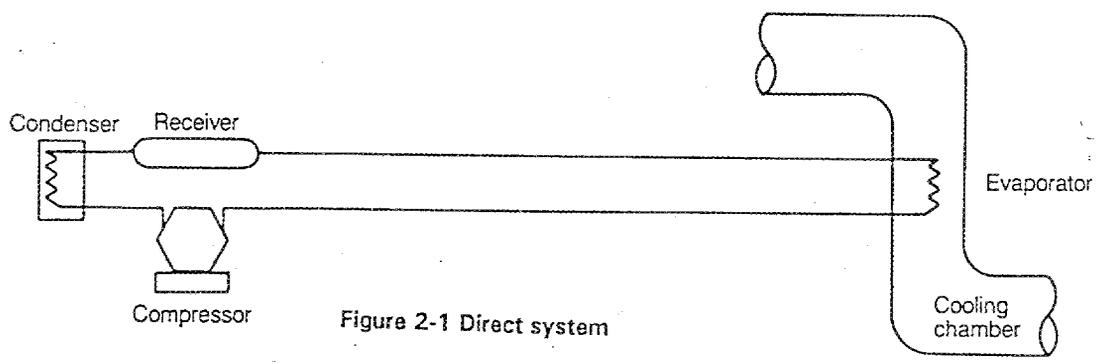


Figure 2-1 Direct system

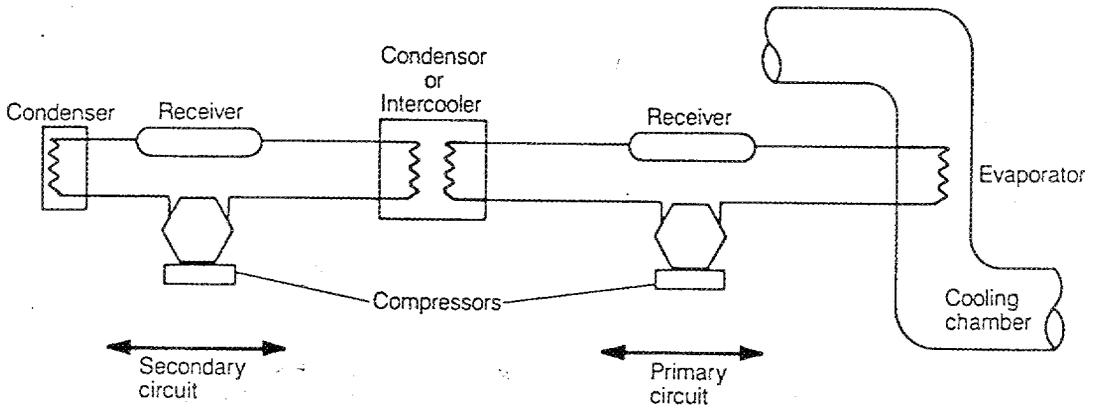


Figure 2-2 Double direct system

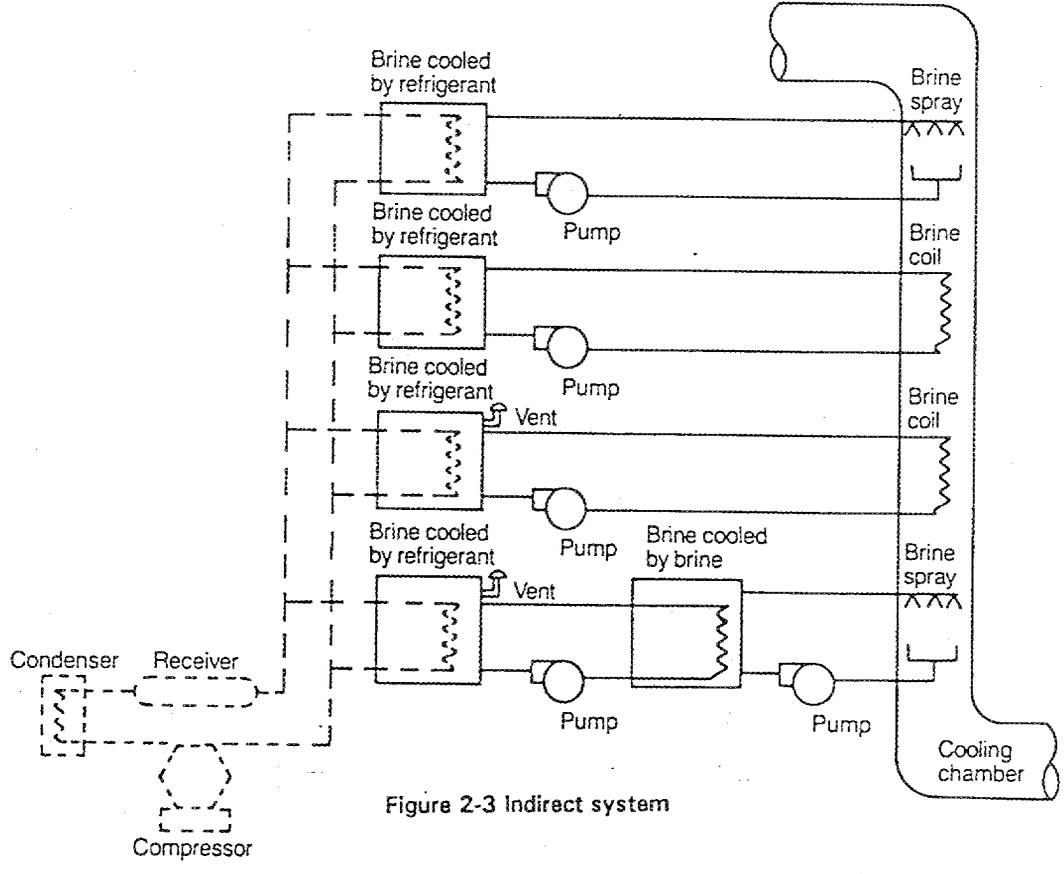


Figure 2-3 Indirect system

1
2 **SECTION 221 — S**

3 **SATURATION PRESSURE** of a refrigerant is the pressure at which there is stable
4 coexistence of the vapor and liquid or the vapor and solid phase.

5 **SEAM, WELDED.** See "joint, welded."

6 **SELF-CONTAINED** means having all essential working parts except energy and control
7 connections so contained in a case or framework that they do not depend on appliances or
8 fastenings outside of the machine.

9 **SHAFT** is an interior space enclosed by walls or construction extending through one or
10 more stories or basements which connects openings in successive floors or floors and roof,
11 to accommodate elevators, dumbwaiters, mechanical equipment or similar devices to
12 transmit light or ventilation air.

13 **SHAFT ENCLOSURE** is the walls or construction forming the boundaries of a shaft.

14 **SLEEVE** is a factory-built chimney fitting designed to protect combustible materials
15 when it is necessary to penetrate a combustible wall to connect to a chimney.

16 **SMOKE DETECTOR** is an approved device that senses visible or invisible particles of
17 combustion.

18 **SOLDERED JOINT** is a joint obtained by the joining of metal parts with metallic
19 mixtures or alloys which melt at a temperature below 800°F. (427°C.) and above 400°F.
20 (204°C.).

21 **SOLID FUEL BURNING APPLIANCE** is any factory-built appliance designed to burn
22 solid fuels.

23 **SOURCE SPECIFIC VENTILATION SYSTEM** is a mechanical ventilation system
24 including all fans, controls, and ducting, which is dedicated to exhausting contaminant-laden
25 air to the exterior of the building from the room or space in which the contaminant is
26 generated.

27 **STOP VALVE** is a device to shut off the flow of refrigerant.

28 **STRENGTH, ULTIMATE,** is the highest stress level which the component can tolerate
29 without rupture.

30 **SUBSTANTIALLY AIRTIGHT DUCTS** are welded or gasketed ducts which are
31 mechanically fastened.

32 **SYSTEM** is a combination of equipment and/or controls, accessories, interconnecting
33 means and terminal elements by which air is transferred.

34 **SECTION 222 — T**

35 **THIMBLE** is a listed fitting designed to be installed in the opening in a masonry chimney
36 through which the chimney connector passes.

37 **SECTION 223 — U**

38 **U.B.C. STANDARDS** are those standards published in Volume 3 of the *Uniform Building*
39 *Code* promulgated by the International Conference of Building Officials, as adopted by this
40 jurisdiction.

41 **UNCONDITIONED SPACE.** See "conditioned space."

1 **UNCONFINED SPACE** is a room or space having a volume equal to at least 50 cubic
2 feet per 1,000 Btu/h (4.831 L/W) of the aggregate input rating of all fuel-burning appliances
3 installed in that space. Rooms communicating directly with the space in which the
4 appliances are installed, through openings not furnished with doors, are considered a part of
5 the unconfined space.

6 **UNIT HEATER** is a heating appliance designed for nonresidential space heating and
7 equipped with an integral means for circulation of air.

8 **UNPROTECTED TUBING** is tubing which is not protected by enclosure or suitable
9 location so that it is exposed to crushing, abrasion, puncture or similar mechanical damage
10 under installed conditions.

11 **UNUSUALLY TIGHT CONSTRUCTION** is construction where:

12 1. Walls and ceilings exposed to the outside atmosphere have a continuous water vapor
13 retarder with a rating of one perm or less with any openings gasketed or sealed, and

14 2. Weatherstripping on openable windows and doors, and

15 3. Caulking or sealants are applied to areas such as joints around window and door frames,
16 between sole plates and floors, between wall-ceiling joints, between wall panels and at
17 penetrations for plumbing, electrical and gas lines and at other openings.

18 4. Any building constructed under the 1986 or 1991 Seattle Energy Code, 1986 or 1991
19 Washington State Energy Code, 1986 or 1990 Northwest Energy Code or equivalent.

20 **SECTION 224 — V**

21 **VALVE, PRESSURE RELIEF**, is a pressure-actuated valve held closed by a spring or
22 other means and designed to automatically relieve pressure in excess of its setting; also
23 called a safety valve.

24 **VALVE, STOP**, is a device in a piping system to shut off the flow of the fluid.

25 **VALVE, THREE-WAY-TYPE STOP**, is a manually operated valve with one inlet
26 which alternately can stop flow to either of two outlets.

27 **VALVES, COMPANION OR BLOCK**, are pairs of mating stop valves valving off
28 sections of refrigeration systems and arranged so that these sections may be joined before
29 opening these valves or separated after closing them.

30 **VENT** is a listed factory-made vent pipe and vent fittings for conveying flue gases to the
31 outside atmosphere.

32 **Type B Gas Vent** is a factory-made gas vent listed by a nationally recognized testing
33 agency for venting listed or approved appliances equipped to burn only gas.

34 **Type BW Gas Vent** is a factory-made gas vent listed by a nationally recognized testing
35 agency for venting listed or approved gas-fired vented wall furnaces.

36 **Type L** is a venting system consisting of listed vent piping and fittings for use with oil-
37 burning appliances listed for use with Type L or with listed gas appliances.

38 **VENT CONNECTOR, GAS**, is that portion of a gas-venting system which connects a
39 listed gas appliance to a gas vent and is installed within the space or area in which the
40 appliance is located.

41 **VENTED DECORATIVE APPLIANCE** is a vented appliance whose only function lies
42 in the esthetic effect of the flames.

1 **VENTED WALL FURNACE** is a vented environmental heating appliance designed for
2 incorporation in, or permanent attachment to, a wall, floor, ceiling or partition and arranged
3 to furnish heated air by gravity or by a fan. This definition shall not include floor furnaces,
4 unit heaters and room heaters.

5 **VENTILATING CEILING** is a suspended ceiling (~~((containing many small apertures))~~)
6 through which air, at low pressure, (~~((is forced downward))~~) moves to or from an overhead
7 ((plenum dimensioned by the)) concealed space between suspended ceiling and the floor or
8 roof above.

9 **VENTILATION** is the process of supplying and removing air by natural or mechanical
10 means to and from any space. Such air may or may not be conditioned.

11 **VENTILATION SYSTEM** is all of that equipment intended or installed for the purpose
12 of supplying air to, or removing air from, any room or space by mechanical means, other
13 than equipment which is a portion of an environmental heating, cooling, absorption or
14 evaporative cooling system.

15 **VENTING COLLAR** is the outlet opening of an appliance provided for connection of the
16 vent system.

17 **VENTING SYSTEM** is the vent or chimney and its connectors assembled to form a
18 continuous open passageway from an appliance to the outside atmosphere for the purpose of
19 removing products of combustion. This definition also shall include a venting assembly
20 which is an integral part of an appliance.

21 **VENTING SYSTEM—GRAVITY—TYPE** is a system which depends entirely on the
22 heat from the fuel being used to provide the energy required to vent an appliance.

23 **VENTING SYSTEM—POWER—TYPE** is a system which depends on a mechanical
24 device to provide a positive draft within the venting system.

25 **VOLUME, INTERNAL GROSS**, is the volume as determined from internal dimensions
26 of the container with no allowance for the volume of the internal parts.

27 **SECTION 225 — W**

28 **WALL HEATER.** See definition of "vented wall furnace."

29 **WARM-AIR FURNACE** is an environmental heating appliance designed or arranged to
30 discharge heated air through any duct or ducts.

31 This definition shall not include a unit heater.

32 **WATER HEATER** (~~((or HOT WATER HEATING BOILER))~~) is an appliance
33 designed primarily to supply potable hot water and is equipped with automatic controls
34 limiting water temperature to a maximum of 210°F. (99°C.) provided that a pressure of 160
35 psi volume of 120 gallons and a heat input of 200,000 Btu/h are not exceeded.

36 **WHOLE HOUSE VENTILATION SYSTEM** is a mechanical ventilation system,
37 including fans, controls, and ducts, which replaces, by direct or indirect means, air from the
38 habitable rooms with outdoor air.

39 **WOOD STOVE.** See "Solid fuel burning appliance".

40 **SECTION 226 — X**

41 No definitions.

1 **SECTION 227 — Y**

2 No definitions.

3 **SECTION 228 — Z**

4 **ZEOTROPE** is a blend comprising multiple components of different volatilities that,
5 when used in refrigeration cycles, change volumetric composition and saturation
6 temperatures as they evaporate or condense at constant pressure.

7 **Section 5.** The 1994 Uniform Mechanical Code is amended by adding section
8 302.3 as follows:

9 **302.3 Gas Appliances.** All gas-fired, automatically controlled water heating, space heating,
10 air conditioning and refrigeration equipment, cooking equipment, directly fired air heaters
11 and clothes dryers shall have a nationally recognized label.

12 **Section 6.** The 1994 Uniform Mechanical Code is amended by adding sections
13 304.8 and 304.9 as follows:

14 **304.8 Mechanical Equipment in Hoistways, Elevator Machine Rooms or Machinery**
15 **Spaces.** Mechanical equipment covered under this code shall not be located within
16 hoistways, elevator machine rooms or machinery spaces. See also Sections 504, 505 and
17 604.

18 **EXCEPTIONS:** 1. Heating, cooling and ventilation equipment other than steam
19 equipment, may be located in hoistways, elevator machine rooms and spaces provided
20 they are designed to serve only the hoistway, room or space.

21 2. Ducts and pipes may pass through an elevator machine room or machinery space
22 provided they are separated from the room or space by construction equal to the rated
23 construction of the room or space and so located that all required clearances are
24 maintained.

25 3. Life safety equipment serving only that space.

26 **304.9 Mechanical Equipment in Stairway Enclosures.** The following requirements apply
27 to all occupancies other than Group R, Division 3 Occupancies. No heating or ventilating
28 fans, motors or other related equipment shall be installed in any stairway enclosure.

29 **EXCEPTIONS:** 1. Unfired heaters used for heating stairway enclosures.

30 2. Life safety equipment serving only that space.

31 3. Approved equipment required by Section 403 of the Building Code.

32 **Section 7.** Section 308.1 of the 1994 Uniform Mechanical Code is amended as
33 follows:

34 **308.1 Protection from Mechanical Damage.** Appliances and ducts installed in garages,
35 warehouses or other areas where they may be subjected to mechanical damage shall be
36 suitably guarded against such damage by being installed behind protective barriers or by
37 being elevated or located out of the normal path of vehicles. Ducts shall not interfere with
38 the headroom requirements in Building Code Section 311 in normal pedestrian pathways.

1 **Section 8.** The 1994 Uniform Mechanical Code is amended by adding section
2 308.6 as follows:

3 **308.6 Return Air Ducts from Adjacent Space.** Return air ducts for conditioned space shall
4 be not less than 48 inches above the level of the garage floor.

5 **Section 9.** Section 309.1 of the 1994 Uniform Mechanical Code is amended as
6 follows:

7 **309.1 General.** Equipment regulated by this code requiring electrical connections of more
8 than 50 volts shall have a positive means of disconnect on or adjacent to and in sight from
9 the equipment served. A 120-volt receptacle shall be located within 25 feet (7620 mm) of
10 the equipment on the same building level for service and maintenance purposes. ~~((The~~
11 ~~receptacle need not be located on the same level as the equipment.))~~ Low-voltage wiring of
12 50 volts or less within a structure shall be installed in a manner to prevent physical damage.

13 **Section 10.** Section 316.3 of the 1994 Uniform Mechanical Code is amended as
14 follows:

15 **316.3 Furnace Support.** A furnace supported from the ground shall rest on a concrete slab
16 or other approved material extending not less than 3 inches (76 mm) above the adjoining
17 ground level.

18 **Section 11.** Section 317.1 of the 1994 Uniform Mechanical Code is amended as
19 follows:

20 **317.1 Source.** A warm-air furnace shall be provided with return air, outside air, or both.
21 Heating systems regulated by this code and designed to replace required ventilation shall be
22 arranged to discharge into the conditioned space not less than the amount of outside air
23 specified in the ~~((Building))~~ Mechanical Code.

24 **Section 12.** The 1994 Uniform Mechanical Code is amended by adding section
25 317.9 as follows:

26 **317.9 Exhaust Outlets.** Every exhaust system shall terminate at a point outside of the
27 building not less than 3 feet (914 mm) from any operable opening nor less than 10 feet
28 (3048 mm) from a mechanical air intake and shall be located at a point where it will not
29 cause a public nuisance or hazard.

30 **EXCEPTIONS:** 1. Air which is to be used for recirculation may be discharged to a
31 supply system.

32 2. Air which is suitable for recirculation may be discharged into a boiler room in such
33 quantity as is required to supply the needs of combustion.

34 3. Air suitable for recirculation may be discharged into normally unoccupied spaces.

1 **Section 13.** Section 318.1 of the 1994 Uniform Mechanical Code is amended as
2 follows:

3 **318.1 Supply-air Duct Size.** The minimum unobstructed total area of the supply-air ducts
4 or openings from a blower-type warm-air furnace shall not be less than 2 square inches per
5 1,000 Btu/h (4.4 mm²/W) approved output rating of the furnace, and the minimum
6 unobstructed total area of the supply-air ducts or openings from a gravity-type warm-air
7 furnace shall not be less than 7 square inches per 1,000 Btu/h (15.4 mm²/W) approved
8 output rating or as specified by the conditions of listing of the furnace. Any warm-air
9 heating unit having a bonnet or supply temperature below 140°F (60°C.) shall have ducts or
10 supply openings sized not less than 2 square inches for every 1000 Btu/h (15.4 mm²/W)
11 approved rating of the unit multiplied by a factor to be determined as follows:

12

$$\text{Factor} = \frac{70^{\circ}\text{F} (21^{\circ}\text{C})}{\text{Design bonnet temp } ^{\circ}\text{F} ({}^{\circ}\text{C}) - 70^{\circ}\text{F} (21^{\circ}\text{C})}$$

13

14

15

16

17

18 Branch ducts shall have a cross sectional area proportional to the heating load of the space
19 serviced by the duct(s).

20

21 Rigid fiberglass duct areas shall be increased by a factor of 1.15. Flexible duct areas shall be
22 increased by a factor of 1.25.

23

24 The total area of the supply-air ducts or openings need not exceed the ((~~area of the furnace~~
25 ~~outlet plenum collar~~)) minimum-sized air-supply opening or openings as indicated by the
26 conditions of listing of the furnace.

27 For the purpose of this section, a volume damper, grille or register installed to control
28 airflow shall not be considered an obstruction.

29 **Section 14.** Section 320.1 of the 1994 Uniform Mechanical Code is amended as
30 follows:

31 **320.1 Specific Requirements.** A warm-air furnace installed in the under-floor area of a
32 building shall comply with the following requirements:

33 1. Clearance from combustibles shall be as specified in Section 304.

34 2. An access opening and passageway of a height and width sufficient to permit removal of
35 the furnace, but in no case less than 30 inches by 30 inches (762 mm by 762 mm), shall be
36 provided to the working space in front of the furnace. The access opening to the passageway
37 shall be through an opening in an exterior wall of the building or through a trap door within
38 the building. The distance from the passageway access to the center line of the working
39 space in front of the furnace burner shall not exceed 20 feet (6096 mm) measured along the
40 center line of the passageway.

41 3. A furnace supported from the ground shall rest on a concrete slab or other approved
42 material extending not less than 3 inches (76 mm) above the adjoining ground level.

43 4. The lowest portion of a suspended furnace shall have a clearance of at least 6 inches
44 (152 mm) from the ground. Excavation necessary to install a furnace shall extend to a depth
45 of 6 inches (152 mm) below and 12 inches (305 mm) on all sides of the furnace except the
46 control side, which shall have 30 inches (762 mm). If the depth of the excavation for either
47 furnace or passageway exceeds 12 inches (305 mm), walls of the excavation shall be lined
48 with concrete, ~~((or))~~ masonry or other approved methods acceptable to the building official

1 extending 4 inches (102 mm) above the adjoining ground level. In floodplain areas the entire
2 crawl space grade or height shall provide 12-inch (305 mm) clearance between the bottom
3 of the furnace and the ground.

4 5. A permanent electric outlet and lighting fixture controlled by a switch located at the
5 passageway opening shall be provided at or near the furnace.

6 **Section 15.** The 1994 Uniform Mechanical Code is amended by adding section
7 328 as follows:

8 **SECTION 328 — SOLID FUEL BURNING APPLIANCES**

9 **328.1 Floor Protection.** Floor protection for listed appliances shall be installed in
10 accordance with the terms of the listing.

11 For unlisted appliances and for listed appliances where no instructions for floor protection
12 exist in the terms of the listing, floor protection shall be provided in the following manner:

13 **328.1.1 Dimensions.**

14 18 inches (457 mm) beyond the door or opening in front of the appliance.

15 12 inches (305 mm) beyond the rear.

16 12 inches (305 mm) beyond the sides.

17 **328.1.2 Methods.** Floor coverings shall be continuous (no holes or cracks) and sufficiently
18 strong not to crack, tear or puncture with normal use. Floor protections may be covered with
19 a noncombustible material for decorative appearance. Protection shall be provided, as
20 applicable, in one of the following methods:

21 If there is 6 inches (152 mm) or more clearance between the bottom of the appliance and the
22 floor, the floor shall be protected by a sheet of insulating millboard at least 1/4 inch (6 mm)
23 thick or cement insulating board at least 1/2 inch (13 mm) thick or equivalent material,
24 covered with a continuous sheet of at least 0.024-inch (No.24 gage) sheet metal.

25 Where there is less than 6 inches (152 mm) of open air space, the floor shall be protected
26 with hollow masonry units at least 4 inches (102 mm) thick arranged with the holes aligned
27 to allow free air circulation through the floor protector.

28 The hollow masonry shall be covered with at least 24 gage sheet metal. All unlisted
29 appliances shall have at least 2 inches (51 mm) of clearance between the bottom of the
30 appliance and the floor.

31 **328.2 Wall Protection.** For listed appliances, wall clearances and protection shall be as
32 specified in the terms of the listing. For unlisted appliances and for listed appliances where
33 no instructions concerning wall clearances are provided in the terms of the listing, wall
34 protection shall be as follows:

35 1. Unprotected walls. The appliance shall not be located closer than 42 inches (1067 mm)
36 horizontally to any combustible material.

37 2. Protected walls. Reduced clearances may be allowed when an approved wall shield is
38 installed. The shield shall be constructed and installed so that it extends 12 inches (305 mm)
39 horizontally beyond the sides, 18 inches (457 mm) vertically above the top and 30 inches
40 (762 mm) beyond the opening to the fire chamber for a wall perpendicular to the side
41 containing the opening when closer than 36 inches (914 mm) to the wall. (See also Tables
42 3-E-1 and 3-E-2 for wall protection required for chimney connectors.) Adhesives, fasteners

1 and facing material shall be noncombustible. One of the following methods of construction
2 shall be used:

3 2.1 A listed wall shield may be installed in accordance with the terms of the listing. This
4 will normally include an air space between the wall and the shield.

5 2.2 Listed appliances shall be installed with the clearances specified in the terms of the
6 listing. If a reduced clearance provision using a protective shield is not specified in the
7 terms of the listing, Table 3-B shall be used, starting with the listed clearance. If the listed
8 clearance is not found in Table 3-B, the next more restrictive clearance shall be used.

9 2.3 A noncombustible wall may be constructed of masonry units or metal studs provided
10 it is spaced out from the existing wall at least 1 inch (25 mm) and the framing below is
11 adequate to carry the additional weight. Wall ties must be used to hold the masonry wall in
12 place. Vertical joints shall be left open at the top and bottom for air circulation.

13 2.4 A heat shield may be constructed using the clearances and materials specified in
14 Table 3-B. A minimum air space of 1 inch (25 mm) is required regardless of the material
15 used. Final clearances are measured from the outer surface of the appliance to the original
16 wall. Openings shall be provided at the top and bottom for air circulation.

17 2.5 A heat shield may be approved by the building official when constructed of materials
18 other than those found in Table 3-B provided the material is noncombustible and equal in
19 strength, heat transmission and durability to the materials specified in Table 3-B. A
20 minimum air space of 1 inch (25 mm) is required, regardless of the material used. Openings
21 of at least 1 inch (25 mm) shall be maintained at the top and bottom and the shield shall be
22 terminated 1- 1/2 inches (38 mm) from the floor or ceiling

Section 16. Table 3-A of the 1994 Uniform Mechanical Code is amended as follows:

3-A

1994 UNIFORM MECHANICAL CODE

TABLE 3-A—STANDARD INSTALLATION CLEARANCES, IN INCHES, FOR UNLISTED HEAT-PRODUCING APPLIANCES
See Section 304.

	Fuel	APPLIANCE				
		Above Top of Casing or Appliance	From Top and Sides of Warm-air Bonnet or Plenum	From Front ¹	From Back	From Sides
RESIDENTIAL-TYPE APPLIANCES						
Boilers and water heaters	Automatic oil or comb. gas-oil	6		24	6	6
Steam boilers—15 psi (103.4 Pa)	Automatic gas	6		18	6	6
Water boilers—250°F (121°C.)	Solid	6		48	6	6
Water heaters—200°F (93°C.)	Automatic oil or comb. gas-oil	6 ²	6 ²	24	6	6
All water walled or jacketed	Automatic gas	6 ²	6 ²	18	6	6
Furnaces—central; or heaters—electric central	Solid	18 ³	18 ³	48	18	18
Warm-air furnaces	Electric	6 ²	6 ²	18	6	6
Gravity, upflow, downflow, horizontal and duct	Automatic oil or comb. gas-oil	36		12	12	12
Warm-air—250°F (121°C.) max.	Automatic gas	36		12	12	12
Furnaces—floor						
For mounting in combustible floors						
Heat exchanger		1	1	1	1	1
Steam—15 psi max. (103.4 Pa max.)	Oil or solid	36		24	12	12
Hot water—250°F (121°C.) max.	Gas	36		24	12	12
Room heaters ¹	Oil or solid	36		36	36	36
Circulating type	Gas	36		36	18	18
Room heaters ¹ (cont.)	Gas with double metal or ceramic back	36		36	12	18
Radiant or other type	(Solid)	48 ²	48 ²	54	48 ²	48 ²
Fireplace stove						
Radiators		36		6	6	6
Steam or hot water ⁶						
Ranges—cooking stoves	Oil	307			9	24
	Gas	307			6	6
						Opp. Side
						24
						18

40

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

	Above Top of Casing or Appliance ⁹	From Top and Sides of Warm-air Bonnet or Plenum x 25.4 for mm	APPLIANCE		
			From Front ¹	From Back ²	From Sides ³
Solid clay-lined firepot	307			24	18
Solid unlined firepot	307			36	18
Electric	307			6	6
Incinerators Domestic types	36 ⁸		48	36	36
COMMERCIAL INDUSTRIAL-TYPE LOW-HEAT APPLIANCES ANY AND ALL PHYSICAL SIZES EXCEPT AS NOTED					
Boilers and water heaters 100 cu. ft. (2.83 m ³) or less Any psi steam	18		48	18	18
50 psi (342 Pa) or less Any size	18		48	18	18
Unit heaters	1			1	1
Floor mounted or suspended—any size					
Suspended—100 cu. ft. (2.83 m ³) or less	6		24	18	18
Suspended—100 cu. ft. (2.83 m ³) or less	6		18	18	18
Suspended—Over 100 cu. ft. (2.83 m ³)	18		48	18	18
Floor mounted—Any size	18		48	18	18
Ranges—restaurant-type	48		48	18	18
Floor mounted	48		48	18	18
Other low-heat industrial appliances	18		48	18	18
Floor mounted or suspended	18	18	48	18	18
COMMERCIAL INDUSTRIAL-TYPE MEDIUM-HEAT APPLIANCES					
Boilers and water heaters Over 50 psi (345 Pa) Over 100 cu. ft. (2.83 m ³)	48		96	36	36
Other medium-heat industrial appliances	48		96	36	36
All sizes		36	96	36	36

(Continued)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

3-A

1994 UNIFORM MECHANICAL CODE

TABLE 3-A—STANDARD INSTALLATION CLEARANCES, IN INCHES, FOR UNLISTED HEAT-PRODUCING APPLIANCES—(Continued)
See Section 304.

	Fuel	APPLIANCE			
		Above Top of Casing or Appliance to	From Top and Sides of Warm-air Bonnet or Plenum	From Front ¹	From Back ¹⁰ From Sides ¹⁰
COMMERCIAL INDUSTRIAL-TYPE MEDIUM-HEAT APPLIANCES					
Incinerators All sizes		48		96	36 36
INDUSTRIAL-TYPE HIGH-HEAT APPLIANCES					
High-heat industrial appliances All sizes	All fuels	180		360	120 120

¹The minimum dimension shall be that necessary for servicing the appliance, including access for cleaning and normal care, tube removal, etc.

²For a listed oil, combination gas-oil, gas or electric furnace, this dimension may be 2 inches (51 mm) if the furnace limit control cannot be set higher than 250°F. (121°C.), or this dimension may be 1 inch (25 mm) if the limit control cannot be set higher than 200°F. (93°C.), or the appliance must be marked to indicate that the outlet air temperature cannot exceed 200°F. (93°C.).

³The dimension may be 6 inches (152 mm) for an automatically stoker-fired forced-warm-air furnace equipped with 250°F. (121°C.) limit control and with barometric draft control operated by draft intensity and permanently set to limit draft to a maximum intensity of 0.13-inch water gage (32 Pa).

⁴Approved appliances shall be installed on noncombustible floors and may be installed on protected combustible floors. Heating appliances approved for installation on protected combustible flooring shall be so constructed that flame and hot gases do not come in contact with the appliance base. Protection for combustible floors shall consist of 4-inch (102 mm) hollow masonry covered with sheet metal at least 0.021 inch (0.5 mm) thick (No. 24 manufacturer's standard gage). Masonry shall be permanently fastened in place in an approved manner with the ends unsealed and joints matched so as to provide free circulation of air through the masonry. Floor protection shall extend 12 inches (305 mm) at the sides and rear of the appliance, except that at least 18 inches (457 mm) shall be required on the appliance-opening side or sides measured horizontally from the edges of the opening.

⁵The 48-inch (1219 mm) clearance may be reduced to 36 inches (914 mm) when protection equivalent to that provided by Items 1 through 8 of Table 3-B is applied to the combustible construction.

⁶Steam pipes and hot-water-heating pipes shall be installed with a clearance of at least 1 inch (25 mm) to all combustible construction or material, except that at the points where pipes carrying steam at not over 15 pounds gage pressure (103 kPa) or hot water emerge from a floor, wall or ceiling, the clearance at the opening through the finish floorboards or wall-ceiling boards may be reduced to not less than 1/2 inch (13 mm). Each such opening shall be covered with a plate of noncombustible material.

Such pipes passing through stack shelving shall be covered with not less than 1 inch (25 mm) of approved insulation. Wood boxes or casings enclosing uninsulated steam or hot-water-heating pipes or wooden covers to recesses in walls in which uninsulated pipes are placed shall be lined with metal or insulating millboard.

Where the temperature of the boiler piping does not exceed 160°F. (71°C.), the provisions of this table do not apply. Coverings or insulation used on steam or hot-water pipes shall be of material suitable for the operating temperature of the system. The insulation or jackets shall be of noncombustible materials, or the insulation or jackets and lap-seal adhesives shall be tested as a composite product. Such composite product shall have a flame-spread rating of not more than 25 and a smoke-developed rating not to exceed 50 when tested in accordance with U.B.C. Standard 8-1.

⁷To combustible material or metal cabinets. If the underside of such combustible material or metal cabinet is protected with insulating millboard at least 1/4 inch (6 mm) thick covered with sheet metal of not less than 0.013 inch (0.3 mm) (No. 28 gage), the distance may be reduced to 24 inches (610 mm).

⁸Clearance above charging door must be at least 48 inches (1219 mm).

⁹If the appliance is encased in brick, the 18-inch (457 mm) clearance above and at sides and rear may be reduced to 12 inches (305 mm).

¹⁰If the appliance is encased in brick, the clearance above may be reduced to 36 inches (914 mm) and at sides and rear may be reduced to 18 inches (457 mm).

42

Section 17. The 1994 Uniform Mechanical Code is amended by adding Tables 3-E-1 and 3-E-2 as follows:

Note: This Table is entirely Seattle Amendments to the Uniform Mechanical Code and is not underlined.

Table 3-E-1
REQUIRED CLEARANCE WITH NO PROTECTION
FOR UNLISTED APPLIANCES (inches)

APPLIANCE	Above Top (Ceiling)	From Front (Wall)*	From Back (Wall)	From Sides (Wall)		Closest Point 45° Angle
Room Heater, Circulating	42	30	21	21		21
Room Heater, Radiant	42	42	42	42		36
Cook Stove	42	42	42	Firebox Side	Opposite Side	N/A
				42	24	
Chimney Connector (Stovepipe)	18" minimum or 3 times the diameter of the chimney connector (stovepipe)					

* Side with fuel-loading or ash removal door.

Table 3-E-2
REDUCED CLEARANCE WITH WALL SHIELDS*

WHERE REQUIRED CLEARANCE** WITH NO PROTECTION IS:						
	42 inches	36 inches	30 inches	24 inches	18 inches	12 inches
From Wall	21	18	15	12	9	9
From Ceiling	21	18	15	12	9	9

* Does not apply to side with fuel-loading or ash removal door or to appliances installed in closets or alcoves.

** Clearance from appliance or chimney connector (stovepipe).

UNLISTED WALL SHIELDS:

- (a) 4" of solid masonry spaced out 1" from the surface. Joints struck flush on the back surface.
- (b) 7/8" portland cement plaster on expanded metal lath and metal studs spaced out 1" from the surface
- (c) 1/4" insulating millboard spaced out 1" from the surface.
- (d) 1/4" insulating cement board spaced out 1" from the surface.
- (e) No. 28 standard gage sheet steel spaced out 1" from the surface.
- (f) A wall shield may be approved by the building official when constructed of materials other than those found in Table 3-E-2, provided the material is noncombustible and equal in strength, heat transmission and durability to the materials specified in Table 3-E-2. A minimum air space of 1 inch is required, regardless of the material used. Maintain the 1 inch openings at the top and bottom and terminate the shield 1 1/2 inches from the floor or ceiling.

1
2 **Section 18.** The 1994 Uniform Mechanical Code is amended by adding chapter 3.1 as
3 follows:

4 **Chapter 3.1**
5 **VENTILATION AND INDOOR AIR QUALITY**

6 **SECTION 3.101 — SCOPE AND GENERAL REQUIREMENTS**

7 **3.101.1 Purpose.** The purpose of this chapter is to provide minimum standards for the
8 design and installation of mechanical ventilation systems.

9 It is intended that these provisions provide flexibility to permit the use of innovative
10 approaches and techniques. These provisions are structured to permit compliance with the
11 intent of this chapter by demonstration of performance through on-site testing or through
12 engineered design. This chapter is not intended to abridge any safety or health requirements
13 required under any other applicable codes or ordinances.

14 **3.101.2 Scope.** This chapter sets forth minimum requirements for ventilation in all
15 occupancies, including the design of new construction.

16 **Section 3.102 APPLICATION TO EXISTING BUILDINGS**

17 **3.102.1 Additions to Existing Buildings.** Additions to existing buildings or structures may
18 be made without making the entire building comply, provided that the new addition shall
19 conform to the provisions of this chapter.

20 **EXCEPTION:** Additions with less than 500 square feet of conditioned floor area are
21 exempt from the requirements in this chapter for whole house ventilation systems.

22 **3.102.2 Alterations and Repairs.** All alterations and repairs may be made to existing
23 buildings or moved buildings built or permitted prior to the enforcement of this Chapter
24 without making the entire building comply with the provisions of this Chapter, provided the
25 alterations or repairs comply with this Chapter.

26 **EXCEPTION:** Air handling/conditioning equipment, which is being replaced without
27 alteration or repair of the associated air distribution system is exempt from the
28 requirements of this chapter.

29 **3.102.3 Historic Buildings.** Buildings which are designated as historical landmarks are
30 exempt from this Chapter only to the extent necessary to preserve those features essential to
31 their historical appearance or function.

32 **Section 3.103 — MINIMUM VENTILATION CRITERIA FOR ALL GROUP R**
33 **OCCUPANCIES FIVE STORIES AND LESS**

34 **3.103.1 General.** This section shall apply to all Group R occupancies five stories or less as
35 defined by the Building Code. Residential structures greater than 5 stories in height shall
36 comply with Section 3.105 for outdoor air supply requirements. For source specific
37 ventilation requirements, see Section 3.103.2.1. Compliance with this section shall be
38 demonstrated through engineering calculations or performance testing. Documentation of
39 calculations shall be submitted to the building official where required. Performance testing
40 shall be conducted in accordance with recognized test methods.

1 At the discretion of the building official, flow testing may be required to verify that the
2 mechanical system(s) satisfies the requirements of this section. Flow testing may be
3 performed using flow hoods measuring at the intake or exhaust points of the system, in-line
4 pitot tube, or pitot-transverse type measurement systems in the duct, short term tracer gas
5 measurements, or other means approved by the building official.

6 **3.103.2 Minimum Ventilation Performance.** Each dwelling unit or guest room shall be
7 equipped with source specific and whole house ventilation systems designed and installed to
8 satisfy the ventilation requirements of this chapter.

9 **EXCEPTION:** All public corridors shall meet the ventilation requirements in Section
10 1203.3 of the Building Code.

11 **3.103.2.1 Source Specific Ventilation.** Source specific exhaust ventilation shall be required
12 in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and
13 other rooms where excess water vapor or cooking odor is produced.

14 The minimum source specific ventilation effective exhaust capacity shall be not less than
15 levels specified in Table 3.1-A.

16 **3.103.2.2 Whole House Ventilation Systems.** Each dwelling unit shall be equipped with a
17 whole house ventilation system which shall be capable of providing at least 0.35 air changes
18 per hour, but not less than 15 cubic feet per minute (7 L/s) per bedroom plus an additional
19 15 cubic feet per minute (7 L/s). Whole house ventilation systems shall be designed to limit
20 ventilation to a level no greater than 0.5 air changes per hour under normal operation
21 conditions. Whole house ventilation systems shall supply outside air to all habitable rooms
22 through individual outside air inlets, forced-air heating system, ducting or equivalent means.
23 Doors and operable lites in windows are deemed not to meet the outside air supply intake
24 requirements.

25 **EXCEPTION:** For dwelling units of no more than 1400 square feet (130m²), the
26 maximum ventilation rate shall be 0.65 air changes per hour.

27 **3.103.3 Controls.** All ventilation system controls shall be readily accessible. Controls for
28 whole house ventilation systems shall be capable of operating the ventilation system without
29 energizing other energy-consuming appliances.

30 **EXCEPTION:** Continuously operated whole house ventilation systems switches shall
31 not be readily accessible by the occupant.

32 **3.103.3.1 Source Specific Ventilation Systems.** Source specific ventilation systems shall be
33 controlled by manual switches, dehumidistats, timers or other approved means.

34 **3.103.3.2 Intermittently Operated Whole House Ventilation Systems.** The intermittently
35 operated whole house ventilation systems shall be constructed to have the capability for
36 continuous operation, and shall have a manual control and an automatic control, such as a
37 clock timer. At the time of final inspection, the automatic control timer shall be set to
38 operate the whole house fan for a minimum of eight hours a day.

39 **3.103.4 Noise.** Whole house fans located four feet (1219 mm) or less from the interior grille
40 shall have a sone rating of 1.5 or less measured at 0.1 inches water gage. Remotely mounted
41 fans shall be acoustically isolated from the structural elements of the building and from
42 attached duct work using insulated flexible duct or other approved material.

43 **EXCEPTION:** Whole house ventilation systems which are integrated with forced-air
44 heating systems or heat-recovery ventilation systems are exempt from the sone rating
45 requirements of this section.

1 **3.103.5 Ventilation Ducts.** All ducts shall terminate outside the building. Exhaust ducts in
2 systems which are designed to operate intermittently shall be equipped with back-draft
3 dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.
4 All supply ducts in the conditioned space shall be insulated to meet minimum of R-4. For
5 all other ducts, see the Seattle Energy Code, Table 5-11.

6 **3.103.6 Outside Air.** A mechanical system shall supply outside air as required in Section
7 3.103.2. The mechanical system may consist of exhaust fans, supply fans, or both.

8 **3.103.6.1 Outside Air Inlets.** Inlets shall be screened or otherwise protected from entry by
9 insects, leaves, or other material. Outside air inlets shall be located so as not to take air from
10 the following areas:

- 11 1. Closer than 10 feet (3048 mm) from an appliance vent outlet, unless such vent outlet is 3
12 feet (914 mm) above the outside air inlet.
- 13 2. Where it will pick up objectionable odors, fumes or flammable vapors.
- 14 3. A hazardous or unsanitary location.
- 15 4. A room or space having any fuel-burning appliances therein.
- 16 5. Closer than 10 feet (3048 mm) from a vent opening of a plumbing drainage system unless
17 the vent opening is at least 3 feet (914 mm) above the air inlet.
- 18 6. Attics, crawl spaces or garages.

19 Individual room outside air inlets shall:

- 20 1. Have controllable and secure openings;
- 21 2. Be sleeved or otherwise designed so as not to compromise the thermal properties of the
22 wall or window in which they are placed;
- 23 3. Provide not less than 4 square inches (2581 mm²) of net free area of opening for each
24 habitable space. Any inlet or combination of inlets which provide 10 cfm (5 L/s) at 10
25 Pascals as determined by the Home Ventilating Institute Air Flow Test Standard is deemed
26 equivalent to 4 square inches (2581 mm²) net free area.

27 **3.103.6.2 Ventilation Integrated with Forced-Air Systems.** The outside air connection to
28 the return air stream shall be located upstream of the forced-air system blower and shall not
29 be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger.

30 **3.103.6.3 Distribution.** Outside air shall be distributed to each habitable room by
31 individual inlets, separate duct systems, or a forced-air system. Where outside air supplies
32 are separated from exhaust points by doors, provisions shall be made to ensure air flow by
33 installation of distribution ducts, undercutting doors, installation of grilles, transoms, or
34 similar means where permitted by the Building Code. Doors shall be undercut to a minimum
35 of one-half inch above the surface of the finish floor covering.

36 **SECTION 3.104 — MECHANICAL VENTILATION CRITERIA AND MINIMUM**
37 **VENTILATION PRESCRIPTIVE REQUIREMENTS FOR ALL GROUP R**
38 **OCCUPANCIES FIVE STORIES AND LESS**

39 **3.104.1 General.** This section establishes minimum prescriptive design requirements for
40 intermittently operated systems. Continuously operated systems shall comply with Section

1 3.103. System characteristics not addressed in the following sections shall comply with
2 Section 3.103. A system which meets the requirements of this section shall be deemed to
3 satisfy the requirements of this chapter.

4 **3.104.2 Source Specific.** Exhaust fans providing source specific ventilation shall have
5 minimum fan flow rating not less than 50 cfm (24 L/s) at 0.25 inches water gage for
6 bathrooms, laundries or similar rooms and 100 cfm (47 L/s) at 0.25 inches water gage for
7 kitchens. Manufacturers' fan flow ratings shall be determined as per HVI Standard No. 916
8 (July 1989) or AMCA Standard No. 210.

9 **EXCEPTION:** Where a range hood or down draft exhaust fan is used to satisfy the
10 source specific ventilation requirements for kitchens, the range hood or down draft
11 exhaust shall not be less than 100 cfm (47 L/s) at 0.10 inches water gage.

12 **3.104.3 Whole House.** Whole house ventilation systems may consist of whole house
13 exhaust, integration with forced-air systems or dedicated heat recovery ventilation systems.
14 Whole house ventilation systems shall provide ventilation capacity as specified in Table 3.1-
15 B and meet the following requirements:

16 Exhaust fans providing whole house ventilation shall have a flow rating at 0.25 inches water
17 gage as specified in Table 3.1-B. Manufacturers' fan flow ratings shall be determined as per
18 HVI Standard No. 916 (July 1989) or AMCA Standard No. 210. Table 3.1-B shall not be
19 used for dwelling units with more than five bedrooms.

20 Integrated forced-air ventilation systems shall have an outside air inlet duct connecting a
21 terminal element on the outside of the building to the return air plenum of the forced-air
22 system, at a point within 4 feet (1218mm) upstream of the air handler, and be equipped with
23 one of the following:

24 1. A motorized damper connected to the automatic ventilation control as specified in
25 Section 3.103.3; or

26 2. A damper installed and set to meet measured flow rates as specified in Table 3.1-B, by
27 either field testing or following manufacturers' installation instructions based on site
28 conditions; or

29 3. An automatic flow regulated device with field measured or field calculated minimum
30 negative pressure differential of 0.07 inches water gage at the point where the outside air
31 duct is connected to the return air plenum.

32 All duct work in heat recovery ventilation systems shall be not less than 6 inch (152 mm)
33 diameter. Balancing dampers shall be installed on the inlet and exhaust side. Flow
34 measurement grids shall be installed on the supply and return. System minimum flow rating
35 shall be not less than that specified in Table 3.1-B. Maximum flow rates in Table 3.1-B do
36 not apply to heat recovery ventilation systems.

37 **3.104.4 Source Specific and Whole House Exhaust Ducts.** Exhaust ducts shall meet all
38 requirements of Section 3.103.5. Duct diameter, length and number of elbows for exhaust
39 fans shall be as specified in Table 3.1-C. Terminal elements for exhaust fan duct systems
40 shall have at least the equivalent net free area of the duct work. Duct diameter, length, and
41 number of elbows for integrated forced air systems shall be as specified in Table 3.1-D.
42 Terminal elements for integrated systems shall be the same size as the connecting ductwork
43 or 8 inches (203 mm) in diameter, whichever is greater.

1 Negative Pressure Test, Section 12.3, of ULC S627-M1984 "Space Heaters for Use with
2 Solid Fuels," modified as follows:

3 1. Negative pressure of 8 Pascal shall be initially established with the chamber sealed and
4 the air supply, if not directly connected to the appliance, closed off.

5 2. The air supply, if not directly connected to the appliance, shall then be opened.

6 3. The maximum allowable air exchange rate from chamber leakage and intentional air
7 supply for the unit (appliance with combustion air supply) in the test chamber is 3.5 air
8 changes per hour, or 28 cfm (13.2 L/s), whichever is less.

9 **EXCEPTION:** Combustion air may be supplied to the room in which the solid fuel
10 burning appliance is located in lieu of direct ducting, provided that one of the following
11 conditions is met:

12 i) The solid fuel burning appliance is part of a central heating plant and installed in an
13 unconditioned space in conformance with the Mechanical Code; or

14 ii) The solid fuel burning appliance is installed in existing construction directly on a
15 concrete floor or surrounded by masonry materials as in a fireplace.

16 The combustion air terminus shall be located as close to the solid fuel burning appliance as
17 possible and shall be provided with a barometric damper or equivalent. The combustion air
18 source shall be specified by the manufacturer or no less than 4 inches (102 mm) in diameter
19 or the equivalent in area or as approved.

20 **3.106.2 Fireplaces.** Fireplaces shall be provided with each of the following:

21 1. Tightly fitting flue dampers, operated by a readily accessible manual or approved
22 automatic control.

23 **EXCEPTION:** Fireplaces with gas logs shall be installed in accordance with the
24 Mechanical Code Section 901.

25 2. An outside source for combustion air ducted into the firebox. The duct shall be at least
26 six square inches (3871 mm²), and shall be provided with an operable outside air duct
27 damper.

28 3. Site built fireplaces shall have tight fitting glass or metal doors, or flue draft induction fan
29 or as approved for minimizing back-drafting. Factory built fireplaces shall use doors listed
30 for the installed appliance.

31 **3.106.3 Masonry Heaters.** Masonry heaters shall be approved by the Department of
32 Ecology and shall contain both of the following:

33 1. Primary combustion air ducted from the outside of the structure to the appliance.

34 2. Tight fitting ceramic glass or metal doors. Flue dampers, when provided, shall have
35 an external control and when in the closed position shall have a net free area of not
36 less than five percent of the flue cross sectional area.

37

Table 3.1A

Minimum Source Specific Ventilation Capacity Requirements

	Bathrooms	Kitchens
Intermittently operating	50 cfm	100 cfm
Continuous operation	20 cfm	25 cfm

Table 3.1B

Whole House Ventilation Flow Requirements¹

Bedrooms	CFM	
	Minimum	Maximum
2 or less	50	75
3	80	120
4	100	150
5	120	180

1. This table shall not be used for dwelling units containing more than 5 bedrooms.

Table 3.1C

Prescriptive Exhaust Duct Sizing

Fan Tested CFM @0.25 W.G.	Minimum Flex Diameter	Maximum Length Feet	Minimum Smooth Diameter	Maximum Length Feet	Maximum Elbows ¹
50	4 inch	25	4 inch	70	3
50	5 inch	90	5 inch	100	3
50	6 inch	No Limit	6 inch	No Limit	3
80	4 inch ²	NA	4 inch	20	3
80	5 inch	15	5 inch	100	3
80	6 inch	90	6 inch	No Limit	3
100	5 inch ²	NA	5 inch	50	3
100	6 inch	45	6 inch	No Limit	3
125	6 inch	15	6 inch	No Limit	3
125	7 inch	70	7 inch	No Limit	3

1. For each additional elbow subtract 10 feet from length.
2. Flex ducts of this diameter are not permitted with fans of this size.

Table 3.1D

Prescriptive Integrated Forced Air Supply Duct Sizing

Number of Bedrooms	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter	Maximum Length ¹	Maximum Number of Elbows ²
2 or less	6"	7"	20'	3
3	7"	8"	20'	3
4 or more	8"	9"	20'	3

1. For lengths over 20 feet increase duct diameter 1 inch.
2. For elbows numbering more than 3 increase duct diameter 1 inch.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Table 3.1E
Outside Air Requirements for Ventilation¹
Occupancies not Subject to Sections 3.1.2 and 3.1.3

Application	Estimated Maximum ² Occupancy P/1000 ft ² or 100 m ²	Outdoor Air Requirements cfm/person
Dry Cleaners, Laundries³		
Commercial laundry	10	25
Commercial dry cleaner	30	30
Storage, pick up	30	35
Coin-operated laundries	20	15
Coin-operated dry cleaner	20	15
Dwelling Units In Buildings Greater Than Four Stories or Attached to I-Occupancy Facilities		
Bedrooms & living areas ²⁴		15
Food and Beverage Service		
Dinning rooms	70	20
Cafeteria, fast food	100	20
Bars, cocktail lounges ⁴	100	30
Kitchens(cooking) ²³	20	15
Garages, Repair, Service Stations		
Enclosed parking garage ⁵		1.50 cfm/ft.sq.
Auto repair rooms		1.50 cfm/ft.sq.
Hotels, Motels, Resorts, Congregate Residences with More Than Four Stories⁶		
Bedrooms		30 cfm/room
Living Rooms		30 cfm/room
Bath ⁷		35 cfm/room
Lobbies	30	15
Conference rooms	50	20
Assembly rooms	120	15
Gambling casinos ⁴	120	30
Offices		
Office space ⁸	7	20
Reception area	60	15
Telecommunication centers and data entry areas	60	20
Conference rooms	50	20
Public Spaces		
Corridors and utilities		0.05 cfm/ft.sq.
Public restroom, cfm/wc or urinal ¹⁰		50
Lockers and dressing rooms		0.50 cfm/ft.sq.
Smoking lounge ¹¹	70	60
Elevators ¹²		1.0 cfm/ft.sq.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Table 3.1E(continued)
Outside Air Requirements for Ventilation¹
Occupancies not Subject to Sections 3.1.2 and 3.1.3

Application	Estimated Maximum ² Occupancy P/1000 ft ² or 100 m ²	Outdoor Air Requirements cfm/person
Retail Stores, Sales Floors, and Show Room Floors		
Basement and street	30	0.30 cfm/ft.sq.
Upper floors	20	0.20 cfm/ft.sq.
Storage rooms	15	0.15 cfm/ft.sq.
Dressing rooms		0.20 cfm/ft.sq.
Malls and arcades	20	0.20 cfm/ft.sq.
Shipping and receiving	10	0.15 cfm/ft.sq.
Smoking lounge ¹¹	70	60
Warehouses	5	0.05 cfm/ft.sq.
Specialty Shops		
Barber	25	15
Beauty	25	25
Reducing salons	20	15
Florists ¹³	8	15
Clothiers, furniture		0.30 cfm/ft.sq.
Hardware, drugs, fabric	8	15
Supermarkets	8	15
Pet shops		1.00 cfm/ft.sq.
Sports and Amusement¹⁴		
Spectator areas	150	15
Game rooms	70	25
Ice arenas(playing areas)		0.50 cfm/ft.sq.
Swimming Pools(pool and deck area) ¹⁵		0.50 cfm/ft.sq.
Playing floor(gymnasium)	30	20
Ballrooms and discos	100	25
Bowling alleys(seating areas)	70	25
Theaters¹⁶		
Ticket booths	60	20
Lobbies	150	20
Auditorium	150	20
Stages, studios	70	15
Transportation¹⁷		
Waiting rooms	100	15
Platforms	100	15
Vehicles	150	15
Workrooms		
Meat processing ¹⁸	10	15
Photo studios	10	15
Darkrooms	10	0.50 cfm/ft.sq.
Pharmacy	20	15
Bank vaults	5	15
Duplicating, printing ¹⁹		0.50 cfm/ft.sq.

Table 3.1E(continued)
Outside Air Requirements for Ventilation¹
Occupancies not Subject to Sections 3.1.2 and 3.1.3

Application	Estimated Maximum ² Occupancy P/1000 ft ² or 100 m ²	Outdoor Air Requirements cfm/person
INSTITUTIONAL FACILITIES		
Education		
Classroom	50	15
Laboratories ²⁰	30	20
Training shop	30	20
Music rooms	50	15
Libraries	20	15
Locker rooms		0.50 cfm/ft.sq.
Corridors		0.10 cfm/ft.sq.
Auditoriums	150	15
Smoking lounges ¹¹	70	60
Hospitals, Nursing and Convalescent Homes		
Patient rooms ²¹	10	25
Medical procedure	20	15
Operating rooms	20	30
Recovery and ICU	20	15
Autopsy rooms ²²		0.50 cfm/ft.sq.
Physical Therapy	20	15
Correctional Facilities		
Cells	20	20
Dining halls	100	15
Guard station	40	15

Table 3.1E(continued)
Outside Air Requirements for Ventilation¹
Occupancies not Subject to Sections 3.1.2 and 3.1.3

1. Derived from ASHRAE Standard 62-1989.
2. Net occupiable space.
3. Dry-cleaning process may require more air.
4. Supplementary smoke-removal equipment may be required.
5. Distribution among people must consider worker location and concentration of running engine; stands where engines are run must incorporate systems for positive engine exhaust withdrawal. Contaminant sensors may be used to control ventilation.
6. Independent of room size.
7. Installed capacity for intermittent use.
8. See also food and beverage service, merchandising, barber and beauty shops, garages.
9. Some office equipment may require local exhaust.
10. Mechanical exhaust with no recirculation is recommended.
11. Normally supplied by transfer air, local mechanical exhaust; with no recirculation recommended.
12. Normally supplied by transfer air.
13. Ventilation to optimize plant growth may dictate requirements.
14. When internal combustion engines are operated for maintenance of playing surfaces, increased ventilation rates may be required.
15. Higher values may be required for humidity control.
16. Special ventilation will be needed to eliminate special stage effects.
17. Ventilation within vehicles may require special considerations.
18. Spaces maintained at low temperatures (-10°F. to +50°F.) are not covered by these requirements unless the occupancy is continuous. Ventilation from adjoining spaces is permissible. When the occupancy is intermittent, infiltration will normally exceed the ventilation requirements.
19. Installed equipment must incorporate positive exhaust and control of undesirable contaminants.
20. Special contamination control systems may be required for processes or functions including laboratory animal occupancy.
21. Special requirements or codes and pressure relationships may determine minimum ventilation rates and filter efficiency. Procedures generating contaminants may require higher rates.
22. Air shall not be recirculated into other spaces.
23. Makeup air for hood exhaust may require more ventilating air.
24. Occupant loading shall be based on the number of bedrooms as follows: first bedroom, two persons; each additional bedroom, one person. Where higher occupant loadings are known, they shall be used.

1 **Section 19.** Section 401.1 of the 1994 Uniform Mechanical Code is amended as
2 follows:

3 **401.1 General.** Ventilation air supply requirements for occupancies are contained in Chapter
4 ~~((12 of the Building Code and alternate provisions are provided in Appendix Chapter 3,~~
5 ~~Division III of the Building Code))~~ 3.1 of this code.

6 **Section 20.** Section 402.3 of the 1994 Uniform Mechanical Code is amended as
7 follows:

8 **402.3 Makeup Air for Small Hobby Kilns.** Provisions shall be made for air to enter the
9 room in which a kiln is installed at a rate at least equal to the air being removed through the
10 kiln hood or provide an opening equal to twice the area of hood exhaust duct.

11 **Section 21.** Section 402.4 of the 1994 Uniform Mechanical Code is amended as
12 follows:

13 **402.4 Makeup Air for Commercial Kitchen Hoods.** ~~((Each commercial kitchen space~~
14 ~~provided with an exhaust system shall have air supplied to the room equal to the amount of~~
15 ~~air to be exhausted.))~~ A separate makeup air system shall be provided for the kitchen which
16 supplies not less than 90 percent of the air to be exhausted. Makeup diffusers shall be
17 located to prevent a short-circuiting of air furnished to the exhaust system. The makeup air
18 system shall be capable of heating the air supplied to the space to a minimum of
19 65°F.(18°C), if the amount of makeup air exceeds 2500 cfm (1180L/s) per space. Exterior
20 ~~((W))~~windows and doors shall not be used for the purpose of providing makeup air. The
21 exhaust and makeup-air systems shall be connected by an electric cross-interlocking switch.
22 Compensating hoods shall meet the airflow requirements specified in Section 508.7 ~~((2~~
23 ~~through 508.7.4.))~~ Compensating hoods shall extract at least 20 percent of their required
24 exhaust airflow from the kitchen area.

25 **Section 22.** Section 501 of the 1994 Uniform Mechanical Code is amended as
26 follows:

27 **SECTION 501 — SCOPE OF PART I**

28 Part I of this chapter applies to environmental air-ventilation systems that are not a part of a
29 heating or cooling system and to product-conveying duct systems. For commercial hood
30 and kitchen ventilation systems, see Part II of this chapter. For ventilation (outdoor air
31 quantities) see Chapter 3.1.

1 **Section 23.** Section 502 of the 1994 Uniform Mechanical Code is amended as
2 follows:

3 **SECTION 502 — DEFINITIONS**

4 For the purposes of Part I, the following definitions apply:

5 **ENVIRONMENTAL AIR DUCT** is ducting used for conveying air at temperatures not
6 exceeding 250°F. (121°C.) to or from occupied areas of any occupancy through other than
7 heating or air-conditioning systems, such as ventilation for human usage, domestic kitchen
8 range exhaust, bathroom or restroom exhaust ((~~ducts~~)), parking garage exhaust, elevator and
9 electrical room exhaust and domestic-type clothes dryer exhaust ((~~ducts~~)).

10 **FLAMMABLE VAPOR OR FUMES** is the concentration of flammable constituents in
11 air that exceeds 10 percent of its lower flammability limit (LFL).

12 **PRODUCT-CONVEYING DUCT** is ducting used for conveying solid particulates, such
13 as refuse, dust, fumes and smoke; liquid particulate matter, such as spray residue, mists and
14 fogs; vapors, such as vapors from flammable or corrosive liquids; noxious and toxic gases;
15 and air at temperatures exceeding 250°F. (121°C.). These include, but are not limited to
16 combustion engine, industrial vacuum system, chemical booth, paint booth, paint enclosure
17 or photo-lab exhaust.

18 **Section 24.** Section 504 of the 1994 Uniform Mechanical Code is amended as
19 follows:

20 **Section 504 — ENVIRONMENTAL AIR DUCTS SYSTEMS**

21 **504.1 Makeup and Exhaust Air ((~~Ducts~~)) Systems.** Environmental air ((~~ducts~~)) systems
22 not regulated by other provisions of this code shall comply with this section. Ducts shall be
23 substantially airtight and shall comply with the provisions of Chapter 6. Exhaust ((~~ducts~~))
24 systems shall terminate outside the building and shall be equipped with backdraft or
25 motorized dampers.

26 **EXCEPTION:** Exhaust from environmental air systems may be discharged into an
27 open parking garage as defined in Section 311.9 of the Seattle Building Code.

28 Environmental air ducts which have an alternate function as a part of an approved smoke-
29 control system do not require design as Class ((~~I~~)) 1 product-conveying ducts.

30 **504.2 Domestic Range Vents.** Ducts used for domestic kitchen range ventilation shall be of
31 metal and shall have smooth interior surfaces.

32 **EXCEPTION:** Ducts for domestic kitchen downdraft grill-range ventilation installed
33 under a concrete slab floor may be of approved Schedule 40 PVC provided:

- 34 1. The under-floor trench in which the duct is installed shall be completely backfilled
35 with sand or gravel.
- 36 2. Not more than 1 inch (25 mm) of 6-inch-diameter (152 mm) PVC coupling may
37 protrude above the concrete floor surface.
- 38 3. PVC pipe joints shall be solvent cemented to provided an air- and grease-tight duct.
- 39 4. The duct shall terminate above grade outside the building and shall be equipped with
40 a backdraft damper.

1 **504.3 Domestic Dryer Vent.** Domestic clothes dryer moisture exhaust ducts shall be of
2 metal and shall have smooth interior surfaces.

3 **EXCEPTION:** An approved flexible duct connectors not more than 6 feet in length
4 may be used in connection with domestic dryer exhausts. Flexible duct connectors shall
5 not be concealed within construction.

6 **504.3.1 Moisture exhaust ducts.** Moisture exhaust ducts for domestic clothes dryers shall
7 terminate on the outside of the building and shall be equipped with a back-draft damper.
8 Screens shall not be installed at the duct termination. Ducts for exhausting clothes dryers
9 shall not be connected or installed with sheet metal screws or other fasteners which will
10 obstruct the flow. Clothes-dryer moisture-exhaust ducts shall not be connected to a gas
11 vent connector, gas vent or chimney. Clothes-dryer moisture exhaust ducts shall not
12 extend into or through ducts or plenums.

13 **504.3.2 Length limitation.** Unless otherwise permitted or required by the dryer
14 manufacturer's installation instructions and approved by the building official, domestic
15 dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical
16 length of 14 feet (4267 mm), including two 90-degree elbows. Two feet (610 mm) shall be
17 deducted for each 90-degree elbow in excess of two.

18 **504.4 Commercial Dryer Exhaust Systems.** Commercial dryer moisture exhaust ducts
19 shall be installed in accordance with their listing.

20 **504.5 Gypsum Wallboard Ducts.** Bathroom and laundry room exhaust ducts may be of
21 gypsum wallboard subject to the limitations of Section 601.1.3.
22

23 **Section 25.** Section 505.1 of the 1994 Uniform Mechanical Code is amended as
24 follows:

25 **505.1 General.** A mechanical ventilation or exhaust system shall be installed to control,
26 capture and remove emissions generated from product use or handling when required by the
27 Building Code or Fire Code and when such emissions result in a hazard to life or property.
28 The design of the system shall be such that the emissions are confined to the area in which
29 they are generated by air currents, hoods or enclosures and shall be exhausted by a duct
30 system to a safe location or treated by removing contaminants. Ducts conveying explosives
31 or flammable vapors, fumes or dusts shall extend directly to the exterior of the building
32 without entering other spaces or be enclosed in a shaft from the point of penetration to
33 outside. The fire-rating of the shaft shall be equal to the rating of the structure it penetrates,
34 but not less than one hour fire resistive construction. Exhaust ducts shall not extend into or
35 through ducts and plenums.

36 **EXCEPTION:** Ducts conveying vapor or fumes having flammable constituents less
37 than 25 percent of their lower flammability limit may pass through other spaces.

38 **Section 26.** Section 507.2 of the 1994 Uniform Mechanical Code is amended as
39 follows:

40 **507.2 Definitions.** For the purpose of Part II, the following definitions shall apply:

41 **COMMERCIAL FOOD HEAT-PROCESSING EQUIPMENT** is equipment used in a
42 food establishment for heat-processing food or utensils and which produces grease vapors,

1 steam, fumes, smoke or odors which are required to be removed through a local exhaust
2 ventilation system.

3 **COMPENSATING HOOD** is a hood that has an outside air supply with air delivered
4 below or within the hood. When makeup air is diffused directly into the exhaust within the
5 hood cavity, it becomes a short-circuit hood.

6 **GREASE FILTER** is a device used to capture by entrapment, impingement, adhesion or
7 similar means, grease and similar contaminants before they enter a duct system.

8 **HOOD** is an air-intake device connected to a mechanical exhaust system for collecting
9 and removing grease, vapors, fumes, smoke, steam, heat or odors from commercial food
10 heat-processing equipment.

11 **Type I Hood** is a kitchen hood for collecting and removing grease and smoke generated
12 from equipment such as deep fryers, charbroilers, grills and roasting ovens.

13 **Type II Hood** is a general kitchen hood for collecting and removing steam, vapor, heat or
14 odors generated from equipment such as steamers, pastry ovens, pizza ovens and coffee
15 roaster ovens and roasting ovens of maximum 6kw (20,500 BTU) capacity.

16 **Section 27.** Section 507.6 of the 1994 Uniform Mechanical Code is amended as
17 follows:

18 **507.6 Duct Enclosure.** A grease duct serving a Type I hood which penetrates a fire rated or
19 nonrated ceiling, wall or floor shall be enclosed in a duct enclosure from the point of
20 penetration. A duct serving a Type II hood which penetrates a fire-rated ceiling, floor or wall
21 shall be enclosed in a duct enclosure from the point of penetration to the outside air. A duct
22 may only penetrate exterior walls at locations where unprotected openings are permitted by
23 Table 5-A of the Building Code. Duct enclosures shall be constructed as the Building Code
24 requires shaft enclosures to be constructed. Duct enclosures shall be of at least one-hour
25 fire-resistive construction in all buildings and shall be of two-hour fire-resistive
26 construction in Types I and II fire-resistive buildings. The duct enclosure shall be sealed
27 around the duct at the point of penetration and vented to the exterior through weather-
28 protected openings. The enclosure shall be separated from the duct by at least 3 inches and
29 not more than 12 inches (at least 76 mm and not more than 305 mm) and shall serve a single
30 grease exhaust duct system.

31 **Section 28.** Section 507.11 of the 1994 Uniform Mechanical Code is amended as
32 follows:

33 **507.11 Exhaust Outlets.** Exhaust outlets for grease ducts serving Type I hoods
34 ((commercial food heat processing equipment)) shall extend through the roof unless
35 otherwise approved by the building official. Such extension shall be at least 2 feet (610 mm)
36 above the roof surface, at least 10 feet (3048 mm) from parts of the same or ((contiguous))
37 neighboring buildings, adjacent private property line or air intake opening into any
38 building, and shall be located at least 10 feet (3048 mm) above the adjoining grade level.
39 Exhaust outlets for ducts serving Type II hoods over commercial food heat-processing
40 equipment shall terminate at least 10 feet (3048 mm) from adjacent private property line or
41 air intake opening into any building, and shall be located at least 10 feet (3048 mm) above
42 the adjoining grade level.

43 **EXCEPTIONS:** 1. Exhaust outlets for grease ducts serving commercial food heat-
44 processing equipment may terminate not less than 5 feet (1524 mm) from an adjacent

1 building, adjacent property line or air intake opening into a building if the air from the
2 exhaust outlet is discharged away from such locations.

3 2. Upon approval of the building official, the exhaust from any hood serving
4 commercial food heat-processing equipment may terminate in a properly engineered
5 air-recovery system for recirculation to the room in which the hood is located.

6 **Section 29.** Section 508.1 of the 1994 Uniform Mechanical Code is amended as
7 follows:

8 **508.1 Where Hoods Are Required.** Hoods shall be installed at or above all commercial-
9 type deep fat fryers, broilers, fry grills, steam-jacketed kettles, hot-top ranges, ovens,
10 barbecues, rotisseries, dishwashing machines above 140° F (60° C.) maximum water
11 temperature and similar equipment which produce comparable amounts of steam, smoke,
12 grease or heat in a food-processing establishment. For the purpose of this section a food-
13 processing establishment shall include any building or portion thereof used for the
14 processing of food but shall not include a dwelling unit.

15 **EXCEPTION:** Residential type equipment installed in offices, churches, nursing
16 homes, congregate residences, boarding homes and similar occupancies with a capacity
17 of not more than 50 persons and with kitchens and dining rooms designed to serve not
18 more than 150 meals per day.

19 **Section 30.** Section 508.7 of the 1994 Uniform Mechanical Code is amended as
20 follows:

21 **508.7 Capacity of Hoods.** 1. ~~Type I~~ canopy-type (~~commercial cooking~~) hoods shall
22 exhaust through the hood a minimum quantity of air determined by application of the
23 following formulas:

24 **WHERE:**

25 A = the horizontal surface area of the hood, in square feet (m^2).

26 D = distance in feet (m) between the lower lip of the hood and the cooking surface.

27 P = that part of the perimeter of the hood that is open, in feet (m).

28 Q = quantity of air, in cubic feet per minute (m^3/s).

29
30 **NUMBER OF EXPOSED SIDES**

FORMULA

31 4 (island or central hood)

$Q = 150 A$

32 3 or less

$Q = 100 A$

33 Alternate formula

$Q = 50PD$

34 ~~((When cooking equipment is installed back to back and is covered by a common island-~~
35 ~~type hood, the airflow required may be calculated using the formula for three sides exposed.~~
36 ~~When all appliances are electric, the airflow required may be reduced to 80 percent of the~~
37 ~~formula value. Type II hood airflow requirements shall be in accordance with the~~
38 ~~requirements for low temperature appliance hoods.))~~

39 **508.7.1 Solid fuel.** Type I hoods for use over solid-fuel cooking equipment shall be
40 provided with separate exhaust systems. ~~((Undefined cooking equipment other than solid-~~
41 ~~fuel cooking equipment may be installed under a common hood. The minimum airflow for~~
42 ~~solid fuel cooking equipment, grease burning charboilers, and undefined equipment shall~~
43 ~~be:~~

Number of Exposed Sides **Formula**

	For	SI:
4 (island or central hood)	$Q = 300A$ $Q = 0.46$	A
3 or less	$Q = 200A$ $Q = 0.31$	A
Alternate formula	$Q = 100PD$ $Q = 0.16 PD$	

508.7.2 Type II Hoods. For Type II hoods the minimum quantity of air flow shall be 50 percent of that required for a Type I hood.

~~(508.7.2 High temperature.~~ Type I hoods when the cooking equipment includes high temperature appliances such as deep fat fryers:

Number of Exposed Sides **Formula**

	For	SI:
4 (island or central hood)	$Q = 150A$ $Q = 0.23$	A
3 or less	$Q = 100A$ $Q = 0.16$	A
Alternate formula	$Q = 100PD$ $Q = 0.16 PD$	

~~508.7.3 Medium temperature.~~ Type I hoods when the cooking equipment includes medium temperature appliances such as rotisseries, grills and ranges:

Number of Exposed Sides **Formula**

	For	SI:
4 (island or central hood)	$Q = 100A$ $Q = 0.16$	A
3 or less	$Q = 75A$ $Q = 0.12$	A
Alternate formula	$Q = 50PD$ $Q = 0.08 PD$	

~~508.7.4 Low temperature.~~ Type I hoods where the cooking equipment includes low temperature appliances such as medium to low temperature ranges, roasters, roasting ovens, pastry ovens and equipment approved for use under a Type II hood, such as pizza ovens:

Number of Exposed Sides **Formula**

	For	SI:
4 (island or central hood)	$Q = 75A$ $Q = 0.12$	A
3 or less	$Q = 50A$ $Q = 0.08$	A
Alternate formula	$Q = 50PD$ $Q = 0.08 PD$	

EXCEPTION: Listed exhaust hoods are to be installed in accordance with the terms of their listing and the manufacturer's installation instructions.))

Section 31. Section 509.1 of the 1994 Uniform Mechanical Code is amended as follows:

509.1 General. Motors and fans shall be of sufficient capacity to provide the required air movement as specified in this chapter. Exhaust fans shall continue to run in event of fire, except for carbon dioxide fire extinguishing systems. Electrical equipment shall be approved for the class of use as provided in the Electrical Code. Motors and fans shall be accessible for servicing or maintenance. Motors shall not be installed within ducts or under hoods.

Section 32. Section 601.1 of the 1994 Uniform Mechanical Code is amended as follows:

601.1 Material. Supply air, return air and outside air for heating, cooling or evaporative cooling systems shall be conducted through duct systems constructed of metal as set forth in

1 Tables 6-A, 6-B and 6-C; metal ducts complying with U.M.C. Standard 6-2 with prior
2 approval; or factory-made air ducts complying with U.M.C. Standard 6-1. Ducts, plenums
3 and fittings may be constructed of asbestos cement, concrete, clay, ((Ø)) ceramics or other
4 approved non-metallic materials when installed in the ground or in a concrete slab, provided
5 the joints are tightly sealed.

6 **601.1.1 Use of corridor as plenum.** Corridors shall not be used to convey air to or from
7 rooms if the corridor is required to be of fire-resistive construction by Section 1005 of the
8 Building Code.

9 **EXCEPTIONS:** 1. Where such air is part of an engineered smoke control system.

10 2 Air may be supplied to corridors serving residential occupancies without specific
11 mechanical exhaust, provided:

12 2.1 The supply air is 100% outside air, and

13 2.2 The units served by the corridor have ventilation conforming to the Building Code
14 independent of the air supplied to the corridor, and

15 2.3 The duct penetration at the corridor walls shall be protected by approved fire and
16 smoke dampers.

17 3. For other than highrise buildings, the supply fan will automatically shut off upon
18 activation of corridor smoke detectors which shall be spaced at no more than 30 feet on
19 center along the corridor, or

20 4. For highrise buildings corridor smoke detector activation will close required
21 smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

22 **601.1.2 Use of concealed space as plenums.** Concealed building spaces or independent
23 construction within buildings may be used as ducts or plenums.

24 **601.1.3 Gypsum products exposed in ducts.** When gypsum products are exposed in
25 ducts or plenums, the air temperature shall be restricted to a range from 50°F. to 125°F.
26 (10°C. to 50°C.) and moisture content shall be controlled so that the material is not
27 adversely affected. For the purpose of this section, gypsum products shall not be exposed
28 in ducts serving as supply from evaporative coolers, and in other air-handling systems
29 regulated by this chapter when the temperature of the gypsum product will be below the
30 dew point temperature as determined by the design engineer.

31 See Chapter 8 for limitations on combustion products venting systems extending into or
32 through ducts or plenums.

33 See Chapter 5 for limitations on environmental air systems exhaust ducts extending into
34 or through ducts or plenums.

35 **Section 33.** Section 601.3 of the 1994 Uniform Mechanical Code is amended as
36 follows:

37 **601.3 Combustibles within Ducts or Plenums.** Materials exposed within ducts or plenums
38 shall have a flame-spread index of not more than 25 and a smoke-developed rating of not
39 more than 50 when tested in accordance with the test for Surface Burning Characteristics of
40 Building Materials, U.B.C. Standard 8-1.

41 **EXCEPTIONS:** 1. Return-air and outside-air ducts, plenums or concealed spaces
42 which serve a dwelling unit may be of combustible construction.

43 2. Air filters meeting the requirements of Section 403.

44 3. Water evaporation media in an evaporative cooler.

45 4. Charcoal filters when protected with an approved fire-suppression system.

46 5. Electrical wiring in plenums shall comply with the Electrical Code. ~~((Flame~~
47 ~~propagation and smoke production characteristics of exposed electric cables installed in~~
48 ~~concealed space used as air plenums shall:~~

1 5.1 Exhibit a flame travel of 5 feet or less, and

2 ~~5.2 Produce smoke having an average optical density not greater than 0.15 and~~
3 ~~having a peak optical density of 0.5 or less when tested in accordance with U.M.C.~~
4 ~~Standard 6-3.~~

5 ~~5.3 Wiring meeting these requirements shall be listed and labeled as plenum cable as~~
6 ~~required by the Electrical Code.~~

7 ~~6. Nonmetallic fire sprinkler piping in plenums shall be listed and shall meet the~~
8 ~~following requirements:~~

9 ~~6.1 Exhibit flame travel of 5 feet (1524 mm) or less, and~~

10 ~~6.2 Produce smoke having an average optical density not greater than 0.15 and~~
11 ~~having a peak optical density of 0.5 or less when tested in accordance with U.M.C.~~
12 ~~Standard 6-3.))~~

13 6. Plastic piping for sprinkler, HVAC or plumbing in ceiling plenums used for return
14 air.

15 **Section 34.** Section 601.7 of the 1994 Uniform Mechanical Code is amended as
16 follows:

17 **601.7 Tinned Steel.** Existing tinned steel ducts may be used when cooling coils are added to
18 a heating system, provided the first 10 feet (3048 mm) of the duct or plenum measured from
19 the cooling coil discharge are constructed of metal of the gage thickness set forth in Table
20 6-A, 6-B or 6-C of this chapter or are of approved material and construction. Tinned ducts
21 completely enclosed in inaccessible concealed areas need not be replaced. All accessible
22 ducts shall be insulated to comply with ~~((Table 6-D of this chapter))~~ Sections 503.9 and
23 1414.2 of the Energy Code. For the purpose of this subsection, ducts shall be considered
24 accessible if the access space is 30 inches (762 mm) or greater in height.

25 **Section 35.** Section 603 of the 1994 Uniform Mechanical Code is amended as
26 follows:

27 SECTION 603 - INSTALLATION OF DUCTS

28 **603.1 Metal Ducts.** Ducts shall be securely fastened in place at each change of direction and
29 as set forth in Table 6-E. Vertical rectangular ducts and vertical round ducts shall be
30 supported as set forth in Table 6-E, Part I. Riser ducts shall be held in place by means of
31 metal straps or angles and channels to secure the riser to the structure.

32 Metal ducts shall be installed with at least 4 inches (102 mm) separation from earth. Metal
33 ducts when installed in or under concrete slab shall be encased in at least 2 inches (51 mm)
34 of concrete.

35 **603.1.1 Fire-resistive coatings.** Ducts shall be located so as to maintain the minimum
36 required thickness of fire-resistive materials applied to structural members to provide the
37 required fire-resistive rating.

38 **603.1.2 Rectangular duct supports.** Supports for rectangular ducts as set forth in Table
39 6-E when suspended from above shall be installed on two opposite sides of each duct and
40 shall be riveted, bolted or metal screwed to each side of the duct at not more than the
41 intervals specified.

42 **603.1.3 Horizontal round duct supports.** Horizontal round ducts 40 inches (1016 mm) or
43 less in diameter when suspended from above shall be supported at intervals not more than

1 as set forth in Table 6-E with one hanger installed to comply with the requirements listed
2 below:

3 1. Ducts shall be equipped with tight-fitting circular bands extending around the entire
4 perimeter of the duct at each specified support interval.

5 2. Circular bands shall not be less than 1 inch (25 mm) wide nor less than equivalent to the
6 gage of the duct material it supports.

7 **EXCEPTION:** Ducts 10 inches (254 mm) and less in diameter may be supported by
8 No. 18 gage (10 mm) galvanized steel wire.

9 3. Each circular band shall be provided with a suitable means of connecting to the
10 suspending support.

11 ~~((4. Ducts shall be braced and guyed to prevent lateral or horizontal swing.))~~

12 **603.2 Factory-made Air Ducts.** Approved Class 0 or Class 1 factory-made air ducts may
13 be installed in any occupancy covered by this code. Approved Class 2 air ducts may be
14 installed only in dwellings or apartment houses where the duct system serves not more than
15 one dwelling unit. See Appendix A, Standard 6-2.

16 **603.2.1 Used as risers.** Factory-made air ducts shall not be used for vertical risers in air-
17 duct systems serving more than two stories. Such ducts shall not penetrate construction
18 where fire dampers are required.

19 **603.2.2 Protection.** Factory-made air ducts shall be installed with at least 4 inches (102
20 mm) of separation from earth, except when installed as a liner inside of concrete, tile or
21 metal pipe; they shall be protected from physical damage.

22 **603.2.3 Class 2 air ducts.** Class 2 air ducts shall be installed with at least 3 feet (914 mm)
23 of separation from ~~((a))~~ the heating ((exchanger)) equipment.

24 **603.2.4 Temperature.** The temperature of the air to be conveyed in any of these classes of
25 ducts shall be less than 251°F. (122°C.).

26 **603.3 Protection of Ducts.** Ducts installed in locations where they are exposed to
27 mechanical damage by vehicles or from other causes shall be protected by approved barriers.
28 See also Section 308.1.

29 **603.4 Support of Ducts.** Installers shall furnish the manufacturer's field fabrication and
30 installation instructions to building officials.

31 In the absence of specific supporting materials and spacing, approved factory-made air
32 ducts may be installed as set forth in Table 6-F.

33 **603.5 Seismic Bracing of Ducts.** Longitudinal and transverse bracing shall be required for
34 all round ducts 28 inches (711 mm) in diameter and larger, for rectangular ducts 6 square
35 feet (.56 m²) and larger and on all duct systems used for life safety and smoke control
36 installed in either the horizontal or vertical position.

37 **603.5.1 Transverse Bracing.** Transverse bracing shall occur at maximum intervals of 30
38 feet (9144 mm), at each duct turn and at the end of a duct run.

39 **603.5.2 Longitudinal Bracing.** Longitudinal bracing shall occur at maximum intervals of
40 60 feet (18288 mm). Transverse bracing for one duct section may also act as a longitudinal
41 bracing for a duct section connected perpendicular to it, if bracing is installed within four
42 feet (1219 mm) of the intersection and sized and installed on the larger duct.

1 603.5.3 Grouping of Ducts. Groups of ducts may be combined in a larger size frame
2 using overall dimensions and maximum weight of ducts. At least 2 sides of each duct must
3 be connected to the angles of the brace.

4 603.5.4 Walls as Ducts. Walls, including non-bearing fixed partitions, which have ducts
5 running through them may replace a transverse brace.

6 603.5.5 Seismic Loads. Bracing for ducts shall be designed to resist seismic loading, using
7 accepted engineering practices and Chapter 16 of the Building Code.

8 EXCEPTION: No bracing is required if the duct is suspended by hangers 12 inches
9 (305 mm) or less in length as measured from the top of the duct to the bottom of the
10 support where the hanger is attached. Hangers must be positively attached to the duct
11 within 2 inches (51 mm) of the top of the duct with a minimum of two #10 sheet metal
12 screws.

13 603.6 Installation of Ducts in Hoistways, Elevator Machine Rooms and Elevator
14 Machinery Spaces. Ducts or pipes shall not be located in hoistways, elevator machine
15 rooms and elevator machinery spaces. Steam and hot water pipes are not permitted to be
16 installed in hoistways, elevator machine rooms and elevator machinery spaces.

17 EXCEPTIONS: 1. Ducts used only in the operation or service of the elevator.

18 2. Ducts used to heat or cool a hoistway may be located in the hoistway. Ducts used to
19 heat or cool an elevator machine room or machinery space may be located in that room
20 or space.

21 **Section 36.** Section 604.1 of the 1994 Uniform Mechanical Code is amended as
22 follows:

23 **604.1 Amount of Insulation.** Supply- and return-air ducts and plenums of a heating or
24 cooling system shall be insulated with not less than the amount of insulation set forth in
25 (~~Table 6 D, except for ducts and plenums used exclusively for evaporative cooling~~
26 systems)) Sections 503.9 and 1414.2 of the Energy Code.

27 **Section 37.** Section 609.10 of the 1994 Uniform Mechanical Code is amended as
28 follows:

29 **609.10 Exhaust Outlets.** Outlets for exhausts that exceed 600°F. (315°C.) shall be in
30 accordance with Table 8-D.

31 The termination point for exhaust ducts discharging to the atmosphere shall not be less
32 than the following:

33 1. Duct(s) outlets conveying explosive or flammable vapors, fumes or dusts: 30 feet
34 (9144 mm) from property line; 10 feet (3048 mm) from operable openings into the building;
35 6 feet (1829 mm) from exterior walls or roofs; 30 feet (9144 mm) from combustible walls or
36 operable openings into the building which are in the direction of the exhaust discharge; 10
37 feet (3048 mm) above adjoining grade and 10 feet (3048 mm) from mechanical air intake.
38 This includes carpentry shop exhaust, industrial chemical lab, paint shop and sandblasting
39 exhaust systems.

40 2. Other product-conveying outlets: 10 feet (3048 mm) from property line; 3 feet (914
41 mm) from exterior wall or roof; 10 feet (3048 mm) from operable openings into the
42 building; 10 feet (3048 mm) above adjoining grade and 10 feet (3048mm) from mechanical
43 air intake. This includes central vacuum system, dry cleaner, photo lab, school chemical lab
44 and combustion engine exhaust.

1 3. Environmental air duct exhaust outlets: 3 feet (914 mm) from property line; 3 feet (914
2 mm) from operable openings into the building for all occupancies other than Group U, and
3 10 feet (3048 mm) from a mechanical air intake. This includes environment air ducts
4 regulated by Section 504, except for parking garage exhaust outlets.

5 4. Parking garage exhaust outlets: 10 feet (3048 mm) from a property line; 10 feet (3048
6 mm) from operable openings into a building and 10 feet (3048 mm) from mechanical air
7 intake. Exhaust outlets which extend to the roof shall extend 3 feet (914 mm) above the
8 roof.

9 (For the purpose of this section, property line shall include any property line separating
10 one lot from another lot but shall not include any property line separating a lot from a public
11 street or alley right-of-way.)

12 **Section 38.** Table 6-D of the 1994 Uniform Mechanical Code is hereby deleted.

13 **Section 39.** Section 701 of the 1994 Uniform Mechanical Code is amended as
14 follows:

15 **Section 701 — GENERAL**

16 **701.1 Air Supply.** Fuel-burning equipment shall be assured a sufficient supply of
17 combustion air. The methods of providing combustion air in this chapter do not apply to
18 direct-vent appliances, appliances listed as having separated combustion systems, enclosed
19 furnaces, listed cooking appliances, refrigerators and domestic clothes dryers. Fireplaces and
20 solid fuel-burning appliances shall comply with Chapter 3.1 and Section 328 of this code.

21 **701.2 Unusually Tight Construction.** In buildings of unusually tight construction,
22 combustion air shall be obtained from outside.

23 **701.3 Ordinary Construction.** In existing buildings of ordinary tightness insofar as
24 infiltration is concerned, all or a portion of the combustion air for fuel-burning appliances
25 may be obtained from infiltration when the ~~((requirement for))~~ 50 cubic feet per 1,000 Btu/h
26 (4.831 L/W) input is met. (See Section 703.4.1)

27 **701.4 Existing Buildings.** When fuel-burning appliances are installed in an existing
28 building containing other fuel-burning ~~((appliances))~~ equipment, the room or space shall be
29 provided with sufficient combustion air ~~((as required by this chapter for all fuel burning~~
30 ~~appliances contained therein.))~~

31 **Section 40.** Section 702.1 of the 1994 Uniform Mechanical Code is amended as
32 follows:

33 **702.1 Location.** One opening shall be located within the upper 12 inches (304 mm) of the
34 enclosure and one opening shall be located within the lower 12 inches (304 mm) of the
35 enclosure.

36 **EXCEPTION:** Where existing equipment is being replaced with other equipment of
37 equal or smaller size and the room is not being remodeled, one opening location may be
38 provided.

1 **Section 41.** Section 703.2 of the 1994 Uniform Mechanical Code is amended as
2 follows:

3 **703.2 Under-floor Supply.** Lower combustion air openings may connect with under-floor
4 areas conforming to the following requirements:

- 5 1. Under-floor spaces having unobstructed openings to the exterior at least twice the area
6 of the required equipment combustion air openings.
- 7 2. The height of the under-floor space shall comply with the requirements of the Building
8 Code and be without obstruction to the free flow of air.

9 **Section 42.** Section 802.4 of the 1994 Uniform Mechanical Code is
10 amended as follows:

11 **802.4 Solid Fuel.** Solid-fuel-burning appliances shall not be connected to a venting system
12 which serves gas- or oil-burning appliances. For solid fuel burning appliances see Chapter
13 3.1.

14 **Section 43.** Section 804.1 of the 1994 Uniform Mechanical Code is amended as
15 follows:

16 **804.1 Penetrations into Air Ducts and Plenums.** A combustion products venting
17 system(~~(, vent connector, chimney or chimney connector)~~) shall not extend into or through
18 an air duct or plenum.

19 **EXCEPTION:** A combustion products venting system may pass through a combustion
20 air duct.

21 **Section 44.** Section 804.2 of the 1994 Uniform Mechanical Code is amended as
22 follows:

23 **804.2 Enclosure and Support.** Portions of venting systems which extend through occupied
24 spaces shall be enclosed or protected to avoid personal contact with ~~((or))~~ damage to the
25 installation or contact with combustible material.

26 The base of a vent which extends to the ground shall rest on a solid masonry or concrete
27 base at least 2 inches (51 mm) in thickness. The base of a vent which does not extend to the
28 ground and is not self-supporting shall rest on a firm metal or masonry support.

29 Venting systems shall be adequately supported for the weight and the design of the
30 material used.

31 **Section 45.** Section 812.1 of the 1994 Uniform Mechanical Code is amended as
32 follows:

33 **812.1 Factory-built Chimneys.** Factory-built chimneys shall be installed in accordance
34 with the terms of their listing, the manufacturer's installation instructions and the applicable

1 requirements of this code. Factory-built chimneys shall terminate as required for unlisted
2 single-wall metal chimneys in Table 8-D.

3 ~~((Chimneys used with fireplaces or heating appliances in which solid or liquid fuel is used
4 shall be maintained with a spark arrester as required for incinerators.~~

5 ~~**EXCEPTION:** Chimneys which are located more than 200 feet (61 m) from any
6 mountainous, brush covered or forest covered land or land covered with flammable
7 material and are not attached to a structure having less than a Class C roof covering, as
8 set forth in the Building Code.))~~

9 **Section 46.** Section 814.1 of the 1994 Uniform Mechanical Code is amended as
10 follows:

11 **814.1 Prohibited Use.**

12 **814.1.1 Limitations.** Unlisted single-wall metal chimneys (smokestacks) shall not be
13 installed within a dwelling unit of a Group R Occupancy.

14 **814.1.2 Location.** Metal chimneys shall not be carried up inside ventilating ducts unless
15 such ducts are constructed and installed as required by this code for chimneys and are used
16 solely for exhaust of air from the room or space in which the appliances served by the metal
17 chimneys are located.

18 **814.1.3 Design.** Metal chimneys shall have a minimum thickness of 0.127 inch (3.23 mm)
19 (No. 10 manufacturer's standard gage) steel and shall be designed and constructed as
20 specified in this chapter and Chapters 16 and 22 of the Building Code.

21 **814.1.4 Construction.** Unlisted metal chimneys shall be riveted or welded and, unless
22 structurally self-supporting, shall be guyed securely or firmly anchored to or otherwise
23 supported by the building or structure served thereby. All joints shall be liquid tight or of
24 such a design that liquid will drain to the interior of the chimney.

25 **814.1.5 Lining.** Metal chimneys shall be lined as required by Table 8-D.

26 **814.1.6 Termination.** Metal chimneys shall terminate as required by Table 8-D.

27 **814.1.7 Clearance.** Clearance from combustible construction shall be in accordance with
28 Table 8-D and the applicable requirements for each classification of chimney as required by
29 this chapter.

30 When a metal chimney passes through a ceiling or roof constructed of combustible
31 materials, it shall be protected by an approved ventilating thimble extending not less than 9
32 inches (229 mm) below and 9 inches (229 mm) above the ceiling or roof construction.
33 Thimbles shall be of a size to provide a clearance on all sides of the chimney at least 18
34 inches (457 mm), except that for chimneys of low-heat appliances the clearance may be
35 reduced to at least 6 inches (152 mm).

36 **814.1.8 Support.** Metal chimneys shall be supported on properly designed foundations of
37 masonry or reinforced concrete or on noncombustible material having a fire-resistance
38 rating of not less than three hours, provided such supports are independent of the building
39 construction and the load is transferred to the ground.

40 **814.1.9 Enclosure required for interior chimneys.** Metal chimneys or parts thereof in a
41 building exceeding one story in height shall be enclosed above the story in which the

1 appliance served is located, in walls of noncombustible construction having a fire-resistive
2 rating of not less than one hour if the building is less than ~~((four))~~ five stories in height, and
3 not less than two hours if the building is ~~((four))~~ five stories or more in height, with a space
4 on all sides between the chimney and the enclosing walls sufficient to render the entire
5 chimney accessible for examination and repair. The enclosing walls shall be without
6 openings.

7 **EXCEPTION:** Doorways equipped with a fire assembly having a one-hour fire-
8 resistive rating may be permitted at each floor level for inspection purposes.

9 **Section 47.** Section 814.8 of the 1994 Uniform Mechanical Code is amended as
10 follows:

11 **814.8 Enclosures.** Metal chimneys serving flue-fed, chute-fed, commercial or industrial-
12 type incinerators, extending through any story of a building above that in which the
13 incinerator is located, shall be enclosed in the upper stories within a continuous enclosure
14 constructed of materials which are not combustible, such as masonry. The enclosure shall
15 extend from the ceiling of the incinerator room to or through the roof so as to retain the
16 integrity of the fire separations as required by applicable Building Code provisions. The
17 enclosure shall have a fire-resistance rating of not less than one hour if the building is less
18 than ~~((four))~~ five stories in height, and not less than two hours if the building is ~~((four))~~ five
19 or more stories in height. All openings into the enclosing walls shall be protected with a
20 self-closing fire assembly having a fire-resistive rating of not less than one and one-half
21 hours.

22 **Section 48.** Section 817.5 of the 1994 Uniform Mechanical Code is amended as
23 follows:

24 **817.5 Exit Terminals.** The exit terminals of forced-draft and induced-draft systems shall
25 be located not less than 12 inches (305 mm) from any opening through which combustion
26 products could enter the building, nor less than 2 feet (610 mm) from an adjoining building,
27 and not less than ~~((7 feet (2134 mm)))~~ 10 feet (3048 mm) above grade when located adjacent
28 to public walkways.

29 **Section 49.** The 1994 Uniform Mechanical Code is amended by adding section
30 818.3 as follows:

31 **818.3 Interlock Controls.** When the ventilating hood or exhaust system is equipped with a
32 power means of exhaust, the appliance control system shall be interlocked so as to permit
33 appliance operation only when the power means of exhaust is in operation.

34 **Section 50.** Section 903 of the 1994 Uniform Mechanical Code is amended as
35 follows:

36 **Section 903 — INCINERATORS USING THE FLUE AS A REFUSE CHUTE**

37 **903.1 Construction.** Incinerators in which no fuel other than normal refuse, except a gas
38 flame or similar means to accomplish ignition, is used for combustion, and in which the
39 chute and smoke flue are identical, shall not be installed. ~~((have the enclosing walls of the~~

1 combustion chamber constructed of clay or shale brickwork not less than 4 inches (102 mm)
2 thick when there is a horizontal grate area of not more than 9 square feet (0.8 m²) and not
3 less than 8 inches thick (203 mm) when there is a horizontal grate area exceeding 9 square
4 feet (0.8 m²) and, in each case, a lining of firebrick not less than 4 inches (102 mm) thick,
5 with an air space, in the case of the thicker wall, between the clay or shale brick and the
6 firebrick sufficient to provide for expansion and contraction.

7 The combined chute and flue shall be constructed as required for incinerator chimneys in
8 Chapter 31 of the Building Code. The chute and flue shall be constructed straight and
9 plumb, and finished smooth on the inside. All flues shall terminate in a substantially
10 constructed spark arrester having a mesh not exceeding $\frac{1}{2}$ inch (13 mm).

11 Firebrick shall be laid in fireclay mortar.

12 ~~903.2 Service Openings. Service openings into the chute shall be equipped with approved~~
13 ~~self-closing hoppers so constructed that the openings are closed off while the hopper is~~
14 ~~being charged and no part will project into the chute or flue. The area of the service opening~~
15 ~~shall not exceed one third of the area of the chute or flue.))~~

16 **Section 51.** Section 904.6 of the 1994 Uniform Mechanical Code is amended as
17 follows:

18 **904.6 Chutes.** Refuse chutes shall not feed directly to the combustion chamber but shall
19 discharge into a room or bin enclosed and separated from the incinerator room by floors,
20 ceilings and walls of not less than two-hour fire-resistive construction. The opening through
21 which material is transferred from such room or bin to the incinerator room shall be
22 equipped with a fire assembly having a three-hour fire-resistive rating.

23 Refuse chutes shall rest on substantial noncombustible foundations. The enclosing walls of
24 such chutes shall consist of clay or shale brickwork not less than 8 inches (203 mm) thick or
25 of reinforced concrete not less than 6 inches (152 mm) thick or metal ducts enclosed in
26 shafts meeting the requirements of Section 711.1 of the Building Code. Such chutes shall
27 extend at least 4 feet (1219 mm) above the roof and shall be covered by a metal skylight
28 glazed with single thick plain glass.

29 **Section 52.** Section 1301.1 of the 1994 Uniform Mechanical Code is amended as
30 follows:

31 **1301.1 Scope.** The regulations of this chapter shall govern the installation of fuel-gas piping
32 in or in connection with a building or structure or within the property lines of premises,
33 other than service pipe.

34 The Director of Public Health shall be responsible for the administration and enforcement of
35 this chapter and for this purpose shall have all of the powers of the building official.
36 Whenever the words "building official" are used in this chapter, such words shall mean
37 "Director of Public Health."

38 **Section 53.** Section 1302 of the 1994 Uniform Mechanical Code is amended as
39 follows:

40 **Section 1302 — DEFINITIONS**

41 For the purposes of this chapter, certain terms, phrases, words and their derivatives shall be
42 interpreted as set forth in this section, provided, however, that whenever the words "gas

1 meters" appear, they shall be construed to also mean valves and devices required for the
2 regulation of pressure and the measurement of natural gas being dispensed for a building,
3 structure or premises.

4 **APPLIANCE FUEL CONNECTOR** is an assembly of listed semirigid or flexible tubing
5 and fittings to carry fuel between a fuel piping outlet and a fuel-burning appliance.

6 **APPROVED.** See Section 203.

7 **FUEL GAS** is natural, manufactured, liquefied petroleum or a mixture of these.

8 **GAS PIPING** is an installation of pipe, valves or fittings that is used to convey fuel gas,
9 installed on a premises or in a building, but shall not include:

10 1. Portions of the service piping.

11 2. Approved appliance fuel connectors 6 feet (1800 mm) or less in length between an
12 existing gas outlet and a gas appliance in the same room with the outlet.

13 **GAS PIPING SYSTEM** is an arrangement of gas piping supplied by a single meter or
14 each arrangement of gas piping serving a building, structure or premises, whether
15 individually metered or not.

16 **HIGH-DISTRIBUTION PRESSURE** or **SECOND-STATE PRESSURE** (used in
17 liquefied petroleum gas systems) is pressure exceeding 14 inches water column (3.5 kPa) but
18 not exceeding 20 psig (137 kPa).

19 **LIQUEFIED PETROLEUM GAS FACILITIES** are tanks, containers, container valves,
20 regulating equipment, meters and appurtenances for the storage and supply of liquefied
21 petroleum gas for a building or premises.

22 **MEDIUM PRESSURE** is pressure exceeding 14 inches water column (3.5 kPa) but not
23 exceeding 5 psig (34 kPa).

24 **PIPELINE WELDER** is a person qualified in welding pipes who holds a valid certificate
25 of competency from an approved agency based on demonstrated ability in meeting the
26 requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

27 **QUICK-DISCONNECT DEVICE** is a hand-operated device which provides a means
28 for connecting and disconnecting an appliance or an appliance connector to a gas supply.
29 The device is equipped with an automatic means to shut off the gas supply when the device
30 is disconnected.

31 **SERVICE PIPING** is the piping and equipment between the street gas main and the gas-
32 piping system inlet which is installed by and is under the control and maintenance of the
33 serving gas supplier.

34 **TRANSITION GAS RISER** is any listed or approved section or sections of pipe and
35 fittings used to convey fuel gas and installed in a gas piping system for the purpose of
36 providing a transition from below ground to above ground.

37 **Section 54.** Section 1303 of the 1994 Uniform Mechanical Code is amended as
38 follows:

39 **Section 1303 — PERMIT**

40 A permit shall be obtained prior to installation, removal, alteration or repair of fuel-gas
41 piping systems as required by the provisions of Chapter 1 of this code.

42 **EXCEPTION:** Minor installation of additional gas piping by the serving gas supplier
43 incidental to the relocation of a gas meter.

44 Fees shall be as required by the Permit Fee Subtitle and shall be collected by the Director of
45 Public Health.

1 All gas piping systems for which a permit is required shall be inspected by the Director of
2 Public Health as specified in Section 1306 of this chapter.

3 **Section 55.** The 1994 Uniform Mechanical Code is amended by adding section
4 1312.5 as follows:

5 **1312.5 Corrugated Stainless Steel Tubing (CSST).** Corrugated Stainless Steel Tubing
6 (CSST) may be used for gas piping provided that it is part of a system that has been tested
7 and listed to the ANSI/AGA Standard LC-1 and is installed in accordance with the
8 manufacturers installation instructions.

9 **Section 56.** Section 1313.11 of the 1994 Uniform Mechanical Code is amended as
10 follows:

11 **1313.11 Barbecue or Fireplace Outlets.** Gas outlets in a barbecue or fireplace shall be
12 controlled by an approved operating valve located in the same room and outside the
13 fireplace but not more than 4 feet (1219 mm) from the outlets. If piping on the discharge
14 side of the control valve is standard weight brass or galvanized steel, the piping may be
15 embedded in or surrounded by not less than 2 inches (51 mm) of concrete or masonry.

1 Where it is impractical to locate the operating valve outside the hearth it may be installed
2 just inside the hearth within 2 inches of the outside edge of the hearth on either side of the
3 fire box.

4 **Section 57.** The Director of the Department of Construction and Land Use shall
5 for a period of 60 days following the effective date of this ordinance, accept applications for
6 permits which comply with ordinances 116011 and 116656 in lieu of this ordinance.

7 **Section 58.** This ordinance shall take effect and be in force thirty (30) days from
8 and after its approval by the Mayor, but if not approved and returned by the Mayor within
9 ten (10) days after presentation, it shall take effect as provided by Municipal Code Section
10 1.04.020.

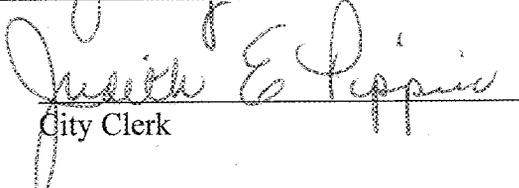
11 Passed by the City Council the 24th day of 1995 and signed by me in open
12 session in authentication of its passage this 24th day of July,
13 1995.

14 
15 **Tom Tom** President of the City Council

16 Approved by me this 26 day of July, 1995.

17 
18 **Norman B. Rice**
Mayor

19 Filed by me this 27th day of July, 1995.

20 
21 **Judith E. Peppin**
City Clerk

22 (Seal)
23 Published _____

Seattle
Department of Construction and Land Use



R. F. Krochalis, Director
Norman B. Rice, Mayor

MEMORANDUM

TO: Jim Street, President, City Council

VIA: Tom Tierney, Director
Office of Management and Planning
ATTN: Elma Borbe

FROM: 
Rick Krochalis, Director

Contact Staff: Maureen Traxler
Code Development Analyst Supervisor

DATE: June 16, 1995

RE: Proposed 1994 Seattle Building, Mechanical and Boiler Codes

Attached for your consideration are the proposed 1994 Seattle Building Code, the Seattle Mechanical Code and the Seattle Boiler Code. These proposals are the result of extensive development by Department staff and a thorough review by the Construction Codes Advisory Board.

BACKGROUND

Washington State law requires that each local jurisdiction adopt and enforce the Uniform Building Code (UBC) and the Uniform Mechanical Code (UMC) (RCW 19.27). These model codes are promulgated by the International Conference of Building Officials (ICBO) and are reissued every three years. The most recent editions were published in June, 1994. The Washington State Building and Mechanical codes take effect on June 30, 1995.

The Boiler Code is somewhat unique to Seattle. It is based on an appendix of the Uniform Mechanical Code with many Seattle amendments. It is not adopted statewide, but two or three other larger cities have similar regulations.

Within certain limitations, state law allows local jurisdictions to amend the model codes. Seattle historically amends both codes. Many of these amendments date from before 1976, when there was no state building code and Seattle had its own codes. Many of our

amendments are unique to the City and reflect the strength and knowledge of our development community, the difficulty of applying a model code to an already-built city, and the desire by the Department to give all users of the codes equal access to commonly-approved alternative methods of construction which the Department has found acceptable. These alternatives often serve to reduce cost of construction.

There are two limitations on local amendments. The first is that the code adopted by Seattle must not reduce the standards of the codes as adopted by the State. These proposed codes, as a total document, meet this limitation. The second limitation is that any amendments which affect the construction of buildings containing four or fewer dwelling units must be reviewed and approved by the State Building Code Council. These proposed ordinances contain a few such amendments. The State Council's procedure requires that the City Council approve such amendments prior to submittal to the State for review. If the State Council does not approve, or requires revision of any of these amendments, we will return to the City Council with an amendatory ordinance.

Over the past several years the Department has worked extensively with ICBO and the State Building Code Council to encourage these organizations to adopt and incorporate Seattle's amendments into the Uniform Codes. As a result, many former Seattle amendments are now contained in the uniform codes, or in the State adoption of those codes. However, many local amendments still remain.

PUBLIC REVIEW

The primary avenue of public review of these codes is the Construction Codes Advisory Board (CCAB). The Board is composed of 13 representatives from the development community and the general public. Staff of the Seattle Fire Marshal's office and the Seattle King County Department of Public Health also participated extensively in review of all three codes. For the review of these codes, the Board established a committee to review the Mechanical Code and the Building Code's elevator regulations, and reviewed the Building Code as a committee of the whole. There was also a separate committee to review the new Boiler Code. Lists of the members serving on the Board and the committees are attached.

We have made public announcements regarding the development of the codes and twice have made available copies of the draft codes to the general public. We have received no comments from the public other than inquiries as to when the codes will be adopted.

We worked with the Board and committees to reach agreement on all the issues in these three codes. The Board recommends their adoption by the City Council. There are, however, some unresolved Building Code issues. We are working on another Building Code ordinance that will address those issues and some additional code sections that the Board is still reviewing. We plan to submit the second ordinance in September. The effective dates of the ordinances in the current submittal is December 3 to coordinate with

the second Building Code ordinance. We are also working with the Fire Department in hopes that the 1994 Seattle Fire Code can also take effect on December 3.

MAJOR CHANGES AND IMPROVEMENTS

A section by section detailed analysis and summary of revisions made at each level (national, state and Seattle) has been prepared for each of the codes. These analyses are attached.

We would like to bring your attention to the following major changes:

Seattle Boiler Code. The regulations governing boilers and pressure vessels have been removed from the Seattle Mechanical Code and placed in a separate code in a new chapter of the Municipal Code. This change will enable Seattle to keep abreast of frequent changes in the state regulations. We are proposing few substantive amendments.

Format Changes. The Uniform Building and Mechanical codes were both reformatted into an arrangement that will be used by all three of the model codes used in the United States.

Seattle is also proposing a formatting innovation. We have identified some "amendments" as standard code alternates or interpretations, and are enclosing them in a box. We have assigned a number to each alternate and interpretation to make it easier to reference them. Requirements from the State Building Code and other sources are also identified using the box format. Our goal is to make information about interpretations and commonly-approved alternates available to everyone, not just sophisticated applicants.

Occupancy Classifications. The current Group B Occupancies have been reorganized in the 1994 UBC. They are now more closely aligned with the classifications used by the two other model codes. In the 1994 code, the occupancies that were classified in Group B are found in Groups B, F, M and S. The current Group M Occupancy has been renamed Group U. More details of the reorganization of Group B occupancies is included in the detailed list of changes that is attached.

Code Alternates and Modifications. The circumstances under which DCLU will approve departures from strict compliance with the code is clarified in both the Building and Mechanical codes. Code alternates are defined as methods and materials which, while not satisfying the letter of the code, will provide equivalent protection. Modifications are methods and materials which may not satisfy the letter of the code, but will provide a reasonable level of protection in light of special circumstances which make strict compliance impractical.

Mixed Use Buildings. For several years, the Seattle Building Code has allowed mixed use buildings with a first floor of noncombustible construction and upper floors of wood. The occupancies allowed in the first floor have been limited to specified commercial uses. In

the 1994 code, we are proposing to allow residential occupancies in the noncombustible portion of the building. Our experience with the safety of these buildings to date has been favorable.

Smoke Control. The 1994 UBC contains new provisions requiring sophisticated smoke control systems in high-rise buildings, atria and covered mall buildings. DCLU convened a committee of staff from DCLU, Seattle Fire and the public to examine these new sections. The committee's recommendation was to keep Seattle's existing smoke control requirements for high-rise buildings, but to require atria and covered mall buildings to comply with the UBC. High-rises will still be able to rely on pressurization of stairway and elevator shafts to keep exits free of smoke in the event of a fire.

Downtown Fire District. The Building Code has historically restricted the types of construction and occupancies that are allowed in several areas of town. Gradually, those restrictions are being reduced. There is now only one fire district, and in the 1994 code, we are proposing to eliminate the restrictions on construction types in that district. As downtown has grown, combustible construction poses much less of a threat, and is unlikely to become common. We believe we are still justified in prohibiting certain hazardous occupancies downtown.

Wood Construction. The wood products industry conducted an extensive "in-grade" testing program which has resulted in significant changes in the allowable stress and span tables for wood. The changes are in effect nationwide. The changes in values are different for different species of wood -- some values are higher, others are lower.

Unvented Gas Appliances. The most controversial issue that arose during the review of the 1994 Mechanical Code was whether to allow unvented decorative gas appliances. The State Mechanical Code will allow them, but we are recommending against them. The CCAB Mechanical Code committee held extensive discussions and reviewed studies and reports about the possible health effects of unvented combustion. They concluded that the evidence raises too many questions to justify allowing potentially injurious decorative appliances. Because this code section affects small residential buildings, we are required to submit it to the State Building Code Council for approval.

Refrigeration. In response to a presidential decree requiring phase-out of chlorofluorocarbon refrigerants, the refrigeration regulations of the Uniform Mechanical Code have been extensively revised. The revisions are based on a nationally-recognized standard. The CCAB Mechanical Code Committee held a special meeting with representatives of the refrigeration industry and recommended no amendments to the UMC.

COST IMPACTS OF ADOPTION

The cost of adopting these codes include the purchase and distribution to staff of the uniform codes, printing of the City's amendments to the codes, training of staff, providing

information to the public, updating forms and brochures, and revising client assistance memoranda (CAMs) and director's rules as needed. In the process of review of these codes, the staff and the Board identified additional areas where new CAMs or Rules would help ease public understanding of new regulations, and the Department's enforcement of them.

The one time, or start-up costs for adopting the new codes are \$123,507.50 for the Building Code, \$16,445.50 for the Mechanical Code, and \$1,184 for the Boiler Code. Since we are mandated by the State to update these codes every three years, these costs have been anticipated in the regular budget process.

Detailed implementation cost analyses for each of the codes is attached for your information.

ENVIRONMENTAL (SEPA) REVIEW

Adoption of the Building, Mechanical and Boiler Codes is categorically exempt from environmental review per Section 25.05.800U of the Seattle Municipal Code.

TRANSITION

Both ordinances include a section allowing a 60-day grace period after the new codes go into effect. The design and development process is one of long lead times. The changes in building codes can have a significant impact on a design. It has been our practice to allow applicants a limited period during which project applications may be submitted subject to either the existing building code or the new codes. A similar transition period was allowed when the last two editions were adopted in 1987 and 1991.

transmem.doc

City of Seattle

Executive Department—Office of Management and Planning

Thomas M. Tierney, Director
Norman B. Rice, Mayor

The Honorable Mark Sidran
City Attorney
City of Seattle

*OK as to form
6/23/95
M.A.*

95-218


COPY RECEIVED
95 JUN 21 AM 11:27
SEATTLE CITY ATTORNEY

Dear Mr. Sidran:

The Mayor is proposing to the City Council that the enclosed legislation be adopted.

REQUESTING DEPARTMENT: Department of Construction and Land Use

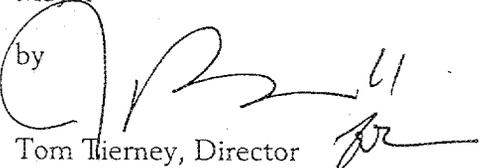
SUBJECT: AN ORDINANCE relating to the Seattle Mechanical Code, repealing Section 22.400.010 (Ordinance 116011 as amended by Ordinance 116656), and adding a new Section 22.400.010 to adopt Chapters 2 through 11 and Chapters 14 and 16 of the 1994 Uniform Mechanical Code; the Uniform Mechanical Code Standards contained in Appendix A of the 1994 Uniform Mechanical Code, Chapter 13 contained in Appendix B of the 1994 Uniform Mechanical Code; amending the adopted Uniform Mechanical code by: adding a new Chapter 1 related to administration, permitting and enforcement; amending Chapter 2, Definitions; amending certain provisions of Chapter 3 related to general requirements for heating, ventilating and cooling equipment, amending certain provisions of Chapter 4 related to ventilation air supply; amending certain provisions of Chapter 5 related to exhaust systems; amending certain provisions of Chapter 6 related to duct systems; amending certain provisions of Chapter 8 related to chimneys and vents; amending certain provisions of Chapter 9 related to special fuel-burning equipment; amending certain provisions of Chapter 11 related to refrigeration; amending certain provisions in Chapter 13 related to fuel gas piping; and adding a new Chapter 3.1, establishing minimum ventilation standards as required by State law.

Pursuant to the City Council's S.O.P. 100-014, the Executive Department is forwarding this request for legislation to your office for review and drafting.

After reviewing this request and any necessary redrafting of the enclosed legislation, return the legislation to OMP. Any specific questions regarding the legislation can be directed to Elma Borbe at 4-8687.

Sincerely,

Norman B. Rice
Mayor

by 
Tom Tierney, Director

legis:borbe4

Enclosure

STATE OF WASHINGTON - KING COUNTY

58644
City of Seattle, City Clerk

—ss.

No. ORDINANCE IN

Affidavit of Publication

The undersigned, on oath states that he is an authorized representative of The Daily Journal of Commerce, a daily newspaper, which newspaper is a legal newspaper of general circulation and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a daily newspaper in Seattle, King County, Washington, and it is now and during all of said time was printed in an office maintained at the aforesaid place of publication of this newspaper. The Daily Journal of Commerce was on the 12th day of June, 1941, approved as a legal newspaper by the Superior Court of King County.

The notice in the exact form annexed, was published in regular issues of The Daily Journal of Commerce, which was regularly distributed to its subscribers during the below stated period. The annexed notice, a

CT:ORD 117722

was published on
08/04/95

The amount of the fee charged for the foregoing publication is the sum of \$ _____, which amount has been paid in full.

Subscribed and sworn to before me on

08/07/95

[Signature]

Notary Public for the State of Washington,
residing in Seattle

Presented for the Term of the City Council
Approved by the City Clerk on July 1, 1995
NORMAN B. RICE
City Clerk
(Seal) JUDITH E. PIPPIN
City Clerk
Publication ordered by JUDITH E. PIPPIN, City Clerk
Date of official publication in Daily Journal of Commerce

City of Seattle Ordinance

City of Seattle ORDINANCE 117722

AN ORDINANCE relating to the Seattle Mechanical Code, repealing Section 22.400.010 (Ordinance 116011 as amended by Ordinance 116656), and adding a new Section 22.400.010 to adopt Chapters 2 through 11 and Chapters 14 and 16 of the 1994 Uniform Mechanical Code; the Uniform Mechanical Code Standards contained in Appendix A of the 1994 Uniform Mechanical Code, Chapter 13 contained in Appendix B of the 1994 Uniform Mechanical Code; amending the adapted Uniform Mechanical Code by: adding a new Chapter 1 related to administration, permitting and enforcement; amending Chapter 2, Definitions; amending certain provisions of Chapter 3 related to general requirements for heating, ventilating and cooling equipment; amending certain provisions of Chapter 4 related to ventilation air supply; amending certain provisions of Chapter 5 related to exhaust systems; amending certain provisions of Chapter 6 related to duct systems; amending certain provisions of Chapter 7 related to combustion air; amending certain provisions of Chapter 8 related to chimneys and vents; amending certain provisions of Chapter 9 related to special fuel-burning equipment; amending certain provisions of Chapter 11 related to refrigeration; amending certain provisions in Chapter 13 related to fuel gas piping; and adding a new Chapter 3.1, establishing minimum ventilation standards as required by State law.

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. As of December 3, 1995, Section 22.400.010 of the Seattle Municipal Code adopting the 1991 Uniform Mechanical Code (Ordinance 116011 as amended by Ordinance 116656) is hereby repealed, and a new Section 22.400.010 is added to the Seattle Municipal Code to read as follows:

22.400.010 Adoption of Uniform Mechanical Code

The Seattle Mechanical Code shall be constituted of the following portions of the 1994 edition of the Uniform Mechanical Code as published by the International Conference of Building Officials, together with the amendments and additions thereto adopted: Chapters 2 through 11, 14 and 16; the Uniform Mechanical Code standards contained in Appendix A, and Chapter 13 of Appendix B. One copy of the Uniform Mechanical Code is filed with the City Clerk in C. F. 300681.

Section 2. Wherever in this ordinance there is a conflict between metric units of measurement and English units, the English units shall govern.

Section 3. The 1994 Uniform Mechanical Code is amended by adding Chapter 1 as follows:

Chapter 1 ADMINISTRATION Part 1—General

SECTION 101 — TITLE

These regulations shall be known as the "Seattle Mechanical Code," may be cited as such, and will be referred to herein as "this code."

SECTION 102 — PURPOSE

The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of heating, ventilating, cooling, refrigeration systems, incinerators and other miscellaneous heat-producing appliances within the City.

The purpose of this code is to provide for and promote the health, safety and welfare of the general public, and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this code.

circumstances. The building official may, but is not required to, record the approved permit plans, modifications and any relevant information in the files of the building official or approved permit plans.

SECTION 107 — TESTS

Whenever there is insufficient evidence of compliance with the provisions of this code, evidence that any material or method of construction does not conform to the requirements of this code, the building official may require tests as proof of compliance to be made at the expense of the City.

Test methods shall be as specified in this code or by other recognized test standards. If there are no recognized and accepted test methods for the proposed alternate, the building official shall determine the test procedures.

All tests shall be made by an approved agency. Reports of such tests shall be retained by the building official.

SECTION 108 — JURISDICTION - POWERS AND DUTIES OF BUILDING OFFICIAL

108.1 Jurisdiction. The Department of Construction and Land Use shall be the enforcement agency in the City of Seattle for this code. The Department shall be the administrative and operational control of the Director of the Department of Construction and Land Use who shall be the building official.

108.2 General. The building official is authorized and directed to enforce this code. The enforcement of Chapter 13 shall be the primary responsibility of the Director of Public Health, and enforcement authority as provided in this code to the building official shall be vested in the Director of Public Health or the Fire Chief. Compliance with the requirements of this code shall be the obligation of the owner of the building, and on the premises, the duly authorized agent of the owner, or other person responsible for the condition or work, and not of the City or any of its officers or employees.

108.3 Deputies. The building official may appoint such officers and inspectors as employees as shall be authorized from time to time. The building official may deputize inspectors or employees as may be necessary to carry out the functions of the Department of Construction and Land Use.

108.4 Right of Entry. With the consent of the owner or occupier of a building or pursuant to a lawfully issued warrant, the building official may enter a building or premises at any reasonable time to perform the duties imposed by this code.

108.5 Stop Orders. Whenever any work is being done contrary to the provisions of this code, or in the event of dangerous or unsafe conditions related to construction or use of the building, the building official may order the affected work stopped by a notice described in writing, posted on the premises or served on any person responsible for the condition or work. It shall be unlawful for any person to engage in or to cause such work to be done until authorization from the building official is received.

108.6 Authority to Disconnect Utilities in Emergencies. The building official shall have the authority to disconnect fuel-gas utility service or energy supplies to a building, premises or equipment regulated by this code in case of emergency where need to eliminate an immediate hazard to life or property. The building official may cause a building or premises to disconnect utility service. The building official shall, if possible, notify the serving utility, the owner and occupant of the building, and the premises of the decision to disconnect prior to taking such action, and shall not disconnect utility, owner and occupant of the building, structure or premises in writing immediately thereafter.

108.7 Authority to Condemn Equipment. Whenever the building official ascertains any equipment or portion thereof, regulated by this code has become hazardous to health or property, the building official shall order in writing that such equipment be removed or restored to a safe or sanitary condition, as appropriate. The written order shall fix a time limit for compliance with such order. It shall be unlawful for a person to use or maintain defective equipment after receiving such notice.

When such equipment or installation is to be disconnected, written notice of disconnection and causes therefor shall be given within 24 hours to the serving utility, owner and occupant of the building, structure or premises. When any equipment is maintained in violation of this code, and in violation of a notice issued pursuant