

Title 51 WAC

BUILDING CODE COUNCIL

Chapters

- 51-04** Policies and procedures for consideration of state-wide and local amendments to the State Building Code.
- 51-06** Public records.
- 51-08** Uniform procedural rules.
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- 51-27** State Building Code adoption of the 1991 edition of the Uniform Plumbing Code standards.

DISPOSITION OF CHAPTERS FORMERLY CODIFIED IN THIS TITLE

Chapter 51-10 BARRIER-FREE FACILITIES

- 51-10** Barrier-free facilities [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW and 1989 c 266. 90-02-110, filed 1/3/90, effective 7/1/90. Statutory Authority: Chapters 19.27 and 70.92 RCW. 88-24-021 (Order 88-09), filed 12/2/88, effective 7/1/89; 86-24-040 (Order 86-18), filed 11/26/86, effective 4/27/87; 85-07-036 (Order 85-02), filed 3/18/85; 85-03-095 (Order 85-01), filed 1/22/85; 83-15-033 (Order 83-4), filed 7/18/83; Order 77-02, filed 8/3/77; Order 76-02, filed 9/1/76; Order 76-01, filed 6/28/76.] Repealed by 92-01-130, filed 12/19/91, effective 7/1/92. Statutory Authority: Chapters 70.92 and 19.27 RCW.

Chapter 51-12 WASHINGTON STATE ENERGY CODE

- 51-12-100** Section 100. Title. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-100, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-101** Section 101. Intent. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-101, filed 11/26/85.] Repealed by

- 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-102** Section 102. Scope. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-102, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-102, filed 9/23/86; 86-11-013 (Order 86-04), § 51-12-102, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-102, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-103** Section 103. Conflicts with other codes. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-103, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-104** Section 104. Materials and equipment. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-104, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-105** Section 105. Alternate materials—Method of construction, design or insulating systems. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-105, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-106** Section 106. Plans and specifications. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-106, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-107** Section 107. Inspections and enforcement. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-107, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-108** Section 108. Severability. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-108, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-109** Section 109. Violations. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-109, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-110** Section 110. Liability. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-110, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-200** Section 200. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-200, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-201** Section 201. A. [Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-201, filed 9/23/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-201, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-202** Section 202. B. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-202, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-203** Section 203. C. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-203, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-204** Section 204. D. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-204, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.

- 51-12-205 Section 205. E. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-205, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-206 Section 206. F. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-206, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-206, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-207 Section 207. G. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-207, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-208 Section 208. H. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-208, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-209 Section 209. I. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-209, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-210 Section 210. J. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-210, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-211 Section 211. K. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-211, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-212 Section 212. L. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-212, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-213 Section 213. M. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-213, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-214 Section 214. N. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-214, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-215 Section 215. O. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-215, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-216 Section 216. P. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-216, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-217 Section 217. Q. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-217, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-218 Section 218. R. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-218, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-219 Section 219. S. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-219, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-219, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-220 Section 220. T. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-220, filed 1/3/90, effective 7/1/90. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-220, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-221 Section 221. U. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-221, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-222 Section 222. V. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-222, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-223 Section 223. W X Y Z. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-223, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-223, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-300 Section 300. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-300, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-301 Section 301. Heated and cooled buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-301, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-302 Section 302. Climatic Zones. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-302, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-303 Section 303. Departures. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-303, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-304 Section 304. Design parameters. [Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-304, filed 9/23/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-304, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-305 Section 305. Ventilation. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-305, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-305, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-400 Section 400. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-400, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-401 Section 401. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-401, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-402 Section 402. Overall thermal performance and building envelope requirements. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-402, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-402, filed 9/23/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-402, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-403 Section 403. Thermal performance criteria and envelope requirements for low-rise residential buildings. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-403, filed 1/3/90, effective 7/1/90. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-403, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-404 Section 404. Thermal performance criteria for all other occupancies. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-404, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-404, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-404, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-405 Section 405. Air leakage for all buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-405, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.

- 51-12-406 Section 406. Building mechanical systems. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-406, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-407 Section 407. Calculations of heating and cooling loads and system sizing limits. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-407, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-408 Section 408. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-408, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-409 Section 409. Simultaneous heating and cooling. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-409, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-410 Section 410. Energy recovery. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-410, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-411 Section 411. HVAC equipment performance requirements. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-411, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-411, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-411, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-412 Section 412. Energy for air delivery. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-412, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-413 Section 413. Balancing. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-413, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-414 Section 414. Cooling with outdoor air (economizer cycle). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-414, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-415 Section 415. Controls. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-415, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-416 Section 416. Air handling duct system insulation. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-416, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-417 Section 417. Duct construction. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-417, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-418 Section 418. Piping insulation. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-418, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-419 Section 419. (Reserved). [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-419, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-420 Section 420. Water heaters, storage tanks, boilers, and piping. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-420, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-421 Section 421. Pump operation. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-421, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-422 Section 422. Pipe insulation. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-422, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-423 Section 423. Conservation of hot water. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-423, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-424 Section 424. Electrical power and lighting. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-424, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-425 Section 425. Lighting switching. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-425, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-426 Section 426. Lighting power budget. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-426, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-426, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-426, filed 9/23/86; 86-11-013 (Order 86-04), § 51-12-426, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-426, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-500 Section 500. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-500, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-501 Section 501. Energy analysis. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-501, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-502 Section 502. Design. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-502, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-503 Section 503. Analysis procedure. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-503, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-503, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-504 Section 504. Calculation procedure. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-504, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-505 Section 505. Documentation. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-505, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-506 Section 506. Buildings utilizing nondepletable energy. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-506, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-507 Section 507. Documentation—buildings using nondepletable energy sources. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-507, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-600 Section 600. General. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-600, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-601 Section 601. Low-rise residential building envelope requirements. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-601, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-601, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-20-024 (Resolution No. 86-17), § 51-12-601, filed 9/23/86; 86-11-013 (Order 86-04), § 51-12-601, filed 5/13/86. Statutory Authority: 1985 c

144. 85-24-028 (Order 85-14), § 51-12-601, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-602 Section 602. Low-rise residential building mechanical systems. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-602, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-602, filed 5/13/86; 85-24-028 (Order 85-14), § 51-12-602, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-603 Section 603. Low-rise residential building service water heating. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-603, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-604 Section 604. Low-rise residential building electrical power and lighting. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-604, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-605 Section 605. Building envelope requirements for other than low-rise residential buildings. [Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-605, filed 1/31/89, effective 7/1/89. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-605, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-606 Section 606. Building mechanical systems requirements for other than low-rise residential buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-606, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-607 Section 607. Service water heating requirement for other than low-rise residential buildings. [Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-607, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.
- 51-12-608 Section 608. Electrical power and lighting requirements for other than low-rise residential buildings. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-12-608, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 19.27A.010 and 19.27A.020. 89-04-043 (Order 88-10), § 51-12-608, filed 1/31/89, effective 7/1/89. Statutory Authority: RCW 19.27A.020 and chapter 19.27A RCW. 86-11-013 (Order 86-04), § 51-12-608, filed 5/13/86. Statutory Authority: 1985 c 144. 85-24-028 (Order 85-14), § 51-12-608, filed 11/26/85.] Repealed by 91-01-112, filed 12/19/90, effective 7/1/91. Statutory Authority: RCW 19.27A.020 and 1990 c 2.

Chapter 51-18

WASHINGTON STATE WATER CONSERVATION PERFORMANCE STANDARDS

- 51-18-010 Declaration of purpose. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-010, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
- 51-18-020 Application. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-020, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
- 51-18-030 Water efficiency standards. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-030, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.
- 51-18-040 Exceptions. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-040, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.

- 51-18-050 Implementation. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-18-050, filed 1/3/90, effective 7/1/90.] Repealed by 92-01-068, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.170 and chapter 19.27 RCW.

Chapter 51-04 WAC

POLICIES AND PROCEDURES FOR CONSIDERATION OF STATE-WIDE AND LOCAL AMENDMENTS TO THE STATE BUILDING CODE

WAC

- 51-04-010 Declaration of purpose.
- 51-04-015 Definitions.
- 51-04-018 Preproposal petition.
- 51-04-020 Policies for the consideration of proposed state-wide amendments.
- 51-04-025 Procedure for submittal or proposed state-wide amendments.
- 51-04-030 Policies for consideration of proposed local government residential amendments.
- 51-04-035 Procedure for submittal of proposed local government residential amendments.
- 51-04-037 Preapproved local government residential amendments.
- 51-04-040 Reconsideration.
- 51-04-050 Ex parte communications.
- 51-04-060 Opinions and interpretations.
- 51-04-070 Council mailing address.

WAC 51-04-010 Declaration of purpose. The Washington state building code council, hereinafter called the council, is required by chapter 266, Laws of 1988, to adopt and maintain the state building code, hereinafter referred to as the building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature.

The primary objective of the council is to encourage consistency in the building code throughout the state of Washington and to maintain the building code consistent with the state's interest as provided in RCW 19.27.020.

The building code shall be as defined in WAC 51-04-015(6).

The council is also required by RCW 19.27.074 to approve or deny all city and county amendments to the building code that apply to single family or multifamily buildings as defined in RCW 19.27.015.

The purpose of this chapter is to establish policies and procedures for submittal and council review and consideration of proposed state-wide and city and county amendments respectively, to the building code.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-010, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-04-010, filed 9/1/76.]

WAC 51-04-015 Definitions. (1) "Supplements and accumulative supplements" mean the publications between editions of the uniform codes and standards which include changes to the current edition of the uniform codes and standards.

(2) "Council" means the Washington state building code council.

(3) "Emergency state-wide amendment" means any proposed state-wide amendment, the adoption of which is necessary immediately in order to protect life, safety or health of building occupants, preserve the structural integrity of buildings built to the state building code or to comply

with enacted state or federal legislation. Emergency state-wide amendments to the state building code must be adopted in accordance with the Administrative Procedure Act, chapter 34.05 RCW.

(4) "Local government amendment" means any amendment to the state building code, as adopted by cities or counties for implementation and enforcement in their respective jurisdictions.

(5) "Local government residential amendment" means any amendment to the state building code, as adopted by cities or counties for implementation and enforcement in their respective jurisdictions, that applies to single and multifamily buildings as defined by RCW 19.27.015.

(6) "State building code" means the Uniform Building Code and Standards; the Uniform Mechanical Code including Appendix B, Chapter 22 Fuel Gas Piping; the Uniform Fire Code and Standards; the Uniform Plumbing Code and Standards, excluding Chapters 11 and 12; the state regulations for barrier-free facilities; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

(7) "State-wide amendment" means any amendment to the building code, initiated through council action or by petition to the council from any agency, city or county, or interested individual or organization, that would have the effect of amending the building code for the entire state of Washington. State-wide amendments to the state building code must be adopted in accordance with the Administrative Procedure Act, chapter 34.05 RCW.

(8) "State building code update cycle" means that period during which the uniform code and standards referenced in chapter 19.27 RCW are updated and amended by the council in accordance with the Administrative Procedure Act, chapter 34.05 RCW. During the code update cycle, the entire building code is updated by the council. The code update cycle commences upon availability of the publication of the current edition of the Uniform Codes by the International Conference of Building Officials, and concludes with formal adoption of the revised building code by the council and final review by the state legislature.

Within sixty days of the receipt of the new current editions of the uniform codes as published by the International Conference of Building Officials, International Association of Plumbing and Mechanical Officials, and Western Fire Chiefs respectively, the council shall enter rulemaking to update the building code.

(9) "Uniform codes" means the Uniform Building, Mechanical, Plumbing, and Fire Codes as published by the International Conference of Building Officials, International Association of Plumbing and Mechanical Officials, and Western Fire Chiefs respectively.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-015, filed 1/3/90, effective 2/3/90.]

WAC 51-04-018 Preproposal petition. An agency, city or county, or other interested individual or organization wishing to submit state-wide or local government residential amendments to the building code for council consideration, may file with the council a preproposal petition in order to solicit comments from council members and interested parties, prior to council action.

The council may refer a preproposal petition to one of the council standing committees for review and comment.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-018, filed 1/3/90, effective 2/3/90.]

WAC 51-04-020 Policies for the consideration of proposed state-wide amendments. The council will accept and consider petitions for emergency state-wide amendments to the building code at any time, in accordance with RCW 19.27.074 and chapter 34.05 RCW.

The council will accept and consider all other petitions for state-wide amendments in conjunction with the state building code update cycle, in accordance with RCW 19.27.074 and chapter 34.05 RCW, and WAC 51-04-015 and 51-04-020.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-020, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-04-020, filed 9/1/76.]

WAC 51-04-025 Procedure for submittal or proposed state-wide amendments. All proposed state-wide amendments shall be submitted in writing to the council, on the form provided by the council.

Petitions for state-wide amendments to the building code should be submitted to the council within thirty days of publication of the new current editions of the uniform codes as revised by the International Conference of Building Officials, International Association of Plumbing and Mechanical Officials, and Western Fire Chiefs respectively.

Petitions for emergency state-wide amendments to the building code may be submitted at any time, in accordance with RCW 19.27.074 and chapter 34.05 RCW, and WAC 51-04-015 and 51-04-020.

The council may refer a proposed state-wide amendment to one of the council standing committees for review and comment prior to council action in accordance with chapter 34.05 RCW.

The council shall deal with all proposed state-wide amendments within the time frames required by chapter 19.27 RCW, RCW 34.05.330, and all other deadlines established by statute.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-025, filed 1/3/90, effective 2/3/90.]

WAC 51-04-030 Policies for consideration of proposed local government residential amendments. All amendments to the building code, as adopted by cities and counties for implementation and enforcement in their respective jurisdictions, that apply to single and multifamily buildings as defined by RCW 19.27.015, shall be submitted to the council for approval.

The council shall consider and approve or deny all proposed local government residential amendments to the building code within ninety days of receipt of a proposal, unless alternative scheduling is agreed to by the council and the proposing entity.

All local government residential amendments to the building code that require council approval shall be submitted in writing to the council, after the city or county legislative body has adopted the amendment and prior to imple-

mentation and enforcement of the amendment by the local jurisdiction.

It is the policy of the council to encourage joint proposals for local government residential amendments from more than one jurisdiction. Local government residential amendments submitted to the council for approval should be based on:

- (1) Climatic conditions that are unique to the jurisdiction.
- (2) Geologic or seismic conditions that are unique to the jurisdiction.
- (3) Environmental impacts such as noise, dust, etc., that are unique to the jurisdiction.
- (4) Life, health, or safety conditions that are unique to the local jurisdiction.
- (5) Other special conditions that are unique to the jurisdiction.

EXCEPTIONS: Appendices or portions thereof that have the effect of amending the uniform codes, that do not conflict with the building code for single and multifamily residential buildings as defined by RCW 19.27.015, may be adopted by local jurisdictions without council review or approval.

Local government residential amendments to Chapters 1, 2, or 3 of the uniform building code need not be submitted to the council for review and approval provided that such amendments do not diminish the construction requirements of those chapters.

Those portions of the supplement or accumulative supplements that affect single and multifamily residential buildings as defined by RCW 19.27.015 that are not adopted by the council shall be submitted to the council for consideration as local government residential amendments to the building code.

Local government residential amendments shall conform to the limitations provided in RCW 19.27.040.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-030, filed 1/3/90, effective 2/3/90.]

WAC 51-04-035 Procedure for submittal of proposed local government residential amendments. All proposed local government residential amendments to the state building code shall be submitted in writing to the council, on a form provided by the council, along with a statement of need for the proposed amendment.

The council shall accept and consider all applications for review of local government residential amendments submitted to the council in a proper manner.

The council may refer a proposed local government residential amendment to one of the council standing committees for review and comment prior to council action in accordance with RCW 19.27.074.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-035, filed 1/3/90, effective 2/3/90.]

WAC 51-04-037 Preapproved local government residential amendments. Any local government residential amendment, that the council determines to be appropriate for adoption by other local governments, may be designated as a preapproved local government residential amendment.

A preapproved local government residential amendment may be adopted by any local government upon notification of the council.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-037, filed 1/3/90, effective 2/3/90.]

WAC 51-04-040 Reconsideration. Any party proposing a state-wide or local government amendment to the building code may, upon denial of the amendment by the council, file a petition for reconsideration in accordance with RCW 34.05.470.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-040, filed 1/3/90, effective 2/3/90.]

WAC 51-04-050 Ex parte communications. All written communications received by council members during council rule-making proceedings, shall be forwarded to staff for inclusion in the public record.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-050, filed 1/3/90, effective 2/3/90.]

WAC 51-04-060 Opinions and interpretations. RCW 19.27.031 grants the council authority to render opinions relating to the building code at the request of a local building official.

Council building code related opinions and interpretations shall be limited to the state regulations for barrier-free facilities, the state energy code, and council amendments to the uniform codes.

The Washington state energy office shall provide opinions and interpretations related to the state energy code.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-060, filed 1/3/90, effective 2/3/90.]

WAC 51-04-070 Council mailing address. All requests for information, documentation, etc., should be submitted to:

Washington State Building Code Council
Ninth and Columbia Building
Mailstop: GH-51
Olympia, Washington 98504-4151
(206) 753-2222

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-04-070, filed 1/3/90, effective 2/3/90.]

Chapter 51-06 WAC PUBLIC RECORDS

WAC

- 51-06-010 Purpose of chapter.
- 51-06-020 Public records available.
- 51-06-070 Copying.
- 51-06-120 Address for communications.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 51-06-030 Definitions. [Order 76-02, § 51-06-030, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.

- 51-06-040 Public records officer. [Order 76-02, § 51-06-040, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
- 51-06-050 Office hours. [Order 76-02, § 51-06-050, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
- 51-06-060 Requests for public records. [Order 76-02, § 51-06-060, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
- 51-06-080 Exemptions. [Order 76-02, § 51-06-080, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
- 51-06-090 Review of denials of public records requests. [Order 76-02, § 51-06-090, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
- 51-06-100 Protection of public records. [Order 76-02, § 51-06-100, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.
- 51-06-110 Records index. [Order 76-02, § 51-06-110, filed 9/1/76.] Repealed by 90-02-108, filed 1/3/90, effective 2/3/90. Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348.

WAC 51-06-010 Purpose of chapter. The purpose of this chapter shall be to ensure compliance by the state building code council (hereinafter referred to as the "council"), including its members and staff, with the provisions of chapter 42.17 RCW (Initiative 276), and in particular with RCW 42.17.250 - 42.17.320 dealing with public records.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-06-010, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-010, filed 9/1/76.]

WAC 51-06-020 Public records available. All public records of the council as defined in WAC 51-06-030 are available for public inspection and copying at the Department of Community Development, Ninth and Columbia Building, Olympia, Washington 98504, pursuant to these rules, except as otherwise provided by RCW 42.17.310.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-06-020, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-020, filed 9/1/76.]

WAC 51-06-070 Copying. The department of community development may charge a fee of twenty-five cents per page for providing copies of public records and for use of the office's copy equipment.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-06-070, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-070, filed 9/1/76.]

WAC 51-06-120 Address for communications. All requests for information, documentation, etc., should be submitted to the:

Washington State Building Code Council
Ninth and Columbia Building
Mailstop: GH-51
Olympia, Washington 98504-4151
(206) 753-2222

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-06-120, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-06-120, filed 9/1/76.]

Chapter 51-08 WAC

UNIFORM PROCEDURAL RULES

WAC

51-08-010 Uniform procedural rules.

WAC 51-08-010 Uniform procedural rules. The state building code council, hereinafter referred to as the council, adopts as its own rules of practice all those uniform procedural rules promulgated by the code reviser now codified in the Washington Administrative Code, as WAC 1-08-005 through 1-08-590, as now or hereinafter amended, subject to any additional rules the council may add from time to time. The council reserves the right to make whatever determination is fair and equitable should any question not covered by its rules come before the council, said determination to be in accordance with the spirit and intent of the law.

[Statutory Authority: Chapters 19.27 and 34.05 RCW and 1989 c 348. 90-02-108, § 51-08-010, filed 1/3/90, effective 2/3/90; Order 76-02, § 51-08-010, filed 9/1/76.]

Chapter 51-11 WAC

WASHINGTON STATE ENERGY CODE

WAC

51-11-0100	Chapter 1—Administration and enforcement.
51-11-0101	Section 101. Scope and general requirements.
51-11-0102	Materials and equipment.
51-11-0103	Alternate materials—Method of construction, design or insulating systems.
51-11-0104	Plans and specifications.
51-11-0105	Inspections and enforcement.
51-11-0106	Violations.
51-11-0107	Liability.
51-11-0108	Conflicts with other codes.
51-11-0109	Severability.
51-11-0200	Chapter 2—Definitions.
51-11-0201	General definitions.
51-11-0300	Chapter 3—Design conditions.
51-11-0301	Design criteria.
51-11-0302	Thermal design parameters.
51-11-0303	Mechanical ventilation.
51-11-0400	Chapter 4—Building design by systems analysis.
51-11-0401	Scope.
51-11-0402	Systems analysis.
51-11-0500	Chapter 5—Building design by component performance approach.
51-11-0501	Scope.
51-11-0502	Building envelope requirements.
51-11-0503	Building mechanical systems.
51-11-0504	Service water heating.
51-11-0505	Electrical power and lighting.
51-11-0525	Equation 1—Group R Occupancy.
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51-11-0528	Equation 4—Other than Group R Occupancy.
51-11-0529	Equation 5—Other than Group R Occupancy.
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51-11-0602	Building envelope requirements for group R occupancy.
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51-11-0604	Electric power and lighting for group R occupancy.
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51-11-0606	Building mechanical systems requirements for other than Group R occupancies.
51-11-0607	Service water heating requirement for other than Group R occupancies.
51-11-0608	Electrical power and lighting requirements for other than Group R occupancies.
51-11-0625	Table 6-1.
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51-11-0627	Table 6-3.
51-11-0628	Table 6-4.
51-11-0629	Table 6-5.
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51-11-0700	Chapter 7—Standards.
51-11-0701	Standards.
51-11-0800	Section 0800—Suggested software for chapter 4 systems analysis approach for Group R occupancy.
51-11-0900	Section 0900—Prescriptive heating system sizing.
51-11-1000	Chapter 10.
51-11-1001	Section 1001 General.
51-11-1002	Section 1002: Below grade walls and slabs.
51-11-1003	Section 1003: On-grade slab floors.
51-11-1004	Section 1004: Crawlspace floors.
51-11-1005	Section 1005: Above-grade walls.
51-11-1006	Section 1006 Default u-values for glazing and doors.
51-11-1007	(Reserved.)
51-11-1008	Section 1007 Ceilings.
51-11-1009	Section 1008 Air infiltration.
51-11-1010	Section 1009 Mass.

WAC 51-11-0100 Chapter 1—Administration and enforcement.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0100, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0101 Section 101. Scope and general requirements.

101.1 Title: This Code shall be known as the "Washington State Energy Code" and may be cited as such; and will be referred to herein as "this Code."

101.2 Purpose and Intent: The purpose of this Code is to provide minimum standards for new or altered buildings and structures or portions thereof to achieve efficient use and conservation of energy.

The purpose of this Code is not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefitted by the terms of this Code.

It is intended that these provisions provide flexibility to permit the use of innovative approaches and techniques to achieve efficient use and conservation of energy. These provisions are structured to permit compliance with the intent of this Code by any one of the following three paths of design:

1. A systems analysis approach for the entire building and its energy-using sub-systems which may utilize renewable energy sources, Chapter 4.

2. A component performance approach for various building elements and mechanical systems and components, Chapter 5.

3. A prescriptive requirements approach, Chapter 6.

Compliance with any one of these approaches meets the intent of this Code. This Code is not intended to abridge any safety or health requirements required under any other applicable codes or ordinances.

The provisions of this Code do not consider the efficiency of various energy forms as they are delivered to the building envelope. A determination of delivered energy efficiencies in conjunction with this Code will provide the most efficient use of available energy in new building construction.

101.3 Scope: This Code sets forth minimum requirements for the design of new buildings and structures that provide facilities or shelter for public assembly, educational, business, mercantile, institutional, storage and residential occupancies, as well as those portions of factory and industrial occupancies designed primarily for human occupancy by regulating their exterior envelopes and the selection of their HVAC, service water heating, electrical distribution and illuminating systems and equipment for efficient use and conservation of energy.

Buildings shall be designed to comply with the requirements of either Chapter 4, 5, or 6 of this Code.

101.3.1 Exempt Buildings: Buildings and structures or portions thereof meeting any of the following criteria shall be exempt from the building envelope requirements of sections 502 and sections 602 and 605, but shall comply with all other requirements for building mechanical systems, service water heating and lighting systems.

101.3.1.1: Buildings and structures or portions thereof whose peak design rate of energy usage is less than three and four tenths (3.4) Btu/h per square foot or one point zero (1.0) watt per square foot of floor area for space conditioning requirements.

101.3.1.2: Buildings and structures or portions thereof which are neither heated according to the definition of heated space in Chapter 2, nor cooled by a non-renewable energy source, provided that the non-renewable energy use for space conditioning complies with requirements of section 101.3.1.1.

101.3.1.3: Greenhouses isolated from any conditioned space and not intended for occupancy.

101.3.2 Application to Existing Buildings: Additions, historic buildings, changes of occupancy or use, and alterations or repairs shall comply with the requirements in the subsections below.

EXCEPTION: The building official may approve designs of alterations or repairs which do not fully conform with all of the requirements of this Code where in the opinion of the building official full compliance is physically impossible and/or economically impractical and:

1. The alteration or repair improves the energy efficiency of the building; or

2. The alteration or repair is energy efficient and is necessary for the health, safety, and welfare of the general public.

In no case, shall building envelope requirements or mechanical system requirements be less than those requirements in effect at the time of the initial construction of the building.

101.3.2.1 Additions to Existing Buildings: Additions to existing buildings or structures may be made to such buildings or structures without making the entire building or structure comply, provided that the new additions shall conform to the provisions of this Code.

EXCEPTION: New additions which do not fully comply with the requirements of this Code and which have a floor area which is less than seven hundred fifty square feet shall be approved provided that improvements are made to the existing occupancy to compensate for any deficiencies in the new addition. Compliance shall be demonstrated by either systems analysis or component performance calculations. The nonconforming addition and upgraded, existing occupancy shall have an energy budget or heat loss which is less than or equal to the unimproved existing building, with the addition designed to comply with this Code.

101.3.2.2 Historic Buildings: The building official may modify the specific requirements of this Code for historic buildings and require in lieu thereof alternate requirements which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings which have been specifically designated as historically significant by the state or local governing body, or listed in The National Register of Historic Places or which have been determined to be eligible for listing.

101.3.2.3 Change of Occupancy or Use:

1. Any Other than Group R Occupancy which is presently unconditioned where the occupancy or use is changed to require conditioning shall be required to be brought into full compliance with this Code.

2. The use or occupancy of any Other than Group R Occupancies which are presently conditioned may be changed without complying with this code, provided additional heat or cooling is not added.

3. Any Other than Group R Occupancy which is converted to Group R Occupancy shall be brought into full compliance with this Code.

4. Any Group R Occupancy which is converted to Other than Group R Occupancy shall be required to comply with all of the provisions of this code if either new or increased heating or cooling is provided.

5. All Occupancies, which are converted from a Group R Occupancy or an Other than Group R Occupancy or use, to a new Other than Group R Occupancy or use shall comply with the lighting standards set forth in this code unless the existing lighting is not altered.

101.3.2.4 Alterations and Repairs: All alterations and repairs to buildings or portions thereof originally constructed subject to the requirements of this Code shall conform to the provisions of this Code without exception. For all other existing buildings, initial tenant alterations shall comply with the new construction requirements of this Code. Other

alterations and repairs may be made to existing buildings and moved buildings without making the entire building comply with all of the requirements of this Code for new buildings, provided the following requirements are met:

101.3.2.5 Building Envelope: The result of the alterations or repairs both:

1. Improves the energy efficiency of the building, and

2. Complies with the overall average thermal transmittance values of the elements of the exterior building envelope in Table 5-1 or 5-2 of Chapter 5 or the nominal R-values and glazing requirements of the reference case in Tables 6-1 to 6-6 or 6-7.

EXCEPTIONS:

1. Untested storm windows may be installed over existing glazing for an assumed U-value of 0.90, however, where glass and sash are being replaced in Group R Occupancy, glazing with a maximum area weighted average U-value of 0.40 shall be installed where there is an electric resistance space heating system and glazing with a maximum U-value of 0.65 (Climate Zone I) and 0.60 (Climate Zone II) shall be installed where there is any other space heating system.

2. Where the structural elements of the altered portions of roof/ceiling, wall or floor are not being replaced, these elements shall be deemed to comply with this Code if all existing framing cavities which are exposed during construction are filled to the full depth with batt insulation or insulation having an equivalent nominal R-value while, for roof/ceilings, maintaining the required space for ventilation. Existing walls and floors without framing cavities need not be insulated. Existing roofs shall be insulated to the requirements of this Code if

- a. The roof is uninsulated or insulation is removed to the level of the sheathing, or

- b. All insulation in the roof/ceiling was previously installed exterior to the sheathing or nonexistent.

101.3.2.6 Building Mechanical Systems: Those parts of systems which are altered or replaced shall comply with section 503 of this Code.

101.3.2.7 Service Water Heating: Those parts of systems which are altered or replaced shall comply with section 504.

101.3.2.8 Lighting: Those parts of systems which are altered or replaced in buildings initially constructed subject to the requirements of this Code shall comply with section 505. Other remodels or replacements of lighting systems which are part of a substantial remodel shall comply with sections 505. In addition, remodeling of any size area with or without putting a new ceiling grid or suspension system when reusing existing fixtures and/or adding new ones shall not require compliance with the lighting power budget as long as the installed wattage is maintained or reduced. Remodeling of an entire floor or an entire tenant space that includes a new lighting system with or without a new ceiling grid or suspension system shall require compliance of a lighting power budget of section 505. Compliance with switching requirements of section 505.2 is only required when new wiring is being run related to adding fixtures and/or fixtures are being relocated to a new circuit.

101.3.3 Mixed Occupancy: When a building houses more than one occupancy, each portion of the building shall conform to the requirements for the occupancy housed

therein. Where approved by the building official, where minor accessory uses do not occupy more than ten percent of the area of any floor of a building, the major use may be considered the building occupancy.

101.4 Amendments by Local Government: Except as provided in RCW 19.27A.020(7), this Code shall be the maximum and minimum energy code for Group R Occupancy in each town, city and county, no later than July 1, 1991. This Code shall be the minimum energy code for all other than Group R Occupancies in each town, city and county.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0101, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0102 Materials and equipment.

102.1 Identification: All materials and equipment shall be identified in order to show compliance with this Code.

102.2 Maintenance Information: Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. Such label may be limited to identifying, by title or publication number, the operation and maintenance manual for that particular model and type of product. Maintenance instructions shall be furnished for any equipment which requires preventive maintenance for efficient operation.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0102, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0103 Alternate materials—Method of construction, design or insulating systems. The provisions of this Code are not intended to prevent the use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the building official as meeting the intent of this Code. The building official may approve any such alternate provided he finds the proposed alternate meets or exceeds the provisions of this Code and that the material, method, design or work offered is for the purpose intended, at least the equivalent of that prescribed in this Code, in quality, strength, effectiveness, fire-resistance, durability, safety, and efficient use and conservation of energy. The building official may require that sufficient evidence of proof be submitted to substantiate any claims that may be made regarding performance capabilities.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0103, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0104 Plans and specifications.

104.1 General: If required by the building official, plans and specifications shall be submitted in support of an application for a building permit. If required by the building official, plans and specifications shall be stamped and authenticated by a registered design professional currently licensed in the state of Washington. If required by the building official, all energy calculations submitted under the provisions of Chapter 4 for Other than Group R Occupancy shall be stamped and authenticated by an engineer or architect licensed to practice by the state. All plans and specifications, together with supporting data, shall be

submitted to the building official prior to issuance of a building permit.

104.2 Details: The plans and specifications shall show in sufficient detail all pertinent data and features of the building and the equipment and systems as herein governed including, but not limited to: design criteria, exterior envelope component materials, U-values of the envelope systems, R-values of insulating materials, size and type of apparatus and equipment, equipment and systems controls and other pertinent data to indicate compliance with the requirements of this Code.

The building official may accept the professional stamp of an architect or engineer licensed to do business by the state in lieu of a plan and specification check if the engineer or architect stipulates to the best of his knowledge, understanding and belief, the design meets the requirements of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0104, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0105 Inspections and enforcement.

105.1 General: All construction or work for which a permit is required shall be subject to inspection by the building official and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the building official.

105.2 Approvals Required: No work shall be done on any part of the building or structure beyond the point indicated in each successive inspection without first obtaining the approval of the building official.

105.2.1 Required Inspections: The building official, upon notification, shall make the following inspection in addition to those inspections required in section 305(e) of the Washington State Uniform Building Code:

1. **Wall insulation inspection:** To be made after all wall insulation and air vapor retarder sheet or film materials are in place, but before any wall covering is placed.

105.3 Reinspection: The building official may require a structure to be reinspected.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0105, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0106 Violations. It shall be unlawful for any person, firm, or corporation to erect or construct any building, or remodel or rehabilitate any existing building or structure in the state, or allow the same to be done, contrary to or in violation of any of the provisions of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0106, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0107 Liability. Nothing contained in this Code is intended to be nor shall be construed to create or form the basis for any liability on the part of any city or county or its officers, employees or agents for any injury or damage resulting from the failure of a building to conform to the provisions of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0107, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0108 Conflicts with other codes. In addition to the requirements of this Code, all occupancies shall conform to the provisions included in the State Building Code (chapter 19.27 RCW) and Uniform Building Code and Standards Adoption and Amendment rules and (chapter 51-16 WAC). In case of conflicts among codes enumerated in RCW 19.27.031 (1), (2), (3), and (4) and this Code, the first named code shall govern over the following. Provided, in the case of conflict between the duct insulation requirements of this Code and the duct insulation requirements of section 1005 of the Uniform Mechanical Code, the duct insulation requirements of this Code, or where applicable, a local jurisdiction's energy code shall govern.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Wherever in this Code reference is made to the appendix, the provisions in the appendix shall not apply unless specifically adopted.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0108, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0109 Severability. If any provision of this Code or its application to any person or circumstance is held invalid, the remainder of this Code or the application of the provision to other persons or circumstances is not affected.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0109, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0200 Chapter 2—Definitions.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0200, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0201 General definitions.

201.1 Application of Terms: For the purposes of this Code, certain abbreviations, terms, phrases, words and their derivatives, shall be as set forth in this chapter. Where terms are not defined, they shall have their ordinary accepted meanings within the context with which they are used. In the event there is a question about the definition of a term, the definitions for terms in the codes enumerated in RCW 19.27.031 and the edition of Webster's dictionary referenced therein shall be considered as the sources for providing ordinarily accepted meanings.

AAMA: American Architectural Manufacturers Association

Accepted analysis methods: Heating/cooling and lighting load calculations performed in accordance with the most current procedures developed by a nationally recognized professional organization and approved by the Building Official.

Addition: See the Washington State Building Code.

Advanced framed ceiling: Advanced framing assumes full and even depth of insulation extending to the outside edge of exterior walls. (See Standard Framing.)

Advanced framed walls: Studs framed on twenty-four inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and one stud is used to support each header. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

AFUE. Annual fuel utilization efficiency: Unlike steady state conditions, this rating is based on average usage including on and off cycling as set out in the standardized Department of Energy Test Procedures.

Air conditioning, comfort: The process of treating air to control simultaneously its temperature, humidity, cleanliness and distribution to meet requirements of the conditioned space.

Air transport factor: The ratio of the rate of useful sensible heat removal from the conditioned space to the energy input to the supply and return fan motor(s), expressed in consistent units and under the designated operating conditions.

ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.

ASTM: American Society for Testing and Materials

Automatic: Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature or mechanical configuration. (See **Manual**.)

Basement Wall: The opaque portion of a wall which encloses a basement and is partially or totally below grade.

Below grade walls: Walls or the portion of walls which are entirely below the finish grade or which extend two feet or less above the finish grade.

Building, existing: See the Washington State Building Code.

Boiler capacity: The rate of heat output in Btu/h measured at the boiler outlet, at the design inlet and outlet conditions and rated fuel/energy input.

Building envelope: The elements of a building which enclose conditioned spaces through which thermal energy may be transferred to or from the exterior or to or from spaces exempted by the provisions of Section 101.3.1.

Building official: The official authorized to act in behalf of a jurisdiction code enforcement agency or its authorized representative.

Building project: A building or group of buildings, including on-site energy conversion or electric-generating facilities, which utilize a single submittal for a construction permit or are within the boundary of a contiguous area under one ownership.

Clerestory: A window placed in a wall projecting from a roof plane at sixty degrees or more from the horizontal to admit daylight into the interior of a building. (See **Skylight**.)

Comfort Envelope: The area on a psychrometric chart enclosing all those conditions described in Standard RS-4, Figure No. 1, as being comfortable.

Conditioned space: All spaces which are provided with heated and/or cooled air or which are capable of being maintained at temperatures over fifty degrees F during the heating season, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors).

Continuous air barrier: A system of materials installed during construction that is designed to effectively minimize the transfer of air to or from the conditioned space through [through] unintentional openings in the building envelope.

Cooled space: Space within a building which is provided with a positive cooling supply.

COP - Coefficient of performance: The ratio of the rate of net heat output (heating mode) or heat removal (cooling mode) to the rate of total on-site energy input to the heat pump, expressed in consistent units and under designated rating conditions. (See Net Heat Output, Net Heat Removal, Total On-Site Energy Input.)

Deadband: The temperature range in which no heating or cooling is used.

Degree day, heating: A unit, based upon temperature difference and time, used in estimating fuel consumption and specifying nominal heating load of a building in winter. For any one day when the mean temperature is less than sixty-five degrees F there exist as many degree days as there are Fahrenheit degrees difference in temperature between the mean temperature for the day and sixty-five degrees F.

Door area: Total area of door measured using the rough opening and including the door and frame.

Dwelling unit: See the Washington State Building Code.

EER. Energy efficiency ratio: The ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions.

Efficiency, HVAC system: The ratio of useful energy (at the point of use) to the energy input for a designated time period, expressed in percent.

Emissivity: The ability to absorb infrared radiation. A low emissivity implies a higher reflectance of infrared radiation.

Energy: The capacity for doing work; taking a number of forms which may be transformed from one into another, such as thermal (heat), mechanical (work), electrical and chemical; in customary units, measured in kilowatt-hours (kWh) or British thermal units (Btu). (See **New energy**.)

Energy, recovered: (See **Recovered energy**.)

Exterior envelope: (See **Building envelope**.)

Floor over unconditioned space: A floor which separates a conditioned space from an unconditioned space which is buffered from exterior ambient conditions including vented crawlspaces and unconditioned basements or other similar spaces, or exposed to exterior ambient conditions including open parking garages and enclosed garages which are mechanically ventilated.

F-Value: The perimeter heat loss factor expressed in Btu/hr•ft•°F.

Glazing: All areas, including the frames, in the shell of a conditioned space that let in natural light including windows, clerestories, skylights, sliding or swinging glass doors and glass block walls.

Glazing area: Total area of the glazing measured using the rough opening, and including the glazing, sash, and frame. For doors where the daylight opening area is less than fifty percent of the door area, the glazing area is the daylight opening area. For all other doors, the glazing area is the door area.

Gross conditioned floor area: The horizontal projection of that portion of interior space which is contained within exterior walls and which is conditioned directly or indirectly by an energy-using system, and which has an average height of five feet or greater, measured from the exterior faces.

Gross exterior wall area: The normal projection of the building envelope wall area bounding interior space which is conditioned by an energy-using system; includes opaque wall, window and door areas. The gross area of walls consists of all opaque wall areas, including foundation walls, between floor spandrels, peripheral edges of floors, window areas including sash, and door areas, where such surfaces are exposed to exterior ambient conditions and enclose a conditioned space including interstitial areas between two such spaces.

Gross floor area: The sum of the areas of the several floors of the building, including basements, cellars, mezzanine and intermediate floored tiers and penthouses of headroom height, measured from the exterior faces of exterior walls or from the center line of walls separating buildings, but excluding: Covered walkways, open roofed-over areas, porches and similar spaces. Pipe trenches, exterior terraces or steps, chimneys, roof overhangs and similar features.

Gross roof/ceiling area: The sum of the areas of the roof/ceiling assembly, consisting of the total interior surface area of all elements, including skylights, which enclose a conditioned space.

Guest room: See the Washington State Building Code.

Heat: The form of energy that is transferred by virtue of a temperature difference.

Heat storage capacity: The physical property of materials (mass) located inside the building envelope to absorb, store, and release heat.

Heated space: Space within a building which is provided with a positive heating supply. Finished living space within a basement or registers or heating devices designed to supply heat to a basement space shall automatically define that space as heated space. (See **Positive Heating Supply**.)

HSPF. Heating season performance factor: The total heating output (in Btu) of a heat pump during its normal annual usage period for heating divided by the total (watt hour) electric power input during the same period, as determined by test procedures consistent with the U.S. Department of Energy "Test Procedure for Central Air Conditioners, Including Heat Pumps" published in the December 27, 1979, Federal Register, Vol 44, No. 24, IOCFR. 430. When specified in Btu per watt hour an HSPF of 6.826 is equivalent to a COP of 2.0.

Humidistat: A regulatory device, actuated by changes in humidity, used for automatic control of relative humidity.

HVAC: Heating, ventilating and air conditioning.

HVAC system components: HVAC system components provide, in one or more factory-assembled packages, means for chilling and/or heating water with controlled temperature for delivery to terminal units serving the conditioned spaces of the buildings. Types of HVAC system components include, but are not limited to, water chiller packages, reciprocating condensing units and water source (hydronic) heat pumps. (See **HVAC system equipment**.)

HVAC system efficiency: (See Efficiency, HVAC system.)

HVAC system equipment: HVAC system equipment provides, in one (single package) or more (split system) factory-assembled packages, means for air circulation, air cleaning, air cooling with controlled temperature and dehumidification; and optionally, either alone or in combination with a heating plant, the functions of heating and humidifying. The cooling function may be either electrically or heat operated and the refrigerant condenser may be air, water or evaporatively cooled. Where the equipment is provided in more than one package, the separate packages shall be designed by the manufacturer to be used together. The equipment may provide the heating function as a heat pump or by the use of electric elements. (The word "equipment" used without modifying adjective may, in accordance with common industry usage, apply either to HVAC system equipment or HVAC system components.)

Illumination: The density of the luminous flux incident on a surface; it is the quotient of the luminous flux by the area of the surface when the latter is uniformly illuminated.

Infiltration: The uncontrolled inward air leakage through cracks and interstices in any building element and around windows and doors of a building caused by the pressure effects of wind and/or the effect of differences in the indoor and outdoor air density.

Insulation baffle: A rigid material, resistant to wind driven moisture, the purpose of which is to allow air to flow freely into the attic or crawl space and to prevent insulation from blocking the ventilation of these spaces, or the loss of insulation. Example materials for this purpose are sheet metal, or wax impregnated cardboard.

Luminaire: A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the electric power supply.

Manual: Capable of being operated by personal intervention. (See Automatic.)

Net heat output: The change in the total heat content of the air entering and leaving the equipment (not including supplementary heat and heat from boilers).

Net heat removal: The total heat content of the air entering and leaving the equipment (without heat) or the difference in total heat content of the water or refrigerant entering and leaving the component.

New energy: Energy, other than recovered energy, utilized for the purpose of heating or cooling. (See energy.)

Nominal R-value: The thermal resistance of insulation as specified by the manufacturer according to recognized trade and engineering standards.

Nonrenewable energy sources: All energy sources that are not renewable energy sources including natural gas, oil, coal, wood, liquified petroleum gas, steam, and any utility-supplied electricity.

Occupancy: See the Washington State Building Code.

Opaque envelope areas: All exposed areas of a building envelope which enclose conditioned space, except openings for windows, skylights, doors, glazing and building service systems.

Open blown: Loose fill insulation pneumatically installed in an unconfined attic space.

Outdoor air: Air taken from the outdoors and, therefore, not previously circulated through the system.

Packaged terminal air conditioner: A factory-selected combination of heating and cooling components, assemblies or sections intended to serve a room or zone. (For the complete technical definition, see Standard RS-10.)

Packaged terminal heat pump: A factory-selected combination of heating and cooling components, assemblies or sections intended for application in an individual room or zone. (For the complete technical definition, see Standard RS-21.)

Permeance (perm): The ability of a material of specified thickness to transmit moisture in terms of amount of moisture transmitted per unit time for a specified area and differential pressure (grains per hour \bullet ft² \bullet inches of HG). Permeance may be measured using ASTM E-96-72 or other approved dry cup method as specified in RS-1.

Pool cover: A vapor-retardant cover which lies on or at the surface of the pool.

Positive cooling supply: Mechanical cooling deliberately supplied to a space, such as through a supply register. Also, mechanical cooling indirectly supplied to a space through uninsulated surfaces of space cooling components, such as evaporator coil cases and cooling distribution systems which are capable of maintaining air temperatures within the space of eighty-five degrees F, or lower, at the exterior design conditions specified in Section 302.1. To be considered exempt from inclusion in this definition, such surfaces shall comply with the insulation requirements of this Code.

Positive heating supply: Heat deliberately supplied to a space by design, such as a supply register, radiator or heating element. Also, heat indirectly supplied to a space through uninsulated surfaces of service water heaters and space heating components, such as furnaces, boilers and heating and cooling distributions systems which are capable of maintaining air temperature within the space of fifty degrees F, or higher, at the exterior design conditions specified in Section 302.1. To be considered exempt from inclusion in this definition, such surfaces shall comply with the insulation requirements of this Code.

Power: In connection with machines, the time rate of doing work. In connection with the transmission of energy of all types, the rate at which energy is transmitted; in customary units, it is measured in watts (W) or British Thermal Units per hour (Btu/h).

Public facility rest room: A rest room used by the transient public on a regular (rather than casual) basis. Examples include rest rooms in service stations, airports, train terminals and convention halls. Rest rooms incorporated with private guest rooms in hotels, motels or dormitories and rest room facilities intended for the use of employees and not usually used by the general public are not considered public facility rest rooms.

Radiant slab: A slab on grade containing heated pipes, ducts, or electric heating cables that constitute a radiant slab or portion thereof for a complete or partial heating of the structure.

Readily accessible: See the Washington State Mechanical Code.

Recooling: The removal of heat by sensible cooling of the supply air (directly or indirectly) that has been previously

heated above the temperature to which the air is to be supplied to the conditioned space for proper control of the temperature of that space.

Recovered energy: Energy utilized which would otherwise be wasted (i.e. not contribute to a desired end use) from an energy utilization system.

Reheat: The application of sensible heat to supply air that has been previously cooled below the temperature of the conditioned space by either mechanical refrigeration or the introduction of outdoor air to provide cooling.

Renewable energy sources: Renewable energy sources of energy (excluding minerals) are derived from: (1) incoming solar radiation, including but not limited to, natural daylighting and photosynthetic processes; (2) energy sources resulting from wind, waves and tides, lake or pond thermal differences; and (3) energy derived from the internal heat of the earth, including nocturnal thermal exchanges.

Reset: Adjustment of the set point of a control instrument to a higher or lower value automatically or manually to conserve energy.

Roof/ceiling assembly: A roof/ceiling assembly shall be considered as all components of the roof/ceiling envelope through which heat flows, thus creating a building transmission heat loss or gain, where such assembly is exposed exterior ambient conditions to and encloses a conditioned space. The gross area of a roof/ceiling assembly consists of the total interior surface of such assembly, including skylights.

Room air conditioner: A packaged assembly designed as a unit primarily for mounting in a window or through a wall, or as a console, and designed to provide free delivery of conditioned air to an enclosed space, room or zone. It includes a prime source of refrigeration for cooling and dehumidification and means for circulating and cleaning air, and may also include means for ventilating and heating.

Sequence: A consecutive series of operations.

Service systems: All energy-using systems in a building that are operated to provide services for the occupants or processes housed therein, including HVAC, service water heating, illumination, transportation, cooking or food preparation, laundering or similar functions.

Service water heating: Supply of hot water for domestic or commercial purposes other than comfort heating.

Service water heating demand: The maximum design rate of energy withdrawal from a service water heating system in a designated period of time (usually an hour or a day).

Shaded: Glazed area which is externally protected from direct solar radiation by use of devices permanently affixed to the structure or by an adjacent building, topographical feature, or vegetation.

Shall: Denotes a mandatory code requirement.

Single family: One and two family residential dwelling units with no more than two units in a single building.

Skylight: A glazing surface that has a slope of less than sixty degrees from the horizontal plane.

Slab-on-grade, exterior: Any portion of a slab floor in contact with the ground which is less than or equal to twenty-four inches below the final elevation of the nearest exterior grade.

Slab-below-grade: Any portion of a slab floor in contact with the ground which is more than twenty-four inches below the final elevation of the nearest exterior grade.

Solar energy source: Source of natural daylighting and of thermal, chemical or electrical energy derived directly from conversion of incident solar radiation.

Standard framing: All framing practices not defined as "intermediate" or "advanced" shall be considered standard. (See Advanced framed ceiling, Advanced framed walls, Intermediate framed wall.)

Substantial contact: A condition where adjacent building materials are placed in a manner that proximal surfaces are contiguous, being installed and supported as to eliminate voids between materials, without compressing or degrading the thermal performance of either product.

Substantially remodeled or rehabilitated: Any alteration or restoration of a building or structure within any twelve-month period, the cost of which exceeds sixty percent of the current replacement value of the particular building or structure.

System: A combination of central or terminal equipment or components and/or controls, accessories, interconnecting means, and terminal devices by which energy is transformed so as to perform a specific function, such as HVAC, service water heating or illumination.

Tapering: Installation of a reduced level of ceiling insulation at the eaves, due to reduced clearance.

Terminal element: The means by which the transformed energy from a system is finally delivered; i.e. registers, diffusers, lighting fixtures, faucets and similar elements.

Thermal by-pass: An area where the envelope surrounding the conditioned space is breached, or where an ineffective application compromises the performance of a thermal or infiltration barrier, increasing the structure's energy consumption by exposing finished surfaces to ambient conditions and additional heat transfer.

Thermal conductance (C): Time rate of heat flow through a body (frequently per unit area) from one of its bounding surfaces to the other for a unit temperature difference between the two surfaces, under steady conditions ($\text{Btu/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}$).

Thermal resistance (R): The reciprocal of thermal conductance ($\text{hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}/\text{Btu}$).

Thermal transmittance (U): The coefficient of heat transmission (air to air). It is the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films ($\text{Btu/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}$). The U-value applies to the fractional combinations of different materials used in series along the heat flow path.

Thermal transmittance, overall (U^o): The overall (average) heat transmission of a gross area of the exterior building envelope ($\text{Btu/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F}$). The U^o-value applies to the combined effect of the time rate of heat flows through the various parallel paths, such as windows, doors and opaque construction areas, comprising the gross area of one or more exterior building components, such as walls, floors or roof/ceiling.

Thermostat: An automatic control device actuated by temperature and designed to be responsive to temperature.

Total on-site energy input: The combination of all the energy inputs to all elements and accessories as included in

the equipment components, including but not limited to, compressor(s), compressor sump heater(s), circulating pump(s), purge devices, fan(s), and the HVAC system component control circuit.

Transmission coefficient: The ratio of the solar heat gain through a glazing system to that of an unshaded single pane of double strength window glass under the same set of conditions.

U-Value: See thermal transmittance.

Uniform Building Code: The Washington State Uniform Building Code as modified by the Washington State Building Code Council.

Uniform Mechanical Code: The Washington State Uniform Mechanical Code as modified by the Washington State Building Code Council.

Unitary cooling and heating equipment: One or more factory-made assemblies which include an evaporator or cooling coil, a compressor and condenser combination, and may include a heating function as well. Where such equipment is provided in more than one assembly, the separate assemblies shall be designed to be used together.

Unitary heat pump: One or more factory-made assemblies which include an indoor conditioning coil, compressor(s) and outdoor coil or refrigerant-to-water heat exchanger, including means to provide both heating and cooling functions. When such equipment is provided in more than one assembly, the separate assemblies shall be designed to be used together.

Vapor retarder: A layer of low moisture transmissivity material (not more than 1.0 perm dry cup) placed over the warm side (in winter) of insulation, over the exterior of below grade walls, and under floors as ground cover to limit the transport of water and water vapor through exterior walls, ceilings, and floors. Vapor retarding paint, listed for this application, also complies with this Code.

Vaulted ceilings: All ceilings where enclosed joist or rafter space is formed by ceilings applied directly to the underside of roof joists or rafters.

Ventilation: The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.

Ventilation air: That portion of supply air which comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

Walls (exterior): Any member or group of members which defines the exterior boundaries or courts of a building and which have a slope of sixty degrees or greater with the horizontal plane, and separates conditioned from unconditioned space. Band joists between floors are to be considered a part of exterior walls.

Water-chilling package of absorption: A factory-designed and prefabricated assembly (not necessarily shipped as a single package) of one or more condensers, evaporators (water coolers), absorbers and generators with interconnections and accessories used for chilling water.

Water-chilling package, centrifugal or rotary: A factory-designed and prefabricated assembly (not necessarily shipped as one package) or one or more centrifugal or rotary compressors, condensers and water coolers (evaporators) with interconnections and accessories used for chilling water.

Water-chilling package, reciprocating: A factory-designed and prefabricated assembly, self-contained or condenserless, of one or more reciprocating compressors, condenser (self-contained only), water coolers (evaporator) and interconnections and accessories used for chilling water. The condenser may be air, evaporatively or water cooled.

Zone: A space or group of spaces within a building with heating and/or cooling requirements sufficiently similar so that comfort conditions can be maintained throughout by a single controlling device. Each dwelling unit in residential buildings shall be considered a single zone.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0201, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0300 Chapter 3—Design conditions.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0300, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0301 Design criteria.

301.1 General:

The criteria of this chapter establish the design conditions upon which the minimum thermal design requirements of the building envelope and the design of the HVAC system are to be based.

301.2 Heating and Cooling: A building that is designed to be both heated and cooled shall meet the more stringent of the heating or cooling requirements as required in this code when requirements of the exterior envelope differ.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0301, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0302 Thermal design parameters.

302.1 Exterior Design Conditions: The heating or cooling outdoor design temperatures shall be selected from 0.6 percent column for winter and 0.5 percent column for summer from the Puget Sound Chapter of ASHRAE publication "Recommended Outdoor Design Temperatures, Washington State, ASHRAE." (See also Washington State Energy Code Manual.)

302.2 Interior Design Conditions:

302.2.1 Indoor Design Temperature: Indoor design temperature shall be seventy degrees F for heating and seventy-eight degrees F for cooling.

EXCEPTION: Other design temperatures may be used for equipment selection if it results in a lower energy usage.

302.2.2 Humidification: If humidification is provided during heating, it shall be designed for a maximum relative humidity of thirty percent. When comfort air conditioning is provided, the actual design relative humidity within the comfort envelope as defined in Standard RS-4, listed in Chapter 7, shall be selected for minimum total HVAC system energy use.

302.3 Climate Zones: All buildings shall comply with the requirements of the appropriate climate zone as defined herein.

ZONE 1: Climate Zone 1 shall include all counties not included in Climate Zone 2.

ZONE 2: Climate Zone 2 shall include: Adams, Chelan, Douglas, Ferry, Grant, Kittitas, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, and Whitman counties.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0302, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0303 Mechanical ventilation. For all Occupancies, the minimum requirements for ventilation shall comply with the Washington State Ventilation Code and Indoor Air Quality Code. (WAC 51-13)

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0303, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0400 Chapter 4—Building design by systems analysis.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0400, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0401 Scope.

401.1 General: This chapter establishes design criteria in terms of total energy use by a building, including all of its systems. Analysis of design for all Group R Occupancy shall comply with section 402.1 to 402.6. Analysis of design for other buildings shall comply with sections 402.2 to 402.6.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0401, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0402 Systems analysis.

402.1 Special Requirements for All Group R Occupancy:

402.1.1 Energy Budgets: Proposed buildings designed in accordance with this section shall be designed to use no more energy from non-renewable sources for space heating, and domestic hot water heating than a standard building whose enclosure elements and energy consuming systems are designed in accordance with section 502.2 of this Code for the appropriate climate zone, and heating system type. Energy derived from renewable sources may be excluded from the total annual energy consumption attributed to the alternative building.

402.1.2 Calculation of Energy Consumption: The application for a building permit shall include documentation which demonstrates, using a calculation procedure as listed in Chapter 8, or an approved alternate, that the proposed building's annual space heating energy use does not exceed the annual space heating and water heating energy use of a standard building conforming to Chapter 5 of this Code for the appropriate climate zone. The total calculated annual energy consumption shall be shown in units of kWh/ft²/year or Btu/ft²/year of conditioned area.

402.1.3 Input Values: The following standardized input values shall be used in calculating annual space heating budgets:

PARAMETER	VALUE
Thermostat set point, heating	65° F
Thermostat set point, cooling	78° F
Thermostat night set back	65° F
Thermostat night set back period	0 hours
Internal gain	
R-3 units	3000 Btu/hr
R-1 units	1500 Btu/hr
Domestic Hot Water Heater Setpoint	120° F
Domestic Hot Water Consumption	20 gallons/person/day.
Minimum heat storage	Calculated using standard engineering practice for the actual building or as approved.
Site weather data	Typical meteorological year (TMY) or ersatz TMY data for the closest appropriate TMY site or other site as approved.
Heating equipment efficiency	
Electric resistance heat	1.00
Heat Pumps	6.80 HSPF.
Other Fuels	0.78 AFUE.

The standard building shall be modeled with glazing area distributed equally among the four cardinal directions. Parameter values that may be varied by the building designer to model energy saving options include, but are not limited to, the following:

1. Overall thermal transmittance, U°, of building envelope or individual building components;
2. Heat storage capacity of building;
3. Glazing orientation; area; and shading coefficients;
4. Heating system efficiency.

402.1.4 Solar Shading and Access: Building designs using passive solar features with eight percent or more south facing equivalent glazing to qualify shall provide to the building official a sun chart or other approved documentation depicting actual site shading for use in calculating compliance under this section. The building shall contain at least forty-five Btu/°F for each square foot of south facing glass.

402.1.5 Infiltration: Infiltration levels used shall be set at 0.35 air changes per hour for thermal calculation purposes only.

402.1.6 Heat Pumps: The heating season performance factor (HSPF) for heat pumps shall be calculated using procedures consistent with section 5.2 of the U.S. Department of Energy Test Procedure for Central Air Conditioners, including heat pumps published in the December 27, 1979

Federal Register Vol. 44, No. 24.10 CFR 430. Climate data as specified above, the proposed buildings overall thermal performance value (Btu/°F) and the standardized input assumptions specified above shall be used to model the heat pumps HSPF.

402.2 Energy Analysis: Compliance with this chapter will require an analysis of the annual energy usage, hereinafter called an annual energy analysis.

EXCEPTION: Chapters 5, and 6 of this Code establish criteria for different energy-consuming and enclosure elements of the building which, will eliminate the requirement for an annual systems energy analysis while meeting the intent of this Code.

A building designed in accordance with this chapter will be deemed as complying with this Code if the calculated annual energy consumption is not greater than a similar building (defined as a "standard design") whose enclosure elements and energy-consuming systems are designed in accordance with Chapter 5.

For an alternate building design to be considered similar to a "standard design," it shall utilize the same energy source(s) for the same functions and have equal floor area and the same ratio of envelope area to floor area, environmental requirements, occupancy, climate data and usage operational schedule.

402.3 Design: The standard design, conforming to the criteria of Chapter 5 and the proposed alternative design shall be designed on a common basis as specified herein:

The comparison shall be expressed as kBtu or kWh input per square foot of conditioned floor area per year at the building site.

402.4 Analysis Procedure: The analysis of the annual energy usage of the standard and the proposed alternative building and system design shall meet the following criteria:

a. The building heating/cooling load calculation procedure used for annual energy consumption analysis shall be detailed to permit the evaluation of effect of factors specified in section 402.5.

b. The calculation procedure used to simulate the operation of the building and its service systems through a full-year operating period shall be detailed to permit the evaluation of the effect of system design, climatic factors, operational characteristics, and mechanical equipment on annual energy usage. Manufacturer's data or comparable field test data shall be used when available in the simulation of systems and equipment. The calculation procedure shall be based upon eight thousand seven hundred sixty hours of operation of the building and its service systems.

402.5 Calculation Procedure: The calculation procedure shall cover the following items:

a. Design requirements—Environmental requirements as required in Chapter 3.

b. Climatic data—Coincident hourly data for temperatures, solar radiation, wind and humidity of typical days in the year representing seasonal variation.

c. Building data—Orientation, size, shape, mass, air, moisture and heat transfer characteristics.

d. Operational characteristics—Temperature, humidity, ventilation, illumination, control mode for occupied and unoccupied hours.

e. Mechanical equipment—Design capacity, part load profile.

f. Building loads—Internal heat generation, lighting, equipment, number of people during occupied and unoccupied periods.

EXCEPTION: Group R Occupancy shall comply with calculation procedures in Chapter 8, or an approved alternate.

402.6 Documentation: Proposed alternative designs, submitted as requests for exception to the standard design criteria, shall be accompanied by an energy analysis comparison report. The report shall provide technical detail on the two building and system designs and on the data used in and resulting from the comparative analysis to verify that both the analysis and the designs meet the criteria of Chapter 4 of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0402, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0500 Chapter 5—Building design by component performance approach.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0500, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0501 Scope.

501.1 General: Buildings that are heated or mechanically cooled shall be constructed so as to provide the required thermal performance of the various components. A building that is designed to be both heated and cooled shall meet the more stringent of the heating or cooling requirements as provided in this Code when requirements of the exterior envelope differ.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0501, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0502 Building envelope requirements.

502.1 General:

502.1.1: The stated U- or F-value of any component assembly, listed in Table 5-1 or 5-2, such as roof/ceiling, opaque wall or opaque floor may be increased and the U-value for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-values specified in this Section.

The U-values for typical construction assemblies are included in Chapter 10. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 10, values shall be calculated in accordance with Chapters 19-27 in RS-1 listed in Chapter 7, using the framing factors listed in Chapter 10 where applicable.

For envelope assemblies containing metal framing, the U-value shall be determined by one of the following methods:

1. Results of laboratory or field measurements.
2. Standard RS-25, listed in Chapter 7, where the metal framing is bonded on one or both sides to a metal skin or covering.
3. The zone method as provided in Chapter 22 of RS-1, listed in Chapter 7.
4. Effective framing/cavity R-values as provided from the following table for metal stud walls:

WALL FRAMING	CAVITY INSULATION	
	R-11	R-19
2 x 4 @ 16" o.c.	5.50	-
2 x 4 @ 24" o.c.	6.60	-
2 x 6 @ 16" o.c.	-	7.60
2 x 6 @ 24" o.c.	-	8.55

502.1.2: For consideration of thermal mass effects, see section 402.4.

502.1.3: When return air ceiling plenums are employed, the roof/ceiling assembly shall:

- a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and
- b. For gross area purposes, be based upon the interior face of the upper plenum surface.

502.1.4 Insulation:

502.1.4.1 General: All insulating materials shall comply with sections 1712 and/or 1713 of the Uniform Building Code. Substantial contact of the insulation with the surface being insulated is required. All insulation materials shall be installed according to the manufacturer's instructions to achieve proper densities, and maintain uniform R-values. To the maximum extent possible, insulation shall extend over the full component area to the intended R-value.

502.1.4.2 Insulation Materials: All insulation materials including facings such as vapor barriers or breather papers installed within floor/ceiling assemblies, roof/ceiling assemblies, walls, crawl spaces, or attics shall have a flame spread rating of less than twenty-five and a smoke density not to exceed four hundred fifty when tested in accordance with UBC Standard 42-1.

- EXCEPTIONS:
1. Foam plastic insulation shall comply with section 1712 of the Uniform Building Code.
 2. When such materials are installed in concealed spaces of Types III, IV, and V construction, the flame spread and smoke developed limitations do not apply to facing, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor, or wall finish.
 3. Cellulose insulation shall comply with section 1713 of the Uniform Building Code.

502.1.4.3 Clearances: Where required, insulation shall be installed with clearances according to manufacturers specifications. Insulation shall be installed so that required ventilation is unobstructed. For blown or poured loose fill insulation clearances shall be maintained through installation of a permanent retainer.

502.1.4.4 Access Hatches and Doors: Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer must be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

502.1.4.5 Roof/Ceiling Insulation: Open-blown or poured loose-fill insulation may be used in attic spaces where the slope of the ceiling is not more than three feet in twelve and there is at least thirty inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation. Baffles shall be, rigid material, resistant to wind driven moisture. Requirements for baffles for ceiling insulation shall meet the Uniform Building Code section 3205(c) for minimum ventilation requirements. When feasible, the baffles shall be installed from the top of the outside of the exterior wall, extending inward, to a point six inches vertically above the height of noncompressed insulation, and twelve inches vertically above loose fill insulation.

502.1.4.6 Wall Insulation: Insulation installed in exterior walls shall comply with the provisions of this section. All wall insulation shall fill the entire cavity. Exterior wall cavities isolated during framing shall be fully insulated to the levels of the surrounding walls. All faced insulation shall be face stapled to avoid compression.

502.1.4.7 Floor Insulation: Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is no more than twenty-four inches on center. Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation.

EXCEPTION: Insulation may be omitted from floor areas over heated basements, heated garages, or underfloor areas used as HVAC supply plenums. See Uniform Mechanical Code section 1008 for underfloor supply plenum requirements. When foundation walls are insulated, the insulation shall be attached in a permanent manner. The insulation shall not block the airflow through foundation vents when installed. When foundation vents are not placed so that the top of the vent is below the lower surface of the floor insulation, a permanently attached baffle shall be installed at an angle of thirty degrees from horizontal, to divert air flow below the lower surface of the floor insulation.

502.1.4.8 Slab-On-Grade: Slab-on-grade insulation, installed inside the foundation wall, shall extend downward from the top of the slab for a minimum distance of twenty-four inches or downward and then horizontally beneath the slab for a minimum combined distance of twenty-four inches. Insulation installed outside the foundation shall extend downward to a minimum of twenty-four inches or to the frostline. Above grade insulation shall be protected.

EXCEPTION: For monolithic slabs, the insulation shall extend downward from the top of the slab to the bottom of the footing.

502.1.4.9 Radiant Slabs: The entire area of a radiant slab shall be thermally isolated from the soil, with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use. If a soil-gas control system is present below the radiant slab, which results in increased convective flow below the radiant slab, the radiant slab shall be thermally isolated from the sub-slab gravel layer.

502.1.4.10 Below-Grade Walls:

a. Below grade exterior wall insulation used on the exterior (cold) side of the wall shall extend from the top of the below-grade wall to the top of the footing and shall be approved for below-grade use. Above grade insulation shall be protected.

b. Insulation used on the interior (warm) side of the wall shall extend from the top of the below-grade wall to the below-grade floor level.

502.1.5 Glazing and Door U-Values: For Group R Occupancy, glazing and door U-values shall be determined in accordance with section 502.1.5.1. For other occupancies, glazing and door U-values shall be determined in accordance with either section 502.1.5.1 or 502.1.5.2.

502.1.5.1 Standard Procedure for Determination of Glazing and Door U-Values: U-values for glazing and doors, including all fire doors, shall be the tested U-values for thermal transmittance due to conduction resulting from either the AAMA 1503.1-88 test procedure or the ASTM C236-87 or C976-82 test procedures, provided that testing shall be conducted under established winter horizontal heat flow test conditions using fifteen mile per hour wind speed directed perpendicular to the exterior surface of the glazing as specified under AAMA 1503.1-88.

AAMA 1503.1-88 testing, shall be conducted by a laboratory accredited by AAMA to perform that test. ASTM C236-87 or C976-82 testing shall be conducted by an independent laboratory accredited by a nationally recognized accreditation program, independent of that laboratory. All tested U-values reported for listing by the state building code council after January 1, 1991, shall include certification by the manufacturer of gas content in the sealed insulated glass unit used for testing and in the production unit.

Product samples tested shall be production line units or representative of units as purchased by the consumer or contractor. Product sample sizes tested shall be in accordance with AAMA 1503.1-88, except that skylights shall be tested with a nominal two foot by four foot size, or a nominal four foot by four foot size. The installation of the test sample shall be in accordance with AAMA 1503.1-88, section 8.4. All testing performed after January 1, 1991, shall not include screens. All glazing and doors shall be identified with a label that states an overall product U-value that is no less than the actual tested U-value. The labeled U-value shall be used in all calculations to determine compliance with this Code. Sealed insulating glass shall conform to, or be in test for, ASTM E-774-81 level A.

EXCEPTIONS:

1. The exterior frame dimensions of the product sample size tested shall not deviate by more than three inches from the height and width specified, except that skylights are allowed to be tested in the closest production line size to that specified above.

2. Passive air inlets are not required to be part of the tested assembly.

3. Products tested prior to December 31, 1990, to AAMA 1503.1-80, ASTM C236-80 or C976-82 which are not in compliance with the test size requirement above, and which are in compliance with the product sample sizes in AAMA 1503.1-80, shall be acceptable until December 31, 1994.

4. Untested glazing and doors shall be assigned the default U-values listed in Chapter 10. The default values for the opaque portions of doors shall be those listed in Chapter 10, provided that the U-value listed for a door with a thermal break shall only be allowed if both the door and the frame have a thermal break.

5. The U-value of an insulated glazing product which has a 'grille pattern' installed between the glazing layers shall be deemed equal to the U-value of an insulated glazing product which is tested without a 'grille pattern' in between glazing layers, provided a minimum one-eighth inch air space exists between the 'grille pattern' and both glass lites.

6. For a glazing product which is manufactured with an alternative 'low-e coating' than the 'low-e coating' of the tested glazing product, the U-value shall be deemed equal provided that the alternative 'low-e coating' material has an equal or lower rated emissivity.

7. U-factors, either tested or simulated, labeled and certified in accordance with the National Fenestration Rating Council's (NFRC) procedure 100-91 are acceptable if based on model size AA.

502.1.5.2 Alternate Glazing and Door U-Values for Other Than Group R Occupancy: Glazing U-values for other than Group R Occupancy are also allowed to be taken from Table 13 of Chapter 27 of RS-1 listed in Chapter 7 or calculated in accordance with the procedures of Chapter 27 of RS-1 listed in Chapter 7 and door U-values are also allowed to be taken from Table 6 in Chapter 22 of RS-1 listed in Chapter 7.

502.1.6 Moisture Control:

502.1.6.1: Vapor retarders shall be installed on the warm side (in winter) of insulation as specified in the following cases.

EXCEPTION: Vapor retarder installed with not more than one-third of the nominal R-value between it and the conditioned space.

502.1.6.2 Floors: Floors separating conditioned space from unconditioned space shall have a vapor retarder installed. The vapor retarder shall have a one perm dry cup rating or less (i.e., four mil. polyethylene or kraft faced material).

502.1.6.3: Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of twelve inches shall be provided with a vapor retarder. Faced batt insulation where used as a vapor retarder shall be face stapled. Single rafter joist vaulted ceiling cavities [cavities] shall be of sufficient depth to allow a minimum one inch vented air space above the insulation.

502.1.6.4: Vapor retarders shall not be required in roof/ceiling assemblies where the ventilation space above the insulation averages twelve inches or greater.

502.1.6.5: Vapor retarders shall not be required where all of the insulation is installed between the roof membrane and the structural roof deck.

502.1.6.6 Wall Insulation: Walls separating conditioned space from unconditioned space shall have a vapor retarder installed. Faced batt insulation shall be face stapled.

502.1.6.7 Ground Cover: A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped twelve inches minimum at the joints and shall extend to the foundation wall.

EXCEPTION: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of three and one-half inches.

502.2 Thermal Criteria for Group R Occupancy:

502.2.1: The proposed UA as calculated using Equations 2 and 3 shall not exceed the Target UA as calculated using Equation 1. For the purpose of determining equivalent thermal performance, the glazing area for the target UA shall be calculated using figures in Table 5-1, and all the glazing shall be located in the wall area. The opaque door area shall be the same in the target UA and the proposed UA.

502.2.2 Space Heat Type: The following two categories comprise all space heating types:

1. Electric Resistance: Space heating systems which include baseboard units, radiant units, and forced air units as either the primary or secondary heating system.

EXCEPTION: Electric resistance systems for which the total electric heat capacity in each individual dwelling unit does not exceed the greater of: 1) One thousand watts per dwelling unit, or; 2) One watt per square foot of the gross floor area.

2. Other: All gas, wood, oil, and propane space heating systems, unless electric resistance is used as a secondary heating system, and all heat pump space heating systems. (See EXCEPTIONS, Electric Resistance, section 502.2.2 above.)

502.3 Thermal Performance Criteria For Other Than Group R Occupancies.

502.3.1: The overall thermal transmittance value (U^o) of the gross area of elements of the exterior building envelope of all buildings other than low-rise residential buildings shall not exceed the values given in Tables 5-2. Equations 2, 4 and 5 shall be used to determine acceptable combinations of building components and thermal properties to meet this requirement for heating. U^o and U^w are specified in units of:

Btu

hr. ● ft² ● °F

502.3.2 Slab on Grade Floors: For slab on grade floors the thermal resistance of the insulation around the perimeter of the floor shall not be less than the value given in Table 5-2.

502.3.3 Alternative Wall Allowance for Other Than Group R Occupancies: For other than Group R Occupancies, three stories or less, the maximum allowed value for

average thermal transmittance (U_o) of the exterior walls may be increased to the values given in Table 5-2 BUILDINGS OVER THREE CONDITIONED STORIES provided that at least one of the following criteria is also met:

1. Mechanical supply of outside air and mechanical exhaust of building air shall be automatically shut off and the duct closed for at least eight hours per day during hours of nonoccupancy, or

2. The primary source of heating for the building shall be one or more heat pumps meeting the provisions of section 503.4.2 or gas or oil combustion heating equipment with a minimum combustion efficiency of eighty-five percent for central heating plants and eighty percent for room and space heaters. This efficiency shall be determined in accordance with the provisions of section 503.4.3.

Provided further: That if both criteria are met, the maximum allowed value for thermal transmittance (U^o) of the exterior walls used in Table 5-2 may be increased by 0.05 in determining compliance with the provisions of the Code.

For walls with a wall weight of at least thirty lbs. per ft² (provided that walls constructed of hollow masonry units have cores filled with either grout, concrete, or with an insulating material with resistance per inch (R) of at least 2.25 ft²/hr.-°F/Btu) the calculated thermal resistance of the wall sections measured face to face on wall units which are exposed to inside air temperatures, not including the thermal resistance of air films or additional exterior wall elements may be increased by twenty-five percent in determining compliance with the provisions of the code provided that:

Heating and cooling set-point temperatures in the conditioned spaces or zones of the building shall be separated by at least five degrees F. The temperature control shall be designed to prevent new energy from being used to heat the space above the heating set-point temperature or cool the space below the cooling set-point temperature.

502.4 Air Leakage for All Occupancies:

502.4.1: The requirements of this section shall apply to all buildings and structures, or portions thereof, and only to those locations separating outdoor ambient conditions from interior spaces that are heated or mechanically cooled.

502.4.2: Exterior doors and windows shall be designed to limit air leakage into or from the building envelope. Site-constructed doors and windows shall be sealed in accordance with Section 502.4.3.

502.4.3:

a. Exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors, and roofs; and all other openings in the building envelope for all occupancies and all other openings in between units in R-1 occupancy shall be sealed, caulked, gasketed, or weatherstripped to limit air leakage.

b. All exterior doors or doors serving as access to an enclosed unheated area shall be weatherstripped to limit leakage around their perimeter when in a closed position.

c. Site built windows are exempt from testing but shall be made tight fitting. Fixed lights shall have glass retained by stops with sealant or caulking all around. Operating sash shall have weatherstripping working against overlapping trim, and a closer/latch which will hold the sash closed. The window frame to framing crack shall be made tight with caulking, overlapping membrane, or other approved technique.

d. Openings that are required to be fire resistive are exempt from this section.

502.4.4 Recessed Lighting Fixtures: When installed in the building envelope, recessed lighting fixtures shall meet one of the following requirements:

1. Type IC rated, manufactured with no penetrations between the inside of the recessed fixture and ceiling cavity and sealed or gasketed to prevent air leakage into the unconditioned space.

2. Type IC rated, installed inside a sealed box constructed from a minimum one-half inch thick gypsum wall board, or constructed from a preformed polymeric vapor barrier, or other air tight assembly manufactured for this purpose.

3. Type IC rated, certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at seventy-five Pascals or 1.57 lbs/ft² pressure difference and have a label attached, showing compliance.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0502, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0502, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0503 Building mechanical systems.

503.1 General: This section covers the determination of design requirements, system and component performance, control requirements, insulating systems and duct construction.

EXCEPTION: Special applications, including but not limited to hospitals, laboratories, thermally sensitive equipment, and computer rooms may be exempted from the requirements of this section when approved by the building official.

503.2 Calculations of Heating and Cooling Loads, and System Sizing Limits: The design parameters specified in Chapter 3 shall apply for all computations.

503.2.1 Calculation Procedures: Heating and cooling design loads for the purpose of sizing HVAC systems are required and shall be calculated in accordance with accepted engineering practice, including infiltration and ventilation.

503.2.2 Space Heating and Space Cooling System Sizing Limits: Building mechanical systems for all buildings which provide space heating and/or space cooling shall be sized no greater than one hundred fifty percent of the heating and cooling design loads as calculated above.

EXCEPTIONS: The following limited exemptions from the sizing limit shall be allowed, however, in all cases heating and/or cooling design load calculations shall be submitted.

1. For equipment which provides both heating and cooling in one package unit, including heat pumps with electric heating and cooling and gas-pack units with gas heating and electric cooling, compliance need only be

demonstrated for either the space heating or space cooling system size.

2. Natural gas- or oil-fired space heating equipment whose total rated space heating output in any one dwelling unit is fifty-six thousand Btu/h or less may exceed the one hundred fifty percent sizing limit provided that the installed equipment has an annual fuel utilization efficiency (AFUE) of not less than the sum of seventy-eight percent plus one percent for every five thousand Btu/h that the space heating equipment output exceeds the design heating load of the dwelling unit.

3. Stand-by equipment may be installed if controls and other devices are provided which allow redundant equipment to operate only when the primary equipment is not operating.

503.3 Simultaneous Heating and Cooling: Each temperature control zone shall include thermostatic controls installed and operated to sequence the use of heating and cooling energy to satisfy the thermal and/or humidity requirement of the zone. Controls shall prevent reheating (heating air that is cooler than system mixed air), recooling (cooling air that is warmer than the system mixed air), mixing or simultaneous supply of warm air (warmer than system return air mixed air) and cold air (cooler than system mixed air), or other simultaneous operation of heating and cooling systems to one zone. For the purposes of this section, system mixed air is defined as system return air mixed with the minimum ventilation air requirement by section 303.

EXCEPTIONS:

1. Variable air volume systems designed to reduce the air supply to each zone during periods of occupancy to the larger of the following:

a. Thirty percent or less of the peak supply volume.
b. The minimum allowed to meet ventilation requirements of section 303.

c. 0.5 cfm/ft² of zone conditioned area before reheating, recooling or mixing takes place. Consideration shall be given to supply air temperature reset control.

2. The energy for reheating, or providing warm air in mixing systems, is provided entirely from recovered energy that would otherwise be wasted, or from renewable energy sources. In addition, the system shall comply with section 503.7 without exception.

3. Areas where specific humidity levels are required to satisfy process needs.

4. Where special pressurization relationships or cross-contamination requirements are such that variable air volume systems are impractical, supply air temperatures shall be reset by representative building load or outside air temperature.

503.4 HVAC Equipment Performance Requirements:

503.4.1 Equipment Components:

503.4.1.1: The requirements of this section apply to equipment and mechanical component performance for heating, ventilating and air-conditioning systems. Equipment efficiency levels are specified. Data furnished by the equipment supplier or certified under a nationally recognized certification program or rating procedure shall be used to satisfy these requirements. Equipment efficiencies shall be based on the standard rating conditions in Tables 5-4, 5-5 or 5-6 as appropriate.

503.4.1.2: Where components from more than one manufacturer are assembled into systems regulated under this section, compliance for each component shall be as specified in sections 503.4.2 through 503.4.6 of this Code.

503.4.2: HVAC System Heating Equipment Heat Pump-heating Mode. Heat pumps whose energy input is entirely electric shall have a coefficient of performance (COP) heating, not less than the values in Table 5-7. Heat Pumps with supplementary backup heat other than electricity shall meet the requirements of Table 5-7.

503.4.2.1: These requirements apply to, but are not limited to, unitary (central) heat pumps (air source and water source) in the heating mode, water source (hydronic) heat pumps as used in multiple-unit hydronic HVAC systems, and heat pumps in the packaged terminal air-conditioner in the heating mode.

503.4.2.3 Supplementary Heater: The heat pump shall be installed with a control to prevent supplementary backup heater operation when the operating load can be met by the heat pump compression cycle alone.

503.4.2.4 Heat Pump Controls: Requirements for heat pump controls are listed in section 503.8.3.5 of this Code.

503.4.3 HVAC System Combustion Equipment: For Group R Occupancy, all gas, oil, and propane central heating systems shall have a minimum AFUE of 0.78*. All other Group R Occupancy heating equipment fueled by gas, oil, or propane shall be equipped with an intermittent ignition device, or shall comply with the efficiencies as required in the 1987 National Appliances Energy Conservation Act (Public Law 100-12). For all Other Occupancies, all gas and oil-fired central heating plants shall have a minimum combustion efficiency of not less than that shown in Table 5-3.

* HVAC Heating system efficiency trade-offs shall be made using Chapters 4 or 6 of this Code.

503.4.4 Packaged and Unitary HVAC System Equipment, Electrically Operated, Cooling Mode: HVAC system equipment as listed below, whose energy input in the cooling mode is entirely electric, shall have an energy efficiency ratio (EER) or a seasonal energy efficiency ratio (SEER) cooling not less than values in Table 5-8.

503.4.4.1: These requirements apply to, but are not limited to, unitary (central) and packaged terminal heat pumps (air source and water source); packaged terminal air conditioners.

EXCEPTION: These requirements do not apply to equipment used for refrigerated food or florists' and nurseries' coolers.

503.4.5 Applied HVAC System Components, Electrically Operated, Cooling Mode: HVAC System components, as listed in Table 5-9, whose energy input is entirely electric, shall have an energy efficiency ratio (EER) or a Coefficient of Performance (COP) cooling not less than the values in Table 5-9.

503.4.6 HVAC System Equipment - Heat Operated, Cooling Mode, Efficiency Limitation, Equipment: Heat-operated cooling equipment shall have a COP cooling not less than the values in Table 5-10.

503.5 Transport Energy:

503.5.1 All-air Systems: The air transport factor for each all-air system shall be not less than 5.5. The factor shall be based on design system air flow for constant volume

systems. The factor for variable air volume systems may be based on average conditions of operation. Energy for transfer of air through heat recovery devices shall not be included in determining the factor; however, such energy shall be included in the evaluation of the effectiveness of the heat recovery system.

$$\text{Air Transport Factor} = \frac{\text{Space Sensible Heat Removal}^*}{\text{Supply} + \text{Return Fan(s) Power Input}^*}$$

* Expressed in Btu/h or watts

503.5.2 Other Systems: Air and water, all-water and unitary systems employing chilled, hot, dual-temperature or condenser water transport systems to space terminals shall not require greater transport energy (including central and terminal fan power and pump power) than an equivalent all-air system providing the same space sensible heat removal and having an air transport factor not less than 5.5.

503.6 Balancing: The HVAC system design shall provide a means for balancing air and water systems. Balancing the system shall include, but not be limited to, dampers, temperature and pressure test connections and balancing valves.

503.7 Cooling with Outdoor Air (Economizer Cycle): Each fan system shall be designed to use up to and including one hundred percent of the fan system capacity for cooling with outdoor air automatically whenever its use will result in lower usage of new energy. Activation of economizer cycle shall be controlled by sensing outdoor air enthalpy or outdoor air dry-bulb temperature alone or alternate means approved by the building official.

EXCEPTIONS: Cooling with outdoor air is not required under any one or more of the following conditions:

1. The fan system capacity is less than three thousand five hundred cfm or total cooling capacity is less than ninety thousand Btu/h.
2. The quality of the outdoor air is so poor as to require extensive treatment of the air and approval by the building official.
3. The need for humidification or dehumidification requires the use of more energy than is conserved by the outdoor air cooling on an annual basis.
4. The use of outdoor air cooling may affect the operation of other systems so as to increase the overall energy consumption of the building.
5. When energy recovered from an internal/external zone heat recovery system exceeds the energy conserved by outdoor air cooling on an annual basis.
6. When all space cooling is accomplished by a circulating liquid which transfers space heat directly or indirectly to a heat rejection device such as a cooling tower without use of a refrigeration system.
7. When the use of one hundred percent outside air will cause coil frosting, controls may be added to reduce the quantity of outside air. However, the intent of this exception is to use one hundred percent air in lieu of mechanical cooling when less energy usage will result and this exception applies only to direct expansion systems when the compressor is running.

503.8 Controls:

503.8.1 Temperature Control: Each system shall be provided with at least one adjustable thermostat for the regulation of temperature. Each thermostat shall be capable of being set by adjustment or selection of sensors as follows:

503.8.1.1: When used to control heating only: Fifty-five degrees to seventy-five degrees F.

503.8.1.2: When used to control cooling only: Seventy degrees to eighty-five degrees F.

503.8.1.3: When used to control both heating and cooling, it shall be capable of being set from fifty-five degrees to eighty-five degrees F and shall be capable of operating the system heating and cooling in sequence. The thermostat and/or control system shall have an adjustable deadband of not less than ten degrees F.

503.8.2 Humidity Control: If a system is equipped with a means for adding moisture to maintain specific selected relative humidities in space or zones, a humidistat shall be provided. Humidistats shall be capable of being set to prevent new energy from being used to produce space-relative humidity above thirty percent.

EXCEPTION: Special occupancies requiring different relative humidities may be permitted when approved by the building official.

503.8.3 Zoning for Temperature Control:

503.8.3.1 One- and Two-Family Dwellings: At least one thermostat for regulation of space temperature shall be provided for each separate system. In addition, a readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each zone or floor.

503.8.3.2 Multifamily Dwellings: For multifamily dwellings, each individual dwelling unit shall have at least one thermostat for regulation of space temperature. A readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each room. Spaces other than living units shall meet the requirements of 503.8.3.3.

503.8.3.3 Other Types of Buildings or Occupancies: At least one thermostat for regulation of space temperature shall be provided for:

1. Each separate system.
2. Each separate zone as defined in Chapter 2. As a minimum, each floor of a building shall be considered as a separate zone. In a multistory building where the perimeter system offsets only the transmission losses of the exterior wall, an entire side of uniform exposure may be zoned separately. A readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each floor.

503.8.3.4 Control Setback and Shut-off:

1. Residential Occupancy Groups. One- and Two-Family and Multifamily dwellings—The thermostat required in section 503.8.3.1 or section 503.8.3.2, or an alternate means such as a switch or clock, shall provide a readily accessible, manual or automatic means for reducing the energy required for heating and cooling during the periods of non-use or reduced need, such as, but not limited to unoccupied periods and sleeping hours. Lowering thermostat set points to reduce energy consumption of heating systems shall not cause energy to be expended to reach the reduced setting.

2. Other Buildings and Occupancies. Each HVAC system shall be equipped with a readily accessible, automatic means of shutting off or reducing the energy used for HVAC during periods of non-use or alternate uses of the building spaces or zones served by the system. The following are examples that meet this requirement:

- a. Manually adjustable automatic timing devices.
- b. Automatic control systems.

503.8.3.5 Heat Pump Controls: Programmable thermostats are required for all heat pump systems. The cut-on temperature for the compression heating shall be higher than the cut-on temperature for the supplementary heat, and the cut-off temperature for the compression heating shall be higher than the cut-off temperature for the supplementary heat. Heat pump thermostats will be capable of providing at least two programmable setback periods per day. The automatic setback thermostat shall have the capability of limiting the use of supplemental heat during the warm-up period.

503.9 Air Handling Duct System Insulation: Ducts, plenums and enclosures installed in or on buildings shall be thermally insulated per Table 5-11.

EXCEPTIONS: Duct insulation (except where required to prevent condensation) is not required in any of the following cases:

1. When the heat gain or loss of the ducts, without insulation, will not increase the energy requirements of the building.
2. Within the HVAC equipment.
3. Exhaust air ducts.
4. Supply or return air ducts installed in unvented crawl spaces with insulated walls, basements, or cellars in one- and two-family dwellings.

503.10 Duct Construction: All duct work shall be constructed in accordance with Standards RS-15, RS-16, RS-17, RS-18, RS-19 or RS-20, as applicable, and the Uniform Mechanical Code.

503.10.1: High-pressure and medium-pressure ducts shall be leak tested in accordance with the applicable standards in Chapter 7 of this Code with the rate of air leakage not to exceed the maximum rate specified in that standard.

503.10.2: When low-pressure supply air ducts are located outside of the conditioned space, all HVAC ductwork seams and joints, both longitudinal and transverse, shall be taped and sealed with products approved by the building official only. Ductwork joints shall be mechanically fastened with a minimum of three fasteners per joint for a cylindrical duct. Use Table 5- 11 for duct insulation requirements.

503.10.3: Requirements for Automatic or manual dampers are found in the Washington State Ventilation and Indoor Air Quality Code.

503.11 Piping Insulation: All piping installed to serve buildings (and within) shall be thermally insulated in accordance with Table 5-12. For service hot water systems see section 504.7. If water pipes are outside of conditioned space then the pipe insulation requirement shall be R-3 minimum for non-recirculating hot and cold water pipes. For recirculating service hot and cold water pipes use Table 5-12 for pipe sizes and temperatures.

EXCEPTION: Piping insulation is not required within unitary HVAC equipment.

503.11.1 Other Insulation Thickness: Insulation thickness in Table 5-12 is based on insulation having thermal resistance in the range of 4.0 to 4.6 per inch of thickness on a flat surface at a mean temperature of seventy-five degrees F. Minimum insulation thickness shall be increased for materials having R-values less than 4.0 per inch, or may be reduced for materials having R-values greater than 4.6 per inch.

a. For materials with thermal resistance greater than R = 4.6 per inch, the minimum insulation thickness may be reduced as follows:

$$\frac{4.6 \times (\text{Table 5-12 Thickness})}{\text{Actual Resistance}} = \text{New Minimum Thickness}$$

b. For materials with thermal resistance less than R = 4.0 per inch, the minimum insulation thickness shall be increased as follows:

$$\frac{4.0 \times (\text{Table 5-10 Thickness})}{\text{Actual Resistance}} = \text{New Minimum Thickness}$$

c. Additional insulation with vapor barriers shall be provided to prevent condensation where required by the building official.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0503, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0503, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0504 Service water heating.

504.1 Scope: The purpose of this section is to provide criteria for design and equipment selection that will produce energy savings when applied to service water heating.

504.2 Water Heaters, Storage Tanks and Boilers:

504.2.1 Performance Efficiency: All Storage water heaters shall meet the requirements of the 1987 National Appliance Energy Conservation Act and be so labeled. All electric water heaters in unheated spaces or on concrete floors shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10.

504.2.2 Insulation: Heat loss from unfired hot-water storage tanks shall be limited to a maximum of 9.6 Btu/hr/ft² of external tank surface area. The design ambient temperature shall be no higher than sixty-five degrees F.

504.2.3 Combination Service Water Heating/Space Heating Boilers: Service water heating equipment shall not be dependent on year round operation of space heating boilers.

EXCEPTIONS: 1. Systems with service/space heating boilers having a standby loss Btu/h less than:

$$(13.3 \text{ pmd} + 400)/n$$

determined by the fixture count method

where:

pmd = probably maximum demand in gallons/hour as determined in accordance with Chapter 37 of Standard RS-11.

n = fraction of year when outdoor daily mean temperature exceeds 64.9° F.

The standby loss is to be determined for a test period of twenty-four-hour duration while maintaining a boiler water temperature of ninety degrees F above an ambient of sixty degrees F and a five foot stack on appliance.

2. For systems where the use of a single heating unit will lead to energy savings, such unit shall be utilized.

504.3 Automatic Controls: Service water heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. Temperature setting range shall be set to one hundred twenty degrees F or forty-nine degrees C.

504.4 Shutdown: A separate switch shall be provided to permit turning off the energy supplied to electric service water heating systems. A separate valve shall be provided to permit turning off the energy supplied to the main burner(s) of all other types of service water heater systems.

504.5 Swimming Pools:

504.5.1: All pool heaters shall be equipped with readily accessible ON/OFF switch to allow shutting off the operation of the heater without adjusting the thermostat setting. Controls shall be provided to allow the water temperature to be regulated from the maximum design temperature down to sixty-five degrees F.

504.5.2 Pool Covers: Heated swimming pools shall be equipped with a pool cover, approved by the building official.

504.6 Pump Operation: Circulating hot water systems shall be controlled so that the circulation pump(s) can be conveniently turned off, automatically or manually, when the hot water system is not in operation.

504.7 Pipe Insulation: For recirculating and non-recirculating systems, piping shall be thermally insulated in accordance with section 503.11 and Table 5-12.

504.8 Conservation of Hot Water:

504.8.1 Showers and Lavatories: Showers and lavatories used for other than safety reasons shall be equipped with flow control devices or specially manufactured showerheads or aerators to limit the total water flow rate as set forth in chapter 51-26 WAC, as measured with both hot and cold faucets turned on to their maximum flow.

504.8.2 Lavatories in Restrooms of Public Facilities:

504.8.2.1: Lavatories in restrooms of public facilities shall be equipped with a metering valve designed to close by spring or water pressure when left unattended (self-closing) and limit the flow rate as set forth in chapter 51-26 WAC.

EXCEPTION: Separate lavatories for physically handicapped persons shall not be equipped with self-closing valves.

504.8.2.2: Lavatories in restrooms of public facilities shall be equipped with devices which limit the outlet temperature to a maximum of one hundred ten degrees F.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0504, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0504, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0505 Electrical power and lighting.

505.1 General: Electrical distribution and lighting systems shall be designed for efficient distribution and use of electrical energy from the service entrance to and at the points of use as provided herein.

505.2 Lighting Switching: Switching for building lighting systems shall be designed and installed to permit efficient use of energy and to permit maximum flexibility in the use of the installed lighting. The following mandatory requirements represent the minimum lighting controls to be installed in any building. Additional controls should be provided where deemed appropriate and where the installation of such controls can significantly reduce energy consumption.

a. All lighting controls, except automatic controls or those for special purpose applications which require trained operators or those which would pose a safety problem or a security hazard, shall be installed so as to be readily accessible to personnel occupying or using the lighting space.

b. The maximum lighting power that may be controlled from a single switch or automatic control shall not exceed that provided by a twenty ampere circuit loaded to no more than eighty percent. A master control may be installed provided the individual switches retain their capability to function independently.

c. All lighted spaces enclosed by walls or ceiling height partitions and with floor area less than four hundred square feet shall be provided an individual lighting control or an occupant-sensing automatic control.

d. All lighted spaces with floor area greater than four hundred square feet shall be provided with controls to permit reducing the lighting by not more than one half or occupant-sensing automatic controls.

e. All building areas greater than two hundred square feet where natural lighting is available shall be provided with individual controls or daylight- or occupant-sensing automatic controls which permit control of lights independent of general area lighting. Either individual controls shall be provided for each row of luminaires parallel to a window wall or controls shall be provided to reduce the lighting in at least two steps to not more than one-half and to completely off in the natural lighting area. For office and school occupancies, at a minimum, lighting serving a zone within twelve feet of a window wall or the zone between an interior wall and the window wall of less than twelve feet shall comply with this provision. For retail occupancies, at least the row of luminaires nearest the window shall comply with this provision.

f. All display, exhibition, or specialty lighting shall be controlled independently of general area lighting.

g. All exterior building lighting including facade lighting, parking lots, driveways, walkways shall be furnished with automatic controls to reduce or turn off all lights during periods of non-use or daylight hours, except those required for safety and security. Sign lights shall be exempt from this provision.

505.3 Lighting Power Budget: A lighting power budget is the upper limit of the power to be available to provide the lighting needs in accordance with the criteria and calculation procedure specified herein.

The lighting power budget for a building shall be the sum of the power limits computed for all lighted interior and exterior spaces and shall be determined in accordance with the procedures specified in this section.

EXCEPTION: One- and two-family detached dwellings and the dwelling portion of multifamily buildings are exempt from the requirements of section 505.3.

505.3.1 Budget Development: The installed lighting wattage for the building project shall not exceed the budget level calculated in this section. The budget wattage level shall be the sum of the interior budget calculated and the exterior budget. Lighting wattage includes lamp and ballast wattage.

505.3.2 Building Interiors: The interior lighting budget shall be calculated by multiplying the gross conditioned floor area, in square feet, by the appropriate unit power budget, in watts per square foot, specified in Table 5-13.

For special conditions when approved by the building official, calculation based on Illuminating Engineering Society Unit Power Density or similar nationally recognized standards may be used.

The lighting power budget shall be based on the primary occupancy for which the space within the building is intended. If multiple occupancies are intended, the lighting power budget for each type of occupancy shall be separately calculated and summed to obtain the lighting budget for the interior spaces of the building. If a common circulation area serves multiple occupancies or multiple retail spaces, the lighting power budget for the common circulation area shall be the weighted average of the lighting power budgets for all other areas on that floor. In cases where a lighting plan for only a portion of a building is submitted, the interior lighting budget shall be based on the gross floor area covered by the plan.

EXCEPTIONS:

1. Where the following automatic lighting controls are installed, for calculations used to determine code compliance, the installed lighting wattage may be reduced by the following percentages:

- a. For occupant-sensing devices, energy savings of thirty percent shall be allowed for any single space up to four hundred ft² and enclosed by ceiling height partitions; classrooms, conference rooms, computer rooms, storage areas, corridors, or waiting rooms.

- b. For daylighting controls, energy savings of thirty percent for continuous dimming and twenty percent for stepped controls shall be allowed for any daylight space.

- c. For lumen maintenance controls, energy savings of ten percent shall be allowed for any space.

- d. For daylighting controls with occupant-sensing devices, energy savings of forty-four percent shall be

allowed for any single space up to four hundred ft² within daylight spaces, and enclosed by ceiling height partitions.

e. For occupant-sensing devices with lumen maintenance controls, energy savings of thirty-seven percent shall be allowed for any single space up to four hundred ft² and enclosed by ceiling height partitions.

505.3.2.1: Lighting for the following applications shall be exempted from inclusion in the calculation of lighting power budgets:

A. Stage lighting, entertainment, or audiovisual presentations where the lighting is an essential technical element for the function performed.

B. Lighting for medical and dental tasks.

C. Lighting in areas specifically designed for visually handicapped people.

D. For restaurant occupancies, lighting for kitchens and food preparation areas.

505.3.4 Building Exteriors: The exterior lighting budget shall be calculated by multiplying the building perimeter in feet by 7.5 watts per foot. Lighting for parking structures shall be calculated at 0.3 watts per gross square foot of parking area. An allowance for outdoor surface parking and circulation lighting may be added at 0.05 watts per ft² of area. Lighting for signs that are not an integral part of the building shall be exempted from inclusion in these calculations.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0505, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0505, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0525 Equation 1—Group R Occupancy.

EQUATION 1 -- GROUP R OCCUPANCY

TARGET UA

$$UA_T = U_W A_W + U_{BGW} A_{BGW} + U_G A_G + U_F A_F + U_{RC} A_{RC} + U_{CC} A_{CC} + U_D A_D + F_S P_S$$

Where:

- UA_T = the target combined thermal transmittance of the gross exterior wall, floor, and roof/ceiling assembly area.
- U_W = the thermal transmittance value of the opaque above grade wall area found in Table 5-1.
- A_W = opaque above grade wall area.
- U_{BGW} = the thermal transmittance value of the below grade opaque wall area found in Table 5-1.
- A_{BGW} = opaque below grade wall area.
- U_G = the thermal transmittance value of the glazing area found in Table 5-1.
- A_G = .15 (total floor area of the conditioned space).
- U_F = the thermal transmittance value of the floor area found in Table 5-1.
- A_F = floor area over unconditioned space.
- U_{RC} = the thermal transmittance value of the roof/ceiling area found in Table 5-1.
- A_{RC} = roof/ceiling area.
- U_{CC} = the thermal transmittance value of the cathedral ceiling area found in Table 5-1.
- A_{CC} = cathedral ceiling area.
- U_D = the thermal transmittance value of the opaque door area found in table 5-1.
- A_D = opaque door area.
- F_S = concrete slab component F-value found in Table 5-1.
- P_S = Lineal ft. of concrete slab perimeter.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0525, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0526 Equation 2—All occupancies.

EQUATION 2 -- ALL OCCUPANCIES

$$U = \frac{1}{r_o + R_1 + R_2 \dots r_i}$$

Where:

U = the thermal transmittance of the assembly.

r_o = outside air film resistance.

r_o = .17 for all exterior surfaces.

r_i = inside air film resistance.

r_i = 0.61 for interior horizontal surfaces, heat flow up.

r_i = 0.92 for interior horizontal surfaces, heat flow down.

r_i = 0.68 for interior vertical surfaces.

$R = \frac{1}{C} = \frac{X}{K}$ = measure of the resistance to the passage of heat for each element.

C = conductance, the heat flow through a specific material of specific thickness.

K = insulation value of a material per inch.

X = the thickness of the material in inches.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0526, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0527 Equation 3—Group R Occupancy.

EQUATION 3 -- GROUP R OCCUPANCY

PROPOSED UA

$$UA = U_W A_W + U_{BGW} A_{BGW} + U_G A_G + U_F A_F + U_{RC} A_{RC} + U_{CC} A_{CC} + U_D A_D + F_S P_S$$

Where:

- UA = the combined thermal transmittance of the gross exterior wall, floor, and roof/ceiling assembly area.
- U_W = the thermal transmittance of the opaque wall area.
- U_{BGW} = the thermal transmittance value of the below grade opaque wall area.
- A_{BGW} = opaque below grade wall area.
- A_W = opaque wall area.
- U_G = the thermal transmittance of the glazing (window or skylight) area.
- A_G = glazing area, including windows in exterior doors.
- U_F = the thermal transmittance of the floor area.
- A_F = floor area over unconditioned space.
- U_{RC} = the thermal transmittance of the roof/ceiling area.
- A_{RC} = roof/ceiling area.
- U_{CC} = the thermal transmittance of the cathedral ceiling area.
- A_{CC} = cathedral ceiling area.
- U_D = the thermal transmittance value of the opaque door area.
- A_D = opaque door area.
- F_S = concrete slab component f-factor.
- P_S = lineal ft. of concrete slab perimeter.

NOTE: Where more than one type of wall, window, roof/ceiling, door, and skylight is used, the U and A terms for those items shall be expanded into sub-elements as:

$$U_{W1} A_{W1} + U_{W2} A_{W2} + U_{W3} A_{W3} + \dots \text{etc.}$$

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0527, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0528 Equation 4—Other than Group R Occupancy.

EQUATION 4 -- OTHER THAN GROUP R OCCUPANCY

TARGET U_o

$$U_o = \frac{U_w A_w + U_f A_f + U_c A_c + F_s P_s}{A_w + A_f + A_c + P_s}$$

Where:

- U_o = the target combined thermal transmittance of the gross exterior wall, floor, and roof/ceiling assembly area.
- U_w = the thermal transmittance value of the opaque above grade wall area found in Table 5-2.
- A_w = opaque above grade wall area.
- U_f = the thermal transmittance value of the floor area found in Table 5-2.
- A_f = floor area over unconditioned space.
- U_c = the thermal transmittance value of the ceiling area found in Table 5-2.
- A_c = ceiling area.
- F_s = concrete slab component F-value found in Table 5-2.
- P_s = lineal ft. of concrete slab perimeter

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0528, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0529 Equation 5—Other than Group R Occupancy.

EQUATION 5 -- OTHER THAN GROUP R OCCUPANCY

PROPOSED U_o

$$U_o = \frac{U_w A_w + U_{BGW} A_{BGW} + U_g A_g + U_f A_f + U_{RC} A_{RC} + U_{CC} A_{CC} + U_d A_d + F_s P_s}{A_w + A_{BGW} + A_g + A_f + A_{RC} + A_{CC} + A_d + P_s}$$

where: $A_w + A_{BGW} + A_g + A_f + A_{RC} + A_{CC} + A_d + P_s$

- U_o = the combined thermal transmittance of the gross exterior wall, floor, and roof/ceiling assembly area.
- U_w = the thermal transmittance of the opaque wall area.
- U_{BGW} = the thermal transmittance value of the below grade opaque wall area.
- A_{BGW} = opaque below grade wall area.
- A_w = opaque wall area.
- U_g = the thermal transmittance of the glazing (window or skylight) area.
- A_g = glazing area, including windows in exterior doors.
- U_f = the thermal transmittance of the floor area.
- A_f = floor area over unconditioned space.
- U_{RC} = the thermal transmittance of the roof/ceiling area.
- A_{RC} = roof/ceiling area.
- U_{CC} = the thermal transmittance of the cathedral ceiling area.
- A_{CC} = cathedral ceiling area.
- U_d = thermal transmittance value of opaque door area.
- A_d = opaque door area.
- F_s = concrete slab component F-factor.
- P_s = lineal ft. of concrete slab perimeter.

NOTE: Where more than one type of wall, window, roof/ceiling, door, and skylight is used, the U and A terms for those items shall be expanded into sub-elements as:

$$U_{w1} A_{w1} + U_{w2} A_{w2} + U_{w3} A_{w3} + \dots \text{etc.}$$

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0529, filed 12/19/91, effective 7/1/92.]

WAC 151-11-0530 Table 5-1.

TARGET COMPONENT VALUES FOR GROUP R OCCUPANCY

Climate Zone→	Electric Resistance		Other Fuels	
	1	2	1	2
Component				
Glazing % Floor Area	15%	15%	15%	15%
Glazing U-Factor	U = 0.400	U = 0.400	U = 0.650	U = 0.600
Doors	U = 0.200 (R = 5)	U = 0.200 (R = 5)	U = 0.400 (R = 2.5)	U = 0.400 (R = 2.5)
Ceilings:				
Attic	U = 0.031 (R = 38)	U = 0.031 (R = 38)	U = 0.036 (R = 30)	U = 0.031 (R = 38)
Single Rafter/ Joist Vaulted	U = 0.034 (R = 30)	U = 0.034 (R = 30)	U = 0.034 (R = 30)	U = 0.034 (R = 30)
Walls	U = 0.058 (R = 19A)	U = 0.044 (R = 19+5A)	U = 0.062 (R = 19)	U = 0.062 (R = 19)
Floors	U = 0.029 (R = 30)	U = 0.029 (R = 30)	U = 0.041 (R = 19)	U = 0.029 (R = 30)
Slab on Grade Slab R-Value	F = 0.54 (R = 10)	F = 0.54 (R = 10)	F = 0.54 (R = 10)	F = 0.54 (R = 10)
Below Grade Interior				
Wall R-Value	(R = 19)	(R = 19)	(R = 19)	(R = 19)
2' Depth: Walls Slab	U = 0.043 F = .69	U = 0.043 F = .69	U = 0.043 F = .69	U = 0.043 F = .69
3.5' Depth: Walls Slab	U = 0.041 F = 0.64	U = 0.041 F = 0.64	U = 0.041 F = 0.64	U = 0.041 F = 0.64
7' Depth: Walls Slab	U = 0.037 F = 0.57	U = 0.037 F = 0.57	U = 0.037 F = 0.57	U = 0.037 F = 0.57
Below Grade Exterior				
Wall R-Value	(R = 10)	(R = 12)	(R = 10)	(R = 12)
2' Depth: Walls Slab	U = 0.070 F = 0.60	U = 0.061 F = 0.60	U = 0.070 F = 0.60	U = 0.061 F = 0.60
3.5' Depth: Walls Slab	U = 0.064 F = 0.57	U = 0.057 F = 0.57	U = 0.064 F = 0.57	U = 0.057 F = 0.57
7' Depth: Walls Slab	U = 0.056 F = 0.42	U = 0.050 F = 0.42	U = 0.056 F = 0.42	U = 0.050 F = 0.42

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0530, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0531 Table 5-2.

**COMPONENT REQUIREMENTS FOR OTHER
THAN GROUP R OCCUPANCIES**

BUILDINGS OF THREE CONDITIONED STORIES OR LESS					
Zone	Ceilings	Walls (Includes Glazing)	Floors	Slab on Grade ¹	
	U_o	U_o	U_o	Installed R-Value	Installed F-Value
I.	0.035	0.25	0.05	7	0.56
II.	0.035	0.20	0.05	10	0.54

¹ Insulation shall be water-resistant material manufactured for this use.

BUILDINGS OVER THREE CONDITIONED STORIES					
Zone	Ceilings	Walls (Includes Glazing)	Floors	Slab on Grade ¹	
	U_o	U_o	U_o	Installed R-Value	Installed F-Value
I.	0.08	0.30	0.08	7	0.56
II.	0.06	0.25	0.08	10	0.54

¹ Insulation shall be water-resistant material manufactured for this use.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0531, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0532 Table 5-3.

OTHER THAN GROUP R OCCUPANCY HVAC SYSTEM
HEATING EQUIPMENT - GAS- AND OIL-FIRED
MINIMUM STEADY STATE COMBUSTION EFFICIENCY

Types of Equipment	Furnaces of Capacity of 225,000 Btu/h and less Boilers of Capacities of 300,000 Btu/h and less Percent ¹	All Other Commercial/ Industrial Furnace and Boilers Percent ²
Forced-air furnaces and low-pressure steam or hot-water boilers	74	75
Gravity central furnaces	69	-
All other vented heating equipment	69	-

¹ Combustion efficiency for furnaces of capacities of 225,000 Btu/h and less and boilers of capacities of 300,000 Btu/h and less shall be tested in accordance with the applicable U.S. Department of Energy furnace test procedures.

² Combustion efficiency of commercial/industrial furnaces and boilers is defined as 100 percent minus stack losses in percent of heat input.

Stack losses are:

Loss due to sensible heat in dry flue gas.

Loss due to incomplete combustion.

Loss due to sensible and latent heat in moisture formed by combustion of hydrogen in the fuel.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0532, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0533 Table 5-4.

HVAC SYSTEM HEATING EQUIPMENT (HEAT PUMPS)
ELECTRICALLY OPERATED STANDARD RATING CONDITIONS

CONDITIONS	TYPE		
	AIR SOURCE	WATER SOURCE	
Air entering equipment °F	70°F (dry bulb)	70°F (dry bulb)	70°F (dry bulb)
Outdoor unit ambient °F	47°F (dry bulb) /43°F (wet bulb)	17°F (dry bulb) /15°F (wet bulb)	-----
Entering water temp. °F	-----	-----	60°F
Water flow rate	-----	-----	As used in cooling

Standard ratings are at sea level.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0533, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0534 Table 5-5.

HVAC SYSTEM EQUIPMENT, ELECTRICALLY DRIVEN
STANDARD RATING CONDITIONS--COOLING

	TEMPERATURES				
		DRY BULB	WET BULB	INLET	OUTLET
Air entering equipment	°F	80°	67°	-----	-----
Condenser ambient (air cooled)	°F	95°	75°	-----	-----
Condenser water (water cooled)	°F	---	---	85°	95°

Standard ratings are at sea level.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0534, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0535 Table 5-6.

APPLIED HVAC SYSTEM COMPONENTS ELECTRICALLY DRIVEN
STANDARD RATING CONDITIONS -- COOLING

ITEM	CENTRIFUGAL OR SELF-CONTAINED RECIPROCATING WATER CHILLER	CONDENSERLESS RECIPROCATING WATER-CHILLER
Water Temperature, °F		
Leaving chilled	44°	44°
Entering chilled	54°	54°
Leaving condenser	95°	--
Entering	85°	--
Fouling Factor, Water		
Nonferrous tubes	0.0005*	0.0005
Steel tubes	0.0010*	0.0010
Refrigerant	0.0000*	0.0000
Condenser Ambient (air/evap. cooled) °F	95°F (dry bulb) /75°F (wet bulb)	--
Compressor saturated discharge temperature		
Water cooled (evap. cooled) °F	--	105°
Air cooled °F	--	120°

Standard ratings at sea level.

* hr·ft²·°F/Btu

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0535, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0536 Table 5-7.

MINIMUM HEAT PUMP EFFICIENCIES, HEATING MODE¹

SOURCE	MINIMUM COP	MINIMUM HSPF
Air Source:		
Split System	3.0 ²	6.8
Single Package System	3.0 ²	6.6
Water Source	3.8 ³	---
Ground Water Source	3.0 ⁴	---

¹ When tested at the standard rating specified in Table 5-4.

² When tested @ 47°F(dry bulb)/43°F(wet bulb)

³ @ 70°F entering

⁴ @ 50°F entering

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0536, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0537 Table 5-8.

MINIMUM EFFICIENCY FOR ELECTRIC HVAC EQUIPMENT, COOLING

STANDARD RATING CAPACITY	<u>AIR COOLED</u>		<u>EVAP/WATER COOLED</u>
	SEER	EER	EER
Under 65,000 Btu/hr. (19,050 watts)			
A. Split System	10.0	---	---
B. Single Package ³	9.7	---	9.3 ¹
65,000 Btu/hr. and over	----	8.9 ²	10.5 ¹

¹ @ 80°F dry bulb / 67°F wet bulb

² @ 95°F dry bulb

³ Prior to January 1, 1993 a minimum value of 8.0 SEER may be used.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0537, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0538 Table 5-9.

MINIMUM EFFICIENCY FOR ELECTRIC HVAC COMPONENTS^{1,2}

WATER CHILLING PACKAGES							
CONDENSING MEANS							
TYPE OF COMPONENT	COMPRESSOR TYPE	AIR		WATER		EVAPORATIVE	
		EER	COP	EER	COP	EER	COP
Condenser Included	Centrifugal or rotary	8.00	2.34	13.80	4.04	--	--
	Reciprocating	8.40	2.36	12.00	3.51	--	--
Condenserless Reciproc.		9.90	2.90	12.00	3.51	--	--
Compressor and condenser units 65,000 Btu/hr (19,000 watts) Positive and over ² displacement		9.50	2.78	12.50	3.66	12.50	3.66
HYDRONIC HEAT PUMPS							
Water source under 65,000 Btu/hr (19,000 watts)		Centrifugal or rotary		9.00	2.64		
Water source 65,000 Btu/hr (19,000 watts) and over		Centrifugal or rotary		9.40	2.75		

¹ When tested at the standard rating conditions specified in Table 5-6.

² Ratings in accordance with Standard RS-14 as applicable.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0538, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0539 Table 5-10.

HVAC-SYSTEM HEAT OPERATED COOLING EQUIPMENT

HEAT SOURCE	MINIMUM COP
Direct Fired (gas, oil)	0.48
Indirect Fired (steam, hot water)	0.68

Minimum COP =
$$\frac{\text{Net Cooling Output}}{\text{Total heat input}^1}$$

¹ electrical auxiliary inputs excluded

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0539, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0540 Table 5-11.

DUCT LOCATION	CLIMATE ZONE	INSULATION OF DUCTS		
		INSULATION TYPES MECHANICALLY COOLED	INSULATION TYPES HEATING ONLY	GROUP R OCCUPANCY HEATING OR COOLING DUCTS
On roof or on exterior of building	I II	C, V ² and W D, V ² and W	C and W D and W	E and W D and W
Attic, garage, crawl space, in walls ¹ , in floor/ceiling ¹	I II	B and V ² C and V ²	B C	E E
Within the conditioned space or in heated basements		None Required	None Required	None Required
In cement slab or in ground		A	B	B

Note: Where ducts are used for both heating and cooling, the minimum insulation shall be as required for the most restrictive condition.

¹ Insulation may be omitted on that portion of a duct which is located within a wall or floor-ceiling space where both sides of this space are exposed to conditioned air and where this space is not ventilated or otherwise exposed to unconditioned air.

² Vapor barriers shall be installed on conditioned air supply ducts in geographic areas where the average of the July, August, and September mean dewpoint temperature exceeds 60°F.

INSULATION TYPES: Minimum densities and out-of-package thickness.

- A. 0.5-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket or equivalent to provide an installed total thermal resistance of at least R-2.
- B. 2-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 1.5-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 1.5-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-5.
- C. 3-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 2-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 2-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-7.
- D. 4-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 3-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 3-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-10.
- E. 3.5 inch 0.60 lb/cu.ft. mineral or glass fiber blanket, 2.5 inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-8.
- V. Vapor barrier, with perm rating not greater than 0.5 perm, all joints sealed.
- W. Approved weatherproof barrier.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0540, filed 12/19/91, effective 7/1/92.]

MINIMUM PIPE INSULATION REQUIREMENTS*

PIPING SYSTEM	FLUID TEMP RANGE (°F)	INSULATION THICKNESS FOR GIVEN PIPE DIAMETERS ¹					
		LESS THAN 12 FOOT PIPE RUN ² UP TO 2"	1" AND LESS	GREATER THAN 1" TO 2"	GREATER THAN 2" TO 4"	GREATER THAN 4" TO 6"	GREATER THAN 6" AND LARGER
<u>HEATING & HOT WATER SYSTEMS</u>							
Steam & Hot Water Pressure/temperature							
High	306°F ± 450°F	1.5"	2.5"	2.5"	3.0"	3.5"	3.5"
Medium	251°F ± 305°F	1.5"	2.0"	2.5"	2.5"	3.0"	3.0"
Low	201°F ± 250°F	1.0"	1.5"	1.5"	2.0"	2.0"	2.0"
All Other	100°F ± 200°F	0.5"	1.0"	1.0"	1.5"	1.5"	1.5"
Steam Condensate (for feed water)	Any	1.0"	1.0"	1.5"	2.0"	2.0"	2.0"
<u>COOLING SYSTEMS</u>							
Chilled Water	40°F ± 55°F	0.5"	0.5"	0.75"	1.0"	1.0"	1.0"
Refrigerant/brine	Below 40°F	1.0"	1.0"	1.5"	1.5"	1.5"	1.5"

¹ For piping exposed to ambient air, increase thickness by 0.5".

² Pipe runouts not exceeding 12 feet in length to individual units, with a pipe diameter of less than 2 inches.

* Column headings for pipe diameters amended 5/30/90.

WAC 51-11-0542 Table 5-13.

LIGHTING POWER BUDGET¹

GROUP OCCUPANCY	DESCRIPTION	LIGHTING POWER BUDGET ² (W/sq. ft.)
A	Assembly w/stage	1.1
	Stage lighting	Exempt
	Assembly w/o stage; other than B & E	1.1
B	Gasoline service station	1.7
	Storage garages	0.3
	Office buildings	1.7
	Wholesale stores	2.0
	Police and fire stations	1.7
	Retail stores:	
	less than 6000 sq. ft.	4.0
	6000 to 20,000 sq. ft.	3.0
	over 20,000 sq. ft.	2.0
	Drinking and dining establishments	1.85
	Food preparation task light	Exempt
	Aircraft hangars - storage	0.7
	Process plants ³	1.0
Factories and work shops ³	1.7	
Storage structures	0.7	
E	Schools and daycare centers	1.7
	Audio-visual presentation lighting	Exempt
H	Storage structures	0.7
	Handling areas	1.7
	Paint shops	2.5
	Auto repair shops	1.7
	Aircraft repair hangars	1.7
I	Institutions	1.7
	Administrative support areas	1.7
	Diagnostic, treatment, food service task lighting	Exempt
R	Dwelling units	Exempt
	Food preparation task lighting	Exempt

¹ Watts/ft² of room may be increased by two percent per foot of height above 20 feet.

² Emergency exit lighting is exempt from interior lighting budget.

³ Lighting that is part of machines or equipment is exempt from this budget.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0542, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0600 Chapter 6 building design by prescriptive requirements approach.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-06-065, § 51-11-0600, filed 3/1/91, effective 7/1/91.]

WAC 51-11-0601 Scope.

601.1 General: This chapter establishes design criteria in terms of prescribed requirements for building construction.

The provisions of this chapter are applicable to all Occupancies. Occupancies shall comply with all the requirements of Chapter 5 except for the modifications herein specified.

The building envelope requirements of this chapter may be met by installing one of the prescriptive packages in

Tables 6-1 to 6-6 for Group R Occupancy, or Table 6-7 for Other Occupancies. Installed components shall meet the requirements of section 602 and 605. Compliance with nominal R-Values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only and shall not include the thermal transmittance of other building materials or air films, but shall permit interruption by occasional framing members.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0601, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0602 Building envelope requirements for group R occupancy.

602.1 Roof/Ceiling: Ceilings below vented attics and single-rafter, joist-vaulted ceilings shall be insulated to not less than the nominal R-value specified for ceilings in Tables 6-1 to 6-6 as applicable.

602.2 Exterior Walls Both Above and Below Grade: Above grade exterior walls shall be insulated to not less than the nominal R-value specified in Tables 6-1 to 6-6 as applicable. The following walls should be considered to meet R-19 without additional documentation:

1. 2 x 6 framed and insulated with R-19 fiberglass batts.
2. 2 x 4 framed and insulated with R-13 fiberglass batts plus R-3.2 foam sheathing.
3. 2 x 4 framed and insulated with R-11 fiberglass batts plus R-5.0 foam sheathing.

602.3 Exterior Walls (Below Grade): Below grade exterior walls surrounding conditioned space shall be insulated to not less than the nominal R-value specified for below grade walls in Tables 6-1 to 6-6 as applicable.

602.4 Slab-on-grade Floors: Slab-on-grade floors shall be insulated along their perimeter to not less than the nominal R-values specified for slab-on-grade floors in Tables 6-1 to 6-6 as applicable. Slab insulation shall be installed in compliance with section 502.1.4.8. See Chapter 5, section 502.1.4.9, for additional requirements for radiant slab heating.

602.5 Floors Over Unconditioned Space: Floors over unconditioned spaces, such as vented crawl spaces, unconditioned basements, and parking garages shall be insulated to not less than the nominal R-value shown for floors over unconditioned spaces, in Tables 6-1 to 6-6.

602.6 Exterior Doors: For all doors which are less than fifty percent glazing, including fire doors, the opaque door area shall have a maximum area weighted average U-value not exceeding that shown in Tables 6-1 to 6-6 and the glazing shall comply with section 602.7. U-values for the opaque door area shall be determined in accordance with section 502.1.5.1. For all doors which are fifty percent or more glazing, the entire door area shall comply with the glazing requirements in section 602.7.

EXCEPTION: Doors whose area and U-value are included in the calculations for compliance with the requirements for glazing in section 602.7 shall be exempt from the U-value requirements stated above.

602.7 Glazing:

602.7.1 Glazing Area: The total glazing area as defined in Chapter 2 shall not exceed the percentage of gross conditioned floor area specified in Tables 6-1 to 6-6. This area shall also include any doors using the exception of section 602.6.

602.7.2 Glazing U-Value: The total glazing area as defined in Chapter 2 shall have an area weighted average U-value not to exceed that specified in Tables 6-1 to 6-6. U-values for glazing shall be determined in accordance with section 502.1.5.1. These areas and U-values shall also include any doors using the exception of section 602.6.

If the U-values for all glazing products are below the U-value specified, then no calculations are required. If compliance is to be achieved through an area weighted calculation, then the areas and U-values shall be included in the plans submitted with a building permit application.

EXCEPTION: Single glazing for ornamental, security, or architectural purposes shall have its area doubled and shall be included in the percentage of the total glazing area as allowed for in Tables 6-1 to 6-6. The maximum area (before doubling) allowed for the total of all single glazing is one percent of the floor area.

602.8 Air Leakage For Group R Occupancy: The minimum air leakage control measures shall be as specified in section 502.4 as applicable.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0602, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0603 Building mechanical systems for group R occupancy.

603.1: Group R Occupancies that are space heated by air-to-air, ground-to-air, or water-to-air heat pumps shall comply with Table 6-2 or 6-4 or 6-6 for other fuels. System sizing shall be determined by an analysis consistent with section 503.2 of this Code, or, when approved by the building official, Chapter 9. All mechanical equipment efficiencies and service water heating system efficiencies shall comply with standards as stated in sections 503 and 504 of this Code.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0603, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0604 Electric power and lighting for group R occupancy.

604.1: All electrical power and lighting systems shall comply with the requirements of section 505.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2, 91-01-112, § 51-11-0604, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0605 Building envelope requirements for other than Group R occupancies.

605.1 Opaque Envelope Criteria: Roof/ceilings, exterior walls, floors over unconditioned space, below grade walls, and slab on grade floors enclosing heated spaces shall be insulated to not less than the nominal R-value specified for roof/ceilings, exterior walls, floors over unconditioned space, below grade walls, and slab on grade floors, respectively, in

Table 6-7. Roof/ceilings enclosing mechanically cooled spaces shall be insulated to not less than the nominal R-value specified for roof/ceilings in Table 6-7.

605.2 Glazing Criteria: All glazing shall be, at a minimum, double glazing. Insulating glass with at least one-half inch air space or approved storm sash will be considered as complying. The total glazing area shall not exceed the percentage of gross exterior wall area specified in Table 6-7.

EXCEPTION: Single glazing in doors may be installed provided that the glazing area is doubled for the purpose of demonstrating compliance with the glazing area requirements.

605.3 Air Leakage: All buildings shall comply with the air leakage requirement of section 502.4.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0605, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0606 Building mechanical systems requirements for other than Group R occupancies. All building mechanical systems shall comply with the requirements of section 503.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0606, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0607 Service water heating requirement for other than Group R occupancies. All service water heating systems shall comply with the requirements of section 504.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0607, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0608 Electrical power and lighting requirements for other than Group R occupancies. All electrical power and lighting systems shall comply with the requirements of section 505.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0608, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0608, filed 12/19/90, effective 7/1/91.]

TABLE 6-1
 PRESCRIPTIVE REQUIREMENTS¹ FOR GROUP R OCCUPANCY
 CLIMATE ZONE 1
 HEATING BY ELECTRIC RESISTANCE

OPTION	GLAZING % FLOOR AREA	GLAZING U-VALUE	DOORS U-VALUE	CEILING ²	VAULTED CEILING ³	WALL ABOVE GRADE	WALL•int ⁴ BELOW GRADE	WALL•ext ⁴ BELOW GRADE	FLOOR ⁵	SLAB ⁶ ON GRADE
I.	10%	0.46	0.40	R-38	R-30	R-21	R-21	R-10	R-30	R-10
II.	12%	0.43	0.20	R-38	R-30	R-19	R-19	R-10	R-30	R-10
III.	12%	0.40	0.40	R-38	R-30	R-21	R-21	R-10	R-30	R-10
IV.*	15%	0.40	0.20	R-38	R-30	R-19	R-19	R-10	R-30	R-10
V.	18%	0.39	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10
VI.	21%	0.36	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10
VII. ⁷	25%	0.32 ⁷	0.20	R-38	R-30	R-19+R-5 ⁸	R-21	R-10	R-30	R-10
VIII. ⁷	30%	0.29 ⁷	0.20	R-38	R-30	R-19+R-5 ⁸	R-21	R-10	R-30	R-10

* Reference Case

¹ Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 19%, it shall comply with all of the requirements of the 21% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above, may calculate compliance by Chapters 4 or 5 of this Code.

² Requirement applies to all ceilings except single rafter or joist vaulted ceilings. 'Adv' denotes Advanced Framed Ceiling.

³ Requirement applicable only to single rafter or joist vaulted ceilings.

⁴ Below grade walls shall be insulated either on the exterior or on the interior. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See section 602.2.

⁵ Floors over crawl spaces or exposed to ambient air conditions.

⁶ Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See section 602.4.

⁷ The following options shall be applicable to buildings less than three stories: 0.35 maximum for glazing areas of 25% or less; 0.32 maximum for glazing areas of 30% or less.

⁸ This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.

[Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0625, filed 12/19/91, effective 7/1/92.]

TABLE 6-2
 PRESCRIPTIVE REQUIREMENTS¹ FOR GROUP R OCCUPANCY
 CLIMATE ZONE 1
 HEATING BY OTHER FUELS

OPTION	HVAC ⁹ EQUIP. EFFIC.	GLAZING % FLOOR AREA	GLAZING U-VALUE	DOORS U-VALUE	CEILING ²	VAULTED CEILING ³	WALL ABOVE GRADE	WALL•int ⁴ BELOW GRADE	WALL•ext ⁴ BELOW GRADE	FLOOR ⁵	SLAB ⁶ ON GRADE
I.	Med.	10%	0.70	0.40	R-30	R-30	R-15	R-15	R-10	R-19	R-10
II.	Med.	12%	0.65	0.40	R-30	R-30	R-15	R-15	R-10	R-19	R-10
III.	High	21%	0.75	0.40	R-30	R-30	R-19	R-19	R-10	R-19	R-10
IV.*	Med.	21%	0.65	0.40	R-30	R-30	R-19	R-19	R-10	R-19	R-10
V.	Low	21%	0.60	0.40	R-30	R-30	R-19	R-19	R-10	R-19	R-10
VI. ⁷	Med.	25%	0.45 ⁷	0.40	R-38	R-30	R-19	R-19	R-10	R-25	R-10
VII. ⁷	Med.	30%	0.40 ⁷	0.40	R-30	R-30	R-19	R-19	R-10	R-25	R-10

* Reference Case

¹ Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 19%, it shall comply with all of the requirements of the 21% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above, may calculate compliance by Chapters 4 or 5 of this Code.

² Requirement applies to all ceilings except single rafter or joist vaulted ceilings. 'Adv' denotes Advanced Framed Ceiling.

³ Requirement applicable only to single rafter or joist vaulted ceilings.

⁴ Below grade walls shall be insulated either on the exterior or on the interior. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See section 602.2.

⁵ Floors over crawl spaces or exposed to ambient air conditions.

⁶ Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See section 602.4.

⁷ The following options shall be applicable to buildings less than three stories: 0.50 maximum for glazing areas of 25% or less; 0.45 maximum for glazing areas of 30% or less.

⁸ This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.

⁹ Minimum HVAC Equipment efficiency requirement for combustion appliances. 'Low' denotes an AFUE of 0.74. 'Med.' denotes an AFUE of 0.78. 'High' denotes an AFUE of 0.88 or greater. Minimum HVAC Equipment efficiency requirement for heat pumps. 'Low' denotes an HSPF of 6.35. 'Med' denotes and HSPF of 6.8. 'High' denotes and HSPF of 7.7. Water and ground source heat pumps shall be considered as medium efficiency and have a minimum COP as required in Table 5-7.

[Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0626, filed 12/19/91, effective 7/1/92.]

PRESCRIPTIVE REQUIREMENTS¹ FOR GROUP R OCCUPANCY
 CLIMATE ZONE 2
 HEATING BY ELECTRIC RESISTANCE

OPTION	GLAZING % FLOOR AREA	GLAZING U-VALUE	DOORS U-VALUE	CEILING ²	VAULTED CEILING ³	WALL ABOVE GRADE	WALL•int ⁴ BELOW GRADE	WALL•ext ⁴ BELOW GRADE	FLOOR ⁵	SLAB ⁶ ON GRADE
I.	10%	0.38	0.20	R-38	R-30	R-21	R-21	R-12	R-30	R-10
II.	12%	0.40	0.20	R-38	R-30	R-19+R-5 ⁸	R-21	R-12	R-25	R-10
III.*	15%	0.40	0.20	R-38	R-30	R-19+R-5 ⁸	R-21	R-12	R-30	R-10
IV.	18%	0.38	0.20	R-38	R-30	R-19+R-5 ⁸	R-21	R-12	R-30	R-10
V. ⁷	21%	0.35	0.20	R-38Adv	R-38	R-19+R-5 ⁸	R-21	R-12	R-30	R-10
VI. ⁷	25%	0.30 ⁷	0.20	R-49Adv	R-38	R-19+R-5 ⁸	R-21	R-12	R-30	R-10
VII. ⁷	30%	0.28 ⁷	0.20	R-60Adv	R-38	R21+R7.5 ⁹	R-21	R-12	R-30	R-10

* Reference Case

¹ Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 19%, it shall comply with all of the requirements of the 21% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above, may calculate compliance by Chapters 4 or 5 of this Code.

² Requirement applies to all ceilings except single rafter or joist vaulted ceilings. 'Adv' denotes Advanced Framed Ceiling.

³ Requirement applicable only to single rafter or joist vaulted ceilings.

⁴ Below grade walls shall be insulated either on the exterior or on the interior. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See section 602.2.

⁵ Floors over crawl spaces or exposed to ambient air conditions.

⁶ Required slab perimeter insulation shall be a water resistant material;

manufactured for its intended use, and installed according to manufacturer's specifications. See section 602.4.

⁷ The following options shall be applicable to buildings less than three stories: 0.33 maximum for glazing areas of 25% or less; 0.31 maximum for glazing areas of 30% or less.

⁸ This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.

⁹ This wall insulation requirement denotes R-21 wall cavity insulation plus R-7.5 foam sheathing.

[Statutory Authority: Chapter 19.27A RCW, 92-01-140, § 51-11-0627, filed 12/19/91, effective 7/1/92.]

PRESCRIPTIVE REQUIREMENTS¹ FOR GROUP R OCCUPANCY
CLIMATE ZONE 2
HEATING BY OTHER FUELS

OPTION	HVAC ⁹ EQUIP. EFFIC.	GLAZING % FLOOR AREA	GLAZING U-VALUE	DOORS U-VALUE	CEILING ²	VAULTED CEILING ³	WALL ABOVE GRADE	WALL·int ⁴ BELOW GRADE	WALL·ext ⁴ BELOW GRADE	FLOOR ⁵	SLAB ⁶ ON GRADE
I.	Med.	10%	0.70	0.40	R-38	R-30	R-19	R-19	R-12	R-25	R-10
II.	Med.	12%	0.65	0.40	R-38	R-30	R-19	R-19	R-12	R-25	R-10
III.	High	17%	0.65	0.40	R-38	R-30	R-19	R-19	R-12	R-25	R-10
IV.*	Med.	17%	0.60	0.40	R-38	R-30	R-19	R-19	R-12	R-30	R-10
V.	Low	17%	0.50	0.40	R-38	R-30	R-19	R-19	R-12	R-30	R-10
VI.	Med.	21%	0.50	0.40	R-38	R-30	R-19	R-19	R-12	R-30	R-10
VII.	Med.	25%	0.40 ⁷	0.40	R-38	R-30	R-19	R-19	R-12	R-30	R-10
VIII.	Med.	30%	0.35 ⁷	0.40	R-38	R-30	R-19	R-19	R-12	R-30	R-10

* Reference Case

¹ Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 19%, it shall comply with all of the requirements of the 21% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above, may calculate compliance by Chapters 4 or 5 of this Code.

² Requirement applies to all ceilings except single rafter or joist vaulted ceilings. 'Adv' denotes Advanced Framed Ceiling.

³ Requirement applicable only to single rafter or joist vaulted ceilings.

⁴ Below grade walls shall be insulated either on the exterior or on the interior. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See section 602.2.

⁵ Floors over crawl spaces or exposed to ambient air conditions.

⁶ Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See section 602.4.

⁷ The following options shall be applicable to buildings less than three stories: 0.45 maximum for glazing areas of 25% or less; 0.40 maximum for glazing areas of 30% or less.

⁸ This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.

⁹ Minimum HVAC Equipment efficiency requirement for combustion appliances. 'Low' denotes an AFUE of 0.74. 'Med.' denotes an AFUE of 0.78. 'High' denotes an AFUE of 0.88 or greater. Minimum HVAC Equipment efficiency requirement for heat pumps. 'Low' denotes an HSPF of 6.35. 'Med' denotes and HSPF of 6.8. 'High' denotes and HSPF of 7.7. Water and ground source heat pumps shall be considered as medium efficiency and have a minimum COP as required in Table 5-7.

[Statutory Authority: Chapter 19.27A RCW - 92-01-140, § 51-11-0628, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0629 Table 6-5.

LOG HOMES PRESCRIPTIVE REQUIREMENTS¹
HEATING BY ELECTRIC RESISTANCE

OPTION	AVERAGE ² LOG THICKNESS	GLAZING % FLOOR AREA	GLAZING U-VALUE	DOORS U-VALUE	CEILING ³	VAULTED ⁴ CEILING	FLOOR ⁵	SLAB ⁶ ON GRADE
CLIMATE ZONE 1								
I. ⁷	5.5"	15%	0.31	0.14	R-60 Adv	R-38	R-38	R-10
II. ⁷	7.5"	15%	0.40	0.20	R-60 Adv	R-38	R-30	R-10
III.*	9.6"	15%	0.40	0.20	R-38	R-30	R-30	R-10
CLIMATE ZONE 2								
IV. ⁷	6.7"	15%	0.31	0.14	R-60 Adv	R-38	R-38	R-10
V. ⁷	8.7"	15%	0.40	0.14	R-60 Adv	R-38	R-38	R-10
VI. ⁷	9.8"	15%	0.40	0.20	R-60 Adv	R-38	R-30	R-10
VII. ⁷	10.5"	15%	0.40	0.20	R-49 Adv	R-38	R-30	R-10
VIII.*	13.5"	15%	0.40	0.20	R-38	R-30	R-30	R-10

* Reference Case

¹ For Group R Occupancy use Table 6-5 for only the portion of floor area using log/solid timber walls. Use Tables 6-1 to 6-4 for all other portions of the floor area. Minimum requirements are for each option listed. Interpolations between options is not permitted. Proposed designs which cannot meet the specific requirements of a listed option above, may calculate compliance by Chapters 4 or 5 of this Code.

² Required minimum average log thickness.

³ 'Adv' denotes Advanced Framing. Requirement applies to all ceilings except single rafter joist vaulted ceilings.

⁴ Requirement applicable only to single rafter joist vaulted ceilings.

⁵ Floors over crawl spaces or exposed to ambient air conditions.

⁶ Required slab perimeter insulation shall be water-resistant material, manufactured for its intended use, and installed according to manufacturer's specifications.

⁷ These options shall be applicable to buildings less than three stories.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0629, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0630 Table 6-6.

LOG HOMES PRESCRIPTIVE REQUIREMENTS¹
HEATING BY OTHER FUELS

OPTION	AVERAGE ² LOG THICKNESS	GLAZING % FLOOR AREA	GLAZING U-VALUE	DOORS U-VALUE	CEILING ³	VAULTED ⁴ CEILING	FLOOR ⁵	SLAB ⁶ ON GRADE
<u>CLIMATE ZONE 1</u>								
I. ⁷	3.5"	21%	0.40	0.39	R-49 Adv	R-38	R-30	R-10
II.	4.4"	21%	0.40	0.40	R-38	R-30	R-19	R-10
III.	5.2"	21%	0.50	0.40	R-38	R-30	R-19	R-10
IV.	6.5"	21%	0.60	0.40	R-38	R-30	R-19	R-10
V.	7.0"	21%	0.60	0.40	R-38	R-30	R-19	R-10
VI.*	8.2"	21%	0.65	0.40	R-38	R-30	R-19	R-10
<u>CLIMATE ZONE 2</u>								
VII. ⁷	3.5"	17%	0.31	0.14	R-60 Adv	R-38	R-38	R-10
VIII. ^{7,8}	3.5"	17%	0.40	0.40	R-60 Adv	R-38	R-30	R-10
IX. ⁷	4.6"	17%	0.40	0.40	R-60 Adv	R-38	R-30	R-10
X.	5.4"	17%	0.40	0.40	R-38	R-30	R-30	R-10
XI.	6.8"	17%	0.50	0.40	R-38	R-30	R-30	R-10
XII.*	9.0"	17%	0.60	0.40	R-38	R-30	R-30	R-10

* Reference Case

¹ For Group R Occupancy use Table 6-6 for only the portion of floor area using log/solid timber walls. Use Tables 6-1 to 6-4 for all other portions of the floor area. Minimum requirements are for each option listed. Interpolations between options is not permitted. Proposed designs which cannot meet the specific requirements of a listed option above, may calculate compliance by Chapters 4 or 5 of this Code.

² Required minimum average log thickness.

³ 'Adv' denotes Advanced Framing. Requirement applies to all ceilings except single rafter joist vaulted ceilings.

⁴ Requirement applicable only to single rafter joist vaulted ceilings.

⁵ Floors over crawl spaces or exposed to ambient air conditions.

⁶ Required slab perimeter insulation shall be water-resistant material, manufactured for its intended use, and installed according to manufacturer's specifications.

⁷ These options shall be applicable to buildings less than three stories.

⁸ For this option, minimum HVAC system efficiency is an AFUE of 0.88.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0630, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0631 Table 6-7.

OTHER THAN GROUP R OCCUPANCIES PRESCRIPTIVE REQUIREMENTS

COMPONENT	ZONE I	ZONE II
SPACE CONDITIONING SYSTEM TYPE	ANY	ANY
ROOF/CEILINGS	R-30	R-30
EXTERIOR WALLS	R-11	R-11
FLOORS OVER UNCONDITIONED SPACE	R-11	R-11
BELOW GRADE WALLS	R-4	R-5
SLAB ON GRADE FLOORS ¹	R-7	R-10
GLAZING TYPE	Double ²	Double ²
MAXIMUM TOTAL GLAZING AREA (% of Gross Exterior Wall Area)	32%	22%

¹ Insulation shall be a water-resistant material, manufactured for its intended use, and installed to manufacturer's specifications.

² 'Double' denotes a minimum air space between glazings of 1/2 inch.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0631, filed 12/19/91, effective 7/1/92.]

WAC 51-11-0700 Chapter 7—Standards.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0700, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0701 Standards. The standards and portions thereof, which are referred to in various parts of this code shall be part of the Washington State Energy Code and are hereby declared to be a part of this Code.

CODE STANDARD NO.	TITLE AND SOURCE	
RS-1	1989 ASHRAE Handbook of Fundamentals	
RS-2	Standard Method of Test for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors, Specification E283-84 of ASTM. Specifications for Aluminum Windows, ANSI A134.1, 1972. Specifications for Aluminum Sliding Glass Doors, ANSI A134.2, 1972.	
		RS-2B
		RS-2C
		RS-3
		RS-4
		RS-5
		RS-6
		RS-7

Industry Standard for Wood Window Units, NWWDA IS-2-87, Industry Standard for Wood Sliding Patio Doors, NWWDA IS-3-88.

AAMA 1503.1-88, 1988 Voluntary Test Method for Thermal transmittance of windows, doors and glazed wall sections.

ASTM C236-87 test for thermal conductance and transmittance of built-up sections by means of a guarded hot box; and ASTM C976-82 thermal performance of building assemblies by means of the calibrated hot box.

ASHRAE Standard 62-89 Ventilation for Acceptable Indoor Air Quality.

ASHRAE Standard 55-81 Thermal Environmental Conditions for Human Occupancy.

DOE Test Procedures for Water Heaters, 10 CFR Part 430 Appendix E to Subpart B.

Household Automatic Electric Storage-Type Water Heaters, ANSI C72.1-1972.

Gas Water Heaters, Volume III, Circulating Tank, Instantaneous and Large Automatic Storage-Type Water Heaters, ANSI Z21.10.3, 1974.

- RS-8 IES Lighting Handbook, Illuminating Engineering Society, 1984 Reference Volume, 1987 Application Volume.
- RS-9 ASHRAE Standard 90 1-1989, Efficient Design of New Buildings Except New Low-Rise Residential Buildings.
- RS-10 Standard for Packaged Terminal Air Conditioners, ARI Standard 310-90.
- RS-11 1987 ASHRAE HVAC Systems and Applications Handbook.
- RS-12 Energy Calculations I: Procedures for Determining Heating and Cooling Loads for Computerizing Energy Calculations—Algorithms for Building Heat Transfer Subsystems, ASHRAE 1975.
- RS-13 Energy Calculations II: Procedures for Simulating the Performance of Components and Systems for Energy Calculations, 3rd Edition, ASHRAE 1975.
- RS-14 Standard for Positive Displacement Refrigerant Compressor and Condensing Units, ARI Standard 520-74.
- RS-15 1988 ASHRAE Equipment Handbook.
- RS-16 Heating and Air Conditioning Systems—Installation Standards, SMACNA, February, 1977.
- RS-17 SMACNA Duct Metal and Flexible Construction Standards, 1st Edition, Washington, D.C., 1985.
- RS-18 Same as Standard RS-17.
- RS-19 SMACNA Fibrous Glass Duct Construction Standards, 6th Edition, Washington, D.C., 1990.
- RS-20 1990 ASHRAE Refrigeration Volume.
- RS-21 Standard for Package Terminal Heat Pumps, ARI Standard 380-90.
- RS-22 ASTM E779-87 Standard practice for measuring air leakage by the fan pressurization method.
- RS-23 ASTM E741 Standard practice for measuring air leakage by the tracer dilution method.
- RS-24 Standard 24 CFR Part 3280 HUD.
- RS-25 Thermal Bridge in Sheet Metal Construction from Appendix E of RS-9.
- RS-26 Super Good Cents Technical Reference

ACCREDITED AUTHORITATIVE AGENCIES

AAMA refers to the American Architectural Manufacturers Association, 35 East Wacker Drive, Chicago, IL 60601

ANSI refers to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018

ARI refers to the Air conditioning and Refrigeration Institute, 1815 North Fort Myer Drive, Arlington, VA 22209

ASHRAE refers to the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329

ASTM refers to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103

IES refers to Illuminating Engineering Society, 345 East 47th Street, New York, NY 10017

NESCA refers to the National Environmental System Contractors Association, 1501 Wilson Blvd., Arlington, VA 22209

NWWDA refers to the National Wood Window and Door Association, 1400 East Touhy Avenue, Suite G-54, Des Plaines, IL 60018

SMACNA refers to the Sheet Metal and Air Conditioning contractors National Association, Inc., 8224 Old Courthouse Rd., Tysons Corner, Vienna, VA 22180

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0701, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0800 Section 0800—Suggested software for chapter 4 systems analysis approach for Group R occupancy.

Program Name:	Source
CALPAS 3	BERKELEY SOLAR GROUP 455 Santa Clara Ave. Oakland, CA 94610 (415) 843-7600
DATA CAL	SUNRISE ENERGY, INC. 5708 43rd Ave E. Tacoma, WA 98443 (206) 922-5218
DOE 2	ACROSOFT INTERNATIONAL, INC. 9745 E. Hampten Ave. Suite 230 Denver, CO 80231 (303) 368-9225
F-LOAD	F-CHART SOFTWARE 4406 Fox Bluff Rd. Middleton, WI 53562 (608) 836-8536
MICROPAS	ENERCOMP 123 C Street Davis, CA 95616 (916) 753-3400
SUNDAY	ECOTOPE 2812 East Madison St. Seattle, WA 98112 (206) 322-3753
WATTSUN	WSEO 809 Legion Way S.E. Olympia, WA 98504 Attn: Hank Date (206) 956-2031

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0800, filed 12/19/90, effective 7/1/91.]

WAC 51-11-0900 Section 0900—Prescriptive heating system sizing. When using the prescriptive approach in Chapter 6, if approved by the building official, design heat load calculations are not required to show compliance to this Code if the heating system installed is equal to or less than the following:

Climate Zone I	
Electric Resistance	21 btu/hr•ft ²
Electric Resistance (Forced Air)	24 btu/hr•ft ²
Other Fuels (Forced Air)	27 btu/hr•ft ²
Climate Zone II	
Electric Resistance	29 btu/hr•ft ²
Electric Resistance (Forced Air)	32 btu/hr•ft ²
Other Fuels (Forced Air)	39 btu/hr•ft ²

Example: A 1500 ft² house in Zone I, heated with gas, would not have to submit a design heat load if the proposed furnace is 40,500 BTU or less.

$$1500 \times 27 = 40,500$$

Disclaimer: All heating systems shall be designed and installed in accordance with Uniform Building Code section 1211.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0900, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1000 Chapter 10.

Section 1000 Default heat-loss coefficients.

[Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-1000, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1000, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1001 Section 1001 General.

1001.1 Scope: This chapter includes tables of seasonal average heat-loss coefficients for specified nominal insulation. The heat-loss coefficients may also be used for heating system sizing.

1001.2 Description: These coefficients were developed primarily from data and procedures from Standard RS-1, and taken specifically from Standard RS-26, listed in Chapter 7.

Coefficients not contained in this chapter may be computed using the procedures listed in these references if the assumptions in the following sections and Standard RS-26, listed in Chapter 7, are used, along with data from the sources referenced above.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1001, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1002 Section 1002: Below grade walls and slabs.

1002.1 General: Table 10-1 lists heat-loss coefficients for below-grade walls and floors.

Coefficients for below-grade walls are given as U-values (Btu/°F•hr per square foot of wall area). Coefficients for

below-grade slabs are listed as F-values (Btu/°F•hr per lineal foot of slab perimeter).

Below-grade wall U-values are only valid when used with the accompanying below-grade slab F-value, and vice versa.

1002.2 Component Description: All below-grade walls are assumed to be eight-inch concrete. The wall is assumed to extend from the slab upward to the top of the mud sill for the distance specified in Table 10-1, with six inches of concrete wall extending above grade.

Interior insulation is assumed to be fiberglass batts placed in the cavity formed by 2x4 framing on twenty-four inch centers with one-half inch of gypsum board as the interior finish material. Exterior insulation is assumed to be applied directly to the exterior of the below-grade wall from the top of the wall to the footing. The exterior case does not assume any interior framing or sheetrock.

In all cases, the entire wall surface is assumed to be insulated to the indicated nominal level with the appropriate framing and insulation application. Coefficients are listed for wall depths of two, three and one-half, and seven feet below grade. Basements shallower than two feet should use on-grade slab coefficients.

Heat-loss calculations for wall areas above grade should use above-grade wall U-values, beginning at the mudsill.

1002.3 Insulation Description: Coefficients are listed for the following four configurations:

1. Uninsulated: No insulation or interior finish.
2. Interior insulation: Interior 2x4 insulated wall without a thermal break between concrete wall and slab.
3. Interior insulation w/thermal break: Interior 2x4 insulated wall with R-5 rigid board providing a thermal break between the concrete wall and the slab.
4. Exterior insulation: Insulation applied directly to the exterior surface of the concrete wall.

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TABLE 10-1 DEFAULT WALL U-VALUES AND SLAB F-VALUES FOR BASEMENTS

	Below Grade Wall U-value	Below Grade Slab F-value
2-Foot Depth Below Grade		
Uninsulated	0.350	0.59
R-11 Interior	0.066	0.68
R-11 Interior w/tb	0.070	0.60
R-19 Interior	0.043	0.69
R-19 Interior w/tb	0.045	0.61
R-10 Exterior	0.070	0.60
R-12 Exterior	0.061	0.60
3.5-Foot Depth Below Grade		
Uninsulated	0.278	0.53
R-11 Interior	0.062	0.63
R-11 Interior w/tb	0.064	0.57
R-19 Interior	0.041	0.64
R-19 Interior w/tb	0.042	0.57
R-10 Exterior	0.064	0.57
R-12 Exterior	0.057	0.57
7-Foot Depth Below Grade		
Uninsulated	0.193	0.46
R-11 Interior	0.054	0.56
R-11 Interior w/tb	0.056	0.42
R-19 Interior	0.037	0.57
R-19 Interior w/tb	0.038	0.43
R-10 Exterior	0.056	0.42
R-12 Exterior	0.050	0.42

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1002, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1003 Section 1003: On-grade slab floors.

1003.1 General: Table 10-2 lists heat-loss coefficients for heated on-grade slab floors, in units of Btu/°F•hr per lineal foot of perimeter.

1003.2 Component Description: All on-grade slab floors are assumed to be six-inch concrete poured directly onto the earth. The bottom of the slab is assumed to be at grade line. Monolithic and floating slabs are not differentiated.

Soil is assumed to have a conductivity of 0.75 Btu/hr•°F•ft². Slabs two-feet or more below grade should use basement coefficients.

1003.3 Insulation Description: Coefficients are provided for the following three configurations:

Two-Foot (or four-foot) vertical: Insulation is applied directly to the slab exterior, extending downward from the top of the slab to a depth of two-feet (or four-feet) below grade.

Two-Foot (or four-foot) horizontal: Insulation is applied directly to the underside of the slab, and run horizontally from the perimeter inward for two-feet or four-feet. The slab edge is exposed in this configuration.

Note: A horizontal installation with a thermal break of at least R-5 at the slab edge should use the vertical-case F-values.

Fully insulated slab: Insulation extends from the top of the slab, along the entire perimeter, and completely covers the area under the slab.

TABLE 10-2 DEFAULT F-VALUES FOR ON-GRADE SLABS

Insulation type	R-0	R-5	R-10	R-15
Uninsulated slab	0.73	—	—	—
2-ft Horizontal (No thermal break)	—	0.70	0.70	0.69
4-ft Horizontal (No thermal break)	—	0.67	0.64	0.63
2-ft Vertical (or Horiz. w/T.B.)	—	0.58	0.54	0.52
4-ft Vertical (or Horiz. w/T.B.)	—	0.54	0.48	0.45
Fully insulated slab	—	—	0.36	—

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1003, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1004 Section 1004: Crawlspace floors.

1004.1 General: Tables 10-3 and 10-4 list heat-loss coefficients for floors over crawlspaces in units of Btu/°F•hr per square foot of floor.

They are derived from procedures listed in RS-1, listed in Chapter 7, assuming an average outdoor temperature of 45° F, an average indoor temperature of 65° F, and a crawlspace area of one thousand three hundred fifty ft² and one hundred fifty ft of perimeter. The crawlspace is

assumed to be 2.5-feet high, with twenty-four inches below grade and six inches above grade.

1004.2 Crawlspace Description: Four crawlspace configurations are considered: Vented, unvented, enclosed and heated plenum.

Vented crawlspaces: Assumed to have three air-changes per hour, with at least one ft² of net-free ventilation in the foundation for every three hundred ft² of crawlspace floor area. The crawlspace is not actively heated.

Floors over unheated areas, such as garages, may only use those values which have R-0 perimeter insulation.

Unvented crawlspaces: Assumed to have 1.5 air changes per hour, with less than one ft² of net-free ventilation in the foundation for every three hundred ft² of crawlspace floor area. The crawlspace is not actively heated. Floors over unheated basements may only use those values which have R-0 perimeter insulation.

Heated-plenum crawlspaces: Assumed to have 0.25 air-changes per hour, with no foundation vents. Heated supply air from central furnace is blown into a crawlspace and allowed to enter the living space unducted via holes cut into the floor.

Enclosed floors: Assumes no buffer space, and a covering of one-half inch of T1-11 on the exterior of the cavity exposed to the outside air.

1004.3 Construction Description: Floors are assumed to be either joisted floors framed on sixteen inch centers, or post and beam on four by eight foot squares. Insulation is assumed to be installed under the subflooring between the joists or beams with no space between the insulation and the subfloor. Insulation is assumed to be uncompressed.

Perimeter insulation is assumed to extend from the top of the rim joist to the crawlspace floor and then inward along the ground (on top of the ground cover) for at least twenty-four inches.

Floor coverings are assumed to be light carpet with rubber pad.

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TABLE 10-3 DEFAULT U-VALUES FOR FLOORS OVER VENTED CRAWLSPACE OR UNHEATED BASEMENT

Floor	Nominal R-value		U-value	
	Perimeter		Post & Beam	Joists
0	0		0.112	0.134
	11		0.100	0.116
	19		0.098	0.114
	30		0.093	0.107
11	0		0.052	0.056
	11		0.048	0.052
19	0		0.038	0.041
	11		0.036	0.038
22	0		0.034	0.037
	11		0.033	0.035
25	0		0.032	0.034
	11		0.031	0.033
30	0		0.028	0.029
	11		0.027	0.028
38	0		0.024	0.025
	11		0.024	0.024

TABLE 10-4 DEFAULT U-VALUES FOR FLOORS OVER HEATED PLENUM CRAWLSPACES

Nominal R-value	U-value
Perimeter	
11	0.085
19	0.075
30	0.069

Note: Crawlspace used as heated plenums have approximately 30-percent higher heat-loss rate than unvented crawlspaces with the same assumed ACH. Default U-values in Table 10-4 reflect this higher rate of heat loss.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1004, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1005 Section 1005: Above-grade walls.

Section 1005.1 General: Table 10-5 lists heat-loss coefficients for the opaque portion of above-grade walls (Btu/°F•hr per square foot). They are derived from procedures listed in RS-1, listed in Chapter 7, assuming exterior air films at 7.5-mph wind speed.

Insulation is assumed to uniformly fill the entire cavity and to be installed as per manufacturer's directions. All walls are assumed to be finished on the inside with one-half inch gypsum wallboard, and on the outside with either beveled wood siding over one-half inch plywood sheathing or with five-eighths inch T1-11 siding. Insulated sheathing (either interior or exterior) is assumed to cover the entire opaque wall surface.

1005.2 Framing Description: Three framing types are considered, and defined as follows:

Standard: Studs framed on sixteen inch centers with double top plate and single bottom plate. Corners use three studs and each opening is framed using two studs. Headers consist of double 2X or single 4X material with an air space left between the header and the exterior sheathing. Interior partition wall/exterior wall intersections use two studs in the exterior wall.

Framing weighting factors:	Studs and plates	.19
	Insulated cavity	.77
	Headers	.04

Intermediate: Studs framed on sixteen inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and each opening is framed by two studs. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

Framing weighting factors:	Studs and plates	.18
	Insulated cavity	.78
	Headers	.04

Advanced: Studs framed on twenty-four inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and one stud is used to support each header. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

Framing weighting factors:	Studs and plates	.13
	Insulated cavity	.83
	Headers	.04

1005.3 Component Description: Default coefficients for three types of walls are listed: single-stud walls, strap walls, and double-stud walls.

Single-Stud Wall: Assumes either 2x4 or 2x6 studs framed on sixteen or twenty-four inch centers. Headers are solid for 2x4 walls and double 2x for 2x6 walls, with either dead-air or rigid-board insulation in the remaining space.

Strap Wall: Assumes 2x6 studs framed on sixteen or twenty-four inch centers. 2x3 or 2x4 strapping is run horizontally along the interior surface of the wall to provide additional space for insulation.

Double-Stud Wall: Assumes an exterior structural wall and a separate interior, non-structural wall. Insulation is placed in both wall cavities and in the space between the two walls. Stud spacing is assumed to be on twenty-four inch centers for both walls.

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TABLE 10-5 DEFAULT U-VALUES FOR ABOVE-GRADE WALLS

2 x 4 Single Wood Stud: R-11 Batt

	<u>Siding Material/Framing Type</u>				
	R-value of Foam Board	Lapped Wood		T1-11	
		STD	ADV	STD	ADV
NOTE: Nominal Batt R-value: R-11 at 3.5-inch thickness	0	.088	.084	.094	.090
Installed Batt R-value: R-11 in 3.5-inch cavity	1	.080	.077	.085	.082
	2	.074	.071	.078	.075
	3	.069	.066	.072	.070
	4	.064	.062	.067	.065
	5	.060	.058	.063	.061
	6	.056	.055	.059	.057
	7	.053	.052	.055	.054
	8	.051	.049	.052	.051
	9	.048	.047	.050	.049
	10	.046	.045	.047	.046
	11	.044	.043	.045	.044
	12	.042	.041	.043	.042

2 x 4 Single Wood Stud: R-13 Batt

	<u>Siding Material/Framing Type</u>				
	R-value of Foam Board	Lapped Wood		T1-11	
		STD	ADV	STD	ADV
NOTE: Nominal Batt R-value: R-13 at 3.63-inch thickness	0	.082	.078	.088	.083
Installed Batt R-value: R-12.7 in 3.5-inch cavity	1	.075	.072	.080	.076
	2	.069	.066	.073	.070
	3	.065	.062	.068	.065
	4	.060	.058	.063	.061
	5	.057	.055	.059	.057
	6	.053	.052	.056	.054
	7	.051	.049	.052	.051
	8	.048	.047	.050	.048
	9	.046	.045	.047	.046
	10	.044	.043	.045	.044
	11	.042	.041	.043	.042
	12	.040	.039	.041	.040

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2 x 4 Single Wood Stud: R-15 Batt

	<u>Siding Material/Framing Type</u>				
	R-value of Foam Board	Lapped Wood		T1-11	
		STD	ADV	STD	ADV
NOTE: Nominal Batt R-value: R-15 at 3.5-inch thickness	0	.076	.071	.081	.075
Installed Batt R-value: R-15 in 3.5-inch cavity	1	.069	.065	.073	.069
	2	.064	.061	.068	.069
	3	.060	.057	.063	.059
	4	.056	.053	.059	.056
	5	.053	.051	.055	.052
	6	.050	.048	.052	.050
	7	.047	.046	.049	.047
	8	.045	.044	.047	.045
	9	.043	.042	.044	.043
	10	.041	.040	.042	.041
	11	.039	.038	.041	.039
	12	.038	.037	.039	.038

2 x 6 Single Wood Stud: R-19 Batt

	<u>Siding Material/Framing Type</u>						
	R-value of Foam Board	Lapped Wood			T1-11		
		STD	INT	ADV	STD	INT	ADV
NOTE: Nominal Batt R-value R-19 at 6-inch thickness	0	.062	.058	.055	.065	.061	.058
Installed Batt R-Value R-18 in 5.5-inch cavity	1	.058	.055	.052	.060	.057	.055
	2	.054	.052	.050	.056	.054	.051
	3	.051	.049	.047	.053	.051	.049
	4	.048	.046	.045	.050	.048	.046
	5	.046	.044	.043	.048	.046	.044
	6	.044	.042	.041	.045	.044	.042
	7	.042	.040	.039	.043	.042	.040
	8	.040	.039	.038	.041	.040	.039
	9	.038	.037	.035	.039	.038	.037
	10	.037	.036	.035	.038	.037	.036
	11	.036	.035	.034	.036	.035	.035
	12	.034	.033	.033	.035	.034	.033

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	R-value of Foam Board	Siding Material/Framing Type					
		Lapped Wood			T1-11		
		STD	INT	ADV	STD	INT	ADV
NOTE:							
Nominal BATT R-value R-21 at 5.5-inch thickness	0	.057	.054	.051	.060	.056	.053
	1	.054	.051	.048	.056	.053	.050
Installed Batt R-value	2	.050	.048	.045	.052	.050	.047
R-21 in 5.5-inch cavity	3	.048	.045	.043	.049	.047	.045
	4	.045	.043	.041	.047	.045	.043
	5	.043	.041	.040	.044	.042	.041
	6	.041	.039	.038	.042	.041	.039
	7	.039	.038	.036	.040	.039	.037
	8	.038	.036	.035	.039	.037	.036
	9	.036	.035	.034	.037	.036	.035
	10	.035	.034	.033	.036	.035	.033
	11	.033	.033	.032	.034	.033	.032
	12	.032	.031	.031	.033	.032	.031

2 x 6 Single Wood Stud: R-22 Batt

	R-value of Foam Board	Siding Material/Framing Type					
		Lapped Wood			T1-11		
		STD	INT	ADV	STD	INT	ADV
NOTE:							
Nominal Batt R-value R-22 at 6.75-inch thickness	0	.059	.055	.052	.062	.058	.054
	1	.055	.052	.049	.057	.054	.051
Installed Batt R-value	2	.052	.049	.047	.054	.051	.048
R-20 in 5.5-inch cavity	3	.049	.046	.044	.050	.048	.046
	4	.046	.044	.042	.048	.046	.044
	5	.044	.042	.041	.045	.043	.042
	6	.042	.040	.039	.043	.042	.040
	7	.040	.039	.037	.041	.040	.038
	8	.038	.037	.036	.039	.038	.037
	9	.037	.036	.035	.038	.037	.035
	10	.035	.034	.033	.036	.035	.034
	11	.034	.033	.032	.035	.034	.033
	12	.033	.032	.031	.034	.033	.032

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2 x 6 Single Wood Stud: Two R-11 Batts

	R-value of Foam Board	Siding Material/Framing Type					
		Lapped Wood			T1-11		
		STD	INT	ADV	STD	INT	ADV
NOTE: Nominal Batt R-value R-22 at 7-inch thickness	0	.060	.057	.054	.063	.059	.056
Installed Batt R-value R-18.9 in 5.5-inch cavity	1	.056	.053	.051	.059	.056	.053
	2	.053	.050	.048	.055	.052	.050
	3	.050	.048	.046	.052	.049	.047
	4	.047	.045	.044	.049	.047	.045
	5	.045	.043	.042	.046	.045	.043
	6	.043	.041	.040	.044	.043	.041
	7	.041	.040	.038	.042	.041	.039
	8	.039	.038	.037	.040	.039	.038
	9	.038	.037	.036	.039	.038	.036
	10	.036	.035	.034	.037	.036	.035
	11	.035	.034	.033	.036	.035	.034
	12	.034	.033	.032	.034	.034	.033

2 x 8 Single Stud: R-25 Batt

	R-value of Foam Board	Siding Material/Framing Type					
		Lapped Wood			T1-11		
		STD	INT	ADV	STD	INT	ADV
NOTE: Nominal Batt R-value R-25 at 8-inch thickness	0	.051	.047	.045	.053	.049	.046
Installed Batt R-value R-23.6 in 7.25-inch cavity	1	.048	.045	.043	.049	.046	.044
	2	.045	.043	.041	.047	.044	.042
	3	.043	.041	.039	.044	.042	.040
	4	.041	.039	.037	.042	.040	.038
	5	.039	.037	.036	.040	.038	.037
	6	.037	.036	.035	.038	.037	.036
	7	.036	.035	.033	.037	.035	.034
	8	.035	.033	.032	.035	.034	.033
	9	.033	.032	.031	.034	.033	.032
	10	.032	.031	.030	.033	.032	.031
	11	.031	.030	.029	.032	.031	.030
	12	.030	.029	.028	.031	.030	.029

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2 x 6: Strap Wall

	<u>Siding Material/Frame Type</u>			
	Lapped Wood		T1-11	
	STD	ADV	STD	ADV
R-19 + R-11 Batts	.036	.035	.038	.036
R-19 + R-8 Batts	.041	.039	.042	.040

2 x 6 + 2 x 4: Double Wood Stud

<u>Batt Configuration</u>			<u>Siding Material/Frame Type</u>			
			Lapped Wood		T1-11	
			STD	ADV	STD	ADV
Exterior	Middle	Interior				
R-19	-----	R-11	.040	.037	.041	.038
R-19	-----	R-19	.034	.031	.035	.032
R-19	R-8	R-11	.029	.028	.031	.029
R-19	R-11	R-11	.027	.026	.028	.027
R-19	R-11	R-19	.024	.023	.025	.023
R-19	R-19	R-19	.021	.020	.021	.020

2 x 4 + 2 x 4: Double Wood Stud

<u>Batt Configuration</u>			<u>Siding Material/Frame Type</u>			
			Lapped Wood		T1-11	
			STD	ADV	STD	ADV
Exterior	Middle	Interior				
R-11	-----	R-11	.050	.046	.052	.048
R-19	-----	R-11	.039	.037	.043	.039
R-11	R-8	R-11	.037	.035	.036	.036
R-11	R-11	R-11	.032	.031	.033	.032
R-13	R-13	R-13	.029	.028	.029	.028
R-11	R-19	R-11	.026	.026	.027	.026

Log Walls

	<u>Average Log Diameter</u>	<u>U-value</u>
NOTE:		
R-value of wood:	6-inch	0.148
R-1.25 per inch thickness	8-inch	0.111
Average wall thickness	10-inch	0.089
90% average log diameter	12-inch	0.074
	14-inch	0.063
	16-inch	0.056

Stress Skin Panel

	<u>Panel Thickness</u>	<u>U-value</u>
NOTE:		
R-value of expanded polystyrene:	3 1/2-inch	.071
R-3.85/inch	5 1/2-inch	.048
	7 1/4-inch	.037
	9 1/4-inch	.030
Framing: 6%	11 1/4-inch	.025
Spline: 8%		
No thermal bridging between interior and exterior splines		

Single Metal Stud

<u>Nominal Wall Thickness</u>	<u>Nominal Insulation R-Value</u>	<u>Effective Insulation R-Value</u>	<u>Stud Spacing</u>	
			<u>16" O.C.</u>	<u>24" O.C.</u>
4 inch	R-11	R-11	.14	.13
4 inch	R-13	R-12.7	.13	.12
6 inch	R-19	R-18	.11	.10

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1005, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1006 Section 1006 Default u-values for glazing and doors.

1006.1 Untested Glazing and Doors: Untested glazing and doors shall be assigned the following U-values:

- a. Manufactured glazing products:
 - single glazing (all): U = 1.20;
 - double glazing:
 - aluminum or steel framed: U = 0.90;
 - wood or vinyl framed: U = 0.75;

b. Nonmanufactured site built fixed lite glazing products with a minimum of one-half inch airspace in a

wood frame only. All products supplied by manufacturers, such as kits for solariums, shall use the default U-values for manufactured glazing products cited above.

- air-filled: U = 0.60;
- argon-filled: U = 0.55;
- low-e, air-filled: U = 0.50;
- low-e, argon-filled: U = 0.40;

Products which do not comply with all of these criteria shall use the default U-values listed under manufactured glazing products.

c. For Doors, see Table 10-6 on the next page.

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Btu/hr·ft²·°F

Nominal Door Thickness, Inches	Description	No Storm Door	Wood Storm Door ^c	Metal Storm Door ^d
Wood Doors^b				
1-3/8	Panel door with 7/16 inch panels ^e	0.57	0.33	0.37
1-3/8	Hollow core flush door	0.47	0.30	0.32
1-3/8	Solid core flush door	0.39	0.26	0.28
1-3/4	Panel door with 7/16 inch panels ^e	0.57	0.33	0.36
1-3/4	Hollow core flush door	0.46	0.29	0.32
1-3/4	Panel door with 1-1/8 inch panels ^e	0.39	0.26	0.28
1-3/4	Solid core flush door	0.33	0.28	0.25
2-1/4	Solid core flush door	0.27	0.20	0.21
Steel Doors^b				
1-3/4	Fiberglass or mineral wool core w/ steel stiffeners, no thermal break ^f	0.60	----	----
1-3/4	Paper honeycomb core without thermal break ^f	0.56	----	----
1-3/4	Solid urethane foam core without thermal break ^a	0.40	----	----
1-3/4	Solid fire rated mineral fiberboard core without thermal break ^f	0.38	----	----
1-3/4	Polystyrene core without thermal break(18 gage commercial steel) ^f	0.35	----	----
1-3/4	Polyurethane core without thermal break(18 gage commercial steel) ^f	0.29	----	----
1-3/4	Polyurethane core without thermal break(24 gage commercial steel) ^f	0.29	----	----
1-3/4	Polyurethane core w/ thermal break & wood perimeter(24 gage commercial steel) ^f	0.20	----	----
1-3/4	Solid urethane foam core with thermal break	0.19	0.16	0.17

Note: All U-factors for exterior doors in this table are for doors with no glazing, except for the storm doors which are in addition to the main exterior door. Any glazing area in exterior doors should be included with the appropriate glass type and analyzed. Interpolation and moderate extrapolation are permitted for door thicknesses other than those specified.

^a Values are based on a nominal 32 by 80 in. door size with no glazing.

^b Outside air conditions: 15 mph wind speed, 0°F air temperature; inside air conditions: natural convection, 70°F air temperature.

^c Values for wood storm door are for approximately 50 percent glass area.

^d Values for metal storm door are for any percent glass area.

^e 55 percent panel area

^f ASTM C 236 hotbox data on a nominal 3 by 7 ft door size with no glazing.

The U-factors in Table 6 are for exterior wood and steel doors. The values given for wood doors were calculated, and those for steel doors were taken from hot box tests (Sabine et al. 1975; Yellot 1965) or from manufacturer's test reports. An outdoor surface conductance of 6.0 Btu/h·ft²·°F was used, and the indoor surface conductance was taken as 1.4 Btu/h·ft²·°F for vertical surfaces with horizontal heat flow. All values given are for exterior doors without glazing. If an exterior door contains glazing, the glazing should be analyzed as a window.

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1006, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1007 (Reserved.)

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1007, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1008 Section 1007 Ceilings.

1007.1 General: Table 10-7 lists heat-loss coefficients for the opaque portion of exterior ceilings below vented attics, vaulted ceilings, and roof decks in units of Btu/°F●hr per square foot of ceiling.

They are derived from procedures listed in RS-1, listed in Chapter 7. Ceiling U-values are modified for the buffering effect of the attic, assuming an indoor temperature of 65° F and an outdoor temperature of 45° F.

1007.2 Component Description: The three types of ceilings are characterized as follows:

Ceilings Below a Vented Attic: Attic insulation is assumed to be blown-in, loose-fill fiberglass with a K-value of 2.6 hr●°F●ft²/Btu per inch. Full bag count for specified R-value is assumed in all cases. Ceiling dimensions for flat ceiling calculations are forty-five by thirty feet, with a gabled roof having a 4/12 pitch. The attic is assumed to vent naturally at the rate of three air changes per hour through soffit and ridge vents. A void fraction of 0.002 is assumed for all attics with insulation baffles. Standard-framed, unbaffled attics assume a void fraction of 0.008.

Attic framing is either standard or advanced. Standard framing assumes tapering of insulation depth around the perimeter with resultant decrease in thermal resistance. An increased R-value is assumed in the center of the ceiling due to the effect of piling leftover insulation. Advanced framing assumes full and even depth of insulation extending to the outside edge of exterior walls. Advanced framing does not change from the default value.

U-Values for flat ceilings below vented attics with standard framing may be modified with the following table:

Roof Pitch	U-Value for Standard Framing	
	R-30	R-38
4/12	.036	.031
5/12	.035	.030
6/12	.034	.029
7/12	.034	.029
8/12	.034	.028
9/12	.034	.028
10/12	.033	.028
11/12	.033	.027
12/12	.033	.027

Vented scissors truss attics assume a ceiling pitch of 2/12 with a roof pitch of either 4/12 or 5/12. Unbaffled standard framed scissors truss attics are assumed to have a void fraction of .016.

Vaulted Ceilings: Insulation is assumed to be fiberglass batts installed in roof joist cavities. In the vented case, at least 1.5-inches between the top of the batts and the under-

side of the roof sheathing is left open for ventilation in each cavity. A ventilation rate of three air changes per hour is assumed. In the unvented or dense pack case, the ceiling cavity is assumed to be fully packed with insulation, leaving no space for ventilation.

Roof Decks: Rigid insulation is applied to the top of roof decking with no space left for ventilation. Roofing materials are attached directly on top of the insulation. Framing members are often left exposed on the interior side.

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TABLE 10-7 DEFAULT U-VALUES FOR CEILINGS

Ceilings Below Vented Attics			<u>Standard Frame</u>	<u>Advanced Frame</u>
Flat Ceiling			Baffled	
R-19			0.049	0.047
R-30			0.036	0.032
R-38			0.031	0.026
R-49			0.027	0.020
R-60			0.025	0.017
Scissors Truss				
R-30	(4/12 roof pitch)		0.043	0.031
R-38	(4/12 roof pitch)		0.040	0.025
R-49	(4/12 roof pitch)		0.038	0.020
R-30	(5/12 roof pitch)		0.039	0.032
R-38	(5/12 roof pitch)		0.035	0.026
R-49	(5/12 roof pitch)		0.032	0.020
Vaulted Ceilings				
Vented			<u>16" O.C.</u>	<u>24" O.C.</u>
R-19	2x10 joist		0.049	0.048
R-30	2x12 joist		0.034	0.033
R-38	2x14 joist		0.027	0.027
Unvented				
R-30	2x10 joist		0.034	0.033
R-38	2x12 joist		0.029	0.027
R-21 + R-21	2x12 joist		0.026	0.025
Roof Deck			<u>4x Beams, 48" O.C.</u>	
R-12.5	2" Rigid insulation		0.064	
R-21.9	3.5" Rigid insulation		0.040	
R-37.5	6" Rigid insulation		0.025	
R-50	8" Rigid insulation		0.019	

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1008, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1009 Section 1008 Air infiltration.

1008.1 General: Tables 10-8 and 10-9 list effective air-change rates and heat capacities for heat loss due to infiltration.

Estimated seasonal average infiltration rate in air changes per hour (ACH) is given for standard air-leakage control (see section 502.4 Air Leakage for All Occupancies).

The effective air-change rate shall be used in calculations for compliance under either the Component Performance or Systems Analysis approaches.

Heat loss due to infiltration shall be computed using the following equation:

$$Q_{\text{infil}} = \text{ACH}_{\text{eff}} * \text{HCP}$$

where: Q_{infil} = Heat loss due to air infiltration

ACH_{eff} = the effective infiltration rate in Table 10-8

HCP = the Heat Capacity Density Product for the appropriate elevation or climate zone as given below.

TABLE 10-8 ASSUMED EFFECTIVE AIR-CHANGES PER HOUR

Air-Leakage Control Package	Air-Changes per Hour	
	Natural	Effective
Standard	0.35	0.35

TABLE 10-9 DEFAULT HEAT CAPACITY/DENSITY PRODUCT FOR AIR

Zone	Average Elevation	Heat Capacity/Density
1	Mean Sea Level	0.0180 Btu/hr·°F
2	2000	0.0168 Btu/hr·°F
3	3000	0.0162 Btu/hr·°F

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1009, filed 12/19/90, effective 7/1/91.]

WAC 51-11-1010 Section 1009 Mass.

1009.1 General: Table 10-10 lists default mass-values for residential construction types. All calculations are based on standard ASHRAE values for heat-storage capacity as listed in RS-1 Chapter 22.

Thermal capacity of furniture is ignored, as is heat storage beyond the first four inches of mass thickness. All mass is assumed to be in direct contact with the conditioned space. Concrete separated from the heated volume by other materials must multiply the listed concrete mass value by the result of the following formula:

$$\text{Ln}(\text{R-value}) \times (-.221) + 0.5$$

Where:

Ln = Natural log

R-value = R-value of material covering concrete

Note: All default values for covered concrete slabs have been adjusted according to this procedure.

1009.2 Mass Description: Mass is divided into two types: Structural and additional.

Structural Mass: Includes heat-storage capacity of all standard building components of a typical residential structure, including floors, ceilings, and interior and exterior walls in Btu/°F·ft² of floor area. It also assumes exterior

wall, interior wall and ceiling surface area approximately equals three times the floor area.

Additional Mass: Includes any additional building material not part of the normal structure, which is added specifically to increase the building's thermal-storage capability. This category includes masonry fireplaces, water or trombe walls, and extra layers of sheetrock. Coefficients are in Btu/°F·ft² of surface area of material exposed to conditioned space. The coefficient for water is Btu/°F·gallon.

1009.3 Component Description: Light frame assumes one inch thick wood flooring with five-eighths inch sheetrock on ceilings and interior walls, and walls consisting of either five-eighths inch sheetrock or solid logs. Slab assumes a four-inch concrete slab on or below grade, with five-eighths inch sheetrock on exterior and interior walls and ceiling, and with separate values for interior or exterior wall insulation. Adjustments for slab covering is based on R-value of material. Additional mass values are based on the density multiplied by the specific heat of the material adjusted for listed thickness.

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TABLE 10-10 DEFAULT MASS VALUES

Structural Mass M-value	Btu/°F·Ft ² floor area
Light frame:	
Joisted/post & beam floor, sheetrock walls and ceilings	3.0
Joisted/post & beam floor, log walls, sheetrock ceilings	4.0
Slab with interior wall insulation:	
Slab, no covering or tile, sheetrock walls and ceilings	10.0
Slab, hardwood floor covering, sheetrock walls and ceilings	7.0
Slab, carpet and pad, sheetrock walls and ceilings	5.0
Slab with exterior wall insulation:	
Slab, no covering or tile, sheetrock walls and ceilings	12.0
Slab, hardwood floor covering, sheetrock walls and ceilings	9.0
Slab, carpet and pad, sheetrock walls and ceilings	7.0
Additional Mass M-Value:	
	BTU/°F·Ft ² surface area
Gypsum wallboard, 1/2-inch thickness	0.54
Gypsum wallboard, 5/8-inch thickness	0.68
Hardwood floor	1.40
Concrete/Brick, 4 inch-thickness	10.30
Concrete/Brick, 6 inch-thickness	15.40
	BTU/°F·gallon
Water, 1 gallon	8.0

[Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1010, filed 12/19/90, effective 7/1/91.]

Chapter 51-13 WAC VENTILATION AND INDOOR AIR QUALITY

WAC

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51-13-501	Scope.
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WAC 51-13-100 Chapter 1—Administration and enforcement.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-100, filed 12/18/90, effective 7/1/91.]

WAC 51-13-101 Scope and general requirements.

101.1 Title: This Code shall be known as the Washington State Ventilation and Indoor Air Quality Code. It is herein referred to as "this Code".

101.2 Intent: The purpose of this Code is to provide minimum standards for the design and installation of mechanical ventilation systems, the selection of structural materials used within the conditioned space, and the construction of radon mitigation systems for new construction.

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

101.3 Scope: This Code sets forth minimum requirements for ventilation in all occupancies, including the design of new construction.

101.3.1 Application to Existing Buildings

101.3.1.1 Additions to Existing Buildings: Additions to existing buildings or structures may be made without making the entire building comply, provided that the new addition shall conform to the provisions of this Code.

Exceptions

1. Additions that do not include kitchens, bathrooms, water closets, indoor swimming pools, spas, and other areas where excess water vapors are produced and are less than five hundred square feet are exempt from Chapter 3.

2. Additions or alterations to existing buildings which do not require the construction of foundations, crawlspaces, slabs, or basements shall not be required to meet the requirements for radon protection.

101.3.1.2 Alterations and Repairs: All alterations and repairs may be made to existing or moved buildings built or permitted prior to the enforcement of this Code without making the entire building comply with the provisions of this Code, provided the alterations or repairs comply with this Code.

101.3.1.3 Historic Buildings: Historic buildings are exempt from this Code only to the extent necessary to preserve those features essential to their historical appearance or function.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-101, filed 12/18/90, effective 7/1/91.]

WAC 51-13-102 Alternate systems and materials method of design, construction and installation.

102.1 Alternate Materials and Methods of Construction: The provisions of this Code are not intended to prevent the use of any material, method of construction, design or ventilation system not specifically prescribed herein, provided that such construction, design, or ventilation system has been approved by the building official.

The building official may approve any such alternate, provided that the proposed design is satisfactory and complies with the provisions of this Code and that the material, method, or work offered is, for the purpose intended, at least

the equivalent of that prescribed in this Code in suitability, effectiveness, safety, and indoor air quality.

The building official may require plans and specifications to be submitted in support of an application for a building permit. Plans and specifications may be required by the building official to be stamped and authenticated by an engineer or architect licensed by the state to practice as such.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-102, filed 12/18/90, effective 7/1/91.]

WAC 51-13-103 Plans and specifications.

103.1 General: With each application for a building permit, and when required by the building official, plans and specifications demonstrating compliance with this Code shall be submitted. The building official may require that plans and specifications be stamped and authenticated by an engineer, architect, or other qualified professional licensed to practice in the state.

103.2 Details: The plans and specifications shall show in sufficient detail pertinent data and features of the materials, equipment and systems as herein governed, including, but not limited to: design criteria, structural panel materials, size and type of apparatus and equipment, systems and equipment controls, provisions for combustion air to fuel burning appliances, and other pertinent data to indicate conformance with the requirements of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-103, filed 12/18/90, effective 7/1/91.]

WAC 51-13-104 Enforcement and inspections.

104.1 General: Pertinent data and features of the building and the materials, equipment and/or systems as herein governed shall be subject to inspection by the building official.

104.2 Approvals Required: No materials, equipment, systems, or portions thereof, shall be concealed without first obtaining approval from the building official.

104.3 Tests: Whenever there is insufficient evidence of compliance with any of the provisions in this Code or evidence that any material or construction does not conform to the requirements of this Code, the building official may require tests as proof of compliance to be made at no expense to the local jurisdiction.

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

104.4 Final Inspection: All materials, equipment, and systems herein governed shall be inspected and approved before the building shall be deemed ready for occupancy.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-104, filed 12/18/90, effective 7/1/91.]

WAC 51-13-105 Validity.

105.1 Validity: If a section, subsection, sentence, clause, or phrase of this Code is, for any reason, held to be

unconstitutional, such decision shall not affect the validity of the remaining portion of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-105, filed 12/18/90, effective 7/1/91.]

WAC 51-13-106 Conflicts with other codes.

106.1 Conflicts with Other Codes: In addition to the requirements of this Code, buildings must conform to the provisions of the State Building Code (Chapter 19.27 RCW and Chapter 51-16 WAC). In case of conflicts between the Uniform Building, Uniform Plumbing, Uniform Mechanical, and Uniform Fire Codes as adopted and amended in Chapter 51-16 Washington Administrative Code, the provisions of Chapter 51-13 shall govern. This Code is not intended to abridge any safety or health requirements under any other applicable codes or ordinances.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

Wherever in this Code reference is made to the appendix, the provisions of the appendix shall not apply unless specifically adopted.

106.2 Authority: Local legislative authorities are authorized and directed to enforce this Code. Local legislative authorities are authorized to promulgate, adopt, and issue those rules and regulations necessary for the effective and efficient administration of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-106, filed 12/18/90, effective 7/1/91.]

WAC 51-13-107 Violations.

107.1 Violations: It shall be unlawful for any persons, firm, or corporation to erect or construct any building, or remodel or rehabilitate any existing building or structure in the state, or allow the same to be done in violation of any of the provisions of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-107, filed 12/18/90, effective 7/1/91.]

WAC 51-13-108 Liability.

108.1 Liability: Nothing contained in this Code is intended to be nor shall be construed to create nor form the basis for any liability on the part of any city or county or its officers, employees, or agents for any injury or damage resulting from the failure of a building to conform to the provisions of this Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-108, filed 12/18/90, effective 7/1/91.]

WAC 51-13-200 Definitions.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-200, filed 12/18/90, effective 7/1/91.]

WAC 51-13-201 General.

201.1 General: For the purposes of this Code, certain terms, phrases, words, and their derivatives shall be construed as specified in this section. Words used is the singular include the plural and the plural, the singular. Words used in the masculine gender include the feminine and feminine, the masculine.

Where terms are not defined in this section, the definitions shall be taken from Chapter 4 of the Uniform Building Code.

Where terms are not defined in either this section or Chapter 4 of the Uniform Building Code, they shall have their ordinary accepted meanings within the context with which they are used. Webster's Third International Dictionary of the English Language, Unabridged, copyrighted 1981, shall be considered as providing ordinarily accepted meanings.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-201, filed 12/18/90, effective 7/1/91.]

WAC 51-13-202 Definitions.

Addition: An extension or increase in floor area or height of a building or structure.

Aggregate: Crushed stone, stone, or other inert material, or combinations thereof having hard, strong, durable pieces.

Air barrier: A continuous material or system of materials utilized for the purpose of minimizing the movement of air across a defined boundary, and capable of withstanding the maximum pressure developed across it, without failing by becoming significantly more leaky.

Air, exhaust: Air removed from a space and not reused therein.

Air, outdoor: Air taken from the external atmosphere and, therefore, not previously circulated through the HVAC system or the conditioned space.

Air, supply: That air delivered to the conditioned space and used for ventilation, heating, cooling, humidification, or dehumidification.

Air, transfer: The movement of indoor air from one space to another.

Air, ventilation: That portion of supply air that is outdoor air plus any recirculated air that has been treated for the purpose of maintaining acceptable indoor air quality.

AMCA: Air Movement and Control Association, Inc.

Approved: As to material and types of construction, refers to approved by the building official as the result of investigation and tests conducted by him, or by reason of accepted principles or tests by recognized authorities, technical or scientific organizations.

ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

Automatic: Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for

example, a change in current strength, pressure, temperature, or mechanical configuration.

Back-draft damper: A damper installed to restrict introduction of unconditioned air from an unconditioned space to a conditioned space.

Barometric damper: Shall be any listed non-manual device that freely allows the flow of air in one direction, but does not allow conditioned air to escape. Any installed combustion air damper shall meet the installation requirements of the manufacturer.

Building official: The officer or other designated authority charged with the administration and enforcement of this Code, or his duly authorized representative.

Certified local government: The local government has been certified by the state historical preservation officer as having established its own historic preservation commission and a program meeting federal and state standards.

CFM: Cubic feet per minute.

Conditioned floor area: The floor area within the conditioned space.

Conditioned space: That part of a building that is heated or cooled or both for the comfort of occupants.

Dehumidistat: An automatic control device which measures changes in humidity and controls a device(s) for maintaining a maximum specified humidity range or level.

Exfiltration: The uncontrolled outward air leakage through cracks and concealed spaces in any building element and around sole plates, wall outlets, duct systems, windows, and doors of a building, caused by the pressure effect of wind and/or the effect of differences in the indoor and outdoor air density.

Gravel: A type of aggregate.

Habitable space (room): Space in a structure for living, sleeping, eating, or cooking. Bathrooms, toilet compartments, closets, halls, storage, or utility space and similar areas, are not considered habitable space. For the purpose of this Code, a single habitable space may consist of adjoining rooms when one half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room or twenty five square feet, whichever is greater.

Heat recovery ventilation system: A device or combination of devices applied to provide the outdoor air for ventilation in which energy is transferred between the intake and exhaust airstream.

Historic buildings: Any structure, collection of structures, and their associated sites, deemed of importance to the history, architecture, or culture of an area by an appropriate local, state, or federal government jurisdiction. Including shall be structures on official national, state, or local listings such as the National Register of Historic Places, the State Register of Historic Places, state points of historical interest, and registers or listings of historical or architecturally significant sites, places, historic districts, or landmarks as adopted by a certified local government.

Humidistat: An automatic control device which measures changes in humidity and controls a device(s) for maintaining a minimum specified humidity range or level.

HVAC: Heating, ventilating, and air conditioning.

HVI: Home Ventilating Institute of America, Inc.

Infiltration: The uncontrolled inward air leakage through cracks and concealed spaces in any building element and around sole plates, wall outlets, duct systems, windows, and doors of a building, caused by the pressure effect of wind and/or the effect of differences in the indoor and outdoor air density.

"J" Definitions: (Reserved)

"K" Definitions: (Reserved)

"L" Definitions: (Reserved)

Manual: Capable of being operated by human intervention.

Mitigate: To design, select, apply, and install systems, materials, and processes that reduce radon concentrations in the indoor air of a building, and/or prevent entry of radon into the indoor air of a building, so that the average indoor radon concentration is reduced to an acceptable level.

New construction: Any building, addition or change in occupancy permitted on or after the effective date of this Code.

"O" Definitions: (Reserved)

Picocurie, pCi: A measure of radioactive activity equal to one trillion of a curie. A curie is the amount of any radionuclide that undergoes thirty seven billion nuclear disintegrations per second, hence a picocurie is .037 nuclear disintegrations per second.

Picocurie per liter, pCi/L: A common unit of measurement of the concentration of radioactivity in a gas. One pCi/L corresponds to 2.22 radioactive disintegrations per minute per liter of air.

"Q" Definitions: (Reserved)

R value: (See **Thermal resistance (R)**)

Readily accessible: Readily accessible means capable of being reached safely and quickly for operation, repair, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles, or to resort to the use of portable access equipment.

Soil depressurization system (SDS): A radon control technique that depressurizes the space below a concrete slab or other soil gas retarder relative to the space above it. The purpose of SDS is to maintain a slightly lower pressure in the soil gas under the slab or other soil gas retarder, compared to the indoor pressure above it, to ensure that flows are from the indoors to the soil, thus preventing mass transport of radon contaminated soil gas to the indoor air.

Soil gas retarder membrane: A flexible sheet material placed between the soil and the indoor air for the purpose of reducing the flow of soil gas into the building.

Solid fuel burning appliance: Any factory-built or site built appliance designed to provide heat for a structure by burning solid fuels.

Source specific ventilation system: A mechanical ventilation system including all fans, controls, and ducting, which is dedicated to exhausting contaminant-laden air to the exterior of the building from the room or space in which the contaminant is generated.

System: A combination of equipment and/or controls, accessories, interconnecting means, and terminal elements by which air is transferred.

Terminal element: The means by which the transferred air from a system is finally delivered; i.e., registers, diffusers, through-the-wall vents, roof caps, etc.

Thermal resistance (R): The resistance of a material to heat flow, measured as the inverse of heat flow per unit area, per unit time, per unit temperature difference across the thickness of material considered. In this Code, R has units of sq.ft./hr./°F/Btu.

Thermostat: An instrument which measures changes in temperature and control device(s) for maintaining a desired temperature.

Unconditioned space: (See **Conditioned space**)

Ventilation: The process of supplying and removing air by natural or mechanical means to and from any space. Such air may or may not be conditioned.

Ventilation, mechanical: The introduction and distribution of outdoor air and the removal of indoor air by mechanical means.

Ventilation, natural: Ventilation other than by mechanical means.

Whole house ventilation system: A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct or indirect means, air from the habitable rooms with outdoor air.

Wood stove: (See **Solid fuel burning appliance**)

"X" Definitions: (Reserved)

"Y" Definitions: (Reserved)

Zone: A space or group of spaces within a building with heating and/or cooling requirements sufficiently similar so that comfort conditions can be maintained throughout by a single controlling device.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-202, filed 12/18/90, effective 7/1/91.]

WAC 51-13-300 Chapter 3—Design conditions.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-300, filed 12/18/90, effective 7/1/91.]

WAC 51-13-301 Design criteria.

301.1 General: The criteria of this chapter establish the design conditions upon which the minimum ventilation systems are to be based for all occupancies.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-301, filed 12/18/90, effective 7/1/91.]

WAC 51-13-302 Minimum ventilation criteria for all Group R occupancies.

302.1 General: This section shall apply to all Group R occupancies as defined by the Washington State Building Code. Compliance with this section shall be demonstrated through engineering calculations or performance testing. Documentation of calculations shall be submitted to the building official where required. Performance testing shall be conducted in accordance with recognized test methods.

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

Exception: All public corridors shall meet the ventilation requirements in section 1205 (c) of the Uniform Building Code.

302.2.1 Source Specific Ventilation: Source specific exhaust ventilation shall be required in each kitchen, bathroom, water closet, laundry facility, indoor swimming pool, spa, and other rooms where excess water vapor or cooking odor is produced.

The minimum source specific ventilation effective exhaust capacity shall be not less than levels specified in Table 3-1.

302.2.2 Whole House Ventilation Systems: Each dwelling unit shall be equipped with a whole house ventilation system which shall be capable of providing at least 0.35 air changes per hour, but not less than fifteen cubic feet per minute per bedroom plus an additional fifteen cubic feet per minute. Whole house ventilation systems shall be designed to limit ventilation to a level no greater than 0.5 air changes per hour under normal operation conditions. Whole house ventilation systems shall supply outdoor air to all habitable rooms through individual outdoor air inlets, forced-air heating system, ducting or equivalent means. Doors and operable lites in windows are deemed not to meet the outdoor air supply intake requirements.

302.3 Controls: All ventilation system controls shall be readily accessible. Controls for whole house ventilation systems shall be capable of operating the ventilation system without energizing other energy-consuming appliances.

Exception: Continuously operated whole house ventilation systems switch shall not be readily accessible by the occupant.

302.3.1 Source Specific Ventilation Systems: Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means.

302.3.2 Intermittently Operated Whole House Ventilation Systems: The intermittently operated whole house ventilation systems shall be constructed to have the capability for continuous operation, and shall have a manual control and an automatic control, such as a clock timer.

302.4 Noise: Whole house fans located four feet or less from the interior grille shall have a sone rating of 1.5 or less measured at 0.1 inches water gauge. Remotely mounted fans

shall be acoustically isolated from the structural elements of the building and from attached duct work using insulated flexible duct or other approved material.

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

302.5 Ventilation Ducts: All ducts shall terminate outside the building. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

302.6 Outdoor Air: A mechanical system shall supply outdoor air as required in section 302.2.2. The mechanical system may consist of exhaust fans, supply fans, or both.

302.6.1 Outdoor Air Inlets: Inlets shall be screened or otherwise protected from entry by insects, leaves, or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

- Closer than ten feet from an appliance vent outlet, unless such vent outlet is three feet above the outdoor air inlet.
- Where it will pick up objectionable odors, fumes, or flammable vapors.
- A hazardous or unsanitary location.
- A room or space having any fuel-burning appliances therein.
- Closer than ten feet from a vent opening of a plumbing drainage system unless the vent opening is at least three feet above the air inlet.
- Attic, crawl spaces, or garages.

302.6.2 Individual Room Outdoor Air Inlets: Individual room outdoor air inlets shall have a controllable and secure opening and be capable of a total opening area of not less than four square inches and tested by a nationally recognized standard or approved agency and located to avoid drafts.

302.6.3 Ventilation Integrated with Forced-Air Systems: The outdoor air connection to the return air stream shall be located to prevent thermal shock to the heat exchanger.

302.6.4 Distribution: Outdoor air shall be distributed to each habitable room by individual inlets, separate duct systems, or a forced-air system. Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by undercutting doors, installation of grilles, transoms, or similar means where permitted by the Uniform Building Code.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-302, filed 12/18/90, effective 7/1/91.]

WAC 51-13-303 Mechanical ventilation criteria and minimum ventilation prescriptive requirements for all Group R occupancies.

303.1 General: This section establishes minimum prescriptive design requirements for intermittently operated

systems. Continuously operated systems shall comply with section 302. System characteristics not addressed in the following sections shall comply with section 302. A system which meets the requirements of this section shall be deemed to satisfy the requirements of this chapter.

303.1.1 Source Specific: Exhaust fans providing source specific ventilation shall have a minimum fan flow rating not less than fifty cfm at 0.25 inches water gauge for bathrooms, laundries, or similar rooms and one hundred cfm at 0.25 inches water gauge for kitchens. Manufacturers' fan flow ratings shall be determined as per HVI 916 (July 1989) or AMCA 210.

303.1.2 Whole House: Whole house ventilation systems may consist of whole house exhaust, integration with forced-air systems or dedicated heat recovery ventilation systems. Whole house exhaust systems shall meet the following requirements:

a) Exhaust fans providing whole house ventilation shall have a flow rating at 0.25 inches water gauge as specified in Table 3-2. Manufacturer's fan flow ratings shall be determined as per HVI 916 (July 1989) or AMCA 210. Table 3-2 shall not be used for dwelling units with more than four bedrooms.

b) Integrated forced-air ventilation systems shall have a six inch diameter or equivalent outdoor air inlet duct connecting a terminal element on the outside of the building to the return plenum of the forced-air system. The outdoor air inlet duct shall be equipped with a damper, or other device that regulates air flow to a minimum of 0.35 air changes per hour but not greater than the 0.50 air changes per hour under normal operating conditions.

c) Heat recovery ventilation systems: All duct work in heat recovery ventilation systems shall be not less than six inch diameter. Balancing dampers shall be installed on the inlet and exhaust side. Flow measurement grids shall be installed on the supply and return. System minimum flow rating shall be not less than that specified in Table 3-2. Maximum flow rates in Table 3-2 do not apply to heat recovery ventilation systems.

303.2 Source Specific and Whole House Exhaust Ducts: Exhaust ducts shall meet all requirements of section 302.5. Duct diameter length and number of elbows shall not be less than four inches and duct length shall not exceed levels specified in Table 3-3. Terminal elements shall have at least the equivalent net free area of the duct work.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-303, filed 12/18/90, effective 7/1/91.]

WAC 51-13-304 Mechanical ventilation criteria and minimum ventilation performance for all other occupancies.

304.1 Ventilation: The outdoor air quantities specified in Table 3-4 for each type of occupancy shall be used as the minimum for design. In no case shall the outdoor air quantities be less than five cfm per person.

The minimum requirements for operable area to provide natural ventilation are specified in the Uniform Building Code (UBC) as adopted by the state of Washington.

Where a mechanical ventilation system is installed, the mechanical ventilation system shall be capable of supplying ventilation air to each zone with the minimum outdoor air quantities specified in Table 3-4 based upon the greater of the occupant densities in Table 3-4 or the design occupant density. The outdoor air shall be ducted directly to every air handling unit in each zone not provided with sufficient operable area for natural ventilation. The maximum outdoor air quantities used as the basis for calculating the heating and cooling design loads shall not exceed three times the quantities specified in Table 3-4.

In all parking garages, other than open parking garages as defined in UBC 709 (b), used for storing or handling of automobiles operating under their own power and on all loading platforms in bus terminals, ventilation shall be provided at 1.5 cfm per square foot of gross floor area. The building official may approve an alternate ventilation system designed to exhaust a minimum fourteen thousand cfm for each operating vehicle. Such system shall be based on the anticipated instantaneous movement rate of vehicles but not less than 2.5 percent (or one vehicle) of the garage capacity. Automatic carbon monoxide sensing systems may be submitted for approval.

In all buildings used for the repair of automobiles, each repair stall shall be equipped with an exhaust extension duct, extending to the outside of the building, which if over ten feet in length, shall mechanically exhaust three hundred cfm. Connecting offices and waiting rooms shall be supplied with conditioned air under positive pressure.

Combustion air requirements shall conform to the requirements of Chapter 6 of the UMC.

Mechanical refrigerating equipment and rooms storing refrigerates shall conform to the requirements of Chapter 15 of the UMC.

Exception: If outdoor air quantities other than those specified in Table 3-4 are used or required because of special occupancy or process requirements, source control of air contamination, health, and safety or other standards, the required outdoor air quantities shall be used as the basis for calculating the heating and cooling design loads.

MINIMUM SOURCE SPECIFIC VENTILATION CAPACITY REQUIREMENTS TABLE 3-1

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

WHOLE HOUSE EXHAUST FAN PRESCRIPTIVE REQUIREMENTS TABLE 3-2

<u>Bedrooms</u>	CFM	
	<u>Minimum</u>	<u>Maximum</u>
2 or less	50	75
3	80	120
4	100	150

PRESCRIPTIVE EXHAUST DUCT SIZING TABLE 3-3

PRESCRIPTIVE EXHAUST DUCT SIZING TABLE 3-3

Fan Tested CFM @0.25 W.G.	Maximum Flex	Maximum Length	Maximum Smooth	Maximum Length	Maximum Elbows*
	Diameter	Feet	Diameter	Feet	
50	4 inch	25	4 inch	70	3
50	5 inch	90	5 inch	100	3
50	6 inch	Over 100	6 inch	Over 100	3
80	4 inch	Not Allowed	4 inch	20	3
80	5 inch	15	5 inch	100	3
80	6 inch	90	6 inch	Over 100	3
100	5 inch	Not Allowed	5 inch	50	3
100	6 inch	45	6 inch	Over 100	3
125	6 inch	15	6 inch	Over 100	3
125	7 inch	70	7 inch	Over 100	3

*For each additional elbow subtract 10 feet from length.

VENTILATION REQUIREMENTS IN OTHER THAN GROUP R OCCUPANCY
TABLE NO. 3-4

TABLE 3-4
OUTDOOR AIR REQUIREMENTS FOR VENTILATION¹
COMMERCIAL FACILITIES

Application	Estimated Maximum ²	Outdoor Air
	Occupancy P/1000 ft ² or 100 m ²	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
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, Dormitories⁶		
Bedrooms		30 cfm/ft.sq.
Living Rooms		30 cfm/ft.sq.
Bath ⁷		35
cfm/ft.sq.		
Lobbies	30	15
Conference rooms	50	20
Assembly rooms	120	15
Dormitory sleeping area ⁸	20	15
Gambling casinos ⁴	120	30
Offices		
Office space ⁹	7	20
Reception area	60	15
Telecommunication centers and data entry areas	60	20
Conference rooms	50	20
Public Spaces		
Corridors and utilities		0.005 cfm/ft.sq.
Public restroom, cfm/wc or urinal ¹⁰		50
Lockers and dressing rooms		.05 cfm/ft.sq.
Smoking lounge ¹¹	70	60
Elevators ¹²		1.0 cfm/ft.sq.

TABLE 3-4 Cont.
 OUTDOOR AIR REQUIREMENTS FOR VENTILATION¹
 COMMERCIAL FACILITIES

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	0.3 cfm/ft.sq.
Upper floors	20	0.2 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.
Warehouses	5	0.05 cfm/ft.sq.
Smoking lounge ¹¹	70	60
Specialty Shops		
Barber	25	15
Beauty	25	25
Reducing salons	20	15
Florists ¹³	8	15
Clothiers, furniture		.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

TABLE 3-4 Cont.
 OUTDOOR AIR REQUIREMENTS FOR VENTILATION¹
 COMMERCIAL FACILITIES

Application	Estimated Maximum ² Occupancy P/1000 ft ² or 100 m ²	Outdoor Air Requirements cfm/person
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.
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
Physical Therapy	20	15
Correctional Facilities		
Cells	20	20
Dining halls	100	15
Guard station	40	15

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 engine 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.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-304, filed 12/18/90, effective 7/1/91.]

WAC 51-13-400 Chapter 4—Indoor air quality.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-400, filed 12/18/90, effective 7/1/91.]

WAC 51-13-401 Pollutant source control.

401.1 Formaldehyde Reduction Measures: All structural panel components of the house such as softwood plywood, particle board, wafer board, and oriented strand board shall be identified as "EXPOSURE 1", "EXTERIOR" or "HUD-APPROVED."

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-401, filed 12/18/90, effective 7/1/91.]

WAC 51-13-402 Solid fuel burning appliances and fireplaces.

402.1 General: Solid fuel burning appliances and fireplaces shall satisfy one of the following criteria.

402.2 Solid Fuel Burning Appliances: Solid fuel burning appliances shall be provided with the following:

a) Tight fitting glass or metal doors.

b) An outside source of combustion air directly connected to the fire box, or tested and listed to the performance requirements of the carbon monoxide test required by the Department of Housing and Urban Development Mobile Home Construction and Safety Standards.

Exception: If existing construction prohibits the introduction of outside combustion air directly to the appliance or the solid fuel burning appliance is part of the central heating system and is installed in an unconditioned space, combustion air may be supplied to the room in which the solid fuel burning appliance is located in lieu of direct ducting. The combustion air terminus shall be located as close to the solid fuel burning appliance as possible and shall be provided with a barometric damper or equivalent. The combustion air source shall be no less than four inches in diameter or the equivalent in area or as approved.

402.3 Fireplaces: Fireplaces shall be provided with each of the following:

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

b) An outside source for combustion air ducted into the firebox. The duct shall be at least six square inches, and shall be provided with an operable outside air duct damper.

c) Tightly fitting glass or metal doors, or flue draft induction fan, or as approved for minimizing back-drafting.

Exception: Fireplaces with gas logs shall be installed in accordance with the Uniform Mechanical Code Chapter 803.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-402, filed 12/18/90, effective 7/1/91.]

WAC 51-13-500 Chapter 5—Radon resistive construction standards.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-500, filed 12/18/90, effective 7/1/91.]

WAC 51-13-501 Scope.

501.1 General: The criteria of this chapter establishes minimum radon resistive construction requirements for all Group R Occupancies. These requirements are adopted pursuant to the ventilation requirements of Section 7, of Chapter 2 of the Session Laws of 1990.

501.2 Application: The requirements of this chapter shall be adopted and enforced by all jurisdictions of the state according to the following subsections:

501.2.1: All jurisdictions of the state shall comply with section 502.

501.2.2: Ferry, Grant, Okanogan, Pend Oreille, Skamania, Spokane, Stevens, and Wahkiakum counties shall also comply with section 503.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-501, filed 12/18/90, effective 7/1/91.]

WAC 51-13-502 State-wide radon requirements.

502.1: Crawlspaces

502.1.1 General: All crawlspaces shall comply with the requirements of this section.

502.1.2 Ventilation: All crawlspaces shall be ventilated as specified in section 2516 (c) of the Washington State Uniform Building Code (chapter 51-16 WAC).

If the installed ventilation in a crawlspace is less than one square foot for each three hundred square feet of crawlspace area, or if the crawlspace vents are equipped with operable louvers, a radon vent shall be installed from a point between the ground cover and soil. The radon vent shall be installed in accordance with sections 503.2.6 and 503.2.7.

502.1.3 Crawlspace plenum systems: In crawlspace plenum systems used for providing supply or return air for an HVAC system, aggregate, a soil gas retarder membrane and a radon vent pipe shall be installed in accordance with section 503.2.

In addition, a radon vent fan shall be installed and activated. The fan shall be located as specified in section 503.2.7. The fan shall be capable of providing at least one hundred cfm at one inch water column static pressure.

502.2 Radon monitoring

502.2.1 Three month etched track radon monitoring: A three month etched track radon monitor, installation instructions, and radon information sheets shall be provided by the

builder at the final inspection to all single family residences and to all first floor dwelling units in multi-unit structures. It is not the responsibility of the builder to administer the radon test.

[Statutory Authority: RCW 19.27.190. 91-12-045, § 51-13-502, filed 6/5/91, effective 7/1/91; 91-01-102, § 51-13-502, filed 12/18/90, effective 7/1/91.]

WAC 51-13-503 Radon prescriptive requirements.

503.1 Scope: This section establishes prescriptive construction requirements for reducing the potential for radon entry into all Group R occupancies, and for preparing the building for future mitigation if desired.

503.2 Floors in Contact with the Earth

503.2.1 General: Concrete slabs that are in direct contact with the building envelope shall comply with the requirements of this section.

Exception: Concrete slabs located under garages or other than Group R occupancies need not comply with this chapter.

503.2.2 Aggregate: A layer of aggregate of four inch minimum thickness shall be placed beneath concrete slabs. The aggregate shall be continuous to the extent practical.

503.2.3 Gradation: Aggregate shall:

a) Comply with Uniform Building Standard 26-2 and shall be No. 67 or larger size aggregate as listed in Table 26-2-A, Grading Requirements for Concrete Aggregates; or

b) Meet the 1988 Washington State Department of Transportation specification 9-03.1 (3) "Coarse Aggregate for Portland Cement Concrete", or any equivalent successor standards. Aggregate size shall be of Grade 5 or larger as listed in section 9-03.1 (3) C, "Grading"; or

c) Be screened, washed, and free of deleterious substances in a manner consistent with UBC Standard 26-2 with one hundred percent of the gravel passing a one inch sieve and less than two percent passing a four-inch sieve. Sieve characteristics shall conform to those acceptable under UBC Standard 26- 2.

Exception: Aggregate shall not be required if a substitute material or system, with sufficient load bearing characteristics, and having approved capability to provide equal or superior air flow, is installed.

503.2.4 Soil-Gas Retarder Membrane: A soil-gas retarder membrane, consisting of at least one layer of virgin polyethylene with a thickness of at least six mil, or equivalent flexible sheet material, shall be placed directly under all concrete slabs. The flexible sheet shall extend to the foundation wall or to the outside edge of the monolithic slab. Seams shall overlap at least twelve inches.

503.2.5 Sealing of Penetrations and Joints: All penetrations and joints in concrete slabs or other floor systems and walls below grade, that will not be accessible at the time the certificate of occupancy is granted, shall be sealed by an approved sealant to create an air barrier to limit the movement of soil-gas into the indoor air.

Sealants shall be approved by the manufacturer for the intended purpose. Sealant joints shall conform to manufacturer's specifications. The sealant shall be placed

and tooled in accordance with manufacturer's specifications. There shall be no gaps or voids after the sealant has cured.

503.2.6 Radon Vent: One continuous sealed pipe shall run from a point within the aggregate under each concrete slab to a point outside the building. Joints and connections shall be gas tight.

The continuous sealed pipe shall terminate no less than twelve inches above the eave, and more than ten horizontal feet from a woodstove or fireplace chimney, or operable window. The continuous sealed pipe shall be labeled "radon vent." The label shall be placed so as to remain visible to an occupant.

The minimum pipe diameter shall be three inches unless otherwise approved. Acceptable sealed plastic pipe shall be smooth walled, and may include either PVC schedule 40 or ABS schedule of equivalent wall thickness.

The entire sealed pipe system shall be sloped to drain. The exterior pipe opening shall be protected from blockage by snow accumulation.

The sealed pipe system may pass through an unconditioned attic before exiting the building; but to the extent practicable, the sealed pipe shall be located inside the thermal envelope of the building in order to enhance passive stack venting.

Exception: A fan forced sub-slab depressurization system includes:

- 1) Soil-gas retarder membrane as specified in section 503.2.4;
- 2) Sealing of penetrations and joints as specified in section 503.2.5;
- 3) A three-inch continuous sealed radon pipe shall run from a point within the aggregate under each concrete slab to a point outside the building;
- 4) Joints and connection shall be gas tight, and may be of either PVC schedule 40 or ABS schedule of equivalent in wall thickness;
- 5) A label of "radon vent" shall be placed on the pipe so as to remain visible to the occupant;
- 6) Fan circuit and wiring as specified in section 503.2.7 and a fan.

If the sub-slab depressurization system is exhausted through the concrete foundation wall or rim joist, the exhaust terminus shall be a minimum of six feet from operable windows or outdoor air intake vents and shall be directed away from operable windows and outdoor air intake vents to prevent radon re-entrainment.

503.2.7 Fan Circuit and Wiring and Location: An area for location of an in-line fan shall be provided. The location shall be as close as practicable to the radon vent pipe's point of exit from the building, or shall be outside the building shell; and shall be located so that the fan and all downstream piping is isolated from the indoor air.

Provisions shall be made to allow future activation of an in-line fan on the radon vent pipe without the need to place new wiring. A one hundred ten volt power supply shall be provided at a junction box near the fan location.

503.2.8 Separate Aggregate Areas: If the four-inch aggregate area underneath the concrete slab is not continuous, but is separated into distinct isolated aggregate areas by a footing or other barrier, a minimum of one radon vent pipe shall be installed into each separate aggregate area.

Exception: Separate aggregate areas may be considered a single area if a minimum three-inch diameter connection joining the separate areas is provided for every thirty feet of barrier separating those areas.

503.2.9 Concrete Block Walls: Concrete block walls connected to below grade areas shall be considered unsealed surfaces. All openings in concrete block walls that will not remain accessible upon completion of the building shall be sealed at both vertical and horizontal surfaces, in order to create a continuous air barrier to limit the transport of soil-gas into the indoor air.

[Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-503, filed 12/18/90, effective 7/1/91.]

Chapter 51-16 WAC STATE BUILDING CODE GUIDELINES

WAC

- 51-16-010 Authority.
- 51-16-020 Purpose.
- 51-16-030 Exemptions for indigent housing guidelines.
- 51-16-080 Permit exemptions guideline.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 51-16-040 Uniform Mechanical Code. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-040, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-040, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
- 51-16-050 Uniform Fire Code and Uniform Fire Code Standards. [Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266. 90-02-110, § 51-16-050, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074. 88-24-018 and 89-11-081 (Orders 88-11 and 88-11A), § 51-16-050, filed 12/1/88 and 5/23/89, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-050, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
- 51-16-060 Uniform Plumbing Code and Uniform Plumbing Code standards. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-060, filed 12/1/88, effective 7/1/89; 86-24-041 (Order 86-19), § 51-16-060, filed 11/26/86, effective 4/27/87. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-060, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
- 51-16-070 Exceptions. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-070, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13); § 51-16-070, filed 11/26/85, effective 6/11/86.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.
- 51-16-090 Submittal of proposed city or county amendments. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-090, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-090, filed 11/26/85, effective 6/11/86.] Repealed by 90-13-033, filed 6/13/90, effective 7/23/90. Statutory Authority: RCW 19.27.060 (7)(b).
- 51-16-100 Review of city and county amendments previously approved by the council. [Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-100, filed 12/1/88, effective 7/1/89.] Repealed by 92-01-069, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139.

WAC 51-16-010 Authority. These guidelines are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139, 92-01-069, § 51-16-010, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, 88-24-018 (Order 88-11), § 51-16-010, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360, 85-24-029 (Order 85-13), § 51-16-010, filed 11/26/85, effective 6/11/86.]

WAC 51-16-020 Purpose. The purpose of these guidelines is to provide local governments with amendatory language for specific applications. The guidelines are not required to be adopted and enforced by local governments.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139, 92-01-069, § 51-16-020, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.074, 88-24-018 (Order 88-11), § 51-16-020, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360, 85-24-029 (Order 85-13), § 51-16-020, filed 11/26/85, effective 6/11/86.]

WAC 51-16-030 Exemptions for indigent housing guidelines. Cities and counties are permitted the option of adopting exemptions from the state building code requirements for buildings whose character of use or occupancy has been changed in order to provide housing for indigent persons. The adoption of an ordinance or resolution by cities and counties for the purpose to provide for occupancy exemptions for indigent housing as outlined in this section, shall not be considered a local government residential amendment requiring approval by the state building code council.

The guideline shall read as follows:

The character of use or occupancy of an existing building located in this state, may be changed in order to provide housing for indigent persons, without conforming to all of the requirements of the State Building Code provided that:

1. The building official has reviewed and approved the proposed exemption; and,
2. The proposed housing for indigent persons is less hazardous than the existing use; and,
3. Any code deficiencies exempted pose no threat to human life, health, or safety; and,
4. The building or buildings exempted are owned or administered by a public agency or nonprofit corporation; and,
5. The exemption is authorized for no more than five years, subject to renewal of the exemption by the building official.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139, 92-01-069, § 51-16-030, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.020 and 19.27.074, 91-01-117, § 51-16-030, filed 12/19/90, effective 7/1/91. Statutory Authority: Chapters 19.27, 19.27A and 70.92 RCW, and 1989 c 266, 90-02-110, § 51-16-030, filed 1/3/90, effective 7/1/90. Statutory Authority: RCW 19.27.074, 88-24-018 and 89-11-081 (Orders 88-11 and 88-11A), § 51-16-030, filed 12/1/88 and 5/23/89, effective 7/1/89. Statutory Authority: 1985 c 360, 85-24-029 (Order 85-13), § 51-16-030, filed 11/26/85, effective 6/11/86.]

WAC 51-16-080 Permit exemptions guideline. Cities and counties are permitted the option of adopting a one thousand five hundred dollar building permit exemption for certain construction and alteration activities for Group R, Division 3 and Group M, Division 1 Occupancies. To adopt

the permit exemption guideline, the following section of the 1991 Uniform Building Code shall be amended as follows:

(1) Section 301(b) of the Uniform Building Code shall be amended to read as follows:

(b) Exempted work. A building permit shall not be required for the following:

1. One-story detached accessory buildings used as tool and storage sheds, playhouses and similar uses, provided the projected roof area does not exceed one hundred twenty square feet.

2. Fences not over six feet high.

3. Oil derricks.

4. Movable cases, counters, and partitions not over five feet nine inches high.

5. Retaining walls which are not over four feet in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II, or III-A liquids.

6. Water tanks supported directly upon grade if the capacity does not exceed five thousand gallons and the ratio of height to diameter or width does not exceed two to one.

7. Platforms, walks, and driveways not more than thirty inches above grade and not over any basement or story below.

8. Painting, papering, and similar finish work.

9. Temporary motion picture, television, and theater stage sets and scenery.

10. Window awnings supported by an exterior wall of Group R, Division 3, and Group M Occupancies when projecting not more than fifty-four inches.

11. Prefabricated swimming pools accessory to a Group R, Division 3 Occupancy in which the pool walls are entirely above the adjacent grade and if the capacity does not exceed five thousand gallons.

12. Minor construction and alteration activities to Group R, Division 3 and Group M, Division 1 Occupancies, as determined by the building official, which the total valuation, as determined in Section 304(b) or as documented by the applicant to the satisfaction of the building official, does not exceed one thousand five hundred dollars in any twelve-month period: *Provided*, That the construction and/or alteration activity does not affect any structural components, or reduce existing egress, light, air, and ventilation conditions. This exemption does not include electrical, plumbing, or mechanical activities. The permit exemption shall not otherwise exempt the construction or alteration from the substantive standards of the codes enumerated in RCW 19.27.031, as amended and maintained by the state building code council under RCW 19.27.070.

Unless otherwise exempted, separate plumbing, electrical, and mechanical permits will be required for the above exempted items.

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

The adoption of an ordinance or resolution by cities and counties for the purpose to provide for a permit exemption as outlined in this section, shall not be considered a local government residential amendment requiring approval by the state building code council.

[Statutory Authority: RCW 19.27.074, chapter 19.27 RCW and 1991 c 139. 92-01-069, § 51-16-080, filed 12/13/91, effective 7/1/92. Statutory Authority: RCW 19.27.060 (7)(b), 90-13-033, § 51-16-080, filed 6/13/90, effective 7/23/90. Statutory Authority: RCW 19.27.074. 88-24-018 (Order 88-11), § 51-16-080, filed 12/1/88, effective 7/1/89. Statutory Authority: 1985 c 360. 85-24-029 (Order 85-13), § 51-16-080, filed 11/26/85, effective 6/11/86.]

Chapter 51-19 WAC
WASHINGTON STATE HISTORIC BUILDING
CODE

WAC

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PART I
TITLE AND SCOPE

WAC 51-19-100 Title. This code shall be known as the Washington State Historic Building Code, hereinafter referred to as the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-100, filed 12/18/90, effective 7/1/91.]

WAC 51-19-110 Purpose. It is the purpose of the HBC to provide regulations, as prescribed in RCW 19.27.120(2), providing alternatives, when authorized by the appropriate building official, to conformance to all the requirements of the codes adopted under RCW 19.27.031, for repairs, alterations, and additions necessary for the preservation, restoration and related reconstruction, rehabilitation, strengthening, or relocation of buildings or structures designated as historic buildings, in accordance with RCW 19.27.120(1). Such regulations are intended to preserve original, or restored architectural elements and features, to encourage energy conservation, barrier-free access and a cost-effective approach to preservation, and to provide a historic building or structure that will be less hazardous, based on accepted life and fire safety practices, than the existing building. These regulations, when authorized by the appropriate building official, control and allow alternatives to any and all codes enumerated in RCW 19.27.031 when dealing with historic buildings or sites.

The purpose of this code is 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.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-110, filed 12/18/90, effective 7/1/91.]

WAC 51-19-120 Scope. The provisions of the HBC shall constitute the minimum standards for the preservation, restoration and related reconstruction, rehabilitation, strengthening, or relocation of buildings or structures, changes of occupancy and alteration or repair of historic buildings. Whenever reference is made to an appendix in this code, the provisions of the appendix shall not apply unless specifically adopted.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-120, filed 12/18/90, effective 7/1/91.]

WAC 51-19-130 Existing uses. Historic buildings may have their existing use or occupancy continued if such use or occupancy was legal at the time of the adoption of the HBC, provided such continued use is not dangerous to life and that subsequently adopted regulations specifically applicable to historic buildings or structures are satisfied.

Nothing in the HBC shall be construed to allow the degradation of those systems, devices and equipment required by the prevailing codes under which the building was constructed.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-130, filed 12/18/90, effective 7/1/91.]

WAC 51-19-140 Additions, alterations, and repairs.

Buildings and structures to which additions, alterations, or repairs are made shall comply with all the requirements of the Building Code for new construction except as specifically provided in the HBC. Additions, alterations, or repairs may be made to any building or structure without requiring the historic building or structure to comply with all the requirements of the Building Code, provided:

(1) Additions shall conform to the requirements for a new building or structure.

(2) Additions, alterations, or repairs shall not cause a historic building or structure to become unsafe or overloaded.

(3) New additions shall not add to or cause a historic building to exceed the height, number of stories, or area specified for new buildings.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-140, filed 12/18/90, effective 7/1/91.]

WAC 51-19-150 Change of occupancy. Any change in the use or occupancy of a historic building or structure shall comply with the provisions of the HBC. Any building which involves a change in use or occupancy shall not exceed the height, number of stories, and area permitted for new buildings, except as permitted in the HBC and local ordinances.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-150, filed 12/18/90, effective 7/1/91.]

WAC 51-19-160 Maintenance. All buildings and structures and all parts thereof shall be maintained in a safe and sanitary condition. All systems, devices, or safeguards which were required by the prevailing codes under which the building was constructed shall be maintained in conformance with the requirements of the HBC. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this section, the building official may cause any structure to be reinspected.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-160, filed 12/18/90, effective 7/1/91.]

WAC 51-19-170 Alternative materials, designs, and methods. The provisions of this code are not intended to prevent the use of any material, design, or method of construction not specifically prescribed by the HBC, provided any alternate has been approved and its use authorized by the building official.

The building official may approve any such alternate, provided the building official finds that the proposed design is satisfactory and complies with the provisions of the HBC and that the material and method of work offered is, for the purpose intended, at least the equivalent of that prescribed in

this code in suitability, strength, effectiveness, fire resistance, durability, safety, and sanitation.

The building official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding use of an alternate. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-170, filed 12/18/90, effective 7/1/91.]

WAC 51-19-180 Modifications. Whenever there are practical difficulties involved in carrying out the provisions of the HBC, the building official may accept compliance alternatives or grant modifications for individual cases, provided the building official shall first find that a significant reason makes the strict letter of the HBC impractical and that the compliance alternative or modification is in conformity with the intent and purpose of the HBC and that such compliance alternative or modification does not lessen health, life-safety, and the intent of any fire-safety requirements or any degree of structural integrity. The details of any action granting modifications or the acceptance of a compliance alternative shall be recorded and entered in the files of the code enforcement agency.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-180, filed 12/18/90, effective 7/1/91.]

WAC 51-19-190 Tests. Whenever there is insufficient evidence of compliance with any of the provisions of the HBC or evidence that any material or construction does not conform to the requirements of the HBC, the building official may require tests as proof of compliance to be made at no expense to the jurisdiction.

Test methods shall be as specified by the HBC, the Building 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 test procedures.

All tests shall be made by an approved agency. Reports of such tests shall be retained by the building official for the period required for the retention of public records.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-190, filed 12/18/90, effective 7/1/91.]

PART II ADMINISTRATION

WAC 51-19-200 Enforcement. The building official is hereby authorized to enforce the provisions of the HBC. The building official shall have the power to render interpretations of the HBC and to adopt and enforce rules and regulations supplemental to this code as may be deemed necessary in order to clarify the application of the provisions of the HBC. Such interpretations, rules, and regulations shall be in conformity with the intent and purpose of the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-200, filed 12/18/90, effective 7/1/91.]

WAC 51-19-210 Permits. Buildings or structures regulated by the HBC shall not be enlarged, altered, repaired, improved, or converted unless a separate permit for each building or structure has been obtained from the building official in accordance with and in the manner prescribed in the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-210, filed 12/18/90, effective 7/1/91.]

WAC 51-19-220 Inspection. All buildings or structures within the scope of this code and all construction or work for which a permit is required shall be subject to inspection by the building official in accordance with and in the manner prescribed in the HBC and the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-220, filed 12/18/90, effective 7/1/91.]

WAC 51-19-230 Repairs. Repairs to any portion of a historic building or structure may be made with original materials and original methods of construction, subject to provisions of the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-230, filed 12/18/90, effective 7/1/91.]

WAC 51-19-240 Relocated buildings. Relocated historic buildings shall be considered a historic building for the purposes of the HBC. Relocated residential buildings in or within a county or city are not required to meet the full requirements of the Building Code, as prescribed in RCW 19.27.180, provided the occupancy classification of the building or structure is not changed as a result of the move. If an occupancy classification change occurs as a result of the move, the building or structure shall be reviewed under Part VI, Change of occupancy standards. Relocated historic buildings and structures shall be so sited that exterior wall and opening requirements comply with the Building Code or the compliance alternatives of the HBC. Foundations of relocated historic buildings and structures shall comply with the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-240, filed 12/18/90, effective 7/1/91.]

WAC 51-19-250 Right of entry. Whenever necessary to make an inspection to enforce any of the provisions of the HBC, or whenever the building official or an authorized representative has reasonable cause to believe that there exists in any building or upon any premises any condition or code violation which makes such building or premises unsafe, dangerous or hazardous, the building official or an authorized representative may enter such building or premises at all reasonable times to inspect the same or to perform any duty imposed upon the building official by the HBC, provided that if such building or premises be occupied, proper credentials shall first be presented and entry requested; and if such building or premises be unoccupied, the official shall first make a reasonable effort to locate the owner or other persons having charge or control of the building or premises and request entry. If such entry is refused, the building official or an authorized representative

shall have recourse to every remedy provided by law to secure entry.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-250, filed 12/18/90, effective 7/1/91.]

WAC 51-19-260 Liability. The building official or an authorized representative charged with the enforcement of the HBC, acting in good faith and without malice in the discharge of the prescribed duties, shall not thereby render themselves liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of those duties. Any suit brought against the building official or employee because of such act or omission performed in the enforcement of any provision of the HBC shall be defended by the jurisdiction until final termination of such proceedings and any judgment resulting therefrom shall be assumed by the jurisdiction.

The HBC shall not be construed to relieve from or lessen the responsibility of any person owning, operating, or controlling any building or structure for any damages to persons or property caused by defects, nor shall the code enforcement agency or its parent jurisdiction be held as assuming any such liability by reason of the inspections authorized by the HBC or any permits or certificates issued under the HBC.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-260, filed 12/18/90, effective 7/1/91.]

WAC 51-19-270 Unsafe buildings or structures. All buildings or structures regulated by the HBC which are structurally unsafe or not provided with adequate egress, or which constitute a fire hazard or are otherwise dangerous to human life are, for the purpose of this section, unsafe. Unsafe buildings shall comply with section 203 of the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-270, filed 12/18/90, effective 7/1/91.]

WAC 51-19-280 Appeals. The board of appeals established under the Building Code shall have authority to provide for final interpretation of the provision of the HBC and to hear appeals.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-280, filed 12/18/90, effective 7/1/91.]

PART III DEFINITIONS

WAC 51-19-300 Definitions. For the purpose of the HBC, certain terms, phrases, words, and their derivatives shall be construed as specified in this chapter. Words used in the singular include the plural and the plural the singular. Words used in the masculine gender include the feminine and the feminine the masculine.

Where terms are not defined, they shall have their ordinary accepted meanings within the context in which they are used. In the event there is a question about the definition of a term, the definitions for terms in the codes enumerated in RCW 19.27.031 and the edition of Webster's

Dictionary, referenced therein shall be considered as the sources for providing ordinarily accepted meanings.

"Adaptive use" is the process of adapting a building to accomplish a use other than that for which it was designed; i.e., a piano factory being converted into housing, or a mansion into an office or apartments.

"Addition" is an extension or increase in floor area or height of a building or structure.

"Alter or alteration" is any change, addition, or modification in construction or occupancy.

"Approved agency" is an established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by the building official.

"Building" is any structure used or intended for supporting or sheltering any use or occupancy. (See structure.)

"Building Code" is the Uniform Building Code, promulgated by the International Conference of Building Officials as adopted by the state building code council.

"Building official" is the officer or other designated authority charged with the administration and enforcement of the HBC, or a duly authorized representative.

"Building service equipment" refers to the plumbing, mechanical, electrical, and elevator equipment including piping, wiring, fixtures, and other accessories which provide sanitation, lighting, heating, ventilation, cooling, refrigeration, firefighting, and transportation facilities essential for the habitable occupancy of the building or structure for its designated use and occupancy.

"Certified local government" or "CLG" means the local government has been certified by the state historic preservation officer as having established its own historic preservation commission and a program meeting federal and state standards.

"Dangerous Building Code" is the code, adopted by this jurisdiction, which outlines the processes and procedures for the determination and abatement of dangerous buildings.

"Electrical Code" is the National Electrical Code, promulgated by the National Fire Protection Association, as adopted by the Washington state department of labor and industries, electrical section.

"Equivalency" is meeting the intent of the HBC by means other than those detailed in specific code provisions.

"Fire hazard" is any thing or act which increases or may cause an increase of the hazard or menace of fire to a greater degree than that customarily recognized as normal by persons in the public service regularly engaged in preventing, suppressing, or extinguishing fire; or which may obstruct, delay, hinder, or interfere with the operations of the fire department or the egress of occupants in the event of fire.

"Historic building" is any structure, collection of structures, and their associated sites, deemed of importance to the history, architecture, or culture of an area by an appropriate local, state, or federal governmental jurisdiction. Included shall be structures on official national, state, or local historic registers or official listings such as the National Register of Historic Places, the state register of historic places, state points of historical interest, and registers or listings of historical or architecturally significant sites, places, historic districts, or landmarks as adopted by a certified local government.

"Historic fabric" consists of the original materials and portions of the building intact when exposed or as they appeared and were used in the past.

"Historical aspects" are the particular features of the historic site, building, or structure that gives it its historic significance. Features may include but are not limited to one or more of the following: Historical background, noteworthy architecture, unique design, works of art, memorabilia, and artifacts.

"Imminent hazard" is a condition which could cause serious or life threatening injury or death at any time.

"Occupancy" is the purpose for which a building, or part thereof, is used or intended to be used.

"Original materials" are those portions of the structure's fabric that existed during the period deemed to be most architecturally and/or historically significant.

"Preservation" is the maintenance of the structure in its present condition or as originally constructed. Preservation aims at halting further deterioration and providing structural safety, but does not contemplate significant rebuilding. Preservation includes techniques of arresting or slowing the deterioration of a structure; improvement of structural conditions to make a structure safe, habitable, or otherwise useful; normal maintenance and minor repairs that do not change or adversely affect the fabric or appearance of a structure.

"Prevailing code" is the "regular building regulations" which governed the design and construction or alteration of historical buildings within the jurisdiction of the enforcing agency at the time of their construction.

"Reconstruction" is the process of rebuilding a nonextant structure or portion of a structure to its original appearance through archival and archeological investigation. Although parts of the original structure are sometimes included in the reconstruction, the process usually involves new construction materials.

"Rehabilitation" involves equipping the building or facility for an extended useful life with a minimum alteration of original construction or the process of returning a structure to a state of usefulness by repairs, alterations, or additions.

"Relocation" involves any structure or a portion of a structure that may be moved to a new location.

"Renovation" is to make sound again any structure involved under the various definitions hereunder by cleanup, repair, and replacement of deteriorated detail or structure.

"Repair" is the reconstruction, renovation, or renewal of any portion of a historic building for the purpose of its maintenance.

"Reproduction" is a duplication, copy, or close imitation of the original.

"Restoration" is the process of accurately recovering, by the removal of later work and the replacement of missing earlier work, the form and details of a structure, together with its setting, as it appeared at a particular period of time.

"Structure" is that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-300, filed 12/18/90, effective 7/1/91.]

**PART IV
FIRE AND LIFE SAFETY STANDARDS**

WAC 51-19-400 General. Safety to life in historic buildings and structures shall meet the intent of the Building Code. The provisions of this section shall be deemed as meeting the intent of the Historic Building Code, provided that none of the fire and life-safety features required by the prevailing codes under which the building was constructed will be reduced below the level established by either the HBC or the equivalent provisions of the currently adopted Building Code, whichever is least stringent. Alterations or repairs to a historic building or structure which are nonstructural and do not adversely affect any structural member or any part of the building or structure having required fire resistance may be made with the same materials of which the building or structure is constructed. Fire resistive ratings of archaic materials may be evaluated based upon the Guideline on Fire Ratings of Archaic Materials and Assemblies from Guideline 2 of the Uniform Code for Building Conservation.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-400, filed 12/18/90, effective 7/1/91.]

WAC 51-19-410 Exit systems. (1) Exit system capacity and the arrangement of exits shall comply with the requirements of the Building Code. Exit systems shall comply with the provisions of subsections (1) through (5) of this section, or the provisions of the prevailing code under which the building was constructed, whichever is more stringent. If any provision of the HBC or the prevailing code under which a building was constructed is more stringent than the currently adopted Building Code, the exit system shall comply with the provision of the currently adopted Building Code.

(2) All elements of the exit system shall be of sufficient size, width, and arrangement to provide safe and adequate means of egress. Every required exit shall have access to a public way, directly or through yards, courts or similar spaces, and such access shall be permanently maintained clear of any obstruction which would impede exiting.

(3) Occupants of every floor above the first story and in basements shall have access to at least two separate exits. A fire escape shall not be substituted for a stairway which was required by the prevailing codes under which the building was constructed.

Exceptions: (a) In all occupancies, second stories with an occupant load of less than ten may have one exit.

(b) Only one exit need be provided from the second story within an individual dwelling unit which has an occupant load of less than ten.

(c) Two or more dwelling units on the second story may have access to only one common exit when the total occupant load does not exceed ten.

(d) Floors and basements used exclusively for service of the building may have one exit. For the purposes of this exception, storage rooms, laundry rooms, maintenance offices, and similar uses shall not be considered as providing service to the building.

(e) Basements within an individual dwelling unit having an occupant load of less than ten may have one exit.

(f) Occupied roofs of Group R, Division 3 occupancies may have one exit if such occupied areas are less than five

hundred square feet and located no higher than immediately above the second story.

(4) Corridors serving as a part of the exit system which have an occupant load of thirty or more in a Group A, B, E, or H occupancy or an occupant load of ten or more in a Group R, Division 1 or Group I occupancy shall have walls and ceilings of not less than one hour fire resistive construction. Existing walls and ceilings surfaced with wood lath and plaster or one-half inch thick gypsum wallboard may be permitted in lieu of one hour fire resistive construction, provided the surfaces are in good condition.

Door openings into such corridors shall be protected by a tight fitting smoke and draft control assembly having a fire protection rating of not less than twenty minutes when such opening protection was required by the prevailing codes under which the building was constructed. Door closing devices, door gaskets, and other requirements imposed by the prevailing codes under which the building was constructed shall be maintained. When the building was constructed under a code which did not require twenty minute smoke and draft control assemblies, doorway openings shall be protected by doors having a fire protection rating of not less than twenty minutes or by a minimum one and three-eighths inch thick, solid bonded, wood core door or an equivalent insulated steel door. In such case, the frames need not have a fire resistive time period. Doors shall be maintained self-closing or shall be automatic closing, self-latching by activation of a smoke detector.

Transoms and openings other than doors from corridors to rooms shall be protected as required by the Building Code. Existing transoms may be maintained if fixed in the closed position. When the code under which the building was constructed permitted unprotected transoms or other unprotected openings, other than doors, such transoms or openings shall be covered with a minimum of three-fourths-inch-thick plywood, one-half-inch-thick gypsum wallboard, fixed glazing listed and labeled for a fire protection rating of at least three-fourths hour or equivalent material on the room side. Openings with fixed wired glass set in steel frames are permitted in corridor walls and ceilings.

Exception: Existing corridor walls, ceilings, and opening protection not in compliance with the above may be continued when the building is protected with an approved automatic sprinkler system throughout: *Provided*, That a draft gasket assembly on sound, solid, self-closing, self-latching doors at door openings is installed and that sealing, caulking, and duct penetrations shall have dampers in all one-hour rated exit corridors. Such sprinkler system may be supplied from the domestic water supply system, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.

(5) Every dwelling unit, guest room, or sleeping rooms shall have access directly to the outside or to a public corridor or exit balcony.

(6) Existing fire escapes complying with this section may be accepted by the building official as one of the required exits. The fire escape shall not be the primary or the only exit. Fire escapes shall not take the place of stairways required by the codes under which the building was constructed.

Fire escapes shall comply with the following:

(a) Access from a corridor shall not be through an intervening room.

Exception: Access through an intervening room may be permitted if the intervening door is not lockable and an exit sign is installed above the door which will direct occupants to the fire escape.

(b) All openings in an exterior wall below or within ten feet, measured horizontally, of an existing fire escape serving a building over two stories in height shall be protected by fire assembly having a minimum three-fourths hour fire protection rating, and where operable be self-closing. When openings are located within a recess or vestibule, adjacent enclosure walls shall be of not less than one hour fire resistive construction.

(c) Egress from the building shall be by an opening having a minimum clear width and height of not less than twenty-nine inches. Such openings shall be openable from the inside without the use of a key or special knowledge or effort. The sill of an opening giving access to the fire escape shall be not more than thirty inches above the floor of the building or balcony.

(d) Fire escape stairways and their balconies shall support their dead load plus a live load of not less than one hundred pounds per square foot or concentrated load of three hundred pounds placed anywhere on the balcony or stairway so as to produce the maximum stress conditions. The stairway shall have a pitch not to exceed sixty degrees from the horizontal and shall have a minimum width of eighteen inches. The stairway shall be provided with a top and intermediate railing on each side. Treads shall be not less than four inches in width and the rise between treads shall not exceed ten inches. All stairway and balcony railings shall support a horizontally applied force of not less than fifty pounds per lineal foot of railing or a concentrated load of two hundred pounds placed anywhere on the railing so as to produce the maximum stress conditions.

(e) Fire escape balconies shall be not less than forty-four inches in width with no floor opening greater than five-eighths inch in width except the stairway opening. Stairway openings in such balconies shall be not less than twenty-two inches by forty-four inches. The guardrail of each balcony shall be not less than thirty-six inches high with not more than nine inches between intermediate rails.

(f) Fire escapes shall extend to the roof or provide an approved gooseneck ladder between the top floor landing and the roof when serving buildings four or more stories in height having roofs with a slope not exceeding four in twelve. Such ladders shall be designed and connected to the building to withstand a horizontal force of one hundred pounds per lineal foot; each rung shall support a concentrated load of five hundred pounds placed anywhere on the rung so as to produce the maximum stress conditions. All ladders shall be at least fifteen inches in clear width, be located within twelve inches of the building, and shall be placed flatwise relative to the face of the building. Ladder rungs shall be three-quarters inch in diameter and shall be located ten inches to twelve inches on center. Openings for roof access ladders through cornices and similar projections shall have minimum dimensions of thirty inches by thirty-three inches.

(g) The lowest balcony shall be not more than eighteen feet from the ground. Fire escapes shall extend to the ground or be provided with counterbalanced stairs reaching to the ground.

(h) Fire escapes shall be kept clear and unobstructed at all times and maintained in good working order.

(i) The fire escape shall have a clearance from electrical service conductors as required by the Electrical Code.

(7) Existing winding or spiral stairways may serve as one exit from a building, provided that a complying handrail is located at the stair's outside perimeter. (See WAC 51-19-440.) A winding or spiral stairway may not be the principal exit when used in conjunction with a fire escape as a second exit. The width of a spiral or winding stair may be used in the calculation of provided exit width when in compliance with this section. Circular stairways complying with the Building Code shall be acceptable as an exit.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-410, filed 12/18/90, effective 7/1/91.]

WAC 51-19-420 Structural safety. A building or structure or its individual structural members that exceed the limits established by the Dangerous Buildings Code shall be replaced or strengthened in order that the building, structure, or individual structural members will comply with the requirements of the Building Code for new construction. Roofs, floors, walls, foundations, and all structural components of buildings or structures shall be capable of resisting the forces and loads for the occupancies intended, as specified in the prevailing codes under which the building was constructed or in chapter 23 of the Building Code, except for earthquake forces and loads. See Part V of this chapter for earthquake hazard reduction requirements.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-420, filed 12/18/90, effective 7/1/91.]

WAC 51-19-430 Weather protection. (1) Every building shall provide weather protected shelter for the occupants against the elements and exclude dampness.

(2) The roof of every building or structure shall provide weather protection for the building. All devices which were provided or are required to prevent ponding or flooding or to convey the roof water shall be capable of fulfilling that purpose.

(3) All weather exposed surfaces of historic buildings or structures shall provide weather protection.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-430, filed 12/18/90, effective 7/1/91.]

WAC 51-19-440 Other safety features. (1)(a) The largest tread run within any flight of stairs shall not exceed the smallest by more than three-eighths inch. The greatest riser height within any flight of stairs shall not exceed the smallest by more than three-eighths inch.

Exception: Existing spiral and circular stairs shall be exempt from the variance in tread size requirement.

(b) Every stairway shall have at least one handrail.

Exception: A handrail is not required for existing stairs having less than four risers.

Spiral and winding stairways shall have a handrail on the outside perimeter.

(2) All unenclosed floor and roof openings, open and glazed sides of stairways, landings and ramps, balconies or porches which are more than thirty inches above grade or

floor below, and roofs used for other than service of the building shall be protected by a guardrail.

Exception: Guardrails need not be provided at the following locations:

- (a) On the loading side of loading docks.
- (b) On the auditorium side of a stage or enclosed platform.
- (c) On private stairways thirty inches or less in height.

Existing guardrails, other than guardrails located on the open side of a stairway, which are at least thirty-six inches in height shall be permitted to remain. Guardrails lower than thirty-six inches in height shall be augmented or corrected to raise their effective height to thirty-six inches. Guardrails for stairways, exclusive of their landings, may have a height which is not less than thirty inches measured above the nosing of treads.

The spacing between existing intermediate railings or openings in existing ornamental patterns in significant historical staircases may be accepted; otherwise the Building Code shall apply. Missing elements or members of a guardrail may be replaced in a manner which will preserve the historic appearance of the building or structure.

(3) The installation or replacement of glass shall be as required for new construction by the Building Code and the requirements for energy conservation in Part VIII of this code.

(4) All wires and equipment, and installations thereof, that convey electric current, in, on, or about buildings or structures shall be in strict conformity with chapter 19.28 RCW, the statutes of the state of Washington, and the rules issued by the Washington state department of labor and industries.

(5) Leaking drain or supply lines shall be repaired or replaced. All unsafe conditions shall be corrected. Any cross connections or siphonage between fixtures shall be corrected.

(6) Mechanical systems shall have any unsafe conditions corrected.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-440, filed 12/18/90, effective 7/1/91.]

WAC 51-19-450 Light, ventilation, sanitation, smoke detectors, and heating. (1) For Group R occupancies, light, ventilation, sanitation, smoke detectors, and heating shall meet the requirements of the Building Code.

(2) Skylights set at an angle of less than forty-five degrees from the horizontal plane shall be mounted at least four inches above the plane of the roof on a curb constructed of materials as required for the frame. Skylights may be installed in the plane of the roof when the roof slope is greater than forty-five degrees from horizontal.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-450, filed 12/18/90, effective 7/1/91.]

WAC 51-19-460 Plumbing. All plumbing fixtures shall be connected to a sanitary sewer or to an approved private sewage disposal system. All plumbing fixtures shall be connected to an approved system of water supply and provided with hot and cold running water necessary for its normal operation. All plumbing fixtures shall be of an approved glazed earthenware type or of a similarly nonabsorbent material.

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[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-460, filed 12/18/90, effective 7/1/91.]

PART V EARTHQUAKE HAZARD REDUCTION

WAC 51-19-500 Survey or evaluation. When required by the building official a survey or evaluation shall be made by an architect or structural engineer licensed by the state to practice as such, who is knowledgeable in the earthquake resistant design of structures, regarding the structure's ability to resist the seismic loads prescribed by the Building Code requirements or by established alternate evaluation methodologies. Broad judgment may be exercised concerning the strength and performance of materials not recognized by the Building Code. Past historic records of the structure or similar structures may be used in the evaluation, including the effects of subsequent alterations. The capability of the structure to carry vertical and horizontal loads shall be evaluated. A complete, continuous and adequate stress path, including connections, from every part or portion of the structure to the ground shall be provided for the required vertical and horizontal forces.

Parapets and exterior decoration shall be investigated for conformance with the Building Code or evaluation methodologies and anchorage with the ability to resist seismic forces shall be required, except in the case where those parapets or decoration are judged to present no hazard to life safety.

A report shall be made of the findings of the survey and evaluation noting all deterioration of the existing structure and making recommendations for the repair of deterioration and for any reconstruction or strengthening which should be undertaken. Plans and specifications for the work done pursuant to the survey and evaluation prepared under this section shall be prepared under the responsible charge of an architect or structural engineer.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-500, filed 12/18/90, effective 7/1/91.]

WAC 51-19-510 Alternatives. Alternative materials and methods of construction may be substituted for those otherwise required by the HBC or by the recommendations of the earthquake survey and evaluation provided the alternative methods are necessary to preserve historic materials or features and that such alternative methods provide satisfactorily for the purposes intended, or are reasonably equivalent to the prescribed methods in quality, strength, effectiveness, fire resistance, durability, and safety.

The building official may request that sufficient evidence be submitted to substantiate any claims made regarding such alternative materials, evaluation methodologies, and alternative methods of construction.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-510, filed 12/18/90, effective 7/1/91.]

PART VI CHANGE OF OCCUPANCY STANDARDS

WAC 51-19-600 General. The character of the occupancy of historic buildings and structures may be changed, provided the requirements of this chapter are met.

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Where no specific requirements are included herein, the building or structure shall comply with the Building Code.

Every change of occupancy to a classification in a different group or different division of the same group shall require a new certificate of occupancy regardless of whether any alterations are required by the HBC.

If the building or portion thereof does not conform to the requirements of the HBC for the proposed occupancy group or division, the building or portion thereof shall be made to conform to the Building Code except as specified in the HBC. The building official may issue a new certificate of occupancy stating that the building complies with the HBC.

The relative degree of hazard between different occupancy groups or between divisions of the same group shall be as set forth in the hazard category classifications, Tables Nos. VI-1 through VI-5. A historic building may have its occupancy changed to an occupancy within the same hazard group or to an occupancy in a lesser hazard group without complying with all of the provisions of this chapter. A historic building shall comply with the requirements of the Building Code, except as specified in this chapter, when a change in occupancy will place it in a higher hazard group or when the occupancy is changed to Group A, Division 1 or 2, Group E, H, or I.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-600, filed 12/18/90, effective 7/1/91.]

WAC 51-19-610 Heights and area. Heights and areas of buildings and structures shall meet the requirements of the Building Code for the new occupancy.

Exception: Historic buildings exceeding the maximum allowable heights and areas permitted for new buildings may undergo a change of occupancy if the hazard level of the new occupancy is equal to or less than the existing hazard group as shown in Table No. VI-1.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-610, filed 12/18/90, effective 7/1/91.]

WAC 51-19-620 Fire safety. (1) When a change of occupancy is made to a higher hazard group as shown in Table No. VI-1, all elements of the exit system shall comply with the requirements of the Building Code.

Exceptions: (a) Existing exit corridors and stairways meeting the requirements of Part IV of this chapter may be used.
(b) Exit system elements may meet alternative compliance requirements as approved by the building official.

(2) Existing exit systems complying with Part IV shall be accepted if the occupancy change is to an equal or lesser hazard group when evaluated in accordance with Table No. VI-2.

(3) When a change of occupancy is made to a higher hazard group as shown in Table No. VI-3, occupancy separations shall be provided as specified in the Building Code. When approved by the building official, existing wood lath and plaster in good condition or one-half inch gypsum wall board may be accepted where a one hour occupancy separation is required.

(4)(a) Vertical shafts may be designed to meet the requirements of atriums as required by the Building Code or the requirements of this chapter.

(1992 Ed.)

(b) Interior stairways shall be enclosed as required by the Building Code when a change of occupancy is made to a higher hazard group as shown in Table No. VI-4.

Exceptions: (i) In other than Group I occupancies, an enclosure will not be required for openings serving only one adjacent floor and not connected with corridors or stairways serving other floors.
(ii) Existing stairways not enclosed need not be enclosed in a continuous vertical shaft if each story is separated from other stories by one hour fire resistive construction or approved wired glass set in steel frames and all exit corridors are sprinklered. The openings between the corridor and occupant space shall have at least one quick response sprinkler head above the openings on the tenant side, with a draft gasket assembly on sound, solid, self-closing doors. The sprinkler system may be supplied from the domestic water supply system, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.

(c) Interior shafts, including, but not limited to, elevator hoistways, service and utility shafts, shall be enclosed with a minimum of one-hour fire-resistive construction.

Exceptions: (i) Vertical openings, other than stairways, need not be enclosed if the entire building is provided with an approved automatic sprinkler system. The sprinkler system may be supplied from the domestic water supply system, provided the system is of adequate pressure, capacity, and sizing for the combined domestic and sprinkler requirements.
(ii) Where one-hour fire-resistive floor construction is required, vertical shafts need not be enclosed when such shafts are blocked at every floor level by the installation of not less than two full inches of solid wood or equivalent construction.

(d) All openings into such shafts shall be protected by fire assemblies having a fire protection rating of not less than one hour and shall be maintained self-closing or shall be automatic closing by actuation of a smoke detector. All other openings shall be fire protected in an approved manner. Existing fusible link-type automatic door-closing devices may be permitted if the fusible link rating does not exceed one hundred thirty-five degrees.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-620, filed 12/18/90, effective 7/1/91.]

WAC 51-19-630 Property protection. (1) Exterior walls shall have fire resistance and opening protection as set forth in the Building Code. This provision shall not apply to walls at right angles to the property line.

Exceptions:

(a) Where a fire-resistive rating greater than two hours is required for a building of any type of construction, existing noncombustible exterior walls having a fire resistive rating equivalent to two hours as determined by the building official may be accepted, provided:

(i) The building is classified as a Group A, Division 3; Group B, Division 1 or Group B, Division 2 occupancy; and
(ii) The building does not exceed three stories in height;

or

(iii) The building shall be of heavy timber construction, and does not exceed five stories in height. (The state Building Code council recommends the use of Guideline 2 of the Uniform Code for Building Conservation as reference in determining fire resistive rating equivalency.)

(b) Existing exterior walls shall be accepted if the occupancy is changed to a hazard group which is equal to or less than the existing occupancy as defined in Table No. VI-4.

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(2) New openings in exterior walls shall be protected as required by the Building Code. Existing, nonconforming openings shall be protected by fire assembly having a minimum three-fourth hour fire protection rating, and where operable be self-closing. When openings in the exterior walls are required to be protected due to distance from the property line, the sum of the area of such openings shall not exceed fifty percent of the total wall area in each story.

Exceptions:

(a) Protected openings shall not be required for Group R, Division 1 occupancies which do not exceed three stories in height and which are located not less than three feet from the property line.

(b) Where opening protection is required, an automatic fire extinguishing system throughout may be substituted for opening protection.

(c) Opening protection may be omitted when the change of occupancy is to an equal or lower hazard classification in accordance with Table No. VI-2.

(d) The building shall be of heavy timber construction, and does not exceed five stories in height.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-630, filed 12/18/90, effective 7/1/91.]

WAC 51-19-640 Structural safety. Buildings and structures shall meet the minimum level of performance for structural safety as specified in Parts IV and V of this chapter.

Historic buildings may undergo a change of occupancy if the hazard group is equal to or less than the existing occupancy as shown in Table No. VI-5. Buildings undergoing a change of occupancy to a more hazardous group shall meet the earthquake hazard reduction requirements of Part V of this chapter for the new occupancy.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-640, filed 12/18/90, effective 7/1/91.]

WAC 51-19-650 Light and ventilation. When deemed necessary by the building official, light and ventilation shall comply with the requirements of the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-650, filed 12/18/90, effective 7/1/91.]

WAC 51-19-660 Flame spread reduction. Where finish materials are required to have a flame-spread classification of Class III or better, existing nonconforming materials shall be surfaced with an approved fire retardant paint or finish.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-660, filed 12/18/90, effective 7/1/91.]

WAC 51-19-670 Roof coverings. Regardless of occupancy group, roof covering materials not less than Class C shall be permitted where a fire retardant roof covering is required. Nonrated materials may be acceptable only where approved by the building official.

TABLE NO. VI-1
HEIGHTS AND AREAS
HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	A-1, H, I-3 (highest hazard group)
2	A-2, A-2.1, I-1, I-2
3	A-3, A-4, B, E, R-1
4	R-3, M (lowest hazard group)

* See Table 5-A of the Building Code.

TABLE NO. VI-2
LIFE SAFETY AND EXITS
HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	A-1, A-2, A-2.1, E, I, H-1, H-2, H-3 and H-7 (highest hazard group)
2	A-3
3	R-1, R-3, B-2 dining and drinking establishments
4	B-2 all others, B-4, H other than H-1, H-2, H-3 and H-7
5	B-1, B-3
6	M (lowest hazard group)

* See Table 5-A of the Building Code.

TABLE NO. VI-3
OCCUPANCY SEPARATIONS
HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	B-1, H, I (highest hazard group)
2	A, B-2, B-3, B-4
3	E
4	R-1, M
5	R-3 (lowest hazard group)

* See Table 5-A of the Building Code.

TABLE NO. VI-4
EXPOSURE OF EXTERIOR WALLS
AND STAIRWAY ENCLOSURES
HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	H (highest hazard group)
2	B-2 mercantile and warehouses
3	A, E, I

- 4 B-1, B-2 all others, R
- 5 B-4, M (lowest hazard group)

* See Table 5-A of the Building Code.

TABLE NO. VI-5
EARTHQUAKE SAFETY
HAZARD CATEGORIES AND CLASSIFICATIONS

Relative Hazard	Occupancy Classification*
1	A, E, I (highest hazard group)
2	R-1
3	B-3, B-4, H
4	B-1, B-2
5	R-3, M (lowest hazard group)

* See Table 5-A of the Building Code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-670, filed 12/18/90, effective 7/1/91.]

**PART VII
ACCESSIBILITY TO PERSONS WITH
DISABILITIES**

WAC 51-19-700 General. The HBC shall provide the standards for accessibility of historic buildings to persons with disabilities. The value of access to buildings, structures, and sites of historic and cultural significance can be best obtained by providing the greatest degree of access while preserving the historic or architectural features of a building. Where accessibility is required by chapter 51-10 WAC, such standards shall be incorporated as practical.

Code users may consult the appendix bibliography concerning accessibility designs in historic buildings. Appendix Table A- 901 is also provided to assist in application of the code.

Where additions are undertaken they shall incorporate useful accessible design features.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-700, filed 12/18/90, effective 7/1/91.]

WAC 51-19-710 Building access and use. (1) Entry. At least one primary entrance to a historic building shall be usable by persons with disabilities. When the building official, building designer, and local or state preservation officer concur that adaptation of a primary entrance will have a detrimental impact on the aesthetic or historic context of the entrance, then the building official may accept a reasonable alternate public entrance. When access is provided by other than a primary entrance, the entrance access shall be clearly indicated by directional signs. Accessible parking shall be located so as to provide the closest practical distance to the accessible entrance.

(2) Ramps.

(a) General. The building official shall accept alternate ramp designs which comply with the HBC when it is determined that installation of a ramp having a slope which complies with chapter 51-10 WAC cannot be achieved.

(b) Slope. The slope of the ramp shall be not steeper than one vertical to nine horizontal for a horizontal length

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not to exceed twelve feet. Ramps which have a horizontal length which does not exceed two feet may have a slope not to exceed one vertical to six horizontal. Adequate warnings shall be posted indicating steepness where slopes exceed the requirements provided in the regulations for barrier-free facilities.

(3) Doors. Existing doorways which provide a net clear opening of not less than twenty-nine and one-half inches shall be deemed to meet the access requirements of this chapter.

(4) Changes in elevation. Changes in elevation of portions of buildings on accessible routes of travel shall be accessible by ramps or lifts consistent with the intent of the HBC.

(5) Toilet rooms. Where toilet facilities are provided, at least one such facility designed for use by persons with disabilities, shall be provided for each sex, or a separate facility usable by either sex located along an accessible route of travel. Alternate provisions providing substantially equivalent facilities shall comply with this code.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-710, filed 12/18/90, effective 7/1/91.]

**PART VIII
ENERGY CONSERVATION**

WAC 51-19-800 General. Historic buildings shall comply with the energy conservation and ventilation and indoor air quality requirements of the Washington State Energy Code chapter 51-11 WAC and the Washington State Ventilation and Indoor Air Quality Code chapter 51-13 WAC. The building official may modify the specific requirements of the Energy Code for Historic Buildings and require in lieu thereof alternate requirements which will result in a reasonable degree of energy efficiency.

Exceptions: The historic elements of the following buildings and structures are exempt from the State Energy Code:

- Totally preserved buildings used as historical exhibits.
- Seasonal use buildings.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-800, filed 12/18/90, effective 7/1/91.]

WAC 51-19-810 Alternative energy conservation provisions. (1) General. The alternative energy conservation requirements as specified in this part may be applied to a historic building if approved by the building official. The building official may approve other alternatives designed to improve energy efficiency without loss of the historic fabric of the building.

(2) Building envelope requirements. Historic buildings shall meet the minimum thermal performance values specified in the energy code, or the alternative measures specified in this subsection.

(a) Attics. Where accessible, insulation shall be installed in the attic to the requirements of the Energy Code, or lesser levels to maintain adequate ventilation, to reduce condensation problems or to provide safety clearances around electrical wiring or utility systems.

Additional insulation with an integral vapor barrier shall not be installed on top of existing insulation. A vapor barrier shall not be installed between layers of insulation.

(b) Exterior walls. Accessible wall cavities where finishes are being disturbed by alteration or renovation work shall be insulated to the extent practical. If accessible, a vapor retarder shall be installed on the winter warm side of the insulation (facing the conditioned space). An approved vapor retarding paint or clear finish is an acceptable vapor retarder. Permeable materials on the exterior side of the cavity (or unheated side) or an air space or means of venting framing cavities to the exterior are required if insulation is added to the cavities in wood frame construction.

(c) Doors. Doors which are not of the original material or which are not replicas designed to be compatible with the historic aspects of the structure shall conform to the requirements of the Energy Code.

(d) Floors over crawl spaces. If accessible, adequately ventilated, and with ground clearance in conformance with Building Code requirements, insulation with an R-value of eleven or greater shall be installed in floors of unheated crawl spaces.

(e) Moisture control in crawl spaces. Minimum foundation ventilation shall be provided in unheated crawl spaces. The net-free area of ventilation shall be at least 1/300th of the floor area. The vents shall be distributed around the perimeter of the foundation as equally as practical to provide adequate cross-ventilation. If accessible, a black polyethylene vapor barrier shall be applied to cover the exposed earth as prescribed in the Building Code.

(f) Air leakage. Windows and doors.

(i) All exterior windows and doors shall be gasketed or weatherstripped.

(ii) If the existing windows and doors are replaced with factory manufactured windows, the windows shall be double glazed units or shall be equipped with interior or exterior storm windows.

(iii) Single glazed windows which are part of the historic features of the building may be retained, repaired, or restored with or without the addition of storm windows.

(g) Chimney flues. Chimney flues which are no longer in use shall be closed off and sealed against air leakage.

(h) Exterior openings. The following openings in the exterior building envelope shall be caulked, gasketed, or otherwise sealed:

(i) Exterior joints around window and door frames;

(ii) Penetrations of utility services through walls, floors, and roofs.

(iii) Any other penetrations as required by the building official.

(i) Insulation materials. New insulation materials shall conform to the applicable provisions of the building, mechanical, plumbing, and energy codes for fire-resistance, flame-spread, smoke-density ratings and Building Code provisions for roof and exposed deck ceiling insulation.

(3) Building mechanical systems. Existing heating, ventilation, and cooling systems which are part of the significant historic features of the building or structure, and which in the opinion of the building official do not constitute a safety hazard, may remain in use, be repaired or be replaced in kind. Replacement, alteration, or addition of other heating, ventilation, and cooling equipment shall

comply with the provisions of the energy, ventilation and indoor air quality, mechanical, and plumbing codes.

(4) Water heating. Replacement or addition of water heating equipment shall comply with the provisions of the Energy Code.

(5) Lighting. Existing lighting may be retained, repaired, and replaced in kind or with replica fixtures. Areas of buildings or structures in which lighting is being replaced shall conform to the requirements of the Energy Code where practical. Appropriate clearances of insulation material from sources of heat; i.e., light fixtures, shall be as required by the Building Code requirements.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-810, filed 12/18/90, effective 7/1/91.]

PART IX
APPENDICES

WAC 51-19-900 Appendix A.

Table A - 901

	BUILDING FEATURES			
	ENTRY	DOORS	TOILET ROOMS	FLOORS & LEVELS
<p>Instructions:</p> <ol style="list-style-type: none"> Determine Building Category; i.e., II.D. under Building Type and Historical Aspects. Go to box in category under Building Features. Numbers in box refer to the Alternatives List. 	<p>Prevailing Codes:</p> <p>Primary public entrance with access to elevators available</p>	<p>Prevailing Codes:</p> <p>-31 1/2" clear openings</p> <p>-5' level perpendicular to closed door</p> <p>-18" clear at strike side</p>	<p>Prevailing Codes:</p> <p>5'-0" x 4'-8" stall clear</p> <p>Length 32" min. clear entry in front of compartment</p> <p>Door 32" clear</p> <p>Turn 60" diameter circle</p> <p>Lavy. 29" clear under for newly designed space. See WAC 51-10 Sec. 511.1.</p>	<p>Prevailing Codes:</p> <p>-Access to all floors, except in offices, retail shops</p> <p>-floor on given story level or ramped.</p>
Category (Building Type and Historical Aspects)	ENTRY See Alternatives List	DOORS See Alternatives List	TOILET ROOMS See Alternatives List	FLOORS & LEVELS See Alternatives List
I. Publicly owned or leased building providing governmental services to general public; i.e., City Hall, Courthouse, etc., adaptive use, restoration, or reconstruction.				
A. Exterior (shell) historical all or part, Interior nonhistorical.	2, 4	1, Exterior only None interior	None	N.A.
B. Interior historical-all or part, Exterior nonhistorical.		1, 2 Interior only None exterior	1, 2	1, 2
C. All historical-major change in use, change in occupancy.	2, 4	1, Exterior 1, 2 Interior only	1, 2	1, 2
D. All historical-minor change in use to equal or less intensive occupancy. Limited services.	2, 4	1, Exterior 1, 2, Interior only	1, 2	1, 2
II. Privately owned buildings offering services to consumers; i.e., taverns, restaurants, general shops, etc., or buildings owned by government and leased or consigned to private operator.				
A. Adaptive use restoration, reconstructions, Interior nonhistorical, Exterior historical (all or part).	1, 2, 3, 4	1, Exterior, and 1 Interior.	None	N.A.
B. Interior historical-(all or part), Exterior		None exterior,	1, 2, 3	N.A.
C. All historical-major change in use, change in occupancy, or mixed occupancy. Minor change of use to equal or less intensive occupancy.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
D. Reconstruction, or restoration. No change in use except to museum. (Minor mixed occupancy with administration space would be allowed.)	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
E. Museum quality restoration and/or reconstruction including museum use. (Minor mixed occupancy compatible with that use would be allowed.) Also includes renovation of historical building or site.	1, 2, 3, 4	1, 2, 3	1, 2, 3,	1, 2, 3
III. Privately or publicly owned buildings used as museums or as site for display of the building itself; i.e., museum, schoolhouse, garden centers, galleries, etc.				
A. Reconstruction, or restoration. No change in use except to museum. (Minor mixed occupancy such as administrative would be allowed.)	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
B. Museum quality restoration and/or reconstruction museum use (Minor mixed occupancy compatible with that would be allowed). Also includes renovation of historical building or site.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
IV. Privately owned buildings not open to general public but employing 3 or more persons; i.e., business offices.				
A. Adaptive use-Interior nonhistorical, Exterior historical (all or part).	1, 2, 3, 4	1, 2, 3, Exterior, None interior	1, 2	1, 2, 3, Exterior Access, None Interior access
B. Adaptive use-Interior historical, Exterior nonhistorical.	1, 2, 3, 4	None exterior, 1, 2, 3, Interior	1, 2	None Exterior access, 1, 2, 3, Interior access
C. All historical-major change in use, change in occupancy or mixed occupancy. Minor change of use to equal or less intensive occupancy.	1, 2, 3, 4	1 through 3	1, 2	1, 2, 3
D. Reconstruction, or restoration. No change in use-except to museum. (Minor mixed occupancy such as administrative would be allowed.)	1, 2, 3, 4	1 through 3	1, 2	1, 2, 3
V. Buildings employing less than 3 people.	All alternatives 1, 2, 3, 4	All alternatives 1- 3	All alternatives 1- 3	All alternatives 1- 3

ALTERNATIVES LIST

These alternatives are listed in order of priority and are to be used with Table A-901.

ENTRY:

1. Ramp at greater than standard slope, but no greater than 1:9 for a horizontal distance not to exceed 12 feet at main, side, or rear entrance.
2. Access, listed in the order of priority, at grade or by ramp or lift to any entrance used by general public.
3. Ramp no greater than 1:6 slope for a distance not to exceed a horizontal distance of 2 feet at main, side, or rear entrance.
4. Access, listed in the order of priority, at grade, or by ramp, or lift at any entrance not used by general public but open (unlocked), with directional signs.

DOORS: (One means of entry into spaces requiring access)

1. 30-inch width of clear opening operable by single motion.
2. Usable 29 1/2 inches clear opening with door(s) operable by single motion.
3. Single or double door to provide a usable 29 1/2 inches clear opening.

TOILET ROOMS:

1. Toilet facility of dimensions no less than those provided in the prevailing provisions in chapter 51-10 WAC designated as a unisex toilet for disabled persons.
2. Provide unisex toilet for disabled persons and general public.
3. No toilet for anyone.

FLOORS AND LEVELS:

1. Access to experiences, services, functions and materials and resources; i.e., maps, plans, courtroom, council chambers, etc., at accessible levels.
2. Access provided to levels and floors by ramps of greater than standard slope and no greater than 1:9 for horizontal distances not to exceed 12 feet. Lifts may be provided.
3. Access provided to levels and floors by ramps of 1:6 slope for horizontal distance not to exceed 2 feet. Adequate warnings shall be provided to indicate steepness of the slope.

USE NOTES:

1. Listed alternatives only apply to building requiring construction permits.
2. These alternatives should be used only where it is not possible to meet prevailing code.
3. Alternatives should be used only in those portions of the building that are historical.
4. Alternatives apply to access for physically disabled persons.
5. Alternatives apply to historic buildings only.
6. For other accessibility standards, see chapter 51-10 WAC.
7. Alternatives are listed in priority order.
8. No alternatives are allowed for simulations.

[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-900, filed 12/18/90, effective 7/1/91.]

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[Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-901, filed 12/18/90, effective 7/1/91.]

Chapter 51-20 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1991 EDITION OF THE UNIFORM BUILDING CODE

WAC

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51-20-009	Recyclable materials and solid waste storage.
51-20-0100	Chapter 1.

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 51-20-0605 Light, ventilation and sanitation.
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 51-20-0800 Chapter 8.
 51-20-0801 Group E Occupancies defined.
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 51-20-1000 Chapter 10.
 51-20-1011 Suite concept.
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 51-20-1210 Smoke detectors and sprinkler systems.
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 51-20-1226 Exits and emergency escapes.
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DIVISION I

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL FAIR HOUSING ACT GUIDELINES FOR SITE TERRAIN
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51-20-93115 Section 3115.

DIVISION II

U.S. DEPARTMENT OF JUSTICE AMERICANS WITH
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51-20-93116 Section 3116.

DIVISION III

U.S. ARCHITECTURAL AND BARRIERS COMPLIANCE BOARD
AMERICANS WITH DISABILITIES ACT ALTERNATE GUIDELINES
FOR DETECTABLE WARNINGS

51-20-93117 Section 3117.

DIVISION IV

U.S. ARCHITECTURAL AND BARRIERS COMPLIANCE BOARD
AMERICANS WITH DISABILITIES ACT ALTERNATE GUIDELINES
FOR AUDIBLE ALARMS

51-20-93118 Section 3118.

DIVISION V

U.S. ARCHITECTURAL AND BARRIERS COMPLIANCE BOARD
AMERICANS WITH DISABILITIES ACT ALTERNATE GUIDELINES
FOR VISUAL CONTRAST

51-20-93119 Section 3119.

DIVISION VI

U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS
COMPLIANCE BOARD AMERICANS WITH DISABILITIES ACT
GUIDELINES FOR AUTOMATED TELLER MACHINES

51-20-93120 Section 3120.

WAC 51-20-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-001, filed 12/19/91, effective 7/1/92.]

WAC 51-20-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain

the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-002, filed 12/19/91, effective 7/1/92.]

WAC 51-20-003 Uniform Building Code. The 1991 edition of the Uniform Building Code as published by the International Conference of Building Officials and available from the International Conference of Building Officials, 5360 South Workman Mill Road, Whittier, California 90601 is hereby adopted by reference with the following additions, deletions, and exceptions.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-003, filed 12/19/91, effective 7/1/92.]

WAC 51-20-004 Conflicts with Washington State Ventilation and Indoor Air Quality Code. In the case of conflict between the ventilation requirements of section 605, section 705, section 905, and section 1205 of this code and the ventilation requirements of chapter 51-13 WAC, the Washington State Ventilation and Indoor Air Quality Code, the provisions of the Ventilation and Indoor Air Quality Code shall govern.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-004, filed 12/19/91, effective 7/1/92.]

WAC 51-20-005 Uniform Building Code requirements for barrier-free accessibility. Chapter 31 and other Uniform Building Code requirements for barrier-free access are adopted pursuant to chapters 70.92 and 19.27 RCW.

Pursuant to RCW 19.27.040, chapter 31 and requirements affecting barrier-free access in sections 3304(b), 3304(h), 3306(g), and 3306(i) shall not be amended by local governments.

In case of conflict with other provisions of this code, chapter 31 and requirements affecting barrier-free access in sections 3304(b), 3304(h), 3306(g), and 3306(i) shall govern.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-005, filed 12/19/91, effective 7/1/92.]

WAC 51-20-007 Exceptions. The exceptions and amendments to the Uniform Building Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-007, filed 12/19/91, effective 7/1/92.]

WAC 51-20-008 Implementation. The Uniform Building Code adopted under chapter 51-20 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-008, filed 12/19/91, effective 7/1/92.]

WAC 51-20-009 Recyclable materials and solid waste storage. (a) For the purposes of this section, the following definition shall apply:

Recycled materials means those solid wastes that are separated for recycling or reuse, such as papers, metals and glass.

(b) All local jurisdictions shall require that space be provided for the storage of recycled materials and solid waste for all new buildings.

EXCEPTION: Group R, Division 3 and Group M Occupancies.

The storage area shall be designed to meet the needs of the occupancy, efficiency of pickup, and shall be available to occupants and haulers.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-009, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0100 Chapter 1. Title, scope and general.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0100, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0104 Application to existing buildings and structures. Section 104.

(a) General. Buildings and structures to which additions, alterations or repairs are made shall comply with all the requirements of this code for new facilities except as specifically provided in this section. See section 1210 for provisions requiring installation of smoke detectors in existing Group R, Division 3 Occupancies.

(b) Additions, alterations or repairs. Additions, alterations or repairs may be made to any building or structure without requiring the existing building or structure to comply with all the requirements of this code, provided the addition, alteration or repair conforms to that required for a new building or structure. Additions or alterations shall not be made to an existing building or structure which will cause the existing building or structure to be in violation of any of the provisions of this code nor shall such additions or alterations cause the existing building or structure to become unsafe. An unsafe condition shall be deemed to have been created if an addition or alteration will cause the existing building or structure to become structurally unsafe or overloaded; will not provide adequate egress in compliance with the provisions of this code or will obstruct existing exits; will create a fire hazard; will reduce required fire resistance or will otherwise create conditions dangerous to human life. Any building so altered, which involves a change in use or occupancy, shall not exceed the height, number of stories and area permitted for new buildings. Any building plus new additions shall not exceed the height, number of stories and area specified for new buildings. Additions or alterations shall not be made to an existing building or structure when such existing building or structure is not in full compliance with the provisions of this code except when such addition or alteration will result in the existing building or structure being no more hazardous based on life-safety, fire-safety and sanitation, than before such additions or alterations are undertaken. (See also section 911(c) for Group H, Division 6 Occupancies.)

Alterations or repairs to an existing building or structure which are nonstructural and do not adversely affect any structural member or any part of the building or structure having required fire resistance may be made with the same materials of which the building or structure is constructed. The installation or replacement of glass shall be as required for new installations.

EXCEPTION: Alterations of existing structural elements or additions of new structural elements which are initiated for the purpose of increasing the vertical or lateral load-carrying strength or stiffness of an existing structure need not be designed for forces conforming to these regulations provided that:

- A. The capacity of existing structural elements to resist forces is not reduced, and;
- B. The loading to existing structural elements is not increased, and;
- C. All new structural elements are detailed and connected to the existing structural elements as required by these regulations, and;
- D. All new or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by these regulations, and;
- E. An unsafe condition is not created.

(c) Existing installations. Buildings in existence at the time of the adoption of this code may have their existing use or occupancy continued, if such use or occupancy was legal at the time of the adoption of this code, provided such continued use is not dangerous to life.

Any change in the use or occupancy of any existing building or structure shall comply with the provisions of sections 308 and 502 of this code.

For existing buildings, see Appendix Chapter 1.

(d) Maintenance. All buildings and structures, both existing and new, and all parts thereof, shall be maintained in a safe and sanitary condition. All devices or safeguards which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this subsection, the building official may cause a structure to be reinspected.

(e) Moved buildings and temporary buildings. Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings or structures.

Temporary structures such as reviewing stands and other miscellaneous structures, sheds, canopies or fences used for the protection of the public around and in conjunction with construction work may be erected by special permit from the building official for a limited period of time. Such buildings or structures need not comply with the type of construction or fire-resistive time periods required by this code. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated in the permit.

(f) Historic buildings. Repairs, alterations and additions necessary for the preservation, restoration, rehabilitation or continued use of a building or structure may be made without conformance to all the requirements of this code when authorized by the building official, provided:

1. The building or structure has been designated by official action of the legally constituted authority of this jurisdiction as having special historical or architectural significance.

2. Any unsafe conditions as described in this code are corrected.

3. The restored building or structure will be no more hazardous based on life safety, fire safety and sanitation than the existing building.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0104, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0300 Chapter 3. Permits and inspections.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0300, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0307 Structural observation. Section 307. Structural observation shall be provided in Seismic Zone No. 3 or 4 when one of the following conditions exists:

1. The structure is defined in Table No. 23-K as Occupancy Category I, II or III, or
2. The structure is required to comply with section 1807, or
3. Construction inspection as defined in section 302(c), Item 2, is required, or
4. When such observation is specifically required by the building official for unusual lateral force-resisting structures or irregular structures as defined in section 2333.

The owner shall employ the engineer or architect responsible for the structural design, or another engineer or architect designated by the engineer or architect responsible for the structural design to perform structural observation as defined in section 420. Any observed deficiencies, that do not generally conform to the approved plans and specifications or to revised details approved by the building official, shall be submitted in writing to the owner's representative, who in turn shall notify the contractor and the building official. The engineer or architect shall submit a statement in writing to the building official stating that the site visits have been made.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0307, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0400 Chapter 4. Definitions and abbreviations.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0400, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0404 Section 404. Cast stone is a precast building stone manufactured from portland cement concrete and used as a trim, veneer or facing on or in buildings or structures.

Central heating plant is environmental heating equipment which directly utilizes fuel to generate heat in a medium for distribution by means of ducts or pipes to areas other than the room or space in which the equipment is located.

C.F.R. is the Code of Federal Regulations, a regulation of the United States of America available from the Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402.

Chief of the fire department is the head of the fire department or a regularly authorized deputy.

Child day care, shall, for the purposes of these regulations, mean the care of children during any period of a 24 hour day.

Child day care home, family is a child day care facility, licensed by the state, located in the family abode of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

Combustible liquid. See the Fire Code.

Congregate residence is any building or portion thereof which contains facilities for living, sleeping and sanitation, as required by this code, and may include facilities for eating and cooking, for occupancy by other than a family. A congregate residence may be a shelter, convent, monastery, dormitory, fraternity or sorority house but does not include jails, hospitals, nursing homes, hotels or lodging houses.

Condominium, residential. See "apartment house."

Control area is a space bounded by not less than a one-hour fire-resistive occupancy separation within which the exempted amounts of hazardous materials may be stored, dispensed, handled or used.

Corrosive is a chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. A chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described in the United States Department of Transportation in Appendix A to C.F.R. 49 Part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

Court is a space, open and unobstructed to the sky, located at or above grade level on a lot and bounded on three or more sides by walls of a building.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0404, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0407 Section 407. Fabrication area (fab area) is an area within a Group H, Division 6 Occupancy in which there are processes involving hazardous production materials and may include ancillary rooms or areas such as dressing rooms and offices that are directly related to the fab area processes.

Family is an individual or two or more persons related by blood or marriage or a group of not more than five persons (excluding servants) who need not be related by blood or marriage living together in a dwelling unit.

Family abode means a single-dwelling unit and accessory buildings occupied for living purposes by a family which provides permanent provisions for living, sleeping, eating, cooking, and sanitation.

Fire assembly. See section 4306 (b).

Fire Code is the Uniform Fire Code promulgated jointly by the Western Fire Chiefs Association and the International Conference of Building Officials, as adopted by this jurisdiction.

Fire resistance or fire-resistive construction is construction to resist the spread of fire, details of which are specified in this code.

Fire-retardant-treated wood is any wood product impregnated with chemicals by a pressure process or other

means during manufacture, and which, when tested in accordance with U.B.C. Standard No. 42-1 for a period of 30 minutes, shall have a flame spread of not over 25 and show no evidence of progressive combustion. In addition, the flame front shall not progress more than 10 1/2 feet beyond the center line of the burner at any time during the test. Materials which may be exposed to the weather shall pass the accelerated weathering test and be identified as exterior type, in accordance with U.B.C. Standard No. 25-28. Where material is not directly exposed to rainfall but exposed to high humidity conditions, it shall be subjected to the hygroscopic test and identified as Interior Type A in accordance with U.B.C. Standard No. 25-28.

All materials shall bear identification showing the fire performance rating thereof. Such identifications shall be issued by an approved agency having a service for inspection of materials at the factory.

Flammable liquid. See Fire Code.

Floor area is the area included within the surrounding exterior walls of a building or portion thereof, exclusive of vent shafts and courts. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above.

FM is Factory Mutual Engineering and Research, 1151 Boston-Providence Turnpike, Norwood, Massachusetts 02062.

Foam plastic insulation is a plastic which is intentionally expanded by the use of a foaming agent to produce a reduced-density plastic containing voids consisting of hollow spheres or interconnected cells distributed throughout the plastic for thermal insulating or acoustical purposes and which has a density less than 20 pounds per cubic foot.

Footing is that portion of the foundation of a structure which spreads and transmits loads directly to the soil or the piles.

Front of lot is the front boundary line of a lot bordering on the street and, in the case of a corner lot, may be either frontage.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0407, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0409 Section 409. Habitable space (room) is space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, and similar areas, are not considered habitable space.

Handling is the deliberate transport of materials by any means to a point of storage or use.

Handrail is a railing provided for grasping with the hand for support. See also section 408, definition of "guardrail."

Hazardous production material (HPM) is a solid, liquid or gas that has a degree of hazard rating in health, flammability or reactivity of 3 or 4 and which is used directly in research, laboratory or production processes which have, as their end product, materials which are not hazardous.

Health hazard is a classification of a chemical for which there is statistically significant evidence based on at least one reproducible study conducted in accordance with

established scientific principles that acute health effects may occur in exposed persons. The term "health hazard" includes chemicals which are toxic or highly toxic agents, irritants, corrosives, hepatotoxins, nephrotoxins, neurotoxins, agents which can have an acute effect on the hematopoietic system, and agents that have acute effects on the lungs, skin, eyes or mucous membrane.

Height of building is the vertical distance above a reference datum measured to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the average height of the highest gable of a pitched or hipped roof. The reference datum shall be selected by either of the following, whichever yields a greater height of building:

1. The elevation of the highest adjoining sidewalk or ground surface within a 5-foot horizontal distance of the exterior wall of the building when such sidewalk or ground surface is not more than 10 feet above lowest grade.

2. An elevation 10 feet higher than the lowest grade when the sidewalk or ground surface described in Item 1 above is more than 10 feet above lowest grade.

The height of a stepped or terraced building is the maximum height of any segment of the building.

Heliport is an area of land or water or a structural surface which is used, or intended for use, for the landing and take-off of helicopters, and any appurtenant areas which are used, or intended for use, for heliport buildings and other heliport facilities.

Helistop is the same as a heliport, except that no refueling, maintenance, repairs or storage of helicopters is permitted.

Highly toxic material is a material which produces a lethal dose or a lethal concentration which falls within any of the following categories:

1. A chemical that has a median lethal dose (LD₅₀) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

2. A chemical that has a median lethal dose (LD₅₀) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.

3. A chemical that has a median lethal concentration (LC₅₀) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

Mixtures of these materials with ordinary materials, such as water, may not warrant a classification of highly toxic. While this system is basically simple in application, any hazard evaluation which is required for the precise categorization of this type of material shall be performed by experienced, technically competent persons.

Horizontal exit. See section 3301(b).

Hotel is any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied for sleeping purposes by guests.

Hot-water heating boiler is a boiler having a volume exceeding 120 gallons, or a heat input exceeding 200,000

Btu/h, or an operating temperature exceeding 210°F. that provides hot water to be used externally to itself.

HPM storage room is a room used for the storage or dispensing of hazardous production material (HPM) and which is classified as a Group H, Division 2, 3 or 7 Occupancy.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0409, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0414 Section 414. Marquee is a permanent roofed structure attached to and supported by the building and projecting over public property. Marquees are regulated in chapter 45.

Masonry is that form of construction composed of stone, brick, concrete, gypsum, hollow-clay tile, concrete block or tile, glass block or other similar building units or materials or combination of these materials laid up unit by unit and set in mortar.

Masonry, solid, is masonry of solid units built without hollow spaces.

Mechanical code is the Uniform Mechanical Code promulgated jointly by the International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials, as adopted by this jurisdiction.

Membrane penetration fire stop is a material, device or construction installed to resist, for a prescribed time period, the passage of flame, heat and hot gases through openings in a protective membrane in order to accommodate cables, cable trays, conduit, tubing, pipes or similar items.

Mezzanine or mezzanine floor is an intermediate floor placed within a room.

Motel shall mean hotel as defined in this code.

Motor vehicle fuel-dispensing station is that portion of a building where flammable or combustible liquids or gases used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles.

Multifamily residential building is a common wall dwelling or apartment house that consists of four or fewer dwelling units that do not exceed two stories in height and that are less than five thousand square feet in total area.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0414, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0417 Section 417. Panic hardware. See section 3301(b).

Pedestrian walkway is a walkway used exclusively as a pedestrian trafficway.

Penetration fire stop is a through-penetration fire stop or a membrane-penetration fire stop.

Permit is an official document or certificate issued by the building official authorizing performance of a specified activity.

Person is a natural person, heirs, executors, administrators or assigns, and also includes a firm, partnership or corporation, its or their successors or assigns, or the agent of any of the aforesaid.

Plastic materials, approved, other than foam plastics regulated under sections 1705(e) and 1713, are those having a self-ignition temperature of 650°F. or greater and a smoke-density rating not greater than 450 when tested in

accordance with U.B.C. Standard No. 42-1, in the way intended for use, or a smoke-density rating no greater than 75 when tested in the thickness intended for use by U.B.C. Standard No. 52-2. Approved plastics shall be classified and shall meet the requirements for either CC1 or CC2 plastic.

Platform. See chapter 39.

Plumbing code is the Uniform Plumbing Code promulgated by the International Association of Plumbing and Mechanical Officials as adopted by this jurisdiction.

Portable school classroom is a structure, transportable in one or more sections, which requires a chassis to be transported, and is designed to be used as an educational space with or without a permanent foundation. The structure shall be trailerable and capable of being demounted and relocated to other locations as needs arise.

Protective membrane is a surface material which forms the required outer layer or layers of a fire-resistive assembly containing concealed spaces.

Public way. See section 3301(b).

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0417, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0420 Section 420. Sensitizer is a chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Service corridor is a fully enclosed passage used for transporting hazardous production materials and for purposes other than required exiting.

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

Shaft enclosure is the walls or construction forming the boundaries of a shaft.

Shall, as used in this code, is mandatory.

Single family residential building is a dwelling containing only one dwelling unit.

Smoke detector is an approved device that senses visible or invisible particles of combustion.

Stage. See chapter 39.

Story is that portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost story shall be that portion of a building included between the upper surface of the topmost floor and the ceiling or roof above. If the finished floor level directly above a usable or unused under-floor space is more than 6 feet above grade as defined herein for more than 50 percent of the total perimeter or is more than 12 feet above grade as defined herein at any point, such usable or unused under-floor space shall be considered as a story.

Story, first, is the lowest story in a building which qualifies as a story, as defined herein, except that a floor level in a building having only one floor level shall be classified as a first story, provided such floor level is not more than 4 feet below grade, as defined herein, for more than 50 percent of the total perimeter, or not more than 8 feet below grade, as defined herein, at any point.

Street is any thoroughfare or public way not less than 16 feet in width which has been dedicated or deeded to the public for public use.

Structural observation means the visual observation of the structural system for general conformance to the approved plans and specifications. Structural observation does not include or waive the responsibility for the inspections required by section 305 and 306.

Structure is that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

Surgical area is the preoperating, operating, recovery and similar rooms within an out-patient health-care center where the patients are incapable of unassisted self-preservation.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0420, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0500 Chapter 5. Classification of all buildings by use or occupancy and general requirements for all occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0500, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0503 Mixed occupancy. Section 503.

(a) General. When a building is used for more than one occupancy purpose, each part of the building comprising a distinct "occupancy," as described in chapters 5 through 12, shall be separated from any other occupancy as specified in section 503(d).

EXCEPTIONS:

1. Where an approved spray booth constructed in accordance with the Fire Code is installed, such booth need not be separated from other Group H Occupancies or from Group B Occupancies.

2. The following occupancies need not be separated from the uses to which they are accessory:

A. Assembly rooms having a floor area of not over 750 square feet.

B. Administrative and clerical offices and similar rooms which do not exceed 25 percent of the floor area of the major use when not related to Group H, Division 2 and Group H, Division 3 Occupancies.

C. Gift shops, administrative offices and similar rooms in Group R, Division 1 Occupancies not exceeding 10 percent of the floor area of the major use.

D. The kitchen serving the dining area of which it is part.

E. Offices, retail, food preparation establishments for off-site consumption, personal care salons or similar Group B, Division 2 Occupancies conducted primarily by the occupants of the dwelling, which are secondary to the use of the unit for dwelling purposes, and which do not exceed 500 square feet.

3. An occupancy separation need not be provided between a Group R, Division 3 Occupancy and a carport having no enclosed uses above, provided the carport is entirely open on two or more sides.

4. A Group B, Division 1 Occupancy used exclusively for the parking or storage of private or pleasure-type motor vehicles need not be separated from a Group B, Division 3 Occupancy open parking garage as defined in section 709.

5. A one-hour occupancy separation need not be provided between fuel-dispensing pumps covered with a canopy that is open on three or more sides, and a Group B, Division 2 Occupancy retail store having an area of

less than 2,500 square feet when the following conditions exist:

A. The Group B, Division 2 Occupancy is provided with two exits separated as required by section 3303(c) and not located in the same exterior wall.

B. Pump islands are not located within 20 feet of the Group B, Division 2 Occupancy retail store.

When a building houses more than one occupancy, each portion of the building shall conform to the requirements for the occupancy housed therein.

An occupancy shall not be located above the story or height set forth in Table No. 5-D, except as provided in section 507. When a mixed occupancy building contains a Group H, Division 6 Occupancy, the portion containing the Group H, Division 6 Occupancy shall not exceed three stories or 55 feet in height.

(b) Forms of occupancy separations. Occupancy separations shall be vertical or horizontal or both or, when necessary, of such other form as may be required to afford a complete separation between the various occupancy divisions in the building.

Where the occupancy separation is horizontal, structural members supporting the separation shall be protected by equivalent fire-resistive construction.

(c) Types of occupancy separations. Occupancy separations shall be classed as "four-hour fire-resistive," "three-hour fire-resistive," "two-hour fire-resistive," and "one-hour fire-resistive."

1. A four-hour fire-resistive occupancy separation shall have no openings therein and shall not be of less than four-hour fire-resistive construction.

2. A three-hour fire-resistive occupancy separation shall not be of less than three-hour fire-resistive construction. All openings in walls forming such separation shall be protected by a fire assembly having a three-hour fire-protection rating. The total width of all openings in any three-hour fire-resistive occupancy separation wall in any one story shall not exceed 25 percent of the length of the wall in that story and no single opening shall have an area greater than 120 square feet.

All openings in floors forming a three-hour fire-resistive occupancy separation shall be protected by vertical enclosures extending above and below such openings. The walls of such vertical enclosures shall not be of less than two-hour fire-resistive construction and all openings therein shall be protected by a fire assembly having a one- and one-half-hour fire-protection rating.

3. A two-hour fire-resistive occupancy separation shall not be of less than two-hour fire-resistive construction. All openings in such separation shall be protected by a fire assembly having a one- and one-half-hour fire-protection rating.

4. A one-hour fire-resistive occupancy separation shall not be of less than one-hour fire-resistive construction. All openings in such separation shall be protected by a fire assembly having a one-hour fire-protection rating.

(d) Fire ratings for occupancy separations. Occupancy separations shall be provided between the various groups and divisions of occupancies as set forth in Table No. 5-B.

EXCEPTIONS:

1. A three-hour occupancy separation may be used between a Group A, Division 1 and a Group B, Division 1 Occupancy used exclusively for the parking or storage of private or pleasure-type motor vehicles and provided no

repair or fueling is done. A two-hour occupancy separation may be used between a Group A, Division 2, 2.1, 3 or 4 or E or I Occupancy and a Group B, Division 1 Occupancy that is used exclusively for the parking or storage of private or pleasure-type motor vehicles and provided no repair or fueling is done.

2. Unless required by section 702(b)1, the three-hour occupancy separation between a Group R, Division 1 Occupancy and a Group B, Division 1 Occupancy used only for the parking or storage of private or pleasure-type motor vehicles with no repair or fueling may be reduced to two hours. Such occupancy separation may be further reduced to one hour where the area of such Group B, Division 1 Occupancy does not exceed 3,000 square feet.

3. In the one-hour occupancy separation between Group R, Division 3 and Group M Occupancies, the separation may be limited to the installation of materials approved for one-hour fire-resistive construction on the garage side and a self-closing, tight-fitting solid wood door 1 3/8 inches in thickness, or a self-closing tight-fitting door having a fire-protection rating of not less than 20 minutes when tested in accordance with Part II of U.B.C. Standard No. 43-2, which is a part of this code, is permitted in lieu of a one-hour fire assembly. Fire dampers need not be installed in air ducts passing through the wall, floor or ceiling separating a Group R, Division 3 Occupancy from a Group M Occupancy, provided such ducts within the Group M Occupancy are constructed of steel having a thickness not less than 0.019 inch (No. 26 galvanized sheet gage) and have no openings into the Group M Occupancy.

4. Group H, Division 2 and Group H, Division 3 Occupancies need not be separated from Group H, Division 7 Occupancies when such occupancies also comply with the requirements for a Group H, Division 7 Occupancy.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0503, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0514 Heating. Section 514.

(a) For the purposes of this section only, the following definitions apply.

Designated areas are those areas designated by a county to be an urban growth area in chapter 36.70A RCW and those areas designated by the United States Environmental Protection Agency as being in nonattainment for particulate matter.

Substantially remodelled means any alteration or restoration of a building exceeding sixty percent of the appraised value of such building within a twelve-month period.

(b) Primary heating sources in all new and substantially remodelled buildings in designated areas, shall not be dependent upon woodstoves.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0514, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0515 Solid fuel burning devices. Section 515. After January 1, 1992, no used solid fuel burning device shall be installed in new or existing buildings unless such device is either Oregon Department of Environmental Quality Phase II or United States Environmental Protection Agency certified or a pellet stove either certified or exempt from certification by the United States Environmental Protection Agency.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0515, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0551 Table No. 5-B—Required separation in buildings of mixed occupancy.

TABLE NO. 5-B—REQUIRED SEPARATION IN BUILDINGS OF MIXED OCCUPANCY¹
(In Hours)

	A-1	A-2	A-2.1	A-3	A-4	B-1	B-2	B-3	B-4	E	H-1	H-2	H-3	H-4-5	H-6-7 ³	I	M ⁴	R-1	R-3
A-1		N	N	N	N	4	3	3	3	N		4	4	4	4	3	I	I	I
A-2	N		N	N	N	3	I	I	I	N		4	4	4	4	3	I	I	I
A-2.1	N	N		N	N	3	I	I	I	N		4	4	4	4	3	I	I	I
A-3	N	N	N		N	3	N	I	I	N		4	4	4	3	2	I	I	I
A-4	N	N	N	N		3	I	I	I	N		4	4	4	4	3	I	I	I
B-1	4	3	3	3	3		I	I	I	3		2	I	I	I	4	I	3	I
B-2	3	I	I	N	I	I		I	I	I		2	I	I	I	2	I	I	I
B-3	3	I	I	I	I	I	I		I	I		2	I	I	I	3	I	I	I
B-4	3	I	I	I	I	I	I	I		I		2	I	I	I	4	N	I	I
E	N	N	N	N	N	3	I	I	I			4	4	4	3	I	I	I	I
H-1	Not Permitted in Mixed Occupancies. See Chapter 9.										Not Permitted in Mixed Occupancies. See Chapter 9.								
H-2	4	4	4	4	4	2	2	2	2	4			1	1	2	4	I	4	4
H-3	4	4	4	4	4	I	I	I	I	4		1		I	I	4	I	3	3
H-4-5	4	4	4	4	4	I	I	I	I	4		1	I		I	4	I	3	3
H-6-7 ³	4	4	4	3	4	I	I	I	I	3		2	I	I		4	3	4	4
I	3	3	3	2	3	4	2	3	4	1		4	4	4	4		I	I	I
M ⁴	I	I	I	I	I	I	I	I	N	I		1	I	I	3	I		I	I
R-1	I	I	I	I	I	3	I	I	I	I		4	3	3	4	I	I		N
R-3	I	I	I	I	I	I	I	I	I	I		4	3	3	4	I	I	N	

¹For detailed requirements and exceptions, see Section 503.

Not Permitted in Mixed Occupancies. See Chapter 9.

³For special provisions on highly toxic materials, see Fire Code.

⁴For agricultural buildings, see also Appendix Chapter 11.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0551, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0600 Chapter 6. Requirements for Group A Occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0600, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0605 Light, ventilation and sanitation. Section 605.

All enclosed portions of Group A Occupancies customarily used by human beings and all dressing rooms shall be provided with natural light by means of exterior glazed openings with an area not less than one tenth of the total floor area, and natural ventilation by means of openable exterior openings with an area of not less than one twentieth of the total floor area, or shall be provided with artificial light and a mechanically operated ventilating system. The mechanically operated ventilating system shall be capable of supplying a minimum of 5 cubic feet per minute of outside air per occupant with a total circulated of not less than 15 cubic feet per minute per occupant in all portions of the building during such time as the building is occupied. If the velocity of the air at the register exceeds 10 feet per second, the register shall be placed more than 8 feet above the floor directly beneath.

Toilet rooms shall be provided with a fully openable exterior window at least 3 square feet in area; or a vertical duct not less than 100 square inches in area for the first toilet facility, with 50 additional square inches for each additional facility; or a mechanically operated exhaust system capable of providing a complete change of air every 15 minutes. Such systems shall be connected directly to the outside, and the point of discharge shall be at least 3 feet from any operable opening into the building.

There shall be provided in an approved location at least one lavatory for each two water closets for each sex, and at least one drinking fountain for each floor level.

EXCEPTION: A drinking fountain need not be provided in a drinking or dining establishment.

For other requirements on water closets, see sections 510 and 511.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0605, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0700 Chapter 7. Requirements for Group B Occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0700, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0702 Construction, height and allowable area. Section 702.

(a) General. Buildings or parts of buildings classed in Group B Occupancy because of the use or character of the occupancy shall be limited to the types of construction set forth in Tables Nos. 5-C and 5-D and shall not exceed, in area or height, the limits specified in sections 505, 506 and 507.

(b) Special provisions.

1. Group B, Division 1 with Group A, Division 3; Group B, Division 2; or Group R, Division 1 Occupancy above. Other provisions of this code notwithstanding, a basement or first story of a building may be considered as a separate and distinct building for the purposes of area limitations, limitation of number of stories and type of construction, when all of the following conditions are met:

A. The basement or first story is of Type I construction and is separated from the building above with a three-hour occupancy separation.

B. The building above the three-hour occupancy separation contains only Group A, Division 3; Group B, Division 2; or Group R, Division 1 Occupancies.

C. The building below the three-hour occupancy separation is used exclusively for the parking and storage of private or pleasure-type motor vehicles.

EXCEPTIONS:

1. Entry lobbies, laundry rooms, mechanical rooms and similar uses incidental to the operation of the building.
2. Group B, Division 2 office and retail occupancies in addition to those incidental to the operation of the building (including storage areas) provided that the entire structure below the three-hour occupancy separation is protected throughout by an automatic sprinkler system.

D. The maximum building height in feet shall not exceed the limits set forth in Table No. 5-D for the least type of construction involved.

2. Group B, Division 1 with Group B, Division 3 Occupancy above. Other provisions of this code notwithstanding, a Group B, Division 1 Occupancy, located in the basement or first story below a Group B, Division 3 open parking garage, as defined in section 709, may be classified as a separate and distinct building for the purpose of determining the type of construction when all of the following conditions are met:

A. The allowable area of the structure shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.

B. The Group B, Division 1 Occupancy is of Type I or II construction and is at least equal to the fire resistance of the Group B, Division 3 Occupancy.

C. The height and the number of the tiers above the basement shall be limited as specified in Table No. 7-A or section 709(e).

D. The floor-ceiling assembly separating the Group B, Division 1 and Group B, Division 3 Occupancies shall be protected as required for the floor-ceiling assembly of the Group B, Division 1 Occupancy. Openings between the Group B, Division 1 and Group B, Division 3 Occupancies, except exit openings, need not be protected.

E. The Group B, Division 1 Occupancy is used exclusively for the parking or storage for private or pleasure-type motor vehicles but may contain (a) mechanical equipment

rooms incidental to the operation of the building and (b) an office, and waiting and toilet rooms having a total area of not more than 1,000 square feet.

(c) Specific use provisions. 1. Group B, Divisions 1 and 3 Occupancies. Marine or motor vehicle fuel-dispensing stations including canopies and supports over pumps shall be of noncombustible, fire-retardant-treated wood or of one-hour fire-resistive construction.

EXCEPTIONS:

1. Roofs of one-story fuel-dispensing stations may be of heavy-timber construction.
2. Canopies conforming to section 5213 may be erected over pumps.

In areas where motor vehicles, boats or aircraft are stored, and in motor vehicle fuel-dispensing stations and Division 1 repair garages, floor surfaces shall be of noncombustible, nonabsorbent materials. Floors shall drain to an approved oil separator or trap discharging to sewers in accordance with the Plumbing Code.

EXCEPTION: Floors may be surfaced or waterproofed with asphaltic paving materials in areas where motor vehicles or airplanes are stored or operated.

Canopies under which fuels are dispensed shall have a clear, unobstructed height of not less than 13 feet 6 inches to the lowest projecting element in the vehicle drive-through area.

2. Group B, Division 2 storage areas. Storage areas in connection with wholesale or retail sales in Division 2 Occupancies shall be separated from the public area by a one-hour fire-resistive occupancy separation.

EXCEPTION: Occupancy separation need not be provided when any one of the following conditions exists:

- A. The storage area does not exceed 1,000 square feet, or
- B. The storage area is sprinklered and does not exceed 3,000 square feet, or
- C. The building is provided with an approved automatic sprinkler system throughout. Area increases as specified in section 506(c) are permitted.

3. Laboratories and vocational shops. Laboratories or suites of laboratories and vocational shops in buildings used for educational purposes and similar areas containing hazardous materials shall be separated from each other and other portions of the building by not less than a one-hour fire-resistive occupancy separation. When the quantities of hazardous materials in such uses do not exceed those listed in Table No. 9-A or 9-B, the requirements of sections 905 and 908 shall apply. When the quantities of hazardous materials in such uses exceed those allowed by Table No. 9-A or 9-B, the use shall be classified as the appropriate Group H Occupancy.

Laboratories having an occupant load in excess of 10 shall have access to at least two exits from the room and all portions of the room shall be within 75 feet of an exit.

4. Medical gas systems. Medical gas systems shall be installed and maintained in accordance with the Fire Code. When nonflammable supply cylinders for such systems are located inside buildings they shall be in a separate room or enclosure separated from the rest of the building by not less than one-hour fire-resistive construction. Openings between the room or enclosure and interior spaces shall be protected by self-closing smoke- and draft-control assemblies having a fire-protection rating of not less than one hour. Rooms

shall have at least one exterior wall in which there are not less than two vents of not less than 36 square inches in area. One vent shall be within 6 inches of the floor and one shall be within 6 inches of the ceiling.

EXCEPTION: When an exterior wall cannot be provided for the room, automatic sprinklers shall be installed within the room and the room shall be vented to the exterior through ducting contained within a one-hour-rated shaft enclosure. Approved mechanical ventilation shall provide six air changes per hour for the room.

5. Parking garage headroom. Parking garages shall have an unobstructed headroom clearance of not less than 7 feet above the finish floor to any ceiling, beam, pipe or similar construction, except for wall-mounted shelves, storage surfaces, racks or cabinets.

6. Group B, Division 4 roof framing. In Division 4 Occupancies, fire protection of the underside of roof framing may be omitted in all types of construction.

7. Amusement buildings. Amusement buildings with an occupant load of less than 50 shall comply with sections 610, 3314(f) and 3802(c).

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

For flammable decorative materials, see the Fire Code.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0702, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0800 Chapter 8. Requirements for Group E Occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0800, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0801 Group E Occupancies defined. Section 801. Group E Occupancies shall be:

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

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

Division 3. Any building or portion thereof used for day-care purposes for more than six persons.

EXCEPTION: Family child day-care homes shall be considered Group R, Division 3 Occupancies.

For occupancy separations, see Table No. 5-B.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0801, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0802 Construction, height and allowable area. Section 802.

(a) General. Buildings or parts of buildings classed in Group E because of the use or character of the occupancy shall be limited to the types of construction set forth in Tables Nos. 5-C and 5-D and shall not exceed, in area or height, the limits specified in sections 505, 506 and 507, except that the area may be increased by 50 percent when the maximum travel distance specified in section 3303(d) is reduced by 50 percent.

(b) Atmospheric separation requirements.

1. Definitions. For the purpose of this chapter and section 3319, the following definitions are applicable:

Common atmosphere. A common atmosphere exists between rooms, spaces or areas within a building which are not separated by an approved smoke- and draft-stop barrier.

Separate atmosphere. A separate atmosphere exists between rooms, spaces or areas that are separated by an approved smoke- and draft-stop barrier.

Smoke and draft barrier. A smoke and draft barrier consists of walls, partitions, floors and openings therein of such construction as will prevent the transmission of smoke or gases through the construction.

2. General provisions. The provisions of this subsection apply when a separate exit system is required in accordance with section 3318.

Walls, partitions and floors forming all of, or part of, an atmospheric separation shall be of materials consistent with the requirements for the type of construction, but of construction not less effective than a smoke- or draft-stop barrier. Glass lights of approved wired glass set in steel frames may be installed in such walls or partitions.

Every door opening therein shall be protected with a fire assembly as required elsewhere in the code, but not less than a self-closing or automatic-closing, tight-fitting smoke barrier and fire assembly having a fire-protection rating of not less than 20 minutes when tested in accordance with U.B.C. Standard No. 43-2 which is a part of this code. (See chapter 60, Part II.)

Ducts penetrating atmospheric separation walls, partitions or floors shall be equipped with an approved automatic-closing smoke damper when having openings into more than one atmosphere.

All automatic-closing fire assemblies installed in the atmospheric separation shall be activated by approved smoke detectors.

The specific requirements of this section are not intended to prevent the design or use of other systems, equipment or techniques which will effectively prevent the products of combustion from breaching the atmospheric separation.

(c) Special provisions. Rooms in Divisions 1 and 2 Occupancies used for kindergarten, first- or second-grade pupils and Division 3 Occupancies shall not be located above or below the first story.

EXCEPTIONS: 1. Rooms on floors which have exits to the exterior of the building which require no more than 4 feet of vertical travel from the floor level to the level of the exterior finished surface of the ground, paving or sidewalk.

2. In buildings equipped with an automatic sprinkler system throughout, rooms used for kindergarten, first- and second-grade children or for day-care purposes may be located on the second story, provided there are at least two exits directly into separate exiting systems as defined in section 3318(a).

3. Division 3 Occupancies located above the second story, shall be in buildings equipped with an automatic sprinkler system throughout and of Type I or Type II fire-resistive construction when:

A. Division 3 Occupancies above the fourth floor shall not have more than 12 children per floor; and,

B. The entire story on which the day-care facility is located is equipped with an approved fire alarm and smoke detection system as set forth in the Fire Code.

Actuation of the system shall sound an alarm audible throughout the entire story; and,

C. The day-care facility is divided into not less than two areas of approximately the same size, separated from each other by not less than one-hour fire-resistive construction. Openings between the two areas shall be protected by an automatic-closing smoke and draft control assembly, having a fire-protection rating of not less than 20 minutes, which will close automatically upon actuation of the fire alarm or detection systems; and,

D. Each separated area is provided with air-moving equipment independent of that serving the other; and,

E. Each separated area has not less than two exits, one of which is permitted to be through the adjoining separated area; and,

F. The exits from the Division 3 Occupancy shall be into separate exiting systems as defined in section 3318.

Stages and platforms shall be constructed in accordance with chapter 39. For attic space partitions and draft stops, see section 2516(f).

(d) Special hazards. Laboratories, vocational shops and similar areas containing hazardous materials shall be separated from each other and from other portions of the building by not less than a one-hour fire-resistive occupancy separation. When the quantities of hazardous materials in such uses do not exceed those listed in Table No. 9-A or 9-B, the requirements of sections 905 and 908 shall apply. When the quantities of hazardous materials in such uses exceed those allowed by Table No. 9-A or 9-B, the use shall be classified as the appropriate Group H Occupancy.

Occupants in laboratories having an area in excess of 200 square feet shall have access to at least two exits from the room and all portions of the room shall be within 75 feet of an exit.

Equipment in rooms or groups of rooms sharing a common atmosphere where flammable liquids, combustible dust or hazardous materials are used, stored, developed or handled shall conform to the requirements of the Fire Code.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0802, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0900 Chapter 9. Requirements for Group H Occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0900, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0901 Group H Occupancies defined. Section 901.

(a) General. For definitions, identification and control of hazardous materials, display of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in Group B, Division 2 Occupancies, see the Fire Code. For application and use of control areas, see Footnote No. 1 of Tables Nos. 9-A and 9-B. Group H Occupancies shall be:

Division 1. Occupancies with a quantity of material in the building in excess of those listed in Table No. 9-A which present a high explosion hazard, including, but not limited to:

1. Explosives, blasting agents, fireworks and black powder.

EXCEPTION: Storage and the use of pyrotechnic special effect materials in motion picture, television, theatrical and group entertainment production when under permit as required in the

Fire Code. The time period for storage shall not exceed 90 days.

2. Unclassified detonatable organic peroxides.
3. Class 4 oxidizers.
4. Class 4 or Class 3 detonatable unstable (reactive) materials.

Division 2. Occupancies with a quantity of material in the building in excess of those listed in Table No. 9-A, which present a moderate explosion hazard or a hazard from accelerated burning, including, but not limited to:

1. Class I organic peroxides.
2. Class 3 nondetonatable unstable (reactive) materials.
3. Pyrophoric gases.
4. Flammable or oxidizing gases.
5. Class I, II or III-A flammable or combustible liquids

which are used in normally open containers or systems or in closed containers pressurized at more than 15-pounds-per-square-inch gauge.

EXCEPTION: Aerosols.

6. Combustible dusts in suspension or capable of being put into suspension in the atmosphere of the room or area.

EXCEPTIONS:

1. Rooms or areas used for woodworking where no more than three fixed in-place woodworking appliances are utilized may be classified as a Group B, Division 2 Occupancy, provided the appliances are equipped with dust collectors sufficient to remove dust generated by the appliance.
2. Lumberyards and similar retail stores utilizing only power saws may be classified as Group B, Division 2 Occupancies.

The building official may revoke the use of these exceptions for due cause.

7. Class 3 oxidizers.

Division 3. Occupancies with a quantity of material in the building in excess of those listed in Table No. 9-A which present a high fire or physical hazard, including, but not limited to:

1. Class II, III or IV organic peroxides.
2. Class 1 or 2 oxidizers.
3. Class I, II or III-A flammable liquids or combustible liquids which are utilized or stored in normally closed containers or systems and containers pressurized at 15-pounds-per-square-inch gauge or less and aerosols.
4. Class III-B combustible liquids.
5. Pyrophoric liquids or solids.
6. Water reactives.
7. Flammable solids, including combustible fibers or dusts, except for dusts included in Division 2 Occupancies.
8. Flammable or oxidizing cryogenic fluids (other than inert).

9. Class 1 unstable (reactive) gas or Class 2 unstable (reactive) materials.

Division 4. Repair garages not classified as Group B, Division 1 Occupancies.

Division 5. Aircraft repair hangars and heliports not classified as Group B, Division 3 Occupancies.

Division 6. Semiconductor fabrication facilities and comparable research and development areas when the facilities in which hazardous production materials (HPM) are used and the aggregate quantity of materials are in excess of those listed in Table No. 9-A or 9-B. Such facilities and

areas shall be designed and constructed in accordance with section 911.

Division 7. Occupancies having quantities of materials in excess of those listed in Table No. 9-B that are health hazards, including but not limited to:

1. Corrosives.
2. Highly toxic materials.
3. Irritants.

(b) Multiple hazards. When a hazardous material has multiple hazards, all hazards shall be addressed and controlled in accordance with the provisions of this chapter.

(c) Liquid use, dispensing and mixing rooms. Rooms in which Class I, Class II and Class III-A flammable or combustible liquids are used, dispensed or mixed in open containers shall be constructed in accordance with the requirements for a Group H, Division 2 Occupancy and the following:

1. Rooms in excess of 500 square feet shall have at least one exterior door approved for fire department access.
2. Rooms shall not exceed 1,000 square feet in area.
3. Rooms shall be separated from other areas by an occupancy separation having a fire-resistive rating of not less than one hour for rooms up to 150 square feet in area and not less than two hours where the room is more than 150 square feet in area. Separations from other occupancies shall not be less than required by chapter 5, Table No. 5-B.

4. Shelving, racks and wainscoting in such areas shall be of noncombustible construction or wood not less than 1-inch nominal thickness.

5. Liquid use, dispensing and mixing rooms shall not be located in basements.

(d) Liquid storage rooms. Rooms in which Class I, Class II and Class III-A flammable or combustible liquids are stored in closed containers shall be constructed in accordance with the requirements for a Group H, Division 3 Occupancy and to the following:

1. Rooms in excess of 500 square feet shall have at least one exterior door approved for fire department access.
2. Rooms shall be separated from other areas by an occupancy separation having a fire-resistive rating of not less than one hour for rooms up to 150 square feet in area and not less than two hours where the room is more than 150 square feet in area. Separations from other occupancies shall not be less than required by chapter 5, Table No. 5-B.
3. Shelving, racks and wainscoting in such areas shall be of noncombustible construction or wood of not less than 1-inch nominal thickness.

4. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

(e) Flammable or combustible liquid storage warehouses. Liquid storage warehouses in which Class I, Class II and Class III-A flammable or combustible liquids are stored in closed containers shall be constructed in accordance with the requirements for a Group H, Division 3 Occupancy and the following:

1. Liquid storage warehouses shall be separated from all other uses by a four-hour area separation wall.
2. Shelving, racks and wainscoting in such warehouses shall be of noncombustible construction or wood not less than 1-inch nominal thickness.
3. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

(f) Requirement for report. The building official may require a technical opinion and report to identify and develop methods of protection from the hazards presented by the hazardous material. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.

The opinion and report may include, but is not limited to, the preparation of a hazardous material management plan (HMMP); chemical analysis; recommendations for methods of isolation, separation, containment or protection of hazardous materials or processes, including appropriate engineering controls to be applied; the extent of changes in the hazardous behavior to be anticipated under conditions of exposure to fire or from hazard control procedures; and the limitations or conditions of use necessary to achieve and maintain control of the hazardous materials or operations. The report shall be entered into the files of the code enforcement agencies. Proprietary and trade secret information shall be protected under the laws of the state or jurisdiction having authority.

EXCEPTION: When an HMMP is required, the applicant may submit the report(s) used for compliance with requirements of 40 CFR "Hazardous Chemical Reporting and Community Right-to-Know Regulations" under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0901, filed 12/19/91, effective 7/1/92.]

WAC 51-20-0902 Construction, height and allowable area. Section 902.

(a) General. Buildings or parts of buildings classed in Group H because of the use or character of the occupancy shall be limited to the types of construction set forth in Tables Nos. 5-C and 5-D and shall not exceed, in area or height, the limits specified in sections 505, 506 and 507.

(b) Floors. Except for surfacing, floors in areas containing hazardous materials and in areas where motor vehicles, boats, helicopters or airplanes are stored, repaired or operated shall be of noncombustible, liquid-tight construction.

EXCEPTION: In Group H, Divisions 4 and 5 Occupancies, floors may be surfaced or waterproofed with asphaltic paving materials in that portion of the facility where no repair work is done.

(c) Spill control. When required by the Fire Code, floors shall be recessed a minimum of 4 inches or shall be provided with a liquid-tight raised sill with a minimum height of 4 inches so as to prevent the flow of liquids to adjoining areas. When liquid-tight sills are provided, they may be omitted at door openings by the installation of an open-grate trench which connects to the room drainage system.

(d) Drainage. When required by the Fire Code, the room, building or area shall be provided with a drainage system to direct the flow of liquids to an approved location or, the room, building or area shall be designed to provide secondary containment for the hazardous materials and fire-protection water.

Drains from the area shall be sized to carry the sprinkler system design flow rate over the sprinkler system design area. The slope of drains shall not be less than 1 percent.

Materials of construction for the drainage system shall be compatible with the stored materials.

Incompatible materials shall be separated from each other in the drain systems. They may be combined when they have been rendered acceptable for discharge by an approved means into the public sewer. Drainage of spillage and fire-protection water directed to a neutralizer or treatment system shall comply with the following:

1. The system shall be designed to handle the maximum worst-case spill from the single largest container plus the volume of fire-protection water from the system over the minimum design area for a period of 20 minutes.

2. Overflow from the neutralizer or treatment system shall be provided to direct liquid leakage and fire-protection water to a safe location away from the building, any material or fire-protection control valve, means of egress, adjoining property, or fire department access roadway.

(e) Containment. When required by the Fire Code, drains shall be directed to a containment system or other location designed as secondary containment for the hazardous material liquids and fire-protection water, or the building, room or area shall be designed to provide secondary containment of hazardous material liquids and fire-protection water through the use of recessed floors or liquid-tight raised sills.

Secondary containment shall be designed to retain the spill from the largest single container plus the design flow rate of the sprinkler system for the area of the room or area in which the storage is located or the sprinkler system design area, whichever is smaller. The containment capacity shall be capable of containing the flow for a period of 20 minutes.

Overflow from the secondary containment system shall be provided to direct liquid leakage and fire-protection water to a safe location away from the building, any material or fire-protection control valve, means of egress, fire access roadway, adjoining property or storm drains.

If the storage area is open to rainfall, the secondary containment shall be designed to accommodate the volume of a 24-hour rainfall as determined by a 25-year storm.

When secondary containment is required, a monitoring method capable of detecting hazardous material leakage from the primary containment into the secondary containment shall be provided. When visual inspection of the primary containment is not practical, other approved means of monitoring may be provided. When secondary containment may be subject to the intrusion of water, a monitoring method for such water shall be provided. Whenever monitoring devices are provided, they shall be connected to distinct visual or audible alarms.

(f) Smoke and heat vents. Smoke and heat venting shall be provided in areas containing hazardous materials as set forth in the Fire Code in addition to the provisions of this code.

(g) Standby power. A standby power system shall be provided for required mechanical exhaust ventilation, treatment, temperature control, liquid-level limit control, pressure control, alarm, and detection or other required electrically operated systems in Group H, Divisions 1, 2, and 3 Occupancies, and in Group H, Division 7 Occupancies in which there is use or storage of corrosives, highly toxic solids and liquids, irritants, sensitizers or other health hazard materials. For required systems, see the Fire Code. The

standby power system shall be designed and installed in accordance with the Electrical Code to automatically supply power to all electrical equipment required by the Fire Code when the normal electrical supply system is interrupted.

(h) Emergency power. An emergency power system shall be provided for required mechanical exhaust ventilation, treatment, temperature control, liquid-level limit control, pressure control, alarm and detection or other required electrically operated systems in Group H, Division 6 Occupancies, and in Group H, Division 7 Occupancies in which highly toxic or toxic gases are stored or used. For required systems, see the Fire Code. The emergency power system shall be designed and installed in accordance with the Electrical Code to automatically supply power to the exhaust ventilation system when the normal electrical supply system is interrupted.

(i) Special provisions for Group H, Division 1 Occupancies. Group H, Division 1 Occupancies shall be in buildings used for no other purpose, without basements, crawl spaces or other under-floor spaces. Roofs shall be of lightweight construction with suitable thermal insulation to prevent sensitive material from reaching its decomposition temperature.

Group H, Division 1 Occupancies containing materials which are in themselves both physical and health hazards in quantities exceeding the exempt amounts in Table No. 9-B shall comply with requirements for both Group H, Division 1 and Group H, Division 7 Occupancies.

(j) Special Provisions for Group H, Divisions 2 and 3 Occupancies. Group H, Divisions 2 and 3 Occupancies containing quantities of hazardous materials in excess of those set forth in Table No. 9-E shall be in buildings used for no other purpose, shall not exceed one story in height and shall be without basements, crawl spaces or other under-floor spaces.

Group H, Division 3 Occupancies containing water-reactive materials shall be resistant to water penetration. Piping for conveying liquids shall not be over or through areas containing water reactives, unless isolated by approved liquid-tight construction.

EXCEPTION: Fire-protection piping may be installed over reactives without isolation.

(k) Special provisions for Group H, Divisions 4 and 5 Occupancies. A Division 4 Occupancy having a floor area not exceeding 2,500 square feet may have exterior walls of not less than two-hour fire-resistive construction when less than 5 feet from a property line and of not less than one-hour fire-resistive construction when 5 feet or more but less than 20 feet from a property line.

(l) Special provisions for Group H, Division 6 Occupancies. See section 911.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-0902, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1000 Chapter 10. Requirements for Group I Occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1000, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1011 Suite concept. Section 1011. Rooms within hospitals and nursing homes may be considered as an adjoining or intervening room when the nature of the rooms is such that the entire configuration functions as a single unit. Any suite of rooms other than patient sleeping rooms, may be subdivided with noncombustible and nonfire-rated walls. Suites shall comply with all of the following:

1. Suites shall not exceed 10,000 square feet in area except patient sleeping room suites shall not exceed 5,000 square feet in area.

2. The maximum travel distance from any point in the suite to a corridor door is limited to 50 feet or there is unrestricted access from patient treatment areas to a corridor with a maximum of one intervening room.

3. Suites of more than 1,000 square feet shall have at least two separate exits.

4. The main building exiting system shall not pass through the suite.

5. Suites shall be separated from the rest of the occupancy by at least a one-hour fire-resistive occupancy separation.

6. The entire building shall be provided with an approved automatic sprinkler system and supervised automatic smoke-detection system.

7. Each patient sleeping room in the suite shall be located to permit visual supervision by the facility staff.

8. Patient corridors (rated and nonrated) within the suite shall be not less than 8 feet in width except in mental health occupancies corridors shall be not less than 6 feet in width.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1011, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1200 Chapter 12. Requirements for Group R Occupancies.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1200, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1201 Group R Occupancies defined. Section 1201. Group R Occupancies shall be:

Division 1. Hotels and apartment houses.

Congregate residences (each accommodating more than 10 persons).

Division 2. Not used.

Division 3. Dwellings, family child day care homes and lodging houses.

Congregate residences (each accommodating 10 persons or less).

For occupancy separations, see Table No. 5-B.

A complete code for construction of detached one- and two-family dwellings is in appendix chapter 12 of this code. When adopted, as set forth in section 103, it will take precedence over the requirements set forth in Parts I through X and chapter 60 of this code.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1201, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1210 Smoke detectors and sprinkler systems. Section 1210. (a) Smoke detectors.

1. General. Dwelling units, congregated residences and hotel or lodging house guest rooms that are used for sleeping purposes shall be provided with operable smoke detectors.

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Detectors shall be installed in accordance with the approved manufacturer's instructions.

2. Additions, alterations or repairs to Group R Occupancies. When the valuation of an addition, alteration or repair to a Group R Occupancy exceeds \$1000.00 and a permit is required, or when one or more sleeping rooms are added or created in existing Group R Occupancies, smoke detectors shall be installed in accordance with subsections 3, 4 and 5 of this section.

3. Power source. In new construction, required smoke detectors shall receive their primary power from the building wiring when such wiring is served from a commercial source and shall be equipped with a battery backup. The detector shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Smoke detectors may be solely battery operated when installed in existing buildings, or in buildings without commercial power; or in buildings which undergo alterations, repairs or additions regulated by subsection 2 of this section.

4. Location within dwelling units. In dwelling units, a detector shall be in each sleeping room and at a point centrally located in the corridor or area giving access to each separate sleeping area. When the dwelling unit has more than one story and in dwellings with basements, a detector shall be installed on each story and in the basement. In dwelling units where a story or basement is split into two or more levels, the smoke detector shall be installed on the upper level, except that when the lower level contains a sleeping area, a detector shall be installed on each level. When sleeping rooms are on an upper level, the detector shall be placed at the ceiling of the upper level in close proximity to the stairway. In dwelling units where the ceiling height of a room open to the hallway serving the bedrooms exceeds that of the hallway by 24 inches or more, smoke detectors shall be installed in the hallway and in the adjacent room. Detectors shall sound an alarm audible in all sleeping areas of the dwelling unit in which they are located.

5. Location in efficiency dwelling units, congregated residences and hotels. In efficiency dwelling units, hotel suites and in hotel and congregated residence sleeping rooms, detectors shall be located on the ceiling or wall of the mainroom or each sleeping room. When sleeping rooms within an efficiency dwelling unit or hotel suite are on an upper level, the detector shall be placed at the ceiling of the upper level in close proximity to the stairway. When actuated, the detector shall sound an alarm audible within the sleeping area of the dwelling unit, hotel suite or sleeping room in which it is located.

6. Location within family child day care homes. In family child day care homes operable detectors shall be located in all sleeping and napping areas. When the family child day care home has more than one story, and in family child day care homes with basements, an operable detector shall be installed on each story and in the basement. In family child day care homes where a story or basement is split into two or more levels, the smoke detector shall be installed in the upper level, except that when the lower level contains a sleeping or napping area, an operable detector shall be located on each level. When sleeping rooms are on an upper level, the detector shall be placed at the ceiling of the upper level in close proximity to the stairway. In family

child day care homes where the ceiling height of a room open to the hallway serving the bedrooms exceeds that of the hallway by 24 inches or more, smoke detectors shall be installed in the hallway and the adjacent room. Detectors shall sound an alarm audible in all areas of the building.

(b) Sprinkler and standpipe systems. When required by other provisions of this code, automatic sprinkler systems and standpipes shall be installed as specified in chapter 38.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1210, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1215 Family child day care homes.

Section 1215. For family child day care homes with more than six children, each floor level used for family child day care purposes shall be served by two remote exits. Outside exit doors shall be operable from the inside without the use of keys or any special knowledge or effort.

Basements located more than four feet below grade level shall not be used for family child day care homes unless one of the following conditions exist:

(a) Exit stairways from the basement open directly to the exterior of the building without entering the first floor; or

(b) One of the two required exits discharges directly to the exterior from the basement level, and a self-closing door is installed at the top or bottom of the interior stair leading to the floor above; or

(c) One of the two required exits is an operable window or door, approved for emergency escape or rescue, that opens directly to a public street, public alley, yard or exit court is provided; or

(d) A residential sprinkler system is provided throughout the entire building in accordance with National Fire Protection Association Standard 13d.

Floors located more than four feet above grade level shall not be occupied by children in family child day care homes.

EXCEPTIONS: 1. Use of toilet facilities while under supervision of an adult staff person.

2. Family child day care homes may be allowed on the second story if one of the following conditions exist:

(a) Exit stairways from the second story open directly to the exterior of the building without entering the first floor; or

(b) One of the two required exits discharges directly to the exterior from the second story level, and a self-closing door is installed at the top or bottom of the interior stair leading to the floor below; or

(c) A residential sprinkler system is provided throughout the entire building in accordance with National Fire Protection Association Standard 13d.

Every sleeping or napping room in a family child day care home shall have at least one operable window for emergency rescue.

EXCEPTION: Sleeping or napping rooms having doors leading to two separate exits ways, or a door leading directly to the exterior of the building.

Rooms or spaces containing a commercial-type cooking kitchen, boiler, maintenance shop, janitor closet, laundry, woodworking shop, flammable or combustible storage, or painting operation shall be separated from the family child day care area by at least one-hour fire-resistive construction.

EXCEPTION: A fire-resistive separation shall not be required where the food preparation kitchen contains only a domestic cooking range, and the preparation of food does not result in the production of smoke or grease laden vapors.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1215, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1223 Division II. Requirements for Group R, Division 4 and Division 5 Occupancies. General. Section 1223.

(a) Purpose. The purpose of this division is to provide minimum standards of safety for group care facilities.

(b) Scope.

1. General. The provisions of this division shall apply to buildings or portions thereof that are to be used for Group R, Division 4 and Division 5 Occupancies.

2. Applicability of other provisions. Except as specifically required by this division, Group R, Division 4 and Division 5 Occupancies shall meet all applicable provisions of this code. Group R, Division 4 and Division 5 Occupancies need not be accessible to people with disabilities.

(c) Definitions. For the purpose of this division, certain terms are defined as follows:

Group R, Division 4 Occupancies shall be residential group care facilities for ambulatory, nonrestrained persons who may have a mental or physical impairment (each accommodating more than five and not more than 16 clients or residents, excluding staff).

Group R, Division 5 Occupancies shall be residential group care facilities for semi-ambulatory and nonambulatory, nonrestrained persons who have a mental or physical impairment (each accommodating more than five and not more than 16 clients or residents, excluding staff).

Ambulatory persons means persons physically and mentally capable of walking or traversing a normal path to safety, including the ascent and descent of stairs, and capable of self-preservation, without the physical assistance of another person.

Nonambulatory persons means persons physically or mentally unable to walk or traverse a normal path to safety without the physical assistance of another person.

Semi-ambulatory persons means persons physically and mentally capable of traversing a normal path to safety with the use of mobility aids, but unable to ascend or descend stairs without the physical assistance of another person.

Separate exit system is a path of exit travel separated in such a manner from other required exits as to provide an atmospheric separation which precludes contamination by both paths by the same fire.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1223, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1224 Construction, height and allowable area. Section 1224.

(a) General. Buildings or portions of buildings classified as Group R, Division 4 or Division 5 shall meet the same construction, height and allowable area requirements as required for a Group R, Division 1 Occupancy.

(b) Special provisions.

(1) Residential or quick response standard sprinkler heads shall be used in all sprinkler systems installed in Group R, Division 4 and Division 5 Occupancies.

(2) Group R, Division 4 Occupancies shall have installed an approved fully automatic fire-extinguishing system conforming to U.B.C. Standard No. 38-3.

EXCEPTION: In areas where adequate water supply is not available, on the approval of the building official a fully automatic fire-extinguishing system conforming to N.F.P.A. Standard 13-d may be used.

(3) All buildings classed as Group R, Division 5 shall:

(A) Have installed an approved fully automatic fire-extinguishing system conforming to UBC Standard No. 38-1; and,

(B) In buildings with individual floor areas over 6,000 square feet, have an approved smoke barrier dividing the floor into at least two compartments, provided that each compartment shall provide no less than 30 square feet per occupant; and,

(C) Be a minimum Type V, One-hour construction.

EXCEPTION: Buildings classed as Group R, Division 5 may be of Type V-N construction provided:

(i) The entire building has an interior wall and ceiling covering consisting of 1/2 inch gypsum wall board or an approved equal installed in accordance with section 4711; and,

(ii) An approved smoke-detection system, supervised by an approved central, proprietary or remote station service, is installed throughout the entire structure and interconnected to the sprinkler system.

(D) Be equipped with an approved smoke detector and automatic shutoff in each single system providing heating and cooling air. Automatic shutoffs shall shut down the air-moving equipment when smoke is detected in a circulating airstream or as an alternate, when smoke is detected in rooms served by the system.

Where required, smoke detectors shall be installed in the main circulating-air duct ahead of any fresh air inlet, or installed in each room or space served by the return-air duct. Activation of any detector shall cause the air-moving equipment to automatically shut down.

(c) Mixed occupancies. Group R, Division 4 and Division 5 Occupancies shall be separated from Group H Occupancies by a four-hour fire-resistive occupancy separation and shall be separated from all other occupancies by a one-hour fire-resistive occupancy separation.

EXCEPTIONS: 1. An occupancy separation need not be provided between a Group R, Division 4 or Division 5 Occupancy and a carport having no enclosed uses above, provided the carport is entirely open on two or more sides.

2. In the one-hour occupancy separation between a Group R, Division 4 or Division 5 Occupancy and a Group M, Division 1 Occupancy, the separation may be limited to the installation of materials approved for one-hour fire-resistive construction on the garage side and a self-closing, tight-fitting solid-wood door 1 3/8 inch in thickness, or a self-closing tight-fitting door having a fire-protection rating of not less than 20 minutes when tested in accordance with Part II UBC Standard No. 43-2, which is part of this code, is permitted in lieu of a one-hour fire assembly. Fire dampers need not be installed in air ducts passing through the wall, floor or ceiling separating a Group R, Division 4 or Division 5 Occupancy from a Group M, Division 1 Occupancy, provided such ducts within the Group M Occupancy are constructed of steel having a thickness not less than 0.019 inch (No. 26

galvanized sheet gauge) and have no openings into the Group M Occupancy.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1224, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1225 Location on property. Section 1225. Exterior walls located less than 3 feet from property lines shall be of one-hour fire-resistive construction. Openings shall not be permitted in exterior walls located less than 3 feet from property lines. For other requirements, see section 504 and Part IV.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1225, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1226 Exits and emergency escapes. Section 1226.

(a) General.

1. Group R, Division 4 and Division 5 Occupancies shall be provided with exits as required by this section and chapter 33 of this code.

2. All Group R, Division 5 Occupancies located above the first floor shall have at least two exits directly to the exterior of the building, or into separate exit systems in accordance with section 3309(a) and this chapter.

(b) Exits required.

1. Number of exits. Every story, basement or portion thereof housing a Group R, Division 4 or Division 5 Occupancy shall have not less than two exits.

EXCEPTIONS: 1. Basements used exclusively for the service of the building may have one exit. For the purpose of this exception, storage rooms, laundry rooms, maintenance offices and similar uses shall not be considered as providing service to the building.

2. Storage rooms, laundry rooms and maintenance offices not exceeding 300 square feet in floor area may be provided with only one exit.

2. Distance to exits. The maximum travel distance specified in chapter 33 shall be reduced by 50 percent.

(c) Corridor width. Corridors shall be not less than 36 inches in width.

(d) Stairways. Stairways shall be constructed as required by section 3306 of this code.

EXCEPTION: In buildings that are converted to a Group R, Division 4 or Division 5 Occupancy, existing stairways may have an 8-inch maximum rise and 9-inch minimum run. Existing stairways may be 30 inches in width in Group R, Division 4 Occupancies, and 36 inches in width in Group R, Division 5 Occupancies.

(e) Emergency exit illumination. In the event of power failure, exit illumination shall be automatically provided from an emergency system. Emergency systems shall be supplied from storage batteries or an on-site generator set and the system shall be installed in accordance with the requirements of the Electrical Code.

(f) Emergency escape. Every sleeping room shall be provided with emergency escape or rescue facilities as required by section 1204 of this code.

(g) Exit doors shall be openable from the inside with one motion and without the use of a key or any special knowledge or effort.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1226, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1227 Light, ventilation and sanitation. Section 1227. Light, ventilation and sanitation shall be as specified in section 1205.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1227, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1228 Yards and courts. Section 1228. Yards and courts shall be as specified in section 1206.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1228, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1229 Room dimensions. Section 1229. Room dimensions shall be as specified in section 1207.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1229, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1230 Section 1230. No requirements.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1230, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1231 Shaft enclosures. Section 1231. Exits shall be enclosed as specified in chapter 33.

Elevator shafts, vent shafts, dumbwaiter shafts, clothes chutes and other vertical openings shall be enclosed and the enclosure shall be as specified in section 1706.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1231, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1232 Fire alarm systems. Section 1232. An approved automatic and manual fire alarm system, supervised by an approved central, proprietary or remote station service, shall be provided in Group R, Division 4 and Division 5 Occupancies in accordance with article 14 of the Fire Code.

EXCEPTION: Heat detectors need not be provided where an approved automatic sprinkler system that is interconnected to the fire alarm system is provided throughout the building.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1232, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1233 Heating. Section 1233. All habitable rooms shall be provided with heating facilities capable of maintaining a room temperature of 70° F. at a point 3 feet above the floor.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1233, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1234 Special hazards. Section 1234.

(a) Heating equipment. All heating equipment shall be permanently installed. Chimneys and heating apparatus shall conform to the requirements of chapter 37 of this code and the Mechanical Code.

(b) Flammable liquids. The storage and handling of gasoline, fuel oil or other flammable liquids shall be in accordance with the Fire Code.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1234, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1800 Chapter 18. Type I Fire-resistive buildings.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1800, filed 12/19/91, effective 7/1/92.]

WAC 51-20-1807 Special provisions for Group B, Division 2 office buildings and Group R, Division 1 Occupancies. Section 1807.

(a) Scope. This section applies to all Group B, Division 2 office and Group R, Division 1 Occupancies, each having floors used for human occupancy located more than 75 feet above the lowest level of fire department access. Such buildings shall be provided with an approved automatic sprinkler system in accordance with section 1807(c).

(b) Certificate of occupancy. All mechanical and electrical equipment and other required life safety systems shall be approved and installed in accordance with approved plans and specifications pursuant to this section and shall be tested and proved to be in proper working condition to the satisfaction of the building official before issuance of the certificate of occupancy. Such system shall be maintained in accordance with the Fire Code.

(c) Automatic sprinkler system.

1. System design. The automatic sprinkler system shall be provided throughout the building. The sprinkler system shall be designed using the parameters set forth in U.B.C. Standard No. 38-1 and the following:

A. Shutoff valves and a water-flow device shall be provided for each floor. The sprinkler riser may be combined with the standpipe riser.

B. In Seismic Zones Nos. 2, 3 and 4, in addition to the main water supply, a secondary on-site supply of water equal to the hydraulically calculated sprinkler design demand plus 100 gallons per minute additional for the total standpipe system shall be provided. This supply shall be automatically available if the principal supply fails and shall have a duration of 30 minutes.

2. Modifications. The following modifications of code requirements are permitted:

A. The fire-resistive time periods set forth in Table No. 17-A may be reduced by one hour for interior bearing walls, exterior bearing and nonbearing walls, roofs and the beams supporting roofs, provided they do not frame into columns. Vertical shafts other than stairway enclosures and elevator shafts may be reduced to one hour when sprinklers are installed within the shafts at alternate floors. The fire-resistive time period reduction as specified herein shall not apply to exterior bearing and nonbearing walls whose fire-resistive rating has already been reduced under the exceptions contained within section 1803(a) or 1903(a).

B. Except for corridors in Group B, Division 2 and Group R, Division 1 Occupancies and partitions separating dwelling units or guest rooms, all interior nonbearing partitions required to be one-hour fire-resistive construction by Table No. 17-A may be of noncombustible construction without a fire-resistive time period.

C. Travel distance from the most remote point in the floor area to a horizontal exit or to an enclosed stairway may be 300 feet.

D. Fire dampers, other than those needed to protect floor-ceiling assemblies to maintain the fire resistance of the assembly, are not required.

E. Emergency windows required by section 1204 are not required.

(d) Smoke-detection systems. At least one approved smoke detector suitable for the intended use shall be installed:

1. In every mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar room.

2. In the main return- and exhaust-air plenum of each air-conditioning system and located in a serviceable area downstream of the last duct inlet.

3. At each connection to a vertical duct or riser serving two or more stories from a return-air duct or plenum of an air-conditioning system. In Group R, Division 1 Occupancies, an approved smoke detector may be used in each return-air riser carrying not more than 5,000 cfm and serving not more than 10 air inlet openings.

The actuation of any detector required by this section shall operate the voice alarm system and shall place into operation all equipment necessary to prevent the recirculation of smoke.

(e) Alarm and communication systems. The alarm and communication systems shall be designed and installed so that damage to any terminal unit or speaker will not render more than one zone of the system inoperative.

The voice alarm and public address system may be a combined system. When approved by the fire department, a communications system may be combined with the voice alarm system and the public address system.

Three communication systems which may be combined as set forth above shall be provided as follows:

1. Voice alarm system. The operation of any smoke detector, sprinkler, waterflow device or manual fire alarm station shall automatically sound an alert signal to the desired areas followed by voice instructions giving appropriate information and direction to the occupants.

The central control station shall contain controls for the voice alarm system so that a selective or general voice alarm may be manually initiated.

The system shall be supervised to cause the activation of an audible trouble signal in the central control station upon interruption or failure of the audiopath including amplifiers, speaker wiring, switches and electrical contacts and shall detect opens, shorts and grounds which might impair the function of the system.

The alarm shall be designed to be heard clearly by all occupants within the building or designated portions thereof as is required for the public address system.

2. Public address system. A public address communication system designed to be clearly heard by all occupants of the building shall operate from the central control station. It shall be established on a selective or general basis to the following terminal areas:

- A. Elevators.
- B. Elevator lobbies.
- C. Corridors.
- D. Exit stairways.
- E. Rooms and tenant spaces exceeding 1,000 square feet in area.

F. Dwelling units in apartment houses.

G. Hotel guest rooms or suites.

3. Fire department communication system. A two-way fire department communication system shall be provided for fire department use. It shall operate between the central control station and elevators, elevator lobbies, emergency and standby power rooms and at entries into enclosed stairways.

(f) Central control station. A central control station for fire department operations shall be provided. The location, size and arrangement of the central control station room shall be approved by the authority having jurisdiction. It shall contain the following as a minimum:

- 1. The voice alarm and public address system panels.
- 2. The fire department communications panel.
- 3. Fire-detection and alarm system annunciator panels.
- 4. Annunciator visually indicating the location of the elevators and whether they are operational.
- 5. Status indicators and controls for air-handling systems.
- 6. Controls for unlocking all stairway doors simultaneously.
- 7. Sprinkler valve and water-flow detector display panels.
- 8. Emergency and standby power controls and status indicators.
- 9. A telephone for fire department use with controlled access to the public telephone system.
- 10. Fire pump status indicators.
- 11. Schematic building plans indicating the typical floor plan and detailing the building core, exit facilities, fire-protection systems, fire-fighting equipment and fire department access.
- 12. Work table.

All control panels in the central control station shall be permanently identified as to function.

Alarm, supervisory and trouble signals as required by Items 3 and 7 above shall be annunciated in compliance with the Fire Code in the central control station by means of an audible and visual indicator. For purposes of annunciation, zoning shall be in accordance with the following:

- 1. When the system serves more than one building, each building shall be considered separately.
- 2. Each floor shall be considered a separate zone. When one or more sprinkler risers serve the same floor, each riser shall be considered a separate zone.

EXCEPTION: When more than one riser serves the same system on the floor.

(g) Smoke control. Natural or mechanical ventilation for the removal of products of combustion shall be provided in every story and shall consist of one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of the building at not more than 50-foot intervals. The area of operable windows or panels shall not be less than 20 square feet per 50 linear feet of perimeter.

- EXCEPTIONS:
- 1. In Group R, Division 1 hotel occupancies, each guest room or suite having an exterior wall may be provided with 2 square feet of venting area in lieu of the area specified above.
 - 2. Windows may be of fixed tempered glass provided that no coating or film is applied which will modify the natural breaking characteristics of the glass.

2. When a complete and approved automatic sprinkler system is installed, the mechanical air-handling equipment may be designed to accomplish smoke removal. Under fire conditions, the return and exhaust air shall be moved directly to the outside without recirculation to other sections of the building. The air-handling system shall provide a minimum of one exhaust air change each 10 minutes for the area involved.

3. Any other approved design which will produce equivalent results.

(h) Elevators. Elevators and elevator lobbies shall comply with the provisions of chapter 51 and the following:

NOTE: A bank of elevators is a group of elevators or a single elevator controlled by a common operating system; that is, all those elevators which respond to a single call button constitute a bank of elevators. There is no limit on the number of cars which may be in a bank or group but there may not be more than four cars within a common hoistway.

1. Elevators on all floors shall open into elevator lobbies which are separated from the remainder of the building, including corridors and other exits, by walls extending from the floor to the underside of the fire-resistive floor or roof above. Such walls shall not be of less than one-hour fire-resistive construction. Openings through such walls shall conform to section 3305(h).

EXCEPTIONS:

1. The main entrance level elevator lobby in office buildings.
2. Elevator lobbies located within an atrium complying with the provisions of section 1715.
3. In fully sprinklered office buildings, corridors may lead through enclosed elevator lobbies if all areas of the building have access to at least one required exit without passing through the elevator lobby.

2. Each elevator lobby shall be provided with an approved listed smoke detector located on the lobby ceiling. When the detector is activated, elevator doors shall not open and all cars serving that lobby are to return to the main floor and be under manual control only. If the main floor detector or a transfer floor detector is activated, all cars serving the main floor or transfer floor shall return to a location approved by the fire department and building official and be under manual control only. The detector may serve to close the lobby doors and additional doors at the hoistway opening allowed in section 5106.

3. Elevator hoistways shall not be vented through an elevator machine room. Cable slots entering the machine room shall be sleeved beneath the machine room floor and extend to not less than 12 inches below the shaft vent to inhibit the passage of smoke into the machine room.

(i) Standby power, light and emergency systems.

1. Standby power. Standby power-generating system conforming to U.B.C. Standard No. 18-1, which is a part of this code (see chapter 60, Part II), shall be provided. The system shall be equipped with suitable means for automatically starting the generator set upon failure of the normal electrical supply systems and for automatic transfer of all functions required by this section at full power within 60 seconds of such normal service failure. System supervision with manual start and transfer override features shall be provided at the central control station.

An on-premises fuel supply sufficient for not less than two hours' full-demand operation of the system shall be provided.

The standby system shall have a capacity and rating that would supply all equipment required to be operational at the same time. The generating capacity need not be sized to operate all the connected electrical equipment simultaneously.

All power, lighting, signal and communication facilities specified in subsections (d), (e), (f), (g), (h), (i) and (j) of this section, as applicable; fire pumps required to maintain pressure, standby lighting and normal circuits supplying exit signs and exit illumination shall be transferable to the standby source.

2. Standby lighting. Standby lighting shall be provided as follows:

A. Separate lighting circuits and fixtures sufficient to provide light with an intensity of not less than one footcandle measured at floor level in all exit corridors, stairways, smokeproof enclosures, elevator cars and lobbies and other areas which are clearly a part of the escape route.

B. All circuits supply lighting for the central control station and mechanical equipment room.

3. Emergency systems. The following are classified as emergency systems and shall operate within 10 seconds of failure of the normal power supply:

A. Exit sign and exit illumination as required by sections 3313 and 3314.

B. Elevator car lighting.

(j) Exits. Exits shall comply with other requirements of this code and the following:

1. All stairway doors which are locked from the stairway side shall have the capability of being unlocked simultaneously without unlatching upon a signal from the central control station.

2. A telephone or other two-way communications system connected to an approved emergency service which operates continuously shall be provided at not less than every fifth floor in each required stairway where other provisions of this code permit the doors to be locked.

(k) Seismic considerations. In Seismic Zones Nos. 2, 3 and 4, the anchorage of mechanical and electrical equipment required for life-safety systems, including fire pumps and elevator drive and suspension systems, shall be designed in accordance with the requirements of section 2330.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-1807, filed 12/19/91, effective 7/1/92.]

WAC 51-20-2300 General design requirements.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2300, filed 12/19/91, effective 7/1/92.]

WAC 51-20-2312 Definitions for wind design. Section 2312. The following definitions apply only to this part:

Basic wind speed is the fastest-mile wind speed associated with an annual probability of 0.02 measured at a point 33 feet above the ground for an area having exposure Category C.

Exposure b has terrain with buildings, forest or surface irregularities 20 feet or more in height covering at least 20 percent of the area extending one mile or more from the site.

Exposure c has terrain which is flat and generally open, extending one-half mile or more from the site in any full quadrant.

Exposure d represents the most severe exposure in areas with basic wind speeds greater than 80 miles per hour (mph) and has terrain which is flat and unobstructed facing large bodies of water over one mile or more in width relative to any quadrant of the building site. Exposure D extends inland from the shoreline 1/4 mile or 10 times the building height, whichever is greater.

Fastest-mile wind speed is the wind speed obtained from wind velocity maps prepared by the National Oceanographic and Atmospheric Administration and is the highest sustained average wind speed based on the time required for a mile-long sample of air to pass a fixed point.

Open structure or story is a partially enclosed structure that has a greater area of exterior wall openings on any one wall than the sum of the areas of the openings on all the other walls and has more than 15 percent of the wall area open. All windows and doors or other openings in exterior walls shall be considered as openings unless such openings and their frames are specifically detailed and designed to resist the loads on elements and components in accordance with the provisions of this section.

Special wind region is an area where local records and terrain features indicate 50-year fastest-mile basic wind speed is higher than shown in Figure No. 23-1.

Unenclosed structure or story is a structure which has openings on two or more sides but the sum of the areas of openings in each side is within 15 percent or less of each other.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2312, filed 12/19/91, effective 7/1/92.]

WAC 51-20-2700 Chapter 27. Steel.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2700, filed 12/19/91, effective 7/1/92.]

WAC 51-20-2710 Steel structures resisting forces induced by earthquake motions in Seismic Zones Nos. 3 and 4. Section 2710.

Sec. 2710. (a) General. Design and construction of steel framing in lateral-force-resisting systems in Seismic Zones Nos. 3 and 4 shall conform to the requirements of the code and to the requirements of this section.

(b) Definitions.

ALLOWABLE STRESSES are prescribed in U.B.C. Standard No. 27-15.

CHEVRON BRACING is that form of bracing where a pair of braces located either above or below a beam terminates at a single point within the clear beam span.

CONNECTION is the group of elements that connect the member to the joint.

DIAGONAL BRACING is that form of bracing that diagonally connects joints at different levels.

ECCENTRICALLY BRACED FRAME (EBF) is that form of braced frame where at least one end of each brace intersects a beam at a point away from the column girder joint.

GIRDER is the horizontal member in a seismic frame. The words beam and girder may be used interchangeably.

JOINT is the entire assemblage at the intersections of the members.

K BRACING is that form of bracing where a pair of braces located on one side of a column terminates at a single point within the clear column height.

LINK BEAM is that part of a beam in an eccentrically braced frame which is designed to yield in shear and/or bending so that buckling of the bracing members is prevented.

STRENGTH is the strength as prescribed in Section 2710 (d) 2.

V BRACING is that form of chevron bracing that intersects a beam from above and inverted V bracing is that form of chevron bracing that intersects a beam from below.

X BRACING is that form of bracing where a pair of diagonal braces cross near midlength of the bracing members.

(c) **Symbols and Notations.** The symbols and notations unique to this section are as follows:

- M_p = plastic moment.
- P_{DL} = axial dead load.
- P_E = axial load on member due to earthquake.
- P_{LL} = axial live load.
- P_{sc} = compressive axial strength of member.
- P_{st} = tensile axial strength of member.
- V_s = shear strength of member.
- Z = plastic section modulus.

(d) **Materials.** 1. Structural steel used in lateral-force-resisting systems shall conform to A 36, A 441, A 500, A 501, A 572 (Grades 42 and 50) and A 588. Structural steel conforming to A 283 (Grade D) may be used for base plates and anchor bolts.

- EXCEPTION:** Other steels permitted in this code may be used for the following:
- A. One-story buildings.
 - B. Light-framed wall systems in accordance with Section 2710 (j).

2. **Member strength.** Where this section requires that the strength of the member be developed, the following shall be used:

	STRENGTH
Flexure	$M_c = ZF_y$
Shear	$V_c = 0.55 F_y A_t$
Axial compression	$P_{nc} = 1.7 F_y A$
Axial tension	$P_{nt} = F_y A$
Connectors	
Full-penetration welds	$F_y A$
Partial penetration welds	1.7 Allowable
Bolts and fillet welds	1.7 Allowable

Members need not be compact unless otherwise required by this section.

(c) **Column Requirements.** 1. **Column strength.** Columns shall satisfy the load combinations required by Section 2303 (f) at allowable stress limits, with stress increases allowed by Section 2303 (d). In addition, in Seismic Zones Nos. 3 and 4, columns in frames shall have the strength to resist the axial loads resulting from the load combinations in Items A and B following.

A. Axial Compression

$$1.0 P_{DL} + 0.7 P_{LL} + 3(R_w/8)P_E$$

B. Axial Tension

$$0.85 P_{DL} + 3(R_w/8)P_E$$

EXCEPTION: The axial load combination as outlined in Items A and B above:

A. Need not exceed either the maximum force that can be transferred to the column, by elements of the structure, or the limit as determined by the overturning uplift which the foundation is capable of resisting.

B. Need not apply to columns in moment-resisting frames complying with Formulas (10-3a) or (10-3b) where f_c is equal to or less than $0.3 F_y$ for all load combinations.

The load combinations from Items A and B need be used only when specifically referred to.

2. **Column splices.** Column splices shall have sufficient strength to develop the column forces determined from Section 2710 (e) 1. Welded column splices subject to net tensile forces shall comply with the more critical of the following:

A. Partial penetration welds shall be designed to resist 150 percent of the force determined from Section 2710 (c) 1 B.

B. Welding shall develop not less than 50 percent of the flange area strength of the smaller column.

Splices employing partial penetration welds shall be located at least three feet from girder flanges.

3. **Slenderness evaluation.** This paragraph is applicable when the provisions are applied to the effective length determination of columns of moment frames resisting earthquake forces. In the plane of the earthquake forces the factor K may be taken as unity when all of the following conditions are met:

A. The column is either continuous or is fixed at each joint.

B. The maximum axial compressive stress, f_c , does not exceed $0.4 F_y$ under design loads.

C. The calculated story drift ratios are less than the values given in Section 2334 (h).

(f) **Ordinary Moment Frame Requirements.** Girder-to-column connections of ordinary moment frames shall meet the requirements of Section 2710 (g) 1 unless it can be shown that they are capable of resisting the combination of gravity loads and $3(R_w/8)$ times the design seismic forces.

(g) **Special Moment-resisting Frame (SMRF) Requirements.** 1. **Girder-to-column connection.** A. **Required strength.** The girder-to-column connection shall be adequate to develop the lesser of the following:

(i) The strength of the girder in flexure.

(ii) The moment corresponding to development of the panel zone shear strength as determined from Formula (10-1).

EXCEPTION: Where a connection is not designed to contribute flexural resistance at the joint, it need not develop the required strength if it can be shown to meet the deformation compatibility requirements of Section 2337 (4) 4.

B. **Connection strength.** The girder-to-column connection may be considered to be adequate to develop the flexural strength of the girder if it conforms to the following:

(i) The flanges have full-penetration butt welds to the columns.

(ii) The girder web-to-column connection shall be capable of resisting the girder shear determined for the combination of gravity loads and the seismic shear forces which result from compliance with Section 2710 (g) 2 A. This connection strength need not exceed that required to develop gravity loads plus $3(R_w/8)$ times the girder shear resulting from the prescribed seismic forces.

Where the flexural strength of the girder flanges is greater than 70 percent of the flexural strength of the entire section (i.e., $b_f(d-f)F_y > 0.7Z_cF_y$) the web connection may be made by means of welding or high-strength bolting.

For girders not meeting the criteria in the paragraph above, the girder web-to-column connection shall be made by means of welding the web directly or through shear tabs to the column. That welding shall have a strength capable of developing at least 20 percent of the flexural strength of the girder web. The girder shear shall be resisted by means of additional welds or friction-type slip-critical high-strength bolts or both.

C. **Alternate connection.** Connection configurations utilizing welds or high-strength bolts not conforming with paragraph B above may be used if they are shown by test or calculation to meet the criteria in paragraph A above. Where conformance is shown by calculation, 125 percent of the strengths of the connecting elements may be used.

D. **Flange detail limitations.** For steel whose specified ultimate strength is less than 1.5 times the specified yield strength, plastic hinges shall not form at locations in which the beam flange area has been reduced, such as for bolt holes. Bolted connections of flange plates of beam-column joints shall have the net-to-gross area ratio A_n/A_g equal to or greater than $1.2 F_y/F_u$.

2. **Panel zone.** A. **Strength.** The panel zone of the joint shall be capable of resisting the shear induced by beam bending moments due to gravity loads plus 1.85 times the prescribed seismic forces, but the shear strength need not exceed that required to develop $0.8\Sigma M_r$ of the girders framing into the column flanges at the joint. The joint panel zone shear strength may be obtained from the following formula:

$$V = 0.55 F_y d_t \left[1 + \frac{3b_d c_f^2}{d_b d_c t} \right] \quad (10-1)$$

WHERE:

t = the total thickness of the joint panel zone including doubler plates.

d_b = the depth of the beam.

d_c = the column depth.

c_f = is the thickness of the column flange.

B. **Thickness.** The panel zone thickness, t , shall conform to the following formula:

$$t \geq (d_t + w_2)/90 \quad (10-2)$$

WHERE:

d_t = the panel zone depth between continuity plates.

w_2 = the panel zone width between column flanges.

For this purpose, t , shall not include any double plate thickness unless the doubler plate is connected to the column web with plug welds adequate to prevent local buckling of the plate.

C. **Doubler plates.** Doubler plates provided to reduce panel zone shear stress or to reduce the web depth thickness ratio shall be placed not more than $1/16$ inch from the column web and shall be welded across the plate width top and bottom with at least a $3/16$ -inch fillet weld. They shall be either butt or fillet welded to the column flanges to develop the shear strength of the doubler plate. Weld strength shall be as given in Section 2710 (d) 2.

3. **Flange width-thickness ratio.** Girders shall comply with U.B.C. Standard No. 27-15, except that the flange width-thickness ratio, $b_f/2t_f$, shall not exceed $52/\sqrt{F_y}$.

4. **Continuity plates.** When determining the need for girder tension flange continuity plates, the value of P_{bf} in U.B.C. Standard No. 27-15 shall be taken as $1.8 (b_f)F_{yb}$.

5. **Strength ratio.** At any moment frame joint, the following relationships shall be satisfied:

$$\Sigma Z_c (F_{yc} - f_c) / \Sigma Z_b F_{yb} > 1.0 \quad (10-3a)$$

or

$$\Sigma Z_c (F_{yc} - f_c) / 1.25 \Sigma M_{pr} > 1.0 \quad (10-3b)$$

WHERE:

$f_c > 0$

M_{pr} = the sum of beam moments when panel zone shear strength reaches the value specified in Formula (10-1).

EXCEPTION: Columns meeting the compactness limitations for beams given in Section 2710 (g) 3 need not comply with this requirement provided they conform to one of the following conditions:

A. Columns with f_c less than $0.4 F_y$ for all load combinations other than loads specified in Section 2710 (e) 1, and

(i) Which are used in the top story of a multistory building with building period greater than 0.7 second; or

(ii) Where the sum of their resistance is less than 20 percent of the shear in a story, and is less than 33 percent of the shear on each of the column lines within that story. A column line is defined for the purpose of this exception as a single line of columns,

or parallel lines of columns located within 10 percent of the plan dimension perpendicular to the line of columns; or

(iii) When the design for combined axial compression and bending is proportioned to satisfy U.B.C. Standard No. 27-15 without the one-third permissible stress increase.

B. Columns in any story which have lateral shear strength 50 percent greater than that of the story above.

C. Columns which lateral shear strengths are not included in the design to resist code-required shears.

6. **Trusses in SMRF.** Trusses may be used as horizontal members in SMRF if the sum of the truss seismic force flexural strength exceeds the sum of the column seismic force flexural strength immediately above and below the truss by a factor of at least 1.25. For this determination the strengths of the members shall be reduced by the gravity load effects. In buildings of more than one story, the column axial stress shall not exceed $0.4F_y$ and the ratio of the unbraced column height to the least radius of gyration shall not exceed 60. Columns shall have allowable stresses reduced 25 percent when one end frames into a truss, and 50 percent when both ends frame into trusses. The connection of the truss chords to the column shall develop the lesser of the following:

A. The strength of the truss chord.

B. The chord force necessary to develop 125 percent of the flexural strength of the column.

7. **Girder-column joint restraint. A. Restrained joint.** Where it can be shown that the columns of SMRF remain elastic, the flanges of the columns need be laterally supported only at the level of the girder top flange.

Columns may be assumed to remain elastic if one of the following conditions is satisfied:

- (i) The ratio in Formula (10-3a) or (10-3b) is greater than 1.25.
- (ii) The flexural strength of the column is at least 1.25 times the moment that corresponds to the panel zone shear strength.
- (iii) Girder flexural strength or panel zone strength will limit column stress ($f_u + f_{bx} + f_{by}$) to F_y of the column.
- (iv) The column will remain elastic under gravity loads plus $3(R_w/8)$ times the prescribed seismic forces.

Where the column cannot be shown to remain elastic, the column flanges shall be laterally supported at the levels of the girder top and bottom flanges. The column flange lateral support shall be capable of resisting a force equal to one percent of the girder flange capacity at allowable stresses and at a limiting displacement perpendicular to the frame of 0.2 inch. Required bracing members may brace the column flanges directly or indirectly through the column web or the girder flanges.

B. Unrestrained joint. Columns without lateral support transverse to a joint shall conform to the requirements of U.B.C. Standard No. 27-15, with the column considered as pin ended and the length taken as the distance between lateral supports conforming with A above. The column stress, f_u , shall be determined from gravity loads plus the lesser of the following:

- (i) $3(R_w/8)$ times the prescribed seismic forces.
- (ii) The forces corresponding to either 125 percent of the girder flexural strength or the panel zone shear strength.

The stress f_{by} , shall include the effects of the bracing force specified in Section 2710 (g) 7 A and P Δ.

l/r for such columns shall not exceed 60.

At truss frames the column shall be braced at each truss chord for a lateral force equal to one percent of the compression yield strength of the chord.

8. **Beam bracing.** Both flanges of beams shall be braced directly or indirectly. The beam bracing between column center lines shall not exceed $96r_y$. In addition, braces shall be placed at concentrated loads where a hinge may form.

9. **Changes in beam flange area.** Abrupt changes in beam flange area are not permitted within possible plastic hinge regions of special moment-resistant frames.

10. **Moment frame drift calculations.** Moment frame drift calculations shall include bending and shear contributions from the clear girder and column spans, column axial deformation and the rotation and distortion of the panel zone.

EXCEPTIONS: 1. Drift calculations may be based on column and girder center lines where either of the following conditions is met:

- A. It can be demonstrated that the drift so computed for frames of similar configuration is typically within 15 percent of that determined above.
 - B. The column panel zone strength can develop $0.8 S M_s$ of girders framing to the column flanges at the joint.
2. Column axial deformations may be neglected if they contribute less than 10 percent to the total drift.

(h) **Requirements for Braced Frames.** 1. **General.** The provisions of this section apply to all braced frames except eccentrically braced frames (EBF) designed in accordance with Section 2710 (i). Those members which resist seismic forces totally or partially by shear or flexure shall be designed in accordance with Section 2710 (g) except Subsection 3.

2. **Bracing members. A. Slenderness.** In Seismic Zones Nos. 3 and 4, the l/r ratio for bracing members shall not exceed $720/\sqrt{F_y}$ except as permitted in Subsections 5 and 6 below.

B. Stress reduction. The allowable stress, F_{as} , for bracing members resisting seismic forces in compression shall be determined from the following formula:

$$F_{as} = BF_a \tag{10-4}$$

WHERE:

F_a = the allowable axial compressive stress allowed in U.B.C. Standard No. 27-15.

B = the stress-reduction factor determined from the following formula:

$$B = 1/[1 + Kl/r/2C_s] \tag{10-5}$$

C. Lateral force distribution. The seismic lateral force along any line of bracing shall be distributed to the various members so that neither the sum of the horizontal components of the forces in members acting in tension nor the sum of the horizontal components of forces in members acting in compression exceed 70 percent of the total force.

EXCEPTION: Where compression bracing acting alone has the strength, neglecting the strength-reduction factor B , to resist $3(R_w/8)$ times the prescribed seismic force such distribution is not required.

A line of bracing is defined, for the purpose of this provision, as a single line or parallel lines within 10 percent of the dimension of the structure perpendicular to the line of bracing.

D. Built-up members. The l/r of individual parts of built-up bracing members between stitches, when computed about a line perpendicular to the axis through the parts, shall not be greater than 75 percent of the l/r of the member as a whole.

E. Compression elements in braces. The width-thickness ratio of stiffened and unstiffened compression elements used in braces shall be as shown in U.B.C. Standard No. 27-15.

3. **Bracing connections. A. Forces.** Bracing connections shall have the strength to resist the lesser of the following:

- (i) The tensile strength of the bracing.
- (ii) $3(R_w/8)$ times the force in the brace due to the prescribed seismic forces.
- (iii) The maximum force that can be transferred to the brace by the system.

Beam-to-column connections for beams that are part of the bracing system shall have the capacity to transfer the force determined above.

B. Net area. In bolted brace connections, the ratio of effective net section area to gross section area shall satisfy the formula:

$$\frac{A_e}{A_g} \geq \frac{1.2 \alpha F^*}{F_u} \tag{10-6}$$

WHERE:

A_e = effective net area as defined in Section 2711 (b) 2.

F^* = stress in brace as determined in Section 2710 (h) 3 A.

F_u = minimum tensile strength.

α = fraction of the member force from Section 2710 (h) 2 A that is transferred across a particular net section.

4. **Bracing configuration. A. Chevron bracing.** Chevron bracing shall conform with the following:

(i) Bracing members shall be designed for 1.5 times the otherwise prescribed forces.

(ii) The beam intersected by chevron braces shall be continuous between columns.

(iii) Where chevron braces intersect a beam from below, i.e., inverted V brace, the beam shall be capable of supporting all tributary gravity loads presuming the bracing not to exist.

EXCEPTION: This limitation need not apply to penthouses, one-story buildings or the top story of buildings.

B. K bracing. K bracing is prohibited except as permitted in Subsection 5 below.

5. **One- and two-story buildings.** Braced frames not meeting the requirements of Section 2710 (h) 2 and 4 may be used in buildings not over two stories in height and in roof structures as defined in Chapter 36 if the braces have the strength to resist $3(R_w/8)$ times the code equivalent static forces.

6. **Nonbuilding structures.** Nonbuilding structures with R_w values defined by Table No. 23-Q need comply only with the provisions of Section 2710 (h) 3.

(i) **Eccentrically Braced Frame (EBF) Requirements.** Eccentrically braced frames shall be designed in accordance with the following:

1. **Link beam.** There shall be a link beam provided at least at one end of each brace. Beams in EBFs shall comply with the requirements of U.B.C. Standard No. 27-15, except that the flange width-thickness ratio, $b_f/2t_f$, shall not exceed $52/\sqrt{F_y}$.

2. **Link beam strength.** A. Link beam shear strength, V_s , and flexural strength, M_s , are the strengths as defined in Section 2710 (d) 2. Where link beam strength is governed by shear, the flexural and axial capacities within the link shall be calculated using the beam flanges only.

B. A reduced flexural strength, M_{rs} , for use in Section 2710 (i) 7 and 12 is defined as $Z(F_y - f_a)$. Where f_a is less than $0.15F_y$, f_a may be neglected.

3. **Link beam rotation.** The rotation of the link segment relative to the rest of the beam, at a total frame drift of $3(R_w/8)$ times the drift determined for prescribed seismic forces, shall not exceed the following:

A. 0.060 radians for link segments having clear lengths of $1.6 M_s/V_s$ or less.

B. 0.015 radians for link segments having clear lengths of $2.6 M_s/V_s$ or greater.

C. A value obtained by linear interpolation for clear lengths between the above limits.

4. **Link beam web.** The web of the link beam shall be single thickness without doubler plate reinforcement. No openings shall be placed in the web of a link beam. The web shear shall not exceed $0.8V_s$ under prescribed lateral forces.

5. **Beam connection braces.** Brace-to-beam connections shall develop the compression strength of the brace and transfer this force to the beam web. No part of the brace-to-beam connection shall extend into the web area of a link beam.

6. **Link beam stiffeners.** Link beams shall have full-depth web stiffeners on both sides of the beam web at the brace end of the link beam. In addition, for link beams with clear lengths within the limits in Section 2710 (i) 3 C, full-depth stiffeners shall be placed at a distance b_f from each end of the link. The stiffeners shall have a combined width not less than $b - 2t_w$ and a thickness not less than $0.75 t_w$ or less than $3/8$ inch.

7. **Intermediate stiffeners.** Intermediate full-depth web stiffeners shall be provided in either of the following conditions:

A. Where the link beam strength is controlled by V_s ,

B. Where the link beam strength is controlled by flexure and the shear determined by applying the reduced flexural strength, M_{rs} , exceeds $0.45 F_y dt$.

8. **Web stiffener spacing.** Where intermediate web stiffeners are required, the spacing shall conform to the requirements given below.

A. For link beams with rotation angle of 0.06 radians, the spacing shall not exceed $38t_w - d/5$.

B. For link beams with a rotation angle of 0.03 radians or less, the spacing shall not exceed $56t_w - d/5$. Interpolation may be used for rotation angles between 0.03 and 0.06 radians.

9. **Web stiffener location.** For beams 24 inches in depth and greater, intermediate full-depth web stiffeners are required on both sides of the web. Such web stiffeners are required only on one side of the beam web for beams less than 24 inches in depth. The stiffener thickness, t_w , of one side stiffeners shall not be less than $\frac{3}{8}$ inch and the width shall not be less than $(b_f/2) - t_w$.

10. **Stiffener welds.** Fillet welds connecting the stiffener to the beam web shall develop a stiffener force of $A_{st}F_u$. Fillet welds connecting the stiffener to the flanges shall develop a stiffener force of $A_{st}F_y/4$, where $A_{st} = bt$ of stiffener and $b =$ width of stiffener plate.

11. **Link beam-column connections.** A. Where a link beam is connected to the column flange, the following requirements shall be met:

(i) The beam flanges shall have full-penetration welds to the column.

(ii) Where the link beam strength is controlled by shear in conformance with Section 2710 (i) 7, the web connection shall be welded to develop the full link beam web shear strength.

B. Where the link beam is connected to the column web, the beam flanges shall have full-penetration welds to the connection plates and the web connection shall be welded to develop the link beam web shear strength.

12. **Brace strength.** Each brace shall have a compressive strength at least 1.5 times the axial force corresponding to the controlling link beam strength. The controlling link beam strength is either the shear strength, V_n , or the reduced flexural strength, M_{n1} , whichever results in the lesser force in the brace.

13. **Column strength.** Columns shall be designed to remain elastic at 1.25 times the strength of the EBF bay, as defined in Subsection 12 above.

14. **Roof link beam.** A link beam is not required in roof beams for EBF over five stories.

15. **Concentric brace in combination.** The first story of an EBF bay over five stories in height may be concentrically braced if this story can be shown to have an elastic capacity 50 percent greater than the yield capacity of the story frames above the first story.

16. **Axial forces.** Axial forces in beams of EBF frames due to braces and due to transfer of seismic force to the end of the frames shall be included in the frame calculations.

17. **Beam flanges.** Top and bottom flanges of EBF frame beams shall be laterally braced at the ends of link beams and at intervals not exceeding $76l/\sqrt{F_y}$ times the beam flange width. End bracing shall be designed to resist 1.5 percent of the beam flange strength, defined as $F_y b_f t_f$. Intermediate bracing shall be designed to resist 1.0 percent of the beam flange force at the brace point using the link beam strength determined in Section 2710 (i) 12.

18. **Beam-column connection.** Beam connections to columns may be designed as pins in the plane of the beam web if the link beam is not adjacent to the column. Such connection shall have the capacity to resist a torsional moment of $0.01F_y b_f t_f d$.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-2710, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3000 Chapter 30—Veneer.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3000, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3007 Plastic veneer. Section 3007.

When used within a building, plastic veneer shall comply with the interior finish requirements of chapter 42. Exterior plastic veneer shall be of approved plastics materials as defined in chapter 4 and shall comply with the following:

(a) Plastic veneer shall not be attached to any exterior wall to a height greater than 50 feet above grade.

(b) Sections of plastic veneer shall not exceed 300 square feet in area and shall be separated by a minimum of 4 feet vertically.

(j) **Stud Wall Systems.** Stud wall systems may be used to resist the specified seismic forces in buildings not over five stories in height. Such systems shall comply with the following:

1. The l/r of the brace may exceed 200 and is unlimited.

2. All boundary members, chords and collectors shall be designed and detailed to transmit the induced axial forces.

3. Connection of the diagonal bracing member, top chord splices, boundary members and collectors shall be designed to develop the full tensile strength of the member or $3(R_w/8)$ times the otherwise prescribed seismic forces.

4. Vertical and diagonal members of the braced bay shall be anchored so the bottom track is not required to resist uplift forces by bending of the track web.

5. Both flanges of studs in a bracing panel shall be braced to prevent lateral torsional buckling. Wire tied bridging shall not be considered to provide such restraint.

6. Screws shall not be used to resist lateral forces by pullout resistance.

7. Provision shall be made for pretensioning or other methods of installation of tension-only bracing to guard against loose diagonal straps.

(k) **Nondestructive Testing.** Welded connections between the primary members of special moment-resisting frames shall be tested by nondestructive methods for compliance with U.B.C. Standard No. 27-6 and job specifications. This testing shall be a part of the special inspection requirements of Section 306. A program for this testing shall be established by the person responsible for structural design and as shown on plans and specifications.

As a minimum, this program shall include the following:

1. All complete penetration groove welds contained in joints and splices shall be tested 100 percent either by ultrasonic testing or by radiography.

EXCEPTION: When approved, the nondestructive testing rate for an individual welder or welding operator may be reduced to 25 percent, provided the reject rate is demonstrated to be 5 percent or less of the welds tested for the welder or welding operator. A sampling of at least 40 completed welds for a job shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. For evaluating the reject rate of continuous welds over 3 feet in length where the effective throat thickness is 1 inch or less, each 12-inch increment or fraction thereof shall be considered as one

weld. For evaluating the reject rate on continuous welds over 3 feet in length where the effective throat thickness is greater than 1 inch, each 6 inches of length or fraction thereof shall be considered one weld.

When approved by the building official and outlined in the project plans and specifications, this nondestructive ultrasonic testing may be performed in the shop of an approved fabricator utilizing qualified test techniques in the employment of the fabricator.

2. Partial penetration groove welds when used in column splices shall be tested either by ultrasonic testing or radiography when required by the plans and specifications.

3. Base metal thicker than $1\frac{1}{2}$ inches, when subjected to through-thickness weld shrinkage strains, shall be ultrasonically inspected for discontinuities directly behind such welds after joint completion.

Any material discontinuities shall be accepted or rejected on the basis of the defect rating in accordance with the (larger reflector) criteria of U.B.C. Standard No. 27-6.

EXCEPTIONS:

1. The area and separation requirements and the smoke-density limitation are not applicable to plastic veneer applied to Type V-N buildings, provided the walls are not required to have a fire-resistive rating.

2. The area and separation requirements are not applicable to veneers of approved plastic materials meeting the ASTM Standard No. D3679-81a when applied to exterior surfaces that have a one-hour fire-resistive rating before the application of the veneer.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3007, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3100 Chapter 31—Accessibility.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3100, filed 12/19/91, effective 7/1/92.]

**PART I
GENERAL**

WAC 51-20-3101 Scope. Section 3101.

(a) General. Buildings or portions of buildings shall be accessible to persons with disabilities as required by this chapter.

Chapter 31 has been amended to comply with the Federal Fair Housing Act (FFHA) Guidelines as published by the U.S. Department of Housing and Urban Development (March 1991) and the Americans With Disabilities Act (ADA) Guidelines as published by the U.S. Architectural and Transportation Barriers Compliance Board and Department of Justice (July, 1991).

Reference is made to appendix chapter 31 for FFHA and ADA requirements not regulated by this chapter.

(b) Design. The design and construction of accessible building elements shall be in accordance with this chapter. For a building, structure or building element to be considered to be accessible, it shall be designed and constructed to the minimum provisions of this chapter.

(c) Maintenance of facilities. Any building, facility, dwelling unit or site which is constructed to be accessible or adaptable under this chapter shall be maintained accessible and/or adaptable during its occupancy.

(d) Alternate methods. The application of section 105 to this chapter shall be limited to the extent that alternate methods of construction, designs, or technologies shall provide substantially equivalent or greater accessibility.

(e) Modifications. Where full compliance with this chapter is impractical due to unique characteristics of the terrain, the building official may grant modifications in accordance with section 106, provided that any portion of the building or structure that can be made accessible shall be made accessible to the greatest extent practical.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3101, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3102 Definitions. Section 3102. For the purpose of this chapter certain terms are defined as follows:

Accessible is approachable and usable by persons with disabilities.

Access aisle is an accessible pedestrian space between elements, such as parking spaces, seating, and desks, that provides clearances appropriate for use of the elements.

Accessible exit is an exit, as defined in section 3301(b), which complies with this chapter and does not contain stairs, steps, or escalators.

Accessible route of travel is a continuous unobstructed path connecting all accessible elements and spaces in an accessible building or facility that can be negotiated by a person using a wheelchair and that is usable by persons with other disabilities.

Area for evacuation assistance is an accessible space which is protected from fire and smoke and which facilitates egress.

Automatic door is a door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be

a photoelectric device, floor mat or manual switch (see also, power-assisted door).

Clear is unobstructed.

Clear floor space is unobstructed floor or ground space (see section 3106(b)).

Common use areas are rooms, spaces or elements inside or outside a building that are made available for use by occupants of and visitors to the building.

Cross slope is the slope that is perpendicular to the direction of travel.

Curb ramp is a short ramp cutting through or built up to a curb.

Detectable warning is a standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired persons of hazards on a circulation path.

Dwelling unit, Type A is an accessible dwelling unit that is designed and constructed in accordance with this chapter to provide greater accessibility than a Type B dwelling unit. (Type A dwelling units constructed in accordance with this chapter also meet the design standards for Type B dwelling units.)

Dwelling unit, Type B is an accessible dwelling unit that is designed and constructed in accordance with this chapter. (Type B Dwelling Unit Standards are based on the U.S. Department of Housing and Urban Development Federal Fair Housing Act accessibility guidelines.)

Element is an architectural or mechanical component of a building, facility, space, or site, such as telephones, curb ramps, doors, drinking fountains, seating, or water closets.

Ground floor is any occupiable floor less than one story above or below grade with direct access to grade. A building may have more than one ground floor.

Landing is a level area (except as otherwise provided), within or at the terminus of a stair or ramp.

Marked crossing is a crosswalk or other identified path intended for pedestrian use in crossing a vehicular way.

Multistory dwelling unit is a dwelling unit with finished living space located on one floor, and the floor or floors immediately above or below it.

Person with disability is an individual who has an impairment, including a mobility, sensory or cognitive impairment, which results in a functional limitation in access to and using a building or facility.

Power-assisted door is a door used for human passage with a mechanism that helps to open the door, or relieve the opening resistance of the door, upon the activation of a switch or a continued force applied to the door itself.

Primary entry is a principal entrance through which most people enter the building. A building may have more than one primary entry.

Primary entry level is the floor or level of the building on which the primary entry is located.

Primary function is a major function for which the facility is intended.

Public use areas are those interior or exterior rooms or spaces which are made available to the general public. Public use may be provided at a privately or publicly owned building or facility.

Ramp is any walking surface having a running slope exceeding 1 inch vertical in 48 inches horizontal.

Service entry is an entrance intended primarily for delivery of goods or services.

Single-story dwelling unit is a dwelling unit with all finished living spaces located on one floor.

Site is a parcel of land bounded by a property line or a designated portion of a public right-of-way.

Tactile is an object that can be perceived using the sense of touch.

Technically Infeasible (see Section 3110).

Text telephone is machinery or equipment that employs interactive graphic (e.g., typed) communications through the transmission of coded signals across the standard telephone network. Text telephones include telecommunications display devices or telecommunications devices for the deaf (TDD's), or computers.

Vehicular way is a route intended for vehicular traffic, such as a roadway, driveway, or parking lot, located on a site.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3102, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3102, filed 12/19/91, effective 7/1/92.]

PART II NEW CONSTRUCTION

WAC 51-20-3103 Building accessibility. Section 3103.

(a) Where required.

1. General. Accessibility to temporary or permanent buildings or portions thereof shall be provided for all occupancy classifications except as modified by this chapter. See also appendix chapter 31.

EXCEPTIONS:

1. Floors or portions of floors not customarily occupied, including, but not limited to, elevator pits, observation galleries used primarily for security purposes, elevator penthouses, nonoccupiable spaces accessed only by ladders, catwalks, crawl spaces, narrow passageways or freight elevators, piping and equipment catwalks and machinery, mechanical and electrical equipment rooms.
2. Temporary structures, sites and equipment directly associated with the construction process such as construction site trailers, scaffolding, bridging or material hoists are not required to be accessible. This exception does not include walkways or pedestrian protection required by Chapter 44.

2. Group A Occupancies.

A. General. All Group A Occupancies shall be accessible as provided in this chapter.

EXCEPTION: In the assembly area of dining and drinking establishments or religious facilities which are located in nonelevator buildings; where the area of mezzanine seating is not more than 25 percent of the total seating, an accessible means of vertical access to the mezzanine is not required; provided that the same services are provided in an accessible space which is not restricted to use only by persons with disabilities. Comparable facilities shall be available in all seating areas.

In banquet rooms or spaces where the head table or speaker's lectern is located on a permanent raised platform, the platform shall be accessible in compliance with section 3106. Open edges on the raised platform shall be protected by a curb with a height of not less than 2 inches.

Stadiums, theaters, auditoriums and similar occupancies shall provide wheelchair spaces in accordance with Table No. 31-A. Removable seats shall be permitted in the wheelchair spaces.

Wheelchair spaces shall be accessible and shall be located in places with unobstructed sight lines. Wheelchair spaces shall be reasonably distributed throughout the seating plan and located on an accessible route of travel.

In addition, one percent, but not less than one, of all fixed seats shall be aisle seats with no armrests, or shall have removable or folding armrests on the aisle side. Each such seat shall be identified by a sign complying with section 3106(p) 1. A.

An accessible route of travel shall connect wheelchair seating locations with performance areas, including stages, arena floors, dressing rooms, locker rooms and other spaces used by performers.

B. Assistive listening devices. Assistive listening systems complying with section 3106(u) 2 shall be installed in assembly areas where audible communications are integral to the use of the space including stadiums, theaters, auditoriums, lecture halls, and similar areas; where fixed seats are provided; as follows:

1. Areas with an occupant load of 50 or more.
2. Areas where an audio-amplification system is installed.

Receivers for assistive-listening devices shall be provided at a rate of 4 percent of the total number of seats, but in no case fewer than two devices. In other assembly areas, where permanently installed assistive-listening systems are not provided, electrical outlets shall be provided at a rate of not less than 4 percent of the total occupant load.

Signage complying with section 3106(p) 1. C. shall be installed to notify patrons of the availability of the listening system.

3. Group B Occupancies. All Group B Occupancies shall be accessible as provided in this chapter. Assembly spaces in Group B Occupancies shall comply with section 3103(a) 2. B.

4. Group E Occupancies. All Group E Occupancies shall be accessible as provided in this chapter. Assembly spaces in Group E Occupancies shall comply with section 3103(a) 2. B.

5. Group H Occupancies. All Group H Occupancies shall be accessible as provided in this chapter.

6. Group I Occupancies. All Group I Occupancies shall be accessible in all public use, common use and employee use areas, and shall have accessible patient rooms, cells and treatment or examination rooms as follows:

A. In Group I, Division 1.1 patient care units within hospitals which specialize in treating conditions that affect mobility, all patient rooms in each nursing unit, including associated toilet rooms and bathrooms.

B. In Group I, Division 1.1 patient care units within hospitals which do not specialize in treating conditions that affect mobility, at least 1 in every 10 patient rooms in each nursing unit, including associated toilet rooms and bathrooms.

C. In Group I, Division 1.1 and Division 2 nursing homes and long-term care facilities, at least 1 in every 2 patient rooms, including associated toilet rooms and bathrooms.

D. In Group I, Division 3 mental health Occupancies, at least 1 in every 10 patient rooms, including associated toilet rooms and bathrooms.

E. In Group I, Division 3 jail, prison and similar Occupancies, at least 1 in every 100 rooms or cells, including associated toilet rooms and bathrooms.

F. In Group I Occupancies, all treatment and examination rooms shall be accessible.

In Group I, Division 1.1 and 2 Occupancies, at least one accessible entrance that complies with section 3103(b) shall be under shelter. Every such entrance shall include a passenger loading zone which complies with section 3108(b).

7. Group M Occupancies. Group M, Division 1 Occupancies shall be accessible as follows:

1. Private garages and carports which contain accessible parking serving Type A dwelling units.

2. In Group M, Division 1 agricultural buildings, access need only be provided to paved work areas and areas open to the general public.

8. Group R Occupancies.

A. General. All Group R Occupancies shall be accessible as provided in this chapter. Public- and common-use areas and facilities such as recreational facilities, laundry facilities, garbage and recycling collection areas, mailbox locations, lobbies, foyers and management offices, shall be accessible.

EXCEPTION: Common- or public-use facilities accessory to buildings not required to contain either Type A or Type B dwelling units in accordance with Section 3103(a) 8.B.

B. Number of dwelling units. In all Group R, Division 1 apartment buildings the total number of Type A dwelling units shall be as required by Table No. 31-B. All other dwelling units shall be designed and constructed to the requirements for Type B units as defined in this chapter.

EXCEPTIONS: 1. Group R Occupancies containing no more than three dwelling units need not be accessible.

2. Dwelling units in Group R, Division 1 apartment buildings which are located on floors other than the ground floor where no elevator is provided within the building need not comply with the standards for Type B dwelling units, provided:

A. Where the ground floor is not a Group R Occupancy, the first level of Group R Occupancy, including dwelling units, shall be accessible; and

B. The number of Type A dwelling units provided shall not be reduced below the number required by Table No. 31-B. See also Section 3105(c) 1.

3. Dwelling units with two or more stories in a nonelevator building need not comply with standards for Type B dwelling units.

4. For sites where multiple, nonelevator buildings are planned for a single site and where portions of the site have grades prior to development which exceed 10 percent, the building official may approve the following modifications:

A. Number of dwelling units:

(i) The number of Type B dwelling units provided may be reduced to a percentage of the ground floor units which is equal to the percentage of the entire site having grades prior to development, which are 10 percent or less; but in no case shall the number of Type B dwelling units be less than 20 percent of the ground floor dwelling units on the entire site; and

(ii) The number of Type A dwelling units provided shall not be reduced below the number required by Table No. 31-B; and

B. Both Type A and B dwelling units may be located in the building or buildings located on the portion of the site where the grade prior to development has slopes of 10 percent or less; and

C. Common-use facilities accessory to buildings not required to contain either Type A or B dwelling units in accordance with Item A, above, need not be accessible unless there are no other similar facilities provided on the site.

See also appendix chapter 31, Division I.

C. Hotels and lodging houses. In all hotels and lodging houses, accessible guest rooms, including associated bathing, shower and toilet facilities, shall be provided in accordance with Table No. 31-C. In addition, sleeping rooms or suites for persons with hearing impairments shall be provided in accordance with Table No. 31-D. In addition, public-use and common-use areas of all hotels and lodging houses shall be accessible.

EXCEPTION: Group R, Division 3 lodging houses that are occupied by the owner or proprietor of the lodging house.

Required sleeping rooms for persons with hearing impairments shall have visible alarms complying with section 3106(o). Such rooms shall have installed telephones complying with section 3106(n) 3., and an electrical outlet installed within 48 inches of the telephone connection. Such rooms shall have devices separate from the visible alarm system which provide visible notification of incoming telephone calls and door bell actuation.

Where provided in accessible guest rooms the following facilities shall be accessible: dining areas; kitchens; kitchenettes; wet bars; patios; balconies; terraces; or similar facilities.

D. Proportional distribution. Accessible dwelling units shall be apportioned among efficiency dwelling units, single-bedroom units and multiple-bedroom units in proportion to the numbers of such units in the building. Accessible hotel guest rooms shall be apportioned among the various classes of sleeping accommodations.

E. Congregate residences. In congregate residences with multi-bed rooms or spaces, a percentage equal to the minimum number of accessible rooms required by Table No. 31-C shall be accessible in accordance with section 3106(z).

EXCEPTION: Congregate residences with 10 or fewer occupants need not be accessible.

9. Other parking facilities. Principal use parking facilities which are not accessory to the use of any building or structure shall provide accessible spaces in accordance with Table No. 31-F.

(b) Design and construction.

1. General. When accessibility is required by this chapter, it shall be designed and constructed in accordance with this chapter.

2. Accessible route of travel. When a building, or portion of a building, is required to be accessible, an accessible route of travel shall be provided to all portions of the building, to accessible building entrances and connecting the building and the public way. Except within an accessible dwelling unit, the accessible route of travel to areas of primary function may serve but shall not pass through kitchens, storage rooms, toilet rooms, bathrooms, closets or other similar spaces.

- EXCEPTIONS:
1. A single accessible route shall be permitted to pass through a kitchen or storage room in an accessible dwelling unit.
 2. Floors above and below accessible levels that have areas of less than 3,000 square feet per floor, need not be served by an accessible route of travel from an accessible level. This exception shall not apply to:
 - A. The offices of health care providers; or,
 - B. Transportation facilities and airports; or,
 - C. Buildings owned or leased by government agency; or,
 - D. Multitenant Group B, Division 2, retail and wholesale occupancies of five tenant spaces or more.
 3. For sites where natural terrain or other unusual property characteristics do not allow the provision of an accessible route of travel from the public way to the building, the point of vehicular debarkation may be substituted for the accessible entrance to the site.

(For Group R, Division 1 apartment buildings see Section 51-20-3105(c)1.

Accessible routes of travel serving any accessible space or element shall also serve as a means of egress for emergencies or connect to an area of evacuation assistance.

Where more than one building or facility is located on a site, accessible routes of travel shall connect accessible buildings and accessible site facilities. The accessible route of travel shall be the most practical direct route connecting accessible building entrances, accessible site facilities and the accessible site entrances.

3. Primary entry access. At least 50% of all public entrances, or a number equal to the number of exits required by section 3303(a), whichever is greater, shall be accessible. One of the accessible public entrances shall be the primary entrance to a building. At least one accessible entrance must be a ground floor entrance. Public entrances do not include loading or service entrances.

EXCEPTION: In Group R, Division 1 apartment buildings only the primary entrance need be accessible, provided that the primary entrance provides an accessible route of travel to all dwelling units required to be accessible.

Where a building is designed not to have common or primary entrances, the primary entrance to each individual dwelling unit required to be accessible, and each individual tenant space, shall be accessible.

4. Signs.

A. International symbol of access. The following elements and spaces of accessible facilities shall be identified by the international symbol of access:

1. Accessible parking spaces
2. Accessible entrances when not all entrances are accessible (inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance)

EXCEPTION: Individual entrances into dwelling units.

3. Accessible passenger loading zone(s)
4. Accessible toilet and bathing facilities when not all are accessible

EXCEPTION: Toilet and bathing facilities within dwelling units, patient rooms and guest rooms.

At every major junction along or leading to an exterior accessible route of travel, there shall be a sign displaying the

international symbol of accessibility. Signage shall indicate the direction to accessible entries and facilities.

B. Other signs. Where provided, signs which identify permanent rooms and spaces shall comply with sections 3106(p) 2, 3, and 5. Where provided, other signs which provide direction to or information about the building or portion of a building shall comply with section 3106(p) 3 and 4.

EXCEPTION: Building directories and all temporary signs.

In hotels and lodging houses, a list of accessible guest rooms shall be posted permanently in a location not visible to the general public, for staff use at each reception or check-in desk.

In assembly areas, a sign notifying the general public of the availability of accessible seating and assistive listening systems shall be provided at ticket offices or similar locations.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3103, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3103, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3104 Egress and areas for evacuation assistance. Section 3104.

(a) General. In buildings or portions of buildings required to be accessible, accessible means of egress shall be provided in the same number as required for exits by chapter 33. When an exit required by chapter 33 is not accessible, an area for evacuation assistance shall be provided.

EXCEPTION: Areas of evacuation assistance are not required in buildings where an approved, automatic fire-extinguishing system is installed in accordance with U.B.C. Standard No. 38-1, provided that quick-response sprinkler heads are used where allowed by the standard; and that a written fire-and life-safety emergency plan which specifically addresses the evacuation of persons with disabilities is approved by the building official and the fire chief.

Every area for evacuation assistance shall comply with the requirements of this code and shall adjoin an accessible route of travel which shall comply with section 3106.

(b) Areas for evacuation assistance.

1. Location and construction. An area for evacuation assistance shall be one of the following:

A. A portion of a landing within a smokeproof enclosure, complying with section 3310.

B. A portion of an exterior exit balcony, located immediately adjacent to an exit stairway, when the exterior exit balcony complies with section 3305. Openings to the interior of the building located within 20 feet of the area for evacuation assistance shall be protected with fire assemblies having a three-fourths-hour fire-protection rating.

C. A portion of a one-hour fire-resistive corridor complying with sections 3305 (g) and (h) located immediately adjacent to an exit enclosure.

D. A vestibule located immediately adjacent to an exit enclosure and constructed to the same fire-resistive standards as required by section 3305 (g) and (h).

E. A portion of a stairway landing within an exit enclosure which is vented to the exterior and is separated from the interior of the building by not less than one-hour fire-resistive door assemblies.

F. When approved by the building official, an area or room which is separated from other portions of the building by a smoke barrier. Smoke barriers shall have a fire-resistive rating of not less than one hour and shall completely enclose the area or room. Doors in the smoke barrier shall be tight-fitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes and shall be self-closing or automatic closing. The area or room shall be provided with an exit directly to an exit enclosure. When the room or area exits into an exit enclosure which is required to be of more than one-hour fire-resistive construction, the room or area shall have the same fire-resistive construction, including the same opening protection, as required for the adjacent exit enclosure.

G. An elevator lobby complying with section 3104(d).

2. Size. Each area for evacuation assistance shall provide at least two wheelchair spaces not smaller than 30 inches by 48 inches for each space. The area for evacuation assistance shall not encroach on any required exit width. The total number of such 30-inch by 48-inch wheelchair spaces per story shall not be less than 1 for every 200 persons of calculated occupant load served by the area for evacuation assistance.

EXCEPTION: The building official may reduce the minimum number of 30-inch by 48-inch areas to one for each area for evacuation assistance on floors where the occupant load is less than 200.

3. Stairway width. Each stairway adjacent to an area for evacuation assistance shall have a minimum clear width of 48 inches between handrails.

4. Two-way communication. A telephone with controlled access to a public telephone system or another method of two-way communication shall be provided between each area for evacuation assistance and the primary entry. The telephone or other two-way communication system shall be located within the reach ranges specified in Section 3106 (b). The fire department may approve location other than the primary entry. The communication system shall not require voice communication.

5. Identification. Each area for evacuation assistance shall be identified by a sign which states: **Area for evacuation assistance** and the international symbol of access. The sign shall be illuminated when exit sign illumination is required. The sign shall comply with sections 3314 (c) and (d). In each area for evacuation assistance, instructions on the use of the area under emergency conditions shall be posted adjoining the two-way communication system.

(c) Accessible exits. All exterior exits which are located adjacent to accessible areas and within 6 inches of grade shall be accessible.

(d) Area for evacuation assistance, high-rise alternative. Within a building of any height or occupancy, constructed in accordance with the requirements of section 1807 or 1907, an area for evacuation assistance may be located in the elevator lobby, or adjacent to the elevator where no lobby is required, when:

1. The area for evacuation assistance complies with the requirements for size, two-way communication and identification as specified in section 3104(b); and,

2. Elevator shafts are pressurized as required for smokeproof enclosures in section 3310. Such pressurization

system shall be activated by smoke detectors on each floor located in a manner approved by the building official. Pressurization equipment and its ductwork within the building shall be separated from other portions of the building by a minimum of two-hour fire-resistive construction.

3. The manager of the building shall establish and maintain a written fire- and life-safety emergency plan which, in addition to other provisions, shall specifically address the evacuation of persons with disabilities, and which has been approved by the building official and fire chief.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3104, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3104, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3105 Facility accessibility. Section 3105.

(a) General. Where buildings are required to be accessible, building facilities shall be accessible to persons with disabilities as provided in this section. For Group R, Division 1 apartment buildings, where specific floors of a building are required to be accessible, the requirements shall apply only to the facilities located on accessible floors.

All building facilities or elements required by this section to be accessible shall be designed and constructed in accordance with section 3106.

(b) Bathing and toilet facilities.

1. Bathing facilities. When bathing facilities are provided, at least 2 percent, but not less than 1, bathtub or shower shall be accessible. In dwelling units where both a bathtub and shower are provided in the same room, only one need be accessible.

2. Toilet facilities. Toilet facilities located within accessible dwelling units, guest rooms and congregate residences shall comply with sections 3106(k) and 3106(aa).

EXCEPTION: For dwelling units, only one toilet facility need be accessible.

In each toilet facility in other occupancies, at least one wheelchair accessible toilet stall with an accessible water closet shall be provided. In addition, when there are 6 or more water closets within a toilet facility, at least one other accessible toilet stall complying with section 3106(k) 4. also shall be installed.

3. Lavatories, mirrors and towel fixtures. At least one accessible lavatory shall be provided within any toilet facility. Where mirrors, towel fixtures and other toilet and bathroom accessories are provided, at least one of each shall be accessible.

4. Adaptable fixtures in dwelling units. See section 3106(aa) 2. for adaptable fixtures in dwelling units.

(c) Elevators, platform lifts, and stairways.

1. Elevators. A. Where required. In multi-story buildings or portions thereof required to be accessible by section 3103, at least one elevator shall serve each level, including mezzanines. Other than within an individual dwelling unit, when an elevator is provided but not required, it shall be accessible.

EXCEPTIONS: 1. In Group R, Division 1 apartment occupancies, an elevator is not required where accessible dwelling

units and guest rooms are accessible by ramp or by grade level route of travel.

2. In a building of fewer than three stories an elevator is not required where ramps, grade-level entrances or accessible horizontal exits from an adjacent building, are provided to each floor.

3. In multistory parking garages, an elevator is not required where an accessible route of travel is provided from accessible parking spaces on levels with accessible horizontal connections to the primary building served.

4. In Group R, Division 1 hotels and lodging houses less than 3 stories in height, an elevator is not required provided that accessible guest rooms are located on the ground floor.

B. Design. All elevators shall be accessible.

EXCEPTIONS:

1. Private elevators serving only one dwelling unit.
2. Where more than one elevator is provided in the building, elevators used exclusively for movement of freight.

Elevators required to be accessible shall be designed and constructed to comply with chapter 296-81 WAC.

2. Platform lifts. Platform lifts may be used in lieu of an elevator under one of the following conditions subject to approval by the building official:

(A) To provide an accessible route of travel to a performing area in a Group A Occupancy; or,

(B) To provide unobstructed sight lines and distribution for wheelchair viewing positions in Group A Occupancies; or,

(C) To provide access to spaces with an occupant load of less than 5, that are not open to the public; or,

(D) To provide access where existing site constraints or other constraints make use of a ramp or elevator infeasible.

All platform lifts used in lieu of an elevator shall be capable of independent operation and shall comply with chapter 296-81 WAC.

3. Stairways. Stairways shall comply with Section 3106(i).

(d) Other building facilities.

1. Water fountains. On any floor where water fountains are provided, at least 50 percent, but in no case less than one fountain shall be accessible complying with section 3106(m) and at least one fountain shall be mounted at a standard height.

2. Telephones. On any floor where public telephones are provided at least one telephone shall be accessible. On any floor where 2 or more banks of multiple telephones are provided, at least one telephone in each bank shall be accessible and at least one telephone per floor shall be designed to allow forward reach complying with section 3106.

Where any bank of public telephones consists of 3 or more telephones, at least one telephone in each bank shall be equipped with a shelf and an electrical outlet complying with section 3106(n) 7.

All accessible telephones and at least 25 percent of all other public telephones, but in no case less than one, shall be provided with volume controls in accordance with section 3106(n) and shall be dispersed among the public telephones provided in the building.

Where four or more public pay telephones are provided at a building site, and at least one is in an interior location, at least one interior telephone shall be a text telephone in accordance with section 3106(n).

Where interior public pay phones are provided in transportation facilities; assembly and similar areas including stadiums and arenas, convention centers, hotels with convention facilities, or covered malls; or in or adjacent to hospital emergency, recovery, or waiting rooms; at least one interior text telephone shall be provided.

3. Kitchens. Kitchens within accessible dwelling units shall be designed in accordance with section 3106 (l) and (aa).

EXCEPTION: Kitchens in Type B dwelling units need not comply with section 3106(l)(1).

Kitchens, kitchenettes or wet bars in other than dwelling units which are provided accessory to a sleeping room, guest room or suite, shall be designed in accordance with section 3106. Countertops and sinks shall be no more than 34 inches above the finished floor. At least 50 percent of shelf space in cabinets and appliances shall be within the reach ranges of section 3106.

4. Recreational facilities. Where common or public use recreational facilities, swimming pools, hot tubs, spas and similar facilities are provided, they shall be accessible. Swimming pools shall be accessible by transfer tier, hydraulic chair, ramp or other means. Hot tubs and spas need be accessible only to the edge of the facility.

EXCEPTION: Common- or public-use facilities accessory to buildings not required to contain either Type A or Type B dwelling units in accordance Section 3103(a) 8. B.

5. Fixed or built-in seating or tables. Where fixed or built-in seating or tables are provided at least 5 percent, but no fewer than two, shall be accessible. Accessible fixed or built-in seating or tables shall comply with section 3106(s). In eating and drinking establishments, such seating or tables shall be distributed throughout the facility.

6. Storage facilities. In other than Group R, Division 1 apartment buildings, where fixed or built-in storage facilities such as cabinets, shelves, closets and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with section 3106(r).

7. Customer service facilities.

A. Dressing and fitting rooms. Where dressing or fitting rooms are provided for use by the general public, patients, customers or employees, 5 percent, but not less than one in each group of rooms serving distinct and different functions shall be accessible in accordance with section 3106(x).

B. Counters and windows. Where customer sales and service counters or windows are provided a portion of the counter or at least one window, shall be accessible in accordance with section 3106(x).

C. Shelving and display. Self-service shelves or display units in retail occupancies shall be located on an accessible route in accordance with section 3103(b) 2. **Not all** self-service shelves and display units need be located within the reach ranges required by Section 3106(b).

D. Check-out aisles. Accessible check-out aisles shall be installed in accordance with Table No. 31-E and section 3106(x) 3.

8. Controls, operating mechanisms and hardware. Controls, operating mechanisms and hardware, including switches that control lighting and ventilation and electrical

convenience outlets, in accessible spaces, along accessible routes, or as parts of accessible elements shall comply with section 3106(c).

9. Alarms. Where provided, alarm systems shall include both audible and visible alarms. Visible alarm devices shall be located in all assembly areas; common-use areas including toilet rooms and bathing facilities; hallways and lobbies; and hotel guest rooms as required by Section 3103(a) 8. C.

EXCEPTIONS: 1. Alarm systems in Group I, Division 1.1 and 1.2 Occupancies may be modified to suit standard health care design practice.
2. Visible alarms are not required in Group R, Division 1 apartment buildings.

[Statutory Authority: RCW 19.27.074 and 70.92.140, 93-01-166, § 51-20-3105, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW, 92-01-145, § 51-20-3105, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3106 Section 3106. Accessible design and construction standards.

(a) General. Where accessibility is required by this chapter, buildings and facilities shall be designed and constructed in accordance with this section, unless otherwise specified in this chapter.

(b) Space allowance and reach ranges.

1. Wheelchair passage width. The minimum clear width for single wheelchair passage shall be 36 inches. The minimum width for two wheelchairs to pass is 60 inches.

EXCEPTION: The minimum width for single wheelchair passage may be 32 inches for a maximum distance of 24 inches.

2. Wheelchair turning spaces. Wheelchair turning spaces shall be designed and constructed to satisfy one of the following requirements:

A. A turning space not less than 60 inches in diameter; or,

B. A turning space at T-shaped intersections or within a room, where the minimum width is not less than 36 inches. Each segment of the T shall be clear of obstructions not less than 24 inches in each direction.

Wheelchair turning space may include knee and toe clearance in accordance with section 3106(b) 4. C.

3. Unobstructed floor space. A floor space, including the vertical space above such floor space, which is free of any physical obstruction including door swings, to a height of 29 inches. Where a pair of doors occurs, the swing of the inactive leaf may be considered to be unobstructed floor space. Unobstructed floor space may include toe spaces that are a minimum of 9 inches in height and not more than 6 inches in depth.

4. Clear floor or ground spaces and maneuvering clearance space for wheelchairs.

A. Size. The minimum clear floor or ground space required to accommodate a single, stationary wheelchair occupant shall be not less than 30 inches by 48 inches.

B. Approach. Wheelchair spaces shall be designed to allow for forward or parallel approach to an accessible feature.

C. Knee and toe clearances. Spaces under obstructions, work surfaces or fixtures may be included in the clear floor or ground space provided that they are at least 30 inches in width, a minimum of 27 inches in height and not greater

than 25 inches in depth. Toe spaces under obstructions, work surfaces or fixtures which comply with the requirements for unobstructed floor space may be included in the clear floor or ground space.

D. Approach to wheelchair spaces. One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin or overlap an accessible route of travel, or shall adjoin another wheelchair clear space. Clear space located in an alcove or otherwise confined on all or part of three sides shall be not less than 36 inches in width where forward approach is provided, or 60 inches in width where parallel approach is provided.

E. Forward reach. Where the clear floor space allows only forward approach to an object, the maximum high forward reach allowed shall not be higher than 48 inches. Reach obstructions 20 inches or less in depth may project into the clear space provided that knee clearance is maintained in accordance with section 3106(b) 4. C. Reach obstructions greater than 20 inches in depth may project into the clear space provided that the reach obstruction shall not exceed 25 inches in depth and the maximum high forward reach shall not exceed 44 inches in height. The minimum low forward reach shall be not lower than 15 inches.

F. Side reach. Where the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall not be higher than 54 inches. Obstructions no greater than 34 inches in height and no more than 24 inches in depth may be located in the side reach area provided that when such obstructions are present the side reach shall be not more than 46 inches. The minimum low side reach shall be not lower than 9 inches.

(c) Controls and hardware.

1. Operation. Handles, pulls, latches, locks and other operating devices on doors, windows, cabinets, plumbing fixtures and storage facilities, shall have a lever or other shape which will permit operation by wrist or arm pressure and does not require tight grasping, pinching or twisting to operate.

The force required to activate controls on lavatories and water fountains, and flush valves on water closets and urinals, shall not be greater than five pounds.

2. Mounting heights. The highest operable part of environmental and other controls, dispensers, receptacles and other operable equipment shall be within at least one of the reach ranges specified in section 3106(b), and not less than 36 inches above the floor. Electrical and communications system receptacles on walls shall be mounted a minimum of 15 inches above the floor. Door hardware shall be mounted at not less than 36 inches and not more than 48 inches above the floor.

3. Clear floor space. Clear floor space that allows a forward or a side approach shall be provided at all controls or hardware.

(d) Accessible route of travel.

1. Width. The minimum clear width of an accessible route of travel shall be 36 inches except at doors (see section 3106(j) 2.). Where an accessible route includes a 180 degree turn around an obstruction which is less than 48 inches in width, the clear width of the accessible route of travel around the obstruction shall be 42 inches minimum. For exterior accessible routes of travel, the minimum clear width shall be 44 inches.

EXCEPTION: The minimum width for single wheelchair passage may be 32 inches for a maximum distance of 24 inches.

Where an accessible route is less than 60 inches in width, passing spaces at least 60 inches by 60 inches shall be located at intervals not to exceed 200 feet. A T-shaped intersection of two corridors or walks may be used as a passing space.

2. **Height.** Accessible routes shall have a clear height of not less than 79 inches. Where the vertical clearance of an area adjoining an accessible route of travel is less than 79 inches but more than 27 inches, a continuous permanent barrier shall be installed to prevent traffic into such areas of reduced clearance.

3. **Slope.** An accessible route of travel shall have a running slope not greater than 1 vertical in 12 horizontal. An accessible route of travel with a running slope greater than 1 vertical in 20 horizontal shall comply with section 3106(h). Cross slopes of an accessible route of travel shall not exceed 1 vertical in 48 horizontal.

4. **Changes in level.** Changes in level along an accessible route of travel shall comply with section 3106(f). Stairs or escalators shall not be part of an accessible route of travel. Any raised area within an accessible route of travel shall be cut through to maintain a level route or shall have curb ramps at both sides and a level area not less than 48 inches long connecting the ramps.

5. **Surfaces.**

A. **General.** All floor and ground surfaces in an accessible route of travel shall comply with section 3106(g).

B. **Detectable warnings.** Curb ramps shall have detectable warnings complying with section 3106(q). Detectable warnings shall extend the full width and depth of the curb ramp.

6. **Illumination.** Illumination shall be provided along the accessible route of travel, at any time the building is occupied, with an intensity of not less than one footcandle on the surface of the route.

7. **Curb ramps.**

A. **Slope.** Slopes of curb ramps shall comply with section 3106(h). Transitions from ramps to walks, gutters or vehicular ways shall be flush and free of abrupt changes in height. Maximum slopes of adjoining gutters and road surfaces immediately adjacent to the curb ramp or accessible route of travel shall not exceed 1 vertical in 20 horizontal.

B. **Width.** Curb ramps shall be not less than 36 inches in width, exclusive of the required side slopes.

C. **Side slopes of curb ramps.** Curb ramps located where pedestrians must walk across the ramp, or where not protected by handrails or guardrails, shall have sloped sides. The maximum side slope shall be 1 vertical in 10 horizontal. Curb ramps with returned curbs may be used where pedestrians would not normally walk across the ramp.

EXCEPTION: Where the width of the walking surface at the top of the ramp and parallel to the run of the ramp is less than 48 inches, the maximum side slope shall be 1 vertical in 12 horizontal.

D. **Location.** Built-up curb ramps shall be located so as not to project into vehicular ways nor be located within accessible parking spaces.

E. **Obstructions.** Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.

F. **Location at marked cross walks.** Curb ramps at marked cross walks shall be wholly contained within the markings, excluding any sloped sides.

8. **Vehicular areas.** Where an accessible route of travel crosses or adjoins a vehicular way, and where there are no curbs, railings or other elements which separate the pedestrian and vehicular areas, and which are detectable by a person who has a severe vision impairment, the boundary between the areas shall be defined by a continuous detectable warning not less than 36 inches wide, complying with section 3106(q).

(e) **Protruding objects.** Protruding objects shall not reduce the clear width of an accessible route of travel or maneuvering space. Any wall- or post-mounted object with its leading edge between 27 inches and 79 inches above the floor may project not more than 4 inches into an accessible route of travel, corridor, passageway, or aisle. Any wall- or post-mounted projection greater than 4 inches shall extend to the floor.

(f) **Changes in level.** Accessible routes of travel and accessible spaces within buildings shall have continuous common floor or ramp surfaces. Abrupt change in height greater than 1/4 inch shall be beveled to 1 vertical in 2 horizontal. Changes in level greater than 1/2 inch shall be accomplished by means of a ramp meeting the requirements of section 3106(h), a curb ramp meeting the requirements of section 3106(d) 7., or an elevator or platform lift meeting the requirements of section 3105(c). For Type B dwelling units, see also section 3106(aa).

(g) **Floor coverings and surface treatments.**

1. **General.** All surfaces shall be firm and stable.

2. **Carpeting.** Carpeting and floor mats in accessible areas shall be securely fastened to the underlying surface, and shall provide a firm, stable, continuous and relatively smooth surface.

3. **Slip-resistant surfaces.** Showers, locker rooms, swimming pool, spa and hot tub decks, toilet rooms and other areas subject to wet conditions shall have slip-resistant floors.

Exterior accessible routes of travel shall have slip-resistant surfaces.

4. **Grates.** Within an accessible route of travel grates shall have openings no more than 1/2 inch in one direction. Where grates have elongated openings, they shall be placed so that the long dimension is perpendicular to the dominant direction of travel. The maximum vertical surface change shall be 1/8 inch.

5. **Expansion and construction joints.** Expansion and construction joints in exterior routes of travel shall have a width of not more than 1/2 inch, shall be filled with a firm, compressible, elastic material, and shall be substantially level with the surface of the accessible route of travel.

(h) **Ramps.**

1. **General.** Ramps required to be accessible shall comply with section 3307 and the provisions of this section. No ramp shall change direction between landings, except ramps with an inside radius of 30 feet or greater.

2. **Slope and rise.** The maximum slope of a ramp shall be 1 vertical in 12 horizontal. The maximum rise for any run shall be 30 inches.

3. Width. The minimum width of a ramp shall be not less than 36 inches for interior ramps and 44 inches for exterior ramps.

4. Landings. Ramps within the accessible route of travel shall have landings at the top and bottom, and at least one intermediate landing shall be provided for each 30 inches of rise. Landings shall be level and shall have a minimum dimension measured in the direction of ramp run of not less than 60 inches. Where the ramp changes direction at a landing, the landing shall be not less than 60 inches by 60 inches. The width of any landing shall be not less than the width of the ramp.

5. Handrails. Ramps having slopes steeper than 1 vertical in 20 horizontal shall have handrails as required for stairways, except that intermediate handrails as required in section 3306(i) are not required. Handrails shall be continuous provided that they shall not be required at any point of access along the ramp, nor at any curb ramp. Handrails shall extend at least 12 inches beyond the top and bottom of any ramp segment.

EXCEPTION: Ramps having a rise less than or equal to 6 inches or a run less than or equal to 72 inches need not have handrails.

6. Exterior ramps. Exposed ramps and their approaches shall be constructed to prevent the accumulation of water on walking surfaces.

7. Edge protection. Any portion of the edge of a ramp with a slope greater than 1 vertical in 20 horizontal, or landing which is more than 1/2 inch above the adjacent grade or floor, shall be provided with edge protection in accordance with the following:

A. Walls and curbs. When used, walls or curbs shall be not less than 2 inches in height above the surface of the accessible route of travel.

B. Railings. When used, railings shall comply with Section 3106 (h) 5. and also shall have one of the following features:

(i) An intermediate rail mounted 17 to 19 inches above the ramp or landing surface.

(ii) A guardrail complying with Section 1712.

(i) Stairways.

1. General. Stairways required to be accessible shall comply with section 3306 and provisions of this section.

2. Open risers. Open risers shall not be permitted.

EXCEPTION: Stairways in Group R, Division 1 apartment buildings may have open risers.

3. Nosings. Stair nosings shall be flush, slip-resistant and rounded to a radius of 1/2 inch maximum. Risers shall be sloped or the underside of the nosing shall have an angle of not less than 60 degrees from the horizontal. Nosings shall project no more than 1 1/2 inches.

4. Exterior stairways. Exposed stairways and their approaches shall be constructed to prevent the accumulation of water on walking surfaces.

(j) Doors.

1. General. Doors required to be accessible shall comply with section 3304 and provisions of this section. For the purpose of this section, gates shall be considered to be doors. An accessible gate or door shall be provided adjacent to any turnstile or revolving door. Where doorways have

two independently operated door leaves, then at least one leaf shall comply with this section.

2. Clear width. Doors shall be capable of being opened so that the clear width of the opening is not less than 32 inches.

EXCEPTION: Doors not requiring full user passage, such as shallow closets, may have a clear opening not less than 20 inches.

3. Maneuvering clearances at doors. Except as provided in section 3106(aa), all doors shall have minimum maneuvering clearances as follows:

A. Where a door must be pulled to be opened, an unobstructed floor space shall extend at least 18 inches beyond the strike jamb.

B. Where a door must be pushed to be opened and is equipped with a closer and a latch, an unobstructed floor space shall extend at least 12 inches beyond the strike jamb.

C. Where two doors are in series, the minimum distance between two hinged or pivoted doors shall be 48 inches in addition to any area needed for door swing. Doors in series shall swing either in the same direction, or away from the space between the doors.

D. Where a door must be pulled to be opened, an unobstructed floor space shall be provided that extends 60 inches, perpendicular to the doorway.

E. Where a door must be pushed to be opened, an unobstructed floor space shall extend 48 inches perpendicular to the doorway.

4. Thresholds at doors. Thresholds at doors shall comply with section 3106.

5. Automatic and power-assisted doors. Door-closers or power-operators shall be operable as required by section 3304(h).

EXCEPTION: Floor pad or electric-eye-actuated power operators.

All power-operated doors shall remain in the fully open position for not less than 6 seconds before closing. Touch switches shall be mounted 36 inches above the floor and not less than 18 inches nor more than 36 inches horizontally from the nearest point of travel of the moving door. Other power-operated doors must be actuated from a location not less than 36 inches from the nearest point of travel of the moving door. Power-operated doors shall automatically reopen when they encounter an obstruction other than the strike jamb.

6. Door closers. Where provided, door closers shall be adjusted to close from an open position of 70 degrees in not less than 3 seconds, to a point 3 inches from the latch, when measured to the leading edge of the door.

7. Vision panels. Where a door contains one or more vision panels, the bottom of the glass of at least one panel, shall be not more than 40 inches above the floor.

(k) Bathrooms, toilet rooms, bathing facilities and shower rooms.

1. General. Bathrooms, toilet rooms, bathing facilities and shower rooms shall be designed in accordance with this section. For dwelling units, see also section 3106(aa).

2. Unobstructed floor space. An unobstructed floor space shall be provided within bathrooms, toilet rooms, bathing facilities and shower rooms of sufficient size to inscribe a circle with a diameter not less than 60 inches. Doors in any position may encroach into this space by not

more than 12 inches. The clear floor spaces at fixtures, the accessible route of travel and the unobstructed floor space may overlap.

3. Wheelchair accessible toilet stalls.

A. Dimensions. Wheelchair accessible toilet stalls shall be at least 60 inches in width. Where wall-hung water closets are installed, the depth of the stall shall be not less than 56 inches. Where floor-mounted water closets are installed, the depth of the stall shall be not less than 59 inches. Entry to the compartment shall have a clear width of 32 inches. Toilet stall doors shall not swing into the clear floor space required for any fixture. Except for door swing, a clear unobstructed access not less than 48 inches in width shall be provided to toilet stalls.

EXCEPTION: Partitions may project not more than one inch, in the aggregate, into the required width of the stall.

B. Toe clearances. In any toilet stall, the front partition and at least one side partition shall provide a toe clearance of at least 9 inches above the floor.

EXCEPTION: Toe clearance is not required in a stall with a depth greater than 60 inches.

C. Door hardware. Doors of accessible toilet stalls shall comply with section 3106(c).

4. Ambulatory accessible toilet stalls. Ambulatory accessible toilet stalls shall be at least 36 inches in width, with an outward swinging, self-closing door. Grab bars shall be installed on each side of the toilet stall and shall comply with sections 3106(k) 5. C. and 3106(k) 11.

5. Water closets.

A. Clear floor space. The lateral distance from the center line of the water closet to the nearest obstruction, excluding grab bars, shall be 18 inches on one side and not less than 42 inches on the other side. In other than stalls, a clear floor space not less than 32 inches, measured perpendicular to the wall on which the water closet is mounted, shall be provided in front of the water closet.

EXCEPTION: A lavatory may be located within the clear floor space required for a water closet provided that knee and toe clearances for the lavatory comply with subsection 7 below and:

A. In Type B dwelling units the edge of the lavatory shall be located not less than 15 inches from the centerline of the water closet; or

B. In all other occupancies the edge of the lavatory shall be located not less than 18 inches from the centerline of the water closet.

B. Height. The height of water closets shall be a minimum of 17 inches and a maximum of 19 inches measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

C. Grab bars. Grab bars shall be installed at one side and the back of the water closet. The top of grab bars shall be not less than 33 inches and not more than 36 inches above and parallel to the floor. Grab bars located at the side shall be a minimum of 42 inches in length with the front end positioned not less than 18 inches in front of the water closet. Grab bars located at the back shall be a minimum of 36 inches in length. Grab bars shall be mounted not more than 9 inches behind the water closet seat. See also Section 3106(k) 11.

D. Flush controls. Flush controls shall be mounted for use from the wide side of the water closet area and not more than 44 inches above the floor. Flush valves shall comply with Section 3106(c).

E. Dispensers and receptacles. Toilet paper and other dispensers or receptacles shall be installed within easy reach of the water closet, and shall not interfere with unobstructed floor space or grab bar utilization.

6. Urinals. A clear floor space measuring 30 inches in width by 48 inches in depth shall be provided in front of urinals. Urinal shields shall have a clear space between them of not less than 29 inches and shall not extend farther than the front edge of the urinal rim. Urinals shall be stall-type or wall-hung with an elongated rim at a maximum of 17 inches above the floor. Flush controls shall be mounted not more than 44 inches above the floor. Flush valves shall comply with Section 3106(c).

7. Lavatories and sinks.

A. Clear floor space. A clear floor space not less than 30 inches in width by 48 inches in depth shall be provided in front of lavatories and sinks to allow forward approach. The clear floor space may include knee and toe clearances not to exceed 19 inches extending under the lavatory or sink.

B. Height. Lavatories and sinks shall be mounted with the rim or counter surface not higher than 34 inches above the finished floor.

C. Knee and toe clearances.

(i) Lavatories. The total depth of the clear space beneath a lavatory shall be not less than 17 inches of which toe clearance shall be not more than 6 inches of the total depth. Knee clearance shall be not less than 29 inches in height and 30 inches in width.

(ii) Sinks. Knee clearance not less than 27 inches in height, 30 inches in width and 19 inches in depth shall be provided underneath sinks.

D. Exposed pipes and surfaces. Hot water and drain pipes exposed under lavatories and sinks shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under lavatories or sinks.

E. Faucets. Faucet control handles shall be located not more than 17 inches from the front edge of the lavatory, sink or counter, and shall comply with section 3106(c). Self-closing valves shall remain open for at least 10 seconds per operation.

F. Sink depth. Sinks shall be not more than 6-1/2 inches in vertical depth.

8. Mirrors, dispensers and other fixtures. Mirrors or shelves shall be installed so that the bottom of the mirror or the top of the shelf is within 40 inches of the floor.

Drying equipment, towel or other dispensers, and disposal fixtures shall be mounted so as not to exceed 40 inches above the finished floor to any rack, operating controls, receptacle or dispenser.

9. Bathtubs.

A. Clear floor space. A clear floor space not less than 60 inches in length shall be provided along the tub. Where the required seat is located at the end of the tub, the clear floor space shall be not less than 75 inches in length. The clear floor space shall be not less than 30 inches in width where access to the space is parallel to the tub and not less than 48 inches in width where access to the space is at right

angles to the tub. A lavatory which complies with subsection 7, above, may be located in the clear floor space for the tub.

B. Seats. An in-tub seat or a seat at the end of the tub shall be provided. In-tub seats shall be portable and removable, not less than 12 inches in width and extend the full width of the tub. Seats at the end of the tub shall be constructed flush with the top of the tub and shall extend not less than 15 inches from the end of the tub. Seats shall be mounted securely and shall not slip during use.

C. Grab bars. All required grab bars shall be installed parallel to the floor. Lower grab bars shall be installed centered 9 inches above the tub rim. Upper or single grab bars shall be installed centered not less than 33 inches and not more than 36 inches above the floor of the clear space.

Where a tub has a seat at the end, two grab bars not less than 48 inches in length shall be installed on the wall opposite the clear floor space, one end of each shall terminate where the tub abuts the seat.

Where a tub has an in-tub seat, two grab bars not less than 24 inches in length shall be installed on the wall opposite the clear floor space. The grab bars shall extend to not less than 24 inches from one end of the tub and not less than 12 inches from the other end. One grab bar shall be installed on the wall at the end of the tub opposite the drain, extending at least 12 inches from the clear floor space.

For all bathtubs one grab bar shall be installed on the wall at the end of the tub nearest the drain, extending at least 24 inches from the clear floor space.

D. Controls and fixtures. Faucets and other controls shall be located above the tub rim and below the grab bars, shall be not more than 24 inches laterally from the clear floor space and shall comply with section 3106(c).

A shower spray unit with a hose at least 60 inches long that can be used as a fixed shower head or as a hand-held shower shall be provided.

E. Bathtub enclosures. Where provided, enclosures for bathtubs shall not obstruct controls or obstruct transfer from wheelchairs onto bathtub seats or into tubs. Bathtub enclosures on bathtubs shall not have tracks mounted on their rims.

10. Shower stalls.

A. Configuration. Shower stalls shall have one of the following configurations:

- (i) Transfer shower stalls shall be 36 inches by 36 inches, nominal, and shall have a seat; or,
- (ii) Roll-in shower stalls shall be not less than 30 inches in depth by 60 inches in length.

B. Clear floor space. A clear floor space not less than 48 inches in length shall be provided adjacent to shower stalls. For roll-in shower stalls, the clear floor space shall be not less than 60 inches in length. The clear floor space shall be not less than 36 inches in width. A lavatory which complies with Subsection 7 above, may be located in the clear floor space of a roll-in shower.

C. Seats. In transfer shower stalls, a seat shall be mounted not less than 17 inches and not more than 19 inches above the floor, and shall extend the full depth of the stall. The seat shall be located on the wall opposite the controls and shall be mounted not more than 1-1/2 inches from the shower walls. The seat shall be not more than 16 inches in width.

EXCEPTION: A section of the seat not more than 15 inches in length and adjacent to the wall opposite the clear space, may be not more than 23 inches in width.

In roll-in shower stalls, a fold down seat complying with the dimensional requirements of this subsection, may be installed.

D. Grab bars. All required grab bars shall be installed parallel to the floor. All grab bars shall be installed not less than 33 inches and not more than 36 inches above the floor of the adjacent clear space.

For transfer shower stalls, a grab bar not less than 18 inches in length shall be installed on the wall opposite the clear floor space. One end of the grab bar shall terminate at the wall opposite the seat. A grab bar not less than 27 inches in length shall also be installed on the wall opposite the seat.

For roll-in shower stalls, grab bars shall be provided on all permanent stall walls. Grab bars located on either end of the stall shall be not less than 27 inches in length. The grab bar located opposite the clear space shall be not less than 48 inches in length.

E. Controls and fixtures. Faucets and other controls shall be located on the same wall as the shower spray unit, and shall be installed not less than 38 inches or more than 48 inches above the shower floor and shall comply with section 3106(c).

A shower spray unit with a hose at least 60 inches long that can be used as a fixed shower head or as a hand-held shower shall be provided.

EXCEPTION: In unmonitored facilities where vandalism is a consideration, a fixed shower head may be installed not more than 48 inches above the stall floor.

F. Thresholds. In transfer shower stalls, thresholds shall be flush or beveled with a maximum edge height of 1/2 inch, and a maximum slope not more than 1 vertical in 2 horizontal.

Thresholds in roll-in shower stalls shall be level with the adjacent clear space.

G. Shower enclosures. Where provided, enclosures for shower stalls shall not obstruct controls or obstruct transfer from wheelchairs onto shower seats.

11. Structural requirements for grab bars, and tub and shower seats.

A. General. All grab bars, and tub and shower seats required to be accessible shall comply with this section.

B. Size and spacing of grab bars. Grab bars shall have an outside diameter of not less than 1-1/4 inch nor more than 1-1/2 inches and shall provide a clearance of 1-1/2 inches between the grab bar and the wall.

C. Structural strength. The structural strength of grab bars, tub and shower seats, fasteners and mounting devices shall meet the following specifications:

(1) Bending stress in a grab bar or seat induced by the maximum bending moment from the application of 300 lbs. shall be less than the allowable stress for the material of the grab bar or seat.

(2) Shear stress induced in a grab bar or seat by the application of 300 lbs. shall be less than the allowable shear stress for the material of the grab bar or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then

direct and torsional shear stresses shall be totaled for the combined shear stress, which shall not exceed the allowable shear stress.

(3) Shear force induced in a fastener or mounting device from the application of 300 lbs. shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.

(4) Tensile force induced in a fastener by a direct tension force of 300 lbs. plus the maximum moment from the application of 300 lbs. shall be less than the allowable withdrawal load between the fastener and the supporting structure.

D. Special hazards. A grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements. Edges shall have a minimum radius of 1/8 inch.

(l) Kitchens.

1. Clear floor space. An unobstructed floor space shall be provided within kitchens of sufficient size to inscribe a circle with a diameter not less than 60 inches. Doors in any position may encroach into this space by not more than 12 inches. The clear floor spaces at fixtures, the accessible route of travel and the unobstructed floor space may overlap.

2. Counter surfaces and shelving. Within Type A dwelling units, a counter surface, a minimum of 30 inches wide by 24 inches deep, shall be provided at a maximum height of 34 inches, with a space beneath at least 27 inches in height.

In other than dwelling units, at least 50 percent of shelf space in cabinets, refrigerators and freezers shall be within the reach ranges specified in sections 3106(b) 4. E. or 3106(b) 4. F.

(m) Water fountains.

1. Clear floor space. Wall- and post-mounted cantilevered units shall have a minimum clear floor space in front of the units 30 inches in width by 48 inches in depth to allow a forward approach.

Free-standing or built-in units not having a clear space under them shall have a clear floor space at least 30 inches in depth by 48 inches in width in order to allow a person in a wheelchair to make a parallel approach to the unit.

2. Knee space. Wall- and post-mounted cantilevered units shall have knee space in accordance with section 3106(b) 3. C. The knee space shall be not less than 19 inches in depth.

3. Spout location. Spouts shall be located not more than 36 inches above the floor or ground surface. Spouts shall be located in the front of the unit and shall direct a water flow not less than 4 inches in height, in a trajectory parallel to the front of the unit. Recessed units shall be installed such that the spout is not recessed beyond the plane of the wall.

4. Controls. Controls shall be located not more than 6 inches from the front of the unit and shall comply with section 3106(c). The force required to activate the control shall not exceed 5 pounds.

5. Water fountains in alcoves. Where a unit is installed in an alcove greater than 8 inches in depth, the alcove shall be not less than 48 inches in width. A minimum 24 inches of clear space shall be provided from the spout to the nearest side wall of the alcove.

(n) Telephones.

1. Clear floor or ground space. A clear floor or ground space not less than 30 inches by 48 inches that allows either a forward or parallel approach shall be provided in front of telephones. Bases, enclosures and fixed seats shall not project into the clear floor space.

Where parallel approach is provided, any shelf or enclosure shall not project farther than 10 inches beyond the face of the telephone.

Where a forward approach is provided, any shelf shall not project further than 20 inches beyond the face of the telephone; any enclosure panels shall be a minimum 30 inches apart, and where less than 36 inches apart, shall project no more than 24 inches beyond the face of the phone.

2. Height. The highest operable part of a telephone shall be within the reach ranges specified in sections 3106(b) 4. E. or 3106(b) 4. F.

3. Equipment for persons with hearing impairments. Telephones shall be equipped with volume controls and shall be hearing aid compatible. Volume controls shall be capable of increasing volume not less than 12 dbA or more than 18 dbA above normal.

EXCEPTION: Where an automatic reset is provided, 18 dbA may be exceeded.

4. Controls. Telephones shall have pushbutton controls where service for such equipment is available.

5. Cord length. The cord from the telephone to the handset shall be not less than 29 inches in length.

6. Text telephones. Text telephones shall be permanently affixed within, or adjacent to the telephone enclosure. Where an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the text telephone and the telephone receiver.

7. Shelf and electrical outlet. Shelves and an electrical outlet shall be located within or adjacent to the telephone enclosure. The shelf shall be not less than 10 inches by 10 inches in dimension, with a vertical clearance above the shelf of not less than 6 inches. The telephone handset shall be capable of being placed flush on the surface of the shelf.

(o) Alarms.

1. Audible alarms. Audible alarms shall produce a sound in accordance with the Fire Code.

2. Visible alarms. Visible alarm signal appliances shall be integrated into the building or facility alarm system. Where single-station audible alarms are provided, single-station visible alarm signals shall be provided.

EXCEPTION: Dwelling units in Group R, Division 1 apartment buildings.

Visible alarms shall be located not less than 80 inches above floor level, or 6 inches below the ceiling, whichever is lower, and at an interval of not more than 50 feet horizontal, in rooms, corridors and hallways.

In rooms or spaces exceeding 100 feet in horizontal dimension, with no obstructions exceeding 6 feet in height above the finished floor, visible alarms may be placed around the perimeter at intervals not to exceed 100 feet horizontally.

Visible alarm signals shall have the following minimum photometric and location features:

1. The lamp shall be a xenon strobe type or equivalent.
2. The color shall be clear or unfiltered white light.

3. The maximum pulse duration shall be two-tenths of one second (0.2 sec) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.

4. The intensity shall be a minimum of 75 candela.

5. The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.

3. Access to manual fire alarm systems. Manual fire alarm devices shall be mounted not more than 54 inches above the floor where a parallel approach is provided.

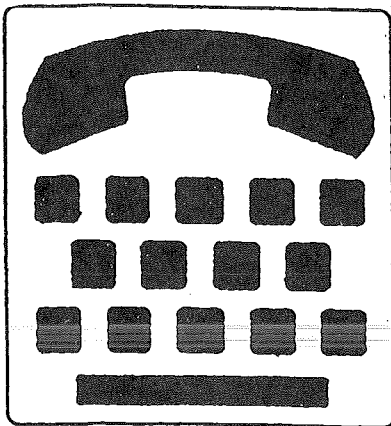
(p) Signage.

1. International symbol of access.

A. General. The international symbol of access shall be as shown below:



B. Text telephones. Text telephones required by section 3105(d) 2. shall be identified by the international text telephone symbol as shown below:



C. Assistive listening systems. Permanently installed assistive listening systems that are required by section 3103(a) 2. B. shall be identified by the international symbol of access for hearing loss as shown below:



D. Volume control telephones. Telephones required by section 3105(d) 2. to have volume controls shall be identified by a handset containing a depiction of a telephone handset with radiating sound waves.

2. Mounting location and height. Signs shall be installed on the wall adjacent to the latch side of the door. Signs shall be centered at 60 inches above the finished floor. Mounting location for such signage shall be such that a person may approach within 3 inches of signage without encountering protruding objects or standing within the swing of a door.

3. Finish and color. Characters and symbols shall have a high contrast with their background. The character and background of interior signs shall be eggshell, matte, or other nonglare finish.

All interior and exterior signs depicting the International Symbol of Access shall be white on a blue background.

4. Character proportion and height. Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum character height for signs that are suspended or projected overhead is 3 inches for upper case letters. Lower case letters are permitted.

5. Raised and braille characters and pictorial symbol signs (pictograms). A. Raised characters and symbols. Characters and symbols on tactile signs shall be raised at least 1/32 inch. Raised characters and symbols shall be upper case characters. Raised characters and symbols shall be between 5/8 inch and 2 inches in height. Raised characters shall be accompanied by braille in accordance with this section.

B. Braille. Braille shall be separated from the corresponding raised characters or symbols. Braille shall be Grade 2.

C. Pictograms. Where provided, pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be not less than 6 inches in height.

(q) Detectable warnings.

1. Walking surfaces. Detectable warnings on walking surfaces shall consist of raised truncated domes having a diameter of 0.9 inches nominal, a height of 0.2 inches nominal and a center-to-center spacing of 2.35 inches nominal, and shall contrast visually with adjoining surfaces.

(r) Storage, shelving and display units.

1. Clear floor space. Storage, shelving and display units shall have a clear floor space not less than 30 inches by 48 inches that allows for either a forward or parallel approach.

2. Height. Accessible storage, shelving and display units shall be within the reach ranges specified in sections 3106(b) 4. E. or 3106(b) 4. F. Clothes rods shall be not more than 54 inches above the floor.

(s) Seating, tables, and sinks.

1. Clear floor space. Seating spaces at tables and sinks shall have a clear floor space of not less than 30 inches by 48 inches that allows a forward approach. The clear floor space shall not overlap knee space by more than 19 inches.

2. Knee clearances. Knee spaces at tables, counters, and sinks shall be provided in accordance with section 3106(b) 4. C. No projection which might obstruct the arm of a wheelchair may intrude into this clearance height, within 24 inches horizontally from the table edge.

3. Height. The tops of tables, and sinks shall be not less than 28 inches nor more than 34 inches in height above the floor or ground.

(t) Aisles. All aisles required to be accessible, including check out aisles, food service lines and aisles between fixed tables, shall be not less than 36 inches in width.

(u) Assembly areas.

1. Wheelchair spaces.

A. Location. Wheelchair spaces shall be an integral part of any fixed seating plan and shall be dispersed throughout the seating area. Spaces shall adjoin an accessible route of travel that also serves as a means of egress and shall be located to provide lines of sight comparable to those for all viewing areas.

EXCEPTION: Accessible viewing positions may be clustered for bleachers, balconies and other areas having sight lines that require slopes of greater than 5 percent. Equivalent accessible viewing positions may be located on levels having accessible egress.

B. Size. Wheelchair spaces shall be not less than 33 inches in width. Where forward or rear approach is provided, wheelchair spaces shall be not less than 48 inches in depth. Where only side approach is provided, wheelchair spaces shall be not less than 60 inches in depth.

C. Surfaces. The ground or floor surfaces at wheelchair locations shall be level and shall comply with section 3106(g).

2. Placement of assistive listening systems. Where an assistive listening system serves individual fixed seats, such seats shall have a clear line of sight and shall be located not more than 50 feet from the stage or performance area.

(v) Restaurants and cafeterias.

1. Aisles. Aisles to fixed tables required to be accessible shall comply with 3106(t).

2. Food service lines.

A. Clear floor space. Food service lines shall comply with section 3106(t).

B. Height. Tray slides shall be mounted not more than 34 inches in height above the floor.

C. Counters and bars. Where service of food or drink is provided at counters more than 34 inches in height, to customers seated on stools or standing, a portion of the main counter shall be provided in compliance with section 3106(s), or service shall be available at accessible tables within the same area.

D. Tableware and condiment areas. Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall be installed to comply with section 3106(s).

(w) Patient bedrooms. Each patient bedroom shall be designed and constructed to provide a 180-degree turn that complies with section 3106(b) 2. A. Each patient room shall have a minimum clear floor space not less than 36 inches on each side of any bed.

(x) Customer service facilities.

1. Dressing and fitting rooms.

A. Clear floor space. Each dressing and fitting room shall have a clear floor space complying with section 3106(b).

EXCEPTION: Dressing and fitting rooms that are entered through a curtained opening need not comply with section 3106(b) 2.

B. Doors. All doors to accessible dressing and fitting rooms shall comply with section 3106(j).

C. Benches. Every accessible dressing or fitting room shall have a bench installed adjacent to the longest wall in the room. The bench shall be not less than 24 inches in width and 48 inches in length, and shall be mounted not less than 17 inches nor more than 19 inches above the finished floor.

Clear floor space shall be provided adjacent to the bench to allow for parallel transfer, and the structural strength of the bench shall comply with section 3106(k) 11.

C. Where benches are installed in dressing and fitting rooms adjacent to showers, swimming pools, or other wet locations, water shall not accumulate upon the surface of the bench and the bench shall have a slip-resistant surface.

D. Mirrors. Where provided, mirrors in accessible dressing and fitting rooms shall be not less than 18 inches in width by 54 inches in height and shall be mounted opposite the bench.

2. Counters and windows. Where counters are required to be accessible, the accessible portion shall be not less than 36 inches in length and not more than 36 inches in height above the finished floor.

Where accessible windows are required, they shall be no more than 36 inches in height above the finished floor.

EXCEPTION: An auxiliary counter with a maximum height of 36 inches is installed in close proximity to the main counter.

3. Check-out aisles. The width of accessible check-out aisles shall comply with section 3106(t). Counters in accessible check-out aisles shall be not more than 38 inches in height, and the top of the raised edge of the counter shall not exceed 40 inches in height above the finished floor.

Accessible check-out aisles shall be identified by the international symbol of access in accordance with section 3106(p) 1. A.

(y) Libraries.

1. Reading and study areas. At least 5 percent or a minimum of one of each element of fixed seating, tables or study carrels shall comply with section 3106(s). Clearances between fixed accessible tables and study carrels shall comply with section 3106(t).

2. Check-out areas. At least one lane at each check-out area shall comply with section 3106(t). Any traffic control or book security gates or turnstiles shall comply with section 3106(j).

3. Card catalogs, magazine displays and stacks. A. Aisles. Aisles between card catalogs, magazine displays or stacks shall comply with section 3106(t).

B. Height. Card catalogs or magazine displays shall have a reach height of not more than 54 inches for side approach and not more than 48 inches for forward approach. Not all shelves in library stacks need be located within reach ranges required by Section 3106(b).

(z) Hotels and congregate residences.

1. Clear floor space. Each sleeping room shall have a space complying with section 3106(b) 1, along both sides of each bed.

EXCEPTION: In rooms with two beds, only one 36 inch-wide maneuvering space need be provided between the two beds.

2. Accessible route of travel. An accessible route complying with section 3103(b) 2. shall connect all accessible spaces and elements; including telephones, patios, terraces, balconies, carports, garages or parking spaces; with all accessible sleeping rooms.

3. Doors. Doors within all sleeping rooms, suites or other covered units shall comply with section 3106(j).

4. Storage. Where fixed or built-in storage is provided in accessible units, sleeping rooms or suites; including cabinets, shelves, closets and drawers; shall comply with section 3106(r).

5. Controls. All controls in accessible units, sleeping rooms and suites shall comply with section 3106(c).

(aa) Dwelling units.

1. Type A and B dwelling units. Type A and B dwelling units shall comply with section 3106.

EXCEPTIONS: 1. Kitchens in Type B dwelling units need not comply with section 3106(l) 1., provided that:

A. A clear space at least 30 inches by 48 inches that allows parallel approach by a person in a wheelchair is provided at the range or cook top and sink, and either a parallel or forward approach is provided at all other appliances; and,

B. In all other kitchens clearance between all opposing counters, base cabinets, countertops, appliances and walls shall be not less than 40 inches; and,

C. In "U" shaped kitchens with a sink, range or cooktop at the base of the "U," an unobstructed floor space of sufficient size to inscribe a circle with a diameter of not less than 60 inches shall be provided.

2. Bathrooms in Type B dwelling units need not comply with section 3106(k) 2. provided that sufficient maneuvering space which is not less than 30 inches by 48 inches is provided within the bathroom. Doors may swing into the clear floor space provided at any fixture, but shall not encroach on the required maneuvering space.

3. Doors in Type B dwelling units other than the primary entry door, need not comply with section 3106(j) 3.

4. Mezzanines in Type A or B dwelling units need not be accessible.

5. Raised or sunken floors in Type B dwelling units need not be accessible, provided that they do not interfere with the accessible route of travel through the unit, and are not located in the kitchen or bathroom.

6. Counter surfaces in Type B dwelling units need not comply with section 3106(l) 2.

7. Within an individual dwelling unit in an elevated building, access to other levels is not required if the accessible level complies with all requirements for accessible dwelling units and contains a bathroom.

8. In Type B dwelling units, exterior deck, patio, or balcony surfaces may be no more than 4 inches below the floor level of the interior surface if the exterior surface is constructed of an impervious material such as concrete, brick or flagstone.

9. Vanities or lavatories in Type A and B dwelling units may be located in the clear floor spaces as permitted in section 3106(k) 5. A.

10. Seats for bathtubs or showers are not required in Type B dwelling units.

11. In Type B dwelling units, the clear floor space for bathtubs or showers may be reduced to not less than 30 inches in width by 48 inches in length.

2. Adaptable fixtures for dwelling units.

A. Grab bars. Grab bars may be omitted in bathing and toilet facilities within Type A or B dwelling units, provided that all structural reinforcements for grab bar installation are provided in the appropriate locations in the adjoining walls.

B. Kitchen counters. Cabinets or shelving may be installed beneath the counter space required by section 3106(l) 2., provided that such cabinetry or shelving is not permanent, and is easily removable.

C. Lavatories. Cabinets or shelving may be installed beneath bathroom lavatories provided that such cabinetry or shelving is not permanent, and is easily removable.

D. Signage. Parking signage required by WAC 51-20-3107(c) need not be installed in spaces designated for accessible dwelling units.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3106, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3106, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3107 Parking facilities. Section 3107.

(a) Accessible parking required. 1. General. For other than Group R, Division 1 apartment buildings, when parking lots or garage facilities are provided, accessible parking spaces shall be provided in accordance with Table No. 31-F.

2. Inpatient Medical Care Facilities. For Group I, Division 1.1, 1.2 and 2 medical care Occupancies specializing in the treatment of persons with mobility impairments, 20 percent of parking spaces provided accessory to such occupancies shall be accessible.

3. Outpatient Medical Care Facilities. For Group I, Division 1.1 and 1.2, and Group B, Division 2 Occupancies providing outpatient medical care facilities, 10 percent of the parking spaces provided accessory to such occupancies shall be accessible.

4. Apartment Buildings. For Group R, Division 1 apartment buildings where parking is provided, one accessible parking space shall be provided for each Type A dwelling unit and reserved for its occupants. In addition, where the total parking provided on a site exceeds 1 parking

space per dwelling unit, not less than 2 percent, and in no case less than 1 space, of this additional parking shall be accessible.

5. Van Parking. For other than Group R, Division 1 apartment buildings, where accessible parking is required, one of every eight accessible parking spaces, or fraction thereof, shall be designated to be accessible to vans.

Accessible parking spaces shall be located on the shortest possible accessible route of travel to an accessible building entrance. In facilities with multiple accessible building entrances with adjacent parking, accessible parking spaces shall be dispersed and located near the accessible entrances. Wherever practical, the accessible route of travel shall not cross lanes of vehicular traffic. Where crossing traffic lanes is necessary, the route of travel shall be designated and marked as a crosswalk.

EXCEPTION: In multilevel parking structures, all accessible van parking spaces may be located on the same level.

Where a parking facility is not accessory to a particular building, accessible parking spaces shall be located on the shortest accessible route to an accessible pedestrian entrance to the parking facility.

(b) Design and construction.

1. General. When accessible parking spaces are required by this section, they shall be designed and constructed in accordance with this section.

2. Size. Parking spaces shall be not less than 96 inches in width and shall have an adjacent access aisle not less than 60 inches in width. Van accessible parking spaces shall have an adjacent access aisle not less than 96 inches in width. Where two adjacent spaces are provided, the access aisle may be shared between the two spaces. Boundaries of access aisles shall be marked so that the aisles will not be used as parking space.

3. Vertical clearance. Where accessible parking spaces are required for vans, the vertical clearance shall be not less than 114 inches at the parking space and along at least one vehicle access route to such spaces from site entrances and exits.

4. Slope. Accessible parking spaces and access aisles shall be located on a surface with a slope not to exceed 1 vertical in 48 horizontal.

5. Surface. Parking spaces and access aisles shall be firm, stable, smooth and slip-resistant.

(c) Signs. Every parking space required by this section shall be identified by a sign, centered between 3 and 5 feet above the parking surface, at the head of the parking space. The sign shall include the international symbol of access and the phrase "state disabled parking permit required."

Van accessible parking spaces shall have an additional sign mounted below the International Symbol of Access identifying the spaces as "Van Accessible."

EXCEPTION: Where all of the accessible parking spaces comply with the standards for van accessible parking spaces.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3107, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3107, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3108 Passenger loading zones. Section 3108.

(a) Location. Where provided, passenger loading zones shall be located on an accessible route of travel.

(b) Design and construction.

1. General. Passenger loading zones shall be designed and constructed in accordance with this section.

2. Size. Passenger loading zones shall provide an access aisle not less than 5 feet in width by 20 feet in length with the long dimension abutting and parallel to: (1) the vehicle space on one side and (2) an accessible route of travel on the other.

3. Slope. Such zones shall be located on a surface with a slope not exceeding 1 vertical in 48 horizontal.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3108, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3108, filed 12/19/91, effective 7/1/92.]

PART III

ACCESSIBILITY FOR EXISTING BUILDINGS

WAC 51-20-3109 Scope. Section 3109.

(a) General. The provisions of this part apply to renovation, alteration and additions to existing buildings including those identified as historic buildings. This chapter includes minimum standards for removing architectural barriers, and providing and maintaining accessibility for persons with disabilities to existing buildings and their related facilities.

(b) Equivalent facilitation. Departures from specific technical and scoping requirements of this part by the use of alternate methods are permitted where such methods will provide equivalent or greater access to, and usability of, the facility. Alternate methods shall permit individuals with disabilities to approach, enter and use a site, building, facility or portion thereof; as easily, safely, conveniently and independently as the specified method.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3109, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3109, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3110 Definitions. Section 3110. For the purpose of this part, certain terms are designated as follows:

Alteration is any change, addition or modification in construction or occupancy.

Alteration, substantial is any alteration where the total cost of all alterations (including but not limited to electrical, mechanical, plumbing and structural changes) for a building or facility within any 12-month period amounts to 60 percent or more of the assessed value.

Path of travel means a continuous, unobstructed way of pedestrian passage by means of which an altered area may be approached, entered, and exited, and which connects the altered area with an exterior approach (including sidewalks, streets, and parking areas), an entry to the facility, and other parts of the facility. For the purposes of this part, the term path of travel also includes restrooms, telephones, and water fountains serving the altered area.

Technically infeasible means that an alteration has little likelihood of being accomplished because existing structural

conditions would require removing or altering a load-bearing member which is an essential part of the structural frame, or because site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and necessary to provide accessibility.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3110, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3110, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3111 Additions. Section 3111. New additions may be made to existing buildings without making the entire building comply, provided the new additions conform to the provisions of Part II of this chapter except as follows:

1. Entries. Where a new addition to a building or facility does not have an accessible entry, at least one entry in the existing building or facility shall be accessible.

2. Accessible route. Where the only accessible entry to the addition is located in the existing building or facility, at least one accessible route of travel shall be provided through the existing building or facility to all rooms, elements and spaces in the new addition which are required to be accessible.

3. Toilet and bathing facilities. Where there are no toilet rooms and bathing facilities in an addition and these facilities are provided in the existing building, then at least one toilet and bathing facility in the existing facility shall comply with section 3106 or with section 3112(c) 7.

4. Group I Occupancies. Where patient rooms are added to an existing Group I Occupancy, a percentage of the additional rooms equal to the requirement of section 3103(a) 6., but in no case more than the total number of rooms required by section 3103(a) 6. shall comply with section 3106(w). Where toilet or bath facilities are part of the accessible rooms, they shall comply with section 3106(k).

5. Group R, Division 1 apartment buildings. Additions of 3 or fewer dwelling units in Group R, Division 1 apartment buildings need not comply with Part II of this chapter.

Where an addition affects the access to or use of an area of primary function, to the maximum extent feasible, the path of travel to the area of primary function shall be made accessible.

EXCEPTION: Subject to the approval of the building official, the path of travel need not be made accessible if the cost of compliance with this part would exceed 20% of the total cost of construction, inclusive of the cost of eliminating barriers, within a 36-month period.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3111, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3111, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3112 Alterations. Section 3112. Alterations.

(a) General.

1. Compliance. Alterations to existing buildings or facilities shall comply with this section. No alteration shall reduce or have the effect of reducing accessibility or usability of a building, portion of a building or facility. If compliance with this section is technically infeasible, the

alteration shall provide accessibility to the maximum extent feasible.

EXCEPTION: Except when substantial as defined by section 3110, alterations to Group R, Division 1 apartment buildings need not comply with this section.

2. Existing elements. If existing elements, spaces, essential features or common areas are altered, each such altered element, space feature or area shall comply with the applicable provisions of Part II of this chapter. Where an alteration is to an area of primary function, to the maximum extent feasible, the path of travel to the altered area shall be made accessible. See also appendix chapter 31 Division II.

EXCEPTIONS:

1. Accessible route of travel need not be provided to altered elements, spaces or common areas which are not areas of primary function.
2. Areas of evacuation assistance need not be added to an altered building.
3. Subject to the approval of the building official [official], the path of travel need not be made accessible if the cost of compliance with this part would exceed 20% of the total cost of construction, inclusive of the cost of eliminating barriers, within a 36-month period.

3. Installation of stairs or escalators. Where an escalator or new stairway is planned or installed requiring major structural changes, then a means of vertical transportation (e.g. elevator, platform lift) shall be provided in accordance with this chapter.

4. Other requirements.

A. Where alterations of single elements, when considered together, amount to an alteration of a room or space in a building or facility, the entire area or space shall be accessible.

B. No alteration of an existing element, space or area of a building shall impose a requirement for greater accessibility than that which would be required for new construction.

C. Where the alteration work is limited solely to the electrical, mechanical or plumbing system or hazardous materials removal, and does not involve the alteration, structural or otherwise, of any elements and spaces required to be accessible under these standards, chapter 31 does not apply.

D. Where alterations would increase the number of public pay phones to four, with at least one on the interior; or where the existing facility has four or more public pay phones and one or more is altered; at least one interior text telephone shall be provided in accordance with section 3106(n).

E. Where a building has an accessible entry, altered entries need not be made accessible unless they provide access to areas of primary function.

F. Where sleeping rooms are altered in an existing Group R, Division 1 hotel or motel, at least 1 sleeping room that complies with section 3106(z) shall be provided for each 25 sleeping rooms or fraction thereof. In addition, at least 1 sleeping room for each 25 sleeping rooms or fraction thereof shall have telephones, visible alarms, and visible notification devices in accordance with section 3103(a) 8. C.

G. Where patient rooms are altered in an existing Group I Occupancy, a percentage of the altered rooms equal to the requirement of section 3103(a) 6., but in no case more than the total number of rooms required by section 3103(a)

6. shall comply with section 3106(w). Where toilet or bath facilities are part of the accessible rooms, they shall comply with section 3106(k).

(b) Substantial alterations. Where substantial alteration as defined in section 3110 occurs to a building or facility, the entire building or facility shall comply with Part II of this code.

EXCEPTION: Areas of evacuation assistance need not be provided to a substantially altered building.

(c) Modifications.

1. General. The following modifications set forth in this section may be used for compliance where the required standard is technically infeasible or when providing access to historic buildings:

2. Ramps. Curb ramps and ramps constructed on existing sites, or in existing buildings or facilities, may have slopes and rises greater than specified in Part II of this chapter, as specified for existing facilities in chapter 31, where space limitations preclude the use of 1 vertical in 12 horizontal slope or less provided that:

A. A slope not greater than 1 vertical in 10 horizontal is allowed for a maximum rise of 6 inches.

B. A slope not greater than 1 vertical in 8 horizontal is allowed for a maximum rise of 3 inches.

C. Slopes greater than 1 vertical in 8 horizontal are prohibited.

3. Stairs. Full extension of stair handrails is not required when such extension would be hazardous or impossible due to plan configuration. When an accessible elevator is provided, existing stairs need not be made accessible.

4. Elevators. Elevators shall comply with chapter 296-81 WAC.

5. Platform lifts. Upon the approval of the building official, platform lifts may be used in alterations, in locations in addition to those permitted in Part II of this chapter, if installation of an elevator is technically infeasible.

Platform lifts shall comply with chapter 296-81 WAC.

6. Doors.

A. Clearance. When existing elements prohibit strict compliance with the clearance requirements, a projection of 5/8 inch maximum is permitted for the latch side door stop.

B. Thresholds. Existing thresholds measuring 3/4 inch high or less which are modified to provide a beveled edge on each side, may be retained.

7. Toilet rooms.

A. Shared facilities. The addition of one unisex toilet facility accessible to all occupants on the floor may be provided in lieu of making existing toilet facilities accessible when it is technically infeasible to comply with either part of chapter 31.

B. Number. The number of toilet facilities and water closets required by the Uniform Plumbing Code may be reduced by one, in order to provide accessible features.

C. Signage. When existing toilet facilities are altered and not all are made accessible, directional signage complying with Section 3106(p) 3, and 4, shall be provided indicating the location of the nearest accessible toilet facility.

8. Assembly areas. Seating shall adjoin an accessible route of travel that also serves as a means of emergency egress or route to an area for evacuation assistance. In

alterations, accessibility to raised or sunken dining areas, or to all parts of outdoor seating areas is not required provided that the same services and amenities are provided in an accessible space usable by the general public and not restricted to use by people with disabilities.

9. Dressing rooms. Where it is technically infeasible to meet the requirements of Part II of this chapter, one dressing room for each sex, or a unisex dressing room, on each level shall be accessible.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3112, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3112, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3113 Historic preservation. Section 3113.

(a) General. Generally, the accessibility provisions of this part shall be applied to historic buildings and facilities as defined in section 104(f) of this code.

The building official, after consulting with the appropriate historic preservation officer, shall determine whether provisions required by this part for accessible routes of travel (interior or exterior), ramps, entrances, toilets, parking or signage would threaten or destroy the historic significance of the building or facility.

If it is determined that any of the accessibility requirements listed above would threaten or destroy the historic significance of a building or facility, the modifications of section 3112(c) for that feature may be utilized.

(b) Special provisions. Where removing architectural barriers or providing accessibility would threaten or destroy the historic significance of a building or facility, the following special provisions may be used:

1. At least one accessible route from a site access point to an accessible route shall be provided.

2. At least one accessible entry which is used by the public shall be provided.

EXCEPTION: Where it is determined by the building official that no entrance used by the public can comply, access at any accessible entry which is unlocked during business hours may be used provided directional signs are located at the main entry and the accessible entry has a notification system. The route of travel for the accessible entry shall not pass through hazardous areas, storage rooms, closets, kitchens or spaces used for similar purposes.

3. Where toilet facilities are provided, at least one toilet facility complying with section 3111 and 3112 shall be provided along an accessible route. Such toilet facility shall be a shared facility available to both sexes.

4. Accessible routes from an accessible entry to all publicly used spaces, on at least the level of the accessible entry, shall be provided. Access should be provided to all levels of a building or facility when practical. Displays and written information and documents shall be located where they can be seen by a seated person.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3113, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3113, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3114 Appeal. Section 3114.

(a) Request for appeal. An appeal from the standards for accessibility for existing buildings may be filed with the building official in accordance with section 204, when:

1. Existing structural elements or physical constraints of the site prevent full compliance or would threaten or destroy the historical significance of a historic building, or
- (b) Review.

1. Consideration of alternative methods. Review of appeal requests shall include consideration of alternative methods which may provide partial access.

2. Waiver or modification of requirements. The appeals board may waive or modify the requirements of this section when it is determined that compliance with accessibility requirements would threaten or destroy the historic significance of a building or facility.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-3114, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3114, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3151 Section 3151.

TABLE NO. 31-A
WHEELCHAIR SPACES REQUIRED IN ASSEMBLY AREAS

Capacity of Seating in Assembly Area	Number of Required Wheelchair Spaces
4 to 25	1
26 to 50	2
51 to 300	4
301 to 500	6
over 500	6 plus 1 for each 100 over 500

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3151, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3152 Section 3152.

TABLE NO. 31-B
REQUIRED TYPE A DWELLING UNITS

Total Number of Dwelling Units on Site	Required Number of Type A Dwelling Units
0-10	None
11-20	1
21-40	2
41-60	3
61-80	4
81-100	5

For every 20 units or fractional part thereof, over 100

1 additional

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3152, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3153 Section 3153.

TABLE NO. 31-C-NUMBER OF ACCESSIBLE ROOMS AND ROLL-IN SHOWERS

TOTAL NUMBER OF ROOMS ¹	MINIMUM REQUIRED ACCESSIBLE ROOMS ¹	ROOMS WITH ROLL-IN SHOWERS
1-25	1	
26-50	2	
51-75	3	1
76-100	4	1
101-150	5	2
151-200	6	2
201-300	7	3
301-400	8	4
401-500	9	4 plus 1 for every 100 rooms or fraction thereof, over 400.
501-1000	2% of total	
Over 1000	20 plus 1 for every 100 rooms or fraction thereof, over 1000	

¹. For congregate residences the numbers in these columns shall apply to beds rather than rooms.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3153, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3154 Section 3154.

TABLE NO. 31-D-NUMBER OF ACCESSIBLE ROOMS FOR PERSONS WITH HEARING IMPAIRMENTS

TOTAL NUMBER OF ROOMS	MINIMUM REQUIRED NUMBER
1-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-300	7
301-400	8
401-500	9
501-1000	2% of total rooms
Over 1000	20 plus 1 for every 100 rooms, or fraction thereof, over 1000.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3154, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3155 Section 3155.

TABLE NO. 31-E
REQUIRED CHECK-OUT AISLES

Total Check-out Aisles Units on Site	Minimum Number of Accessible Check-out Aisles
1-4	1
5-8	2
9-15	3
Over 15	3 plus 20% of additional aisles

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3155, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3156 Section 3156.

TABLE NO. 31-F-NUMBER OF ACCESSIBLE PARKING SPACES

TOTAL PARKING SPACES IN LOT OR GARRAGE	MINIMUM REQUIRED NUMBER OF ACCESSIBLE SPACES
1-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-300	7
301-400	8
401-500	9
501-999	2% of total spaces
Over 1000	20 spaces plus 1 space for every 100 spaces, or fraction thereof, over 1000.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3156, filed 12/19/91, effective 7/1/92.]

WAC 151-20-3300 Chapter 33. Exits.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3300, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3304 Doors. Section 3304.

(a) General. This section shall apply to every exit door serving an area having an occupant load of 10 or more, or serving hazardous rooms or areas, except that subsections (c), (i), (j) and (k) shall apply to all exit doors regardless of occupant load. Buildings or structures used for human occupancy shall have at least one exterior exit door that meets the requirements of subsection (f). Doors and landings at doors which are located within an accessible route of travel shall also comply with chapter 31.

(b) Swing and opening force. Exit doors shall be of the pivoted or side-hinged swinging type. Exit doors shall swing in the direction of exit travel when serving any hazardous area or when serving an occupant load of 50 or more. The door latch shall release when subjected to a 15-pound force, and the door shall be set in motion when subjected to a 30-pound force. The door shall swing to full-open position when subjected to 15-pound force. Forces shall be applied to the latch side. Except that at exit doors within the accessible route of travel such force shall not exceed 8.5 pounds, and at sliding and folding doors, and interior swinging doors such force shall not exceed 5 pounds. At exterior doors where environmental conditions require greater closing pressure, power-operated doors shall be used within the accessible route of travel.

See section 4507 for doors swinging over public property.

- EXCEPTIONS:
1. Group I, Division 3 Occupancy used as a place of detention.
 2. In other than accessible dwelling units doors within or serving an individual dwelling unit.
 3. Special door conforming with subsection (h).

Double-acting doors shall not be used as exits when any of the following conditions exist:

1. The occupant load served by the door is 100 or more.
2. The door is part of a fire assembly.
3. The door is part of a smoke- and draft-control assembly.
4. Panic hardware is required or provided on the floor.

A double-acting door shall be provided with a view panel of not less than 200 square inches.

(c) Type of lock or latch. Exit doors shall be openable from the inside without the use of a key or any special knowledge or effort.

EXCEPTIONS:

1. In Group B Occupancies, key-locking hardware may be used on the main exit when the main exit consists of a single door or pair of doors if there is a readily visible, durable sign on or adjacent to the door stating THIS DOOR TO REMAIN UNLOCKED DURING BUSINESS HOURS. The sign shall be in letters not less than 1 inch high on a contrasting background. When unlocked, the single door or both leaves of a pair of doors must be free to swing without operation of any latching device. The use of this exception may be revoked by the building official for due cause.

2. Exit doors from individual dwelling units; Group R, Division 3 congregate residences; and guest rooms of Group R Occupancies having an occupant load of 10 or less may be provided with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool and mounted at a height not to exceed 48 inches above the finished floor.

Manually operated edge- or surface-mounted flush bolts and surface bolts are prohibited. When exit doors are used in pairs and approved automatic flush bolts are used, the door leaf having the automatic flush bolts shall have no door knob or surface-mounted hardware. The unlatching of any leaf shall not require more than one operation.

- EXCEPTIONS:
1. Group R, Division 3 Occupancies.
 2. When a pair of doors serving a room not normally occupied are needed for the movement of equipment, manually operated edge or surface bolts may be used and a door closer need not be provided on the inactive leaf.

(d) Panic hardware. Panic hardware, when installed, shall comply with the requirements of U.B.C. Standard No. 33-4. The activating member shall be mounted at a height of not less than 30 inches or more than 44 inches above the floor. The unlatching force shall not exceed 15 pounds when applied in the direction of exit travel.

When balanced doors are used and panic hardware is required, panic hardware shall be of the push-pad type and the pad shall not extend across more than one-half of the width of the door measured from the latch side.

(e) Special egress-control devices. When approved by the building official, exit doors in Group B, Division 2 Occupancies may be equipped with approved listed special egress-control devices of the time-delay type, provided the building is protected throughout by an approved automatic sprinkler system and an approved automatic smoke-detection system. Such devices shall conform to all of the following:

1. Automatically deactivate the egress-control device upon activation of either the sprinkler system or the detection system.
2. Automatically deactivate the egress-control device upon loss of electrical power to any one of the following:
 - A. The egress-control device.
 - B. The smoke-detection device.
 - C. Exit illumination as required by section 3313.
3. Be capable of being deactivated by a signal from a switch located in an approved location.
4. Initiate an irreversible process which will deactivate the egress-control device whenever a manual force of not more than 15 pounds is applied for two seconds to the panic

bar or other door-latching hardware. The egress-control device shall deactivate within an approved time period not to exceed a total of 15 seconds. The time delay established for each egress-control device shall not be field adjustable.

5. Actuation of the panic bar or other door-latching hardware shall activate an audible signal at the door.

6. The unlatching shall not require more than one operation.

A sign shall be provided on the door located above and within 12 inches of the panic bar or other door-latching hardware reading: KEEP PUSHING. THIS DOOR WILL OPEN IN SECONDS. ALARM WILL SOUND.

Sign letter shall be at least 1 inch in height and shall have a stroke of not less than 1/8 inch.

Regardless of the means of deactivation, relocking of the egress-control device shall be by manual means only at the door.

(f) Width and height. Every required exit doorway shall be of a size as to permit the installation of a door not less than 3 feet in width and not less than 6 feet 8 inches in height. When installed, exit doors shall be capable of opening so that the clear width of the exit is not less than 32 inches. In computing the exit width required by section 3303(b), the net dimension of the exitway shall be used.

(g) Door leaf width. A single leaf of an exit door shall not exceed 4 feet in width.

(h) Special doors. Revolving, sliding and overhead doors shall not be used as required exits. Where a turnstile is used, a gate or door to accommodate persons with disabilities shall be installed.

EXCEPTION: Horizontal sliding doors complying with U.B.C. Standard No. 43-13 may be used in:

- A. Elevator lobbies.
- B. Smoke barriers of Group I, Division 1.1 Occupancies.

Power-operated doors complying with U.B.C. Standard No. 33-1 may be used for exit purposes. Such doors when swinging shall have two guide rails installed on the swing side projecting out from the face of the door jambs for a distance not less than the widest door leaf. Guide rails shall be not less than 30 inches in height with solid or mesh panels to prevent penetration into door swing and shall be capable of resisting a horizontal load at top of rail of not less than 50 pounds per lineal foot.

EXCEPTIONS:

1. Walls or other type separators may be used in lieu of the above guide rail, provided all the criteria are met.
2. Guide rails in industrial or commercial occupancies not accessible to the public may conform with the exception to the third paragraph of section 1712.
3. Doors swinging toward flow of traffic shall not be permitted for use by untrained pedestrian traffic unless actuating devices start to function at least 8 feet 11 inches beyond door in open position and guide rails extend 6 feet 5 inches beyond door in open position.

Clearances for guide rails shall be as follows:

1. Six inches maximum between rails and leading edge of door at the closest point in its arc of travel.
2. Six inches maximum between rails and the door in an open position.
3. Two inches minimum between rail at hinge side and door in open position.

4. Two inches maximum between freestanding rails and jamb or other adjacent surface.

(i) Floor level at doors. Regardless of the occupant load, there shall be a floor or landing on each side of a door. When access for persons with disabilities is required by chapter 31, the floor or landing shall not be more than 1/2 inch lower than the threshold of the doorway. When such access is not required, such dimension shall not exceed 1 inch. Landings shall be level except for exterior landings, which may have a slope not to exceed 1/4 inch per foot.

EXCEPTIONS:

1. In Group R, Division 3, and Group M Occupancies and within individual units of Group R, Division 1 Occupancies:

A. A door may open at the top step of an interior flight of stairs, provided the door does not swing over the top step.

B. A door may open at a landing that is not more than 8 inches lower than the floor level, provided the door does not swing over the landing.

C. Screen doors and storm doors may swing over stairs, steps or landings.

2. Doors serving building equipment rooms which are not normally occupied.

(j) Landings at doors. Landings shall have a width not less than the width of the stairway or the width of the door, whichever is the greater. Doors in the fully open position shall not reduce a required dimension by more than 7 inches. When a landing serves an occupant load of 50 or more, doors in any position shall not reduce the landing dimension to less than one-half its required width. Landings shall have a length measured in the direction of travel of not less than 44 inches.

EXCEPTION: In Group R, Division 3, and Group M Occupancies and within individual units of Group R, Division 1 Occupancies, such length need not exceed 36 inches.

A landing which has no adjoining door shall comply with section 3306(g).

(k) Door identification. Glass doors shall conform to the requirements specified in section 5406.

Exit doors shall be marked so that they are readily distinguishable from the adjacent construction.

(l) Additional doors. When additional doors are provided for egress purposes, they shall conform to all provisions of this chapter.

EXCEPTION: Approved revolving doors having leaves which will collapse under opposing pressures may be used in exit situations, provided:

A. Such doors have a minimum width of 6 feet 6 inches.

B. At least one conforming exit door is located adjacent to each revolving door.

C. The revolving door shall not be considered to provide any exit width.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3304, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3306 Stairways. Section 3306.

(a) General. Every stairway having two or more risers serving any building or portion thereof shall conform to the requirements of this section. When aisles in assembly rooms have steps, they shall conform with the provisions in section 3315.

EXCEPTION: Stairs or ladders used only to attend equipment are exempt from the requirements of this section.

(b) Width. The minimum stairway width shall be determined as specified in section 3303(b), but shall not be less than 44 inches except as specified herein. Stairways serving an occupant load of 49 or less shall not be less than 36 inches in width.

Handrails may project into the required width a distance of 3 1/2 inches from each side of a stairway. Stringers and other projections such as trim and similar decorative features may project into required width 1 1/2 inches on each side.

(c) Rise and run. The rise of every step in a stairway shall not be less than 4 inches or greater than 7 inches. Except as permitted in subsections (d) and (f), the run shall not be less than 11 inches as measured horizontally between the vertical planes of the furthest projection of adjacent treads. Except as permitted in subsections (d), (e) and (f), the largest tread run within any flight of stairs shall not exceed the smallest by more than 3/8 inch. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch.

EXCEPTIONS:

1. Private stairways serving an occupant load of less than 10 and stairways to unoccupied roofs may be constructed with an 8-inch maximum rise and a 9-inch minimum run.
2. Where the bottom or top riser adjoins a sloping public way, walk or driveway having an established grade and serving as a landing, the bottom or top riser may be reduced along the slope to less than 4 inches in height with the variation in height of the bottom or top riser not to exceed 3 inches in every 3 feet of stairway width.

(d) Winding stairways. In Group R, Division 3 Occupancies and in private stairways in Group R, Division 1 Occupancies, winders may be used if the required width of run is provided at a point not more than 12 inches from the side of the stairway where the treads are narrower, but in no case shall any width of run be less than 6 inches at any point.

(e) Circular stairways. Circular stairways may be used as an exit, provided the minimum width of run is not less than 10 inches and the smaller radius is not less than twice the width of the stairway. The largest tread width or riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch.

(f) Spiral stairways. In Group R, Division 3 Occupancies and in private stairways within individual units of Group R, Division 1 Occupancies, spiral stairways may be installed. Such stairways may be used for required exits when the area served is limited to 400 square feet.

The tread must provide a clear walking area measuring at least 26 inches from the outer edge of the supporting column to the inner edge of the handrail. A run of at least 7 1/2 inches is to be provided at a point 12 inches from where the tread is the narrowest. The rise must be sufficient to provide 6-foot 6-inch headroom. The rise shall not exceed 9 1/2 inches.

(g) Landings. Stairways shall have landings at the top and bottom. Every landing shall have a dimension measured in the direction of travel not less than the width of the stairway. Such dimension need not exceed 44 inches when the stair has a straight run. There shall not be more than 12 feet vertically between landings. For landings with adjoining doors, see section 3304(j).

EXCEPTION: Stairs serving an unoccupied roof are exempt from these provisions.

(h) Basement stairways. When a basement stairway and a stairway to an upper story terminate in the same exit enclosure, an approved barrier shall be provided to prevent persons from continuing on into the basement. Directional exit signs shall be provided as specified in section 3314.

(i) Handrails. Stairways shall have handrails on each side, and every stairway required to be more than 88 inches in width shall be provided with not less than one intermediate handrail for each 88 inches of required width. Intermediate handrails shall be spaced approximately equally across the entire width of the stairway.

EXCEPTIONS:

1. Stairways less than 44 inches in width or stairways serving one individual dwelling unit in Group R, Division 1 or 3 Occupancies, or a Group R, Division 3 congregate residence may have one handrail.
2. Private stairways 30 inches or less in height may have handrails on one side only.
3. Stairways having less than four risers and serving one individual dwelling unit in Group R, Division 1 or 3, or a Group R, Division 3 congregate residence or serving Group M Occupancies need not have handrails.

The top of handrails and handrail extensions shall be placed not less than 34 inches or more than 38 inches above the nosing of treads and landings. Handrails shall be continuous the full length of the stairs and, except for private stairways, at least one handrail shall extend in the direction of the stair run not less than 12 inches beyond the top riser or less than 23 inches beyond the bottom riser. Ends shall be returned or shall terminate in newel posts or safety terminals.

The handgrip portion of handrails shall be not less than 1 1/2 inches or more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface. The handgrip portion of handrails shall have a smooth surface with no sharp corners.

Handrails projecting from a wall shall have a space of not less than 1 1/2 inches between the wall and the handrail. Any recess containing a handrail shall allow a clearance of not less than 18 inches above the top of the rail, and shall be not more than 3 inches in horizontal depth.

Handrails shall not rotate within their fittings.

(j) Guardrails. Stairways open on one or both sides shall have guardrails as required by section 1712.

(k) Exterior stairway protection. Except in Group R, Division 3 Occupancies, all openings in the exterior wall below and within 10 feet, measured horizontally, of an exterior exit stairway serving a building over two stories in height or a floor level having such openings in two or more floors below shall be protected by self-closing fire assembly having a three-fourths-hour fire-protection rating. Exterior stairways enclosed on three or more sides shall comply with the flame-spread requirements for interior stairways.

EXCEPTIONS:

1. Openings may be unprotected when two separate exterior stairways serve an exterior exit balcony.
2. Protection of openings is not required for open parking garages conforming to section 709.

(l) Interior stairway construction. Interior stairways shall be constructed as specified in Part IV of this code.

Except when enclosed useable space under stairs is prohibited by section 3309(f), the walls and soffits of the

enclosed space shall be protected on the enclosed side as required for one-hour fire-resistive construction.

All required interior stairways which extend to the top floor in any building four or more stories in height shall have, at the highest point of the stair shaft, an approved hatch openable to the exterior not less than 16 square feet in area with a minimum dimension of 2 feet.

EXCEPTION: The hatch need not be provided on smokeproof enclosures or on stairways that extend to the roof with an opening onto that roof.

Stairways exiting directly to the exterior of a building four or more stories in height shall be provided with means for emergency entry for fire department access.

(m) Exterior stairway construction. Exterior stairways shall be constructed as specified in Part IV of this code.

Exterior stairways shall not project into yards where openings are not permitted or protection of openings is required.

Enclosed usable space under stairs shall have the walls and soffits protected on the enclosed side as required for one-hour fire-resistive construction.

Stairways exiting directly to the exterior of a building four or more stories in height shall be provided with means for emergency entry for fire department access.

(n) Stairway to roof. In buildings four or more stories in height, one stairway shall extend to the roof surface, unless the roof has a slope greater than 4 in 12. See subsection 3306(l) for roof hatch requirements.

(o) Headroom. Every stairway shall have a headroom clearance of not less than 6 feet 8 inches. Such clearances shall be measured vertically from a plane parallel and tangent to the stairway tread nosings to the soffit above at all points.

(p) Stairway identification. Approved stairway identification signs shall be located at each floor level in all enclosed stairways in buildings four or more stories in height. The sign shall identify the stairway, indicate whether there is roof access, the floor level, and the upper and lower terminus of the stairway. The sign shall be located approximately 5 feet above the floor landing in a position which is readily visible when the door is in the open or closed position. Signs shall comply with requirements of U.B.C. Standard No. 33-2.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3306, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3315 Aisles. Section 3315.

(a) General. Aisles leading to required exits shall be provided from all portions of buildings. Aisles located within an accessible route of travel shall also comply with chapter 31.

(b) Width in occupancies without fixed seats. The width of aisles in occupancies without fixed seats shall comply with this section. Aisle widths shall be provided in accordance with the following:

1. In areas serving employees only, the minimum aisle width may be 24 inches but not less than the width required by the number of employees served.

2. In public areas of Group B, Division 2 Occupancies, and in assembly occupancies without fixed seats, the minimum clear aisle width shall be 36 inches where tables,

counters, furnishings, merchandise or other similar obstructions are placed on one side of the aisle only and 44 inches when such obstructions are placed on both sides of the aisle.

(c) Width in assembly occupancies with fixed seats. Aisles in assembly occupancies with fixed seats shall comply with this section. The clear width of aisles shall be based on the number of occupants within the portion of the seating areas served by the aisle.

The clear width of an aisle in inches shall not be less than the occupant load served by the aisle multiplied by 0.3 for aisles with slopes greater than 1 vertical to 8 horizontal and not less than 0.2 for aisles with slopes of 1 vertical to 8 horizontal or less. In addition, when the rise of steps in aisles exceeds 7 inches, the aisle clear width shall be increased by 1 1/4 inches for each 100 occupants or fraction thereof served for each 1/4 inch of riser height above 7 inches.

Where exiting is possible in two directions, the width of such aisles shall be uniform throughout their length.

When aisles converge to form a single path of exit travel, the aisle width shall not be less than the combined required width of the converging aisle.

In assembly rooms with fixed seats arranged in rows, the clear width of aisles shall not be less than set forth above or less than the following:

48 inches for stairs having seating on both sides.

36 inches for stairs having seating on one side.

23 inches between a stair handrail and seating when the aisles are subdivided by the handrail.

42 inches for level or ramped aisles having seating on both sides.

36 inches for level or ramped aisles having seating on one side.

23 inches between a stair handrail and seating when an aisle does not serve more than five rows on one side.

(d) Aisle termination. Aisles shall terminate at a cross aisle, foyer, doorway or vomitory. Aisles shall not have a dead end greater than 20 feet in length.

EXCEPTION: A longer dead-end aisle is permitted when seats served by the dead-end aisle are not more than 24 seats from another aisle measured along a row of seats having a minimum clear width of 12 inches plus 0.6 inch for each additional seat above seven in a row.

Each end of a cross aisle shall terminate at an aisle, foyer, doorway or vomitory.

(e) Ramp slope. The slope of ramped aisles shall not be more than 1 vertical in 8 horizontal. Ramped aisles shall have a slip-resistant surface.

EXCEPTION: When provided with fixed seating, theaters may have a slope not steeper than 1 vertical to 5 horizontal.

(f) Aisle steps.

1. When prohibited. Steps shall not be used in aisles having a slope of 1 vertical to 8 horizontal or less.

2. When required. Aisles with a slope steeper than 1 vertical to 8 horizontal shall consist of a series of risers and treads extending across the entire width of the aisle, except as provided in subsection (e).

The height of risers shall not be more than 7 inches or less than 4 inches and the tread run shall not be less than 11 inches. The riser height shall be uniform within each flight and the tread run shall be uniform throughout the aisle.

Variations in run or height between adjacent treads or risers shall not exceed 3/16 inch. A contrasting marking stripe or other approved marking shall be provided on each tread at the nosing or leading edge such that the location of each tread is readily apparent when viewed in descent. Such stripe shall be a minimum of 1 inch wide and a maximum of 2 inches wide.

EXCEPTION: When the slope of aisle steps and the adjoining seating area is the same, the riser heights may be increased to a maximum of 9 inches and may be nonuniform but only to the extent necessitated by changes in the slope of the adjoining seating area to maintain adequate sightlines. Variations may exceed 3/16 inch between adjacent risers provided the exact location of such variations is identified with a marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform riser. The marking stripe shall be distinctively different from the contrasting marking stripe.

(g) **Handrails.** Handrails shall comply with the height, size and shape dimensions set forth in section 3306(i) and shall have rounded terminations or bends. Ramped aisles having a slope steeper than 1 vertical to 15 horizontal and aisle stairs (two or more adjacent steps) shall have handrails located either at the side or within the aisle width. Handrails may project into the required aisle width a distance of 3 1/2 inches.

EXCEPTIONS:

1. Handrails may be omitted on ramped aisles having a slope not greater than 1 vertical in 8 horizontal when fixed seating is on both sides of the aisle.
2. Handrails may be omitted when a guardrail is at the side of an aisle which conforms to the size and shape requirements for handrails.

Handrails located within the aisle width shall be discontinuous with gaps or breaks at intervals not to exceed five rows. These gaps or breaks shall have a clear width of not less than 22 inches or more than 36 inches measured horizontally. Such handrails shall have an additional intermediate handrail located 12 inches below the main handrail.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3315, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3350 Section 3350.

TABLE NO. 33-A
MINIMUM EGRESS REQUIREMENTS¹

USE ²	MINIMUM OF TWO EXITS OTHER THAN ELEVATORS ARE REQUIRED WHERE NUMBER OF OCCUPANTS IS AT LEAST	OCCUPANT LOAD FACTOR ³ (sq. ft.)
1. Aircraft hangars (no repair)	10	500
2. Auction rooms	30	7
3. Assembly areas, concentrated use (without fixed seats Auditoriums Churches and chapels Dance floors Lobby accessory to assembly occupancy Lodge rooms Reviewing stands Stadiums Waiting Area	50	7
4. Assembly areas, less-concentrated use Conference rooms Dining rooms Drinking establishments Exhibit rooms Gymnasiums Lounges Stages	50	15
5. Bowling alley (assume no occupant load for bowling lanes)	50	4
6. Children's homes and homes for the aged	6	80
7. Classrooms	50	20
8. Congregate residences (accommodating 10 or less persons and having an area of 3,000 square feet or less)	10	300
Congregate residences (accommodating more than 10 persons or having an area of more than 3,000 square feet)	10	200
9. Courtrooms	50	40
10. Dormitories	10	50
11. Dwellings	10	300
12. Exercising rooms	50	50
13. Garage, parking	30	200

TABLE NO. 33-A--MINIMUM EGRESS REQUIREMENTS¹--(Continued)

USE ²	MINIMUM OF TWO EXITS OTHER THAN ELEVATORS ARE REQUIRED WHERE NUMBER OF OCCUPANTS IS AT LEAST	OCCUPANT LOAD FACTOR ³ (sq. ft.)
14. Hospitals and sanitariums--		
Nursing homes	6	80
Sleeping rooms		
Treatment rooms	10	80
Health-care center	10	80
15. Hotels and apartments	10	200
16. Kitchen--commercial	30	200
17. Laboratories (B-2)		
Instructional and teaching laboratories at schools, colleges and universities	10	50
All other B-2 laboratories	10	100
18. Library reading room	50	50
19. Locker rooms	30	50
20. Malls (see Chapter 56)	--	---
21. Manufacturing areas	30	200
22. Mechanical equipment room	30	300
23. Nurseries for children (day care)	7	35
24. Offices	30	100
25. School shops and vocational rooms	50	50
26. Skating rinks	50	50 on the skating area; 15 on the deck
27. Storage and stock rooms	30	300
28. Stores--retail sales rooms	50	30
29. Swimming pools	50	50 for the pool area; 15 on the deck
30. Warehouses	30	500
31. All others	50	100

¹ Access to, and egress from, buildings for persons with disabilities shall be provided as specified in Chapter 31.

² For additional provisions on number of exits from Groups H and I Occupancies and from rooms containing fuel-fired equipment or cellulose nitrate, see Sections 3319, 3320 and 3321, respectively.

³ This table shall not be used to determine working space requirements per person.

⁴ Occupant load based on five persons for each alley, including 15 feet of runway.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3350, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3800 Chapter 38. Fire-extinguishing systems.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3800, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3801 Scope. Section 3801.

(a) General. All fire-extinguishing systems required in this code shall be installed in accordance with the requirements of this chapter.

Fire hose threads used in connection with fire-extinguishing systems shall be national standard hose thread or as approved by the fire department.

In buildings used for high-piled combustible storage, fire protection shall be in accordance with the Fire Code.

(b) Standard of quality. All fire-extinguishing systems including automatic sprinkler systems, Class I, Class II and Class III standpipe systems, combined systems, special automatic extinguishing systems and basement pipe inlets shall be approved and shall be subject to such periodic tests as may be required. The location of all fire department hose connections shall be approved by the fire department.

The standards listed below labeled a "U.B.C. Standard" are also listed in chapter 60, Part II, and are part of this code.

1. Fire-extinguishing system

A. U.B.C. Standard No. 38-1, Installation of Sprinkler Systems

B. U.B.C. Standard No. 38-3, Installation of Sprinkler Systems in Group R Occupancies Four Stories or Less

2. Standpipe systems

A. U.B.C. Standard No. 38-2, Standpipe Systems

(c) Definitions. For the purpose of this chapter, certain terms are defined as follows:

Automatic fire-extinguishing system is an approved system of devices and equipment which automatically detects a fire and discharges an approved fire-extinguishing agent onto or in the area of a fire.

Combined system is a system of water piping which serves 2 1/2-inch hose outlets for use by the fire department and also supplies water to fire sprinklers.

Fire department inlet connection is a connection through which the fire department can pump water into a standpipe system, or sprinkler system.

Standpipe system is a wet or dry system of piping, valves, outlets and related equipment designed to provide water at specified pressures and installed exclusively for the fighting of fires, including the following:

Class I is a standpipe system equipped with 2 1/2-inch outlets.

Class II is a standpipe system directly connected to a water supply and equipped with 1 1/2-inch outlets and hose.

Class III is a standpipe system directly connected to a water supply and equipped with 2 1/2-inch outlets or 2 1/2-inch and 1 1/2-inch outlets when a 1 1/2-inch hose is required. Hose connections for Class III systems may be made through 2 1/2-inch hose valves with easily removable 2 1/2-inch by 1 1/2-inch reducers.

(d) Standards. Fire-extinguishing systems shall comply with U.B.C. Standards Nos. 38-1 and 38-2.

EXCEPTIONS:

1. Automatic fire-extinguishing systems not covered by U.B.C. Standard No. 38-1 or 38-2 shall be approved and installed in accordance with approved standards.

2. Automatic sprinkler systems may be connected to the domestic water-supply main when approved by the building official, provided the domestic water supply is of adequate pressure, capacity and sizing for the combined domestic and sprinkler requirements. In such case, the sprinkler system connection shall be made between the public water main or meter and the building shutoff valve, and there shall not be intervening valves or connections. The fire department connection may be omitted when approved by the fire department.

3. Automatic sprinkler systems in Group R Occupancies four stories or less may be in accordance with U.B.C. Standard No. 38-3. When residential sprinkler systems as set forth in U.B.C. Standard No. 38-3 are provided, exceptions to or reductions in code requirements based on the installation of an automatic fire-extinguishing system are not allowed.

(e) Modifications. When a residential sprinkler system as set forth in U.B.C. Standard No. 38-1 is provided, exception to, or reductions in, code requirements allowed because of the installation of an automatic fire-extinguishing system are not permitted.

(f) When sprinklers are installed in an insulated ceiling cavity not meeting exceptions of UBC Standard No. 38-1 or where blocked by ducts or other similar obstructions, a space 6 inches or greater in depth with not less than 12 inches clearance from ducts or other similar obstructions shall be provided under all sprinklers.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3801, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3802 Automatic fire-extinguishing systems. Section 3802.

(a) Where required. An automatic fire-extinguishing systems shall be installed in the occupancies and locations as set forth in this section.

For provisions on special hazards and hazardous materials, see the Fire Code.

(b) All Occupancies except Group R, Division 3 and Group M. Except for Group R, Division 3 and Group M Occupancies, an automatic sprinkler system shall be installed:

1. In every story or basement of all buildings when the floor area exceeds 1,500 square feet and there is not provided at least 20 square feet of opening entirely above the adjoining ground level in each 50 lineal feet or fraction thereof of exterior wall in the story or basement on at least one side of the building. Openings shall have a minimum dimension of not less than 30 inches. Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that firefighting or rescue cannot be accomplished from the exterior.

When openings in a story are provided on only one side and the opposite wall of such story is more than 75 feet from such openings, the story shall be provided with an approved automatic sprinkler system, or openings as specified above shall be provided on at least two sides of an exterior wall of the story.

If any portion of a basement is located more than 75 feet from openings required in this section, the basement shall be provided with an approved automatic sprinkler system.

2. At the top of rubbish and linen chutes and in their terminal rooms. Chutes extending through three or more floors shall have additional sprinkler heads installed within such chutes at alternate floors. Sprinkler heads shall be accessible for servicing.

3. In rooms where nitrate film is stored or handled.

4. In protected combustible fiber storage vaults as defined in the Fire Code.

(c) Group A Occupancies.

1. Drinking establishments. An automatic sprinkler system shall be installed in rooms used by the occupants for the consumption of alcoholic beverages and unseparated accessory uses where the total area of such unseparated rooms and assembly uses exceeds 5,000 square feet. For uses to be considered as separated, the separation shall not be less than as required for a one-hour occupancy separation. The area of other uses shall be included unless separated by at least a one-hour occupancy separation.

2. Basements. An automatic sprinkler system shall be installed in basements classified as a Group A Occupancy when the basement is larger than 1,500 square feet in floor area.

3. Exhibition and display rooms. An automatic sprinkler system shall be installed in Group A Occupancies which have more than 12,000 square feet of floor area which can be used for exhibition or display purposes.

4. Stairs. An automatic sprinkler system shall be installed in enclosed usable space below or over a stairway in Group A, Divisions 2, 2.1, 3 and 4 Occupancies. See section 3309(f).

5. Every building containing a multitheater complex.

6. Amusement buildings. An automatic sprinkler system shall be installed in all amusement buildings. The main water-flow switch shall be electrically supervised. The sprinkler main cutoff valve shall be supervised. When the amusement building is temporary, the sprinkler water-supply system may be of an approved temporary type.

EXCEPTION: An automatic sprinkler system need not be provided when the floor area of a temporary amusement building is less than 1,000 square feet and the exit travel distance from any point is less than 50 feet.

7. Other areas. An automatic sprinkler system shall be installed under the roof and gridiron, in the tie and fly galleries, and in all places behind the proscenium wall of stages; over and within permanent platforms in excess of 500 square feet in area; and in dressing rooms, workshops and storerooms accessory to such stages or permanent platforms.

EXCEPTIONS: 1. Stages or platforms open to the auditorium room on three or more sides.

2. Altars, pulpits or similar platforms and their accessory rooms.

3. Stage gridirons when side-wall sprinklers with 135°F. rated heads with heat-baffle plates are installed around the entire perimeter of the stage except for the proscenium opening at points not more than 30 inches below the gridiron or more than 6 inches below the baffle plate.

4. Under stage or under platform areas less than 4 feet in clear height used exclusively for chair or table storage and lined on the inside with materials approved for one-hour fire-resistive construction.

(d) Group B, Division 2 Occupancies. An automatic sprinkler system shall be installed in retail sales rooms

classified as Group B, Division 2 Occupancies where the floor area exceeds 12,000 square feet on any floor or 24,000 square feet on all floors or in Group B, Division 2 retail sales occupancies more than three stories in height. The area of mezzanines shall be included in determining the areas where sprinklers are required.

(e) Group E Occupancies.

1. Basements. An automatic sprinkler system shall be installed in basements classified as a Group E Occupancy when the basement is larger than 1,500 square feet in floor area.

2. Stairs. An automatic sprinkler system shall be installed in enclosed usable space below or over a stairway in Group E Occupancies. See section 3309(f).

3. Division 1. An approved automatic fire-extinguishing system shall be installed in all newly constructed buildings classified as E-1 Occupancies constructed after July 1, 1992.

NOTE: For the purpose of this section, structural additions exceeding 60% of the appraised value of such building or structure, or alterations and repairs to any portion of a building or structure within a twelve-month period that exceeds 100% of the appraised value of such building or structure shall be considered new construction. In the case of structural additions, separation walls shall define separate buildings.

EXCEPTION: Portable school classrooms, provided:

A. Aggregate area of clusters of portable school classrooms does not exceed 5,000 square feet; and

B. Clusters of portable school classrooms separated as required in chapter 5 of the Building Code.

When not required by other provisions of this chapter, a fire-extinguishing system installed in accordance with UBC Standard No. 38-1 may be used for area and height increases and substitution for one hour construction as allowed by the Building Code.

(f) Group H Occupancies.

1. General. An automatic fire-extinguishing system shall be installed in Group H, Divisions 1, 2, 3 and 7 Occupancies.

2. Division 4. An automatic fire-extinguishing system shall be installed in Group H, Division 4 Occupancies having a floor area of more than 3,000 square feet.

3. Division 6. An automatic fire-extinguishing system shall be installed throughout buildings containing Group H, Division 6 Occupancies. The design of the sprinkler system shall not be less than that required under U.B.C. Standard No. 38-1 for the occupancy hazard classifications as follows:

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 3
Service corridors	Ordinary Hazard Group 3
Storage rooms without dispensing	Ordinary Hazard Group 3
Storage rooms with dispensing	Extra Hazard Group 2
Exit corridors	Ordinary Hazard Group 3 ¹

¹ When the design area of the sprinkler system consists of a corridor protected by one row of sprinklers, the maximum number of sprinklers that needs to be calculated is 13.

(g) Group I Occupancies. An automatic sprinkler system shall be installed in Group I Occupancies.

EXCEPTION: In jails, prisons and reformatories, the piping system may be dry, provided a manually operated valve is installed at a continuously monitored location. Opening of the valve will cause the piping system to be charged. Sprinkler heads in such systems shall be equipped with fusible elements or the system shall be designed as required for deluge systems in U.B.C. Standard No. 38-1.

(h) Group R, Division 1 Occupancies. An automatic sprinkler system shall be installed throughout apartment houses three or more stories in height or containing 16 or more dwelling units, in congregate residences three or more stories in height and having an occupant load of 50 or more and in hotels three or more stories in height or containing 20 or more guest rooms. Residential or quick-response standard sprinklers shall be used in the dwelling units and guest room portions of the building.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3802, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3900 Chapter 39. Stages and platforms.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3900, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3901 Scope. Section 3901.

(a) Standards of quality. Platforms and stages shall conform with the requirements of this chapter.

The standards listed below labeled a "UBC Standard" are also listed in chapter 60, Part II, and are part of this code.

1. UBC Standard No. 6-1, Proscenium Curtains
2. UBC Standard No. 38-1, Installation of Sprinkler Systems
3. UBC Standard No. 42-1, Test Method for Surface-burning Characteristics of Building Materials
4. UBC Standard No. 43-1, Fire Tests of Building Construction and Materials.

(b) Definitions. For the purpose of this chapter, certain terms are defined as follows:

Batten is a flown metal pipe or shape on which lights or scenery are fastened.

Drop is a large piece of scenic canvas or cloth which hangs vertically, usually across the stage area.

Fly is the space over the stage of a theater where scenery and equipment can be hung out of view. Also called lofts and rigging lofts.

Fly gallery is a narrow raised platform at the side of legitimate stage from which the lines for flying scenery are manipulated.

Gridiron is the arrangement of beams over a legitimate stage supporting the equipment for flying scenery and hanging battens from which curtains, scenery and lighting are hung.

Leg drop is a long narrow strip of fabric used for masking. When used on either or both sides of the acting area, it is provided to designate an entry onto the stage by the actors. It is also used to mask the side stage area. They may also be called "wings."

Pinrail is a beam at one side of a legitimate stage through which wooden or metal pins are driven and to which lines from the flies are fastened.

Platform is that raised area within a building used for the presentation of music, plays or other entertainment; the

head table for special guests; the raised area for lectures and speakers; boxing and wrestling rings; theater in the round; and similar purposes wherein there are not overhead hanging curtains, drops, scenery or stage effects other than lighting.

Platform, permanent, is a platform used within an area for more than 30 days.

Platform, temporary, is a platform used within an area for not more than 30 days.

Proscenium wall is the wall that separates the stage from the auditorium or house.

Stage is a partially enclosed area within a building used for the purpose of entertainment and shall be classified as either:

Stage, legitimate, is a stage wherein curtains, drops, leg drops, scenery, lighting devices or other stage effects are retractable horizontally or vertically, or suspended overhead.

Stage, regular, is a stage wherein curtains, fixed leg drops, valances, scenery and other stage effects are hung and are not retractable, with the exception of a valance, a light trough, the main (house) curtain, a bank of lights and a single backdrop, which may be retractable without the stage being considered a legitimate stage.

Stage, thrust, is a platform extending beyond the proscenium arch and into the audience.

Theater-in-the-round is an acting area in the middle of a room with the audience sitting all around it.

(c) Materials and design. Materials used in the construction of platforms and stages shall conform to the applicable materials and design requirements as set forth in this code.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3901, filed 12/19/91, effective 7/1/92.]

WAC 51-20-3903 Stages. Section 3903.

(a) Construction. Regular stages and thrust stages shall be constructed of materials as required for the type of construction of the building in which it is located. In all cases the finish floor may be of wood.

Legitimate stages shall be constructed of materials as required for a Type I or II F.R. building. Legitimate stage floors may be constructed with a wood floor of not less than 2 inches in nominal thickness on a resilient mounting upon a concrete or masonry floor.

Openings through stage floors (traps) shall be equipped with tight-fitting trap doors of wood having a nominal thickness of not less than 2 inches with approved safety locks.

(b) Accessory rooms. Dressing rooms, workshops and store rooms accessory to stages shall be separated from each other and from the stage by not less than one-hour fire-resistive construction, and openings within such separations shall be protected as required for corridors.

EXCEPTION: A separation is not required for stages having a floor area not exceeding 500 square feet.

(c) Vents. Stages exceeding 1,000 square feet in floor area shall be provided with one or more vents constructed of noncombustible material. Vents shall be located near the center and above the highest part of any stage. They shall be raised above the stage roof and shall have a total vent area equal to at least 5 percent of the floor area of the stage.

The vents shall open by spring action or force of gravity sufficient to overcome the effects of neglect, rust, dirt, frost, snow or expansion by heat or warping of the framework. Glass, if used in vents, must be protected against falling onto the stage. A wire screen, if used under the glass, must be so placed that, if clogged, it cannot reduce the required venting area or interfere with the operating mechanism or obstruct the distribution of water from an automatic sprinkler. Vents shall be arranged to open automatically by the use of fusible links. The fusible links and operating cable shall hold each door closed against the minimum 30-pound counterforce which may be exerted by springs or counterweights. This minimum counterforce shall be exerted on each door through its entire arc of travel and for a minimum of 90 degrees. A manual control shall be provided at an approved location.

Springs, when employed to actuate vent doors, shall be capable of maintaining full required tension. Springs shall not be stressed more than 50 percent of their rated capacity and shall not be located directly in the airstream or exposed to the outside.

A fusible link shall be placed in the cable control system on the underside of the vent at or above the roof line or as approved by the building official and shall be so located as not to be affected by the operation of an automatic sprinkler system. Remote, manual or electrical controls shall provide for both opening and closing of the vent doors for periodic testing and shall be located at a point on the stage designated by the building official. When remote control vents are electrical, power failure shall not affect its instant operation in the event of fire. Hand winches may be employed to facilitate operation of manually controlled vents.

Curbs for vents shall be as required for skylights.

(d) Proscenium walls. Legitimate stages shall be completely separated from the seating area by a proscenium wall of not less than two-hour fire-resistive noncombustible construction.

All openings in the proscenium wall of a legitimate stage shall be protected by a fire assembly having a 1 1/2-hour fire-protection rating. The main proscenium opening used for viewing performances shall be provided with an automatic-closing fire-protection curtain as provided in U.B.C. Standard No. 6-1. Such curtain materials shall conform to the following conditions:

1. The curtain shall be tested in accordance with U.B.C. Standard No. 43-1 as modified in U.B.C. Standard No. 6-1. The time period for testing shall be not less than 30 minutes, and the unexposed surface of the test sample shall not show any evidence of through penetration of flame or smoke, or excessive smoking (only the vapors escaping as a result of baking the sample).

2. The curtain shall be listed by an approved agency and have a permanent marking giving the manufacturer's name, the approved agency's name or insignia, the rating achieved, and a statement that the curtain shall be installed in accordance with U.B.C. Standard No. 6-1.

3. Curtain fabrics shall have a smoke density no greater than 25 when tested in accordance with U.B.C. Standard No. 42-1. The curtain fabric shall be tested in the condition in which it is to be used.

4. A water curtain or deluge system complying with U.B.C. Standard No. 38-1 may be used only in conjunction with an automatically closing opaque noncombustible curtain

in lieu of the proscenium fire-safety curtain described in U.B.C. Standard No. 6-1. Both the deluge system and curtain closure shall be actuated by combination rate-of-temperature-rise and temperature devices located on the stage. The water system shall be designed to completely wet the entire curtain.

(e) Gridirons, fly galleries and pinrails. Gridirons, fly galleries and pinrails shall be constructed of noncombustible material. Gridirons are not to be considered a floor, when measuring height above a floor for section 1806, omitting of fireproofing.

(f) Special exiting. Each side of a legitimate stage shall be provided with at least one well-marked exit providing not less than 32 inches clear width. Such exit shall open directly to a street, exit court or exit passageway leading to a street.

Fly galleries shall be provided with an exit stair not less than 30 inches in width. Each tier of dressing rooms shall be provided with two exits meeting the requirements of chapter 33.

Stairways required by this subsection need not be enclosed.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-3903, filed 12/19/91, effective 7/1/92.]

WAC 51-20-5100 Chapter 51. Elevators, dumbwaiters, escalators and moving walks.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5100, filed 12/19/91, effective 7/1/92.]

WAC 51-20-5103 Delete section 5103, special provisions.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5103, filed 12/19/91, effective 7/1/92.]

WAC 51-20-5105 Elevator machine room floors. Section 5105. Elevator hoistways shall not be vented through an elevator machine room unless such venting is accomplished by an approved duct system installed through the elevator machine room. Cable slots entering the machine room must be installed in a manner that inhibits the passage of smoke into the machine room.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5105, filed 12/19/91, effective 7/1/92.]

WAC 51-20-5400 Chapter 54. Glass and glazing.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5400, filed 12/19/91, effective 7/1/92.]

WAC 51-20-5401 Scope. Section 5401.

(a) General. The provisions of this chapter apply to:

1. Exterior glass and glazing in all occupancies.

EXCEPTION: Occupancy Groups R and M not over three stories in height and located in areas with a minimum basic wind speed not more than 80 miles per hour.

2. Interior and exterior glass and glazing in all occupancies subject to human impact as specified in section 5406.

(b) Standards. Standards for materials shall be as specified in this chapter and UBC Standard No. 54-1.

Standards for glazing subject to human impact (hazardous location) as specified in section 5406 shall be as specified in UBC Standard No. 54-2.

(c) Other provisions. See Part IV of this code for additional glass requirements where openings are required to be fire protected, and section 5204 for openings glazed with plastics.

(d) Standards of quality. The standards listed below labeled a "UBC standard" are also listed in chapter 60, Part II, and are part of this code.

1. UBC Standard No. 54-1, Glass Standard Specification
2. UBC Standard No. 54-2, Safety Glazing

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-5401, filed 12/19/91, effective 7/1/92.]

WAC 51-20-93100 Appendix chapter 31.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93100, filed 12/19/91, effective 7/1/92.]

DIVISION I

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT FEDERAL FAIR HOUSING ACT GUIDELINES FOR SITE TERRAIN EXEMPTIONS

WAC 51-20-93115 Section 3115. (a) Purpose. The purpose of this division is to provide the United States Department of Housing and Urban Development Federal Fair Housing Act Guidelines for Site Terrain Exemptions.

(b) Scope

1. General. The provisions of this division may apply to all buildings and dwelling units that are regulated by the Federal Fair Housing Act Amendments of 1988.

2. Applicability of other provisions. Except as specifically allowed by this division for determining site terrain exemptions, Group R, Division 1 apartment houses shall meet all applicable provisions of this code.

(c) Definitions. For the purpose of this division, certain terms are defined as follows:

Covered multifamily dwellings means buildings consisting of four or more dwelling units if such buildings have one or more elevators; and ground floor dwelling units in other buildings consisting of four or more dwelling units. Dwelling units within a single structure separated by firewalls do not constitute separate buildings.

Finished grade means the ground surface of the site after all construction, levelling, grading and development has been completed.

Undisturbed site means the site before any construction, levelling, grading or development associated with the current project.

(d) Site impracticality.

1. General. Covered multifamily dwellings with elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route, regardless of terrain or unusual characteristics of the site. Covered multifamily dwellings without elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route unless terrain or unusual characteristics of the site are such that the following conditions are found to exist:

A. Site impracticality due to terrain. There are two alternative tests for determining a site impracticality due to terrain: The individual building test provided in paragraph (i), or the site analysis test provided in paragraph (ii). These tests may be used as follows.

A site with a single building having a common entrance for all units may be analyzed only as described in paragraph (i).

All other sites, including a site with a single building having multiple entrances serving either individual dwellings units or clusters of dwelling units, may be analyzed using the methodology in either paragraph (i) or paragraph (ii). For these sites for which either test is applicable, regardless of which test is selected, at least 20% of the total ground floor units in nonelevator buildings, on any site, must comply with the guidelines.

(i) Individual building test. It is impractical to provide an accessible entrance served by an accessible route when the terrain of the site is such that:

(A) The slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance exceed 10 percent.

(B) The slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance also exceed 10 percent.

If there are no vehicular or pedestrian arrival points within 50 feet of the planned entrance, the slope for the purpose of this paragraph (i) will be measured to the closest vehicular or pedestrian arrival point.

For purposes of these guidelines, vehicular or pedestrian arrival points includes public or resident parking areas; public transportation stops; passenger loading zones; and public streets or sidewalks. To determine site impracticality, the slope would be measured at ground level from the point of the planned entrance, or (ii) if there are no vehicular or pedestrian arrival points closed to the planned entrance. In the case of sidewalks, the closest point to the entrance will be where a public sidewalk entering the site intersects with the sidewalk to the entrance. In the case of resident parking areas, the closest point to the planned entrance will be measured from the entry point to the parking area that is located closest to the planned entrance.

(ii) Site analysis test. Alternatively, for a site having multiple buildings, or a site with a single building with multiple entrances, impracticality of providing an accessible entrance served by an accessible route can be established by the following steps:

(A) The percentage of the total buildable area of the undisturbed site with a natural grade less than 10% slope shall be calculated. The analysis of the existing slope (before grading) shall be done on a topographic survey with two foot contour intervals with slope determination made between each successive interval. The accuracy of the slope analysis shall be certified by a professional licensed engineer, landscape architect, architect or surveyor.

(B) To determine the practicality of providing accessibility to planned multifamily dwellings based on the topography of the existing natural terrain, the minimum percentage of ground floor units [units] to be made accessible should equal the percentage of the total buildable area (not includ-

ing floodplain, wetlands, or other restricted use areas) of the undisturbed site that has an existing natural grade of less than 10% slope.

(C) In addition to the percentage established in paragraph (B), all ground floor units in a building, or ground floor units served by a particular entrance, shall be made accessible if the entrance to the units [units] is on an accessible route, defined as a walkway with a slope between the planned entrance and a pedestrian or vehicular arrival point that is no greater than 8.33%.

B. Site impracticality due to unusual characteristics. Unusual characteristics include sites located in a federally designated floodplain or coastal high-hazard area and sites subject to other similar requirements of law or code that the lowest structural member of the lowest floor must be raised to a specified level at or above the base flood elevation. An accessible route to a building entrance is impractical due to unusual characteristics of the site when:

(i) The unusual site characteristics result in a difference in finished grade elevation exceeding 30 inches and 10 percent measured between an entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance; or

(ii) If there are no vehicular or pedestrian arrival points within 50 feet of the planned entrance, the unusual characteristics result in a difference in finished grade elevation exceeding 30 inches and 10 percent measured between an entrance and the closest vehicular or pedestrian arrival point.

2. Exceptions to site impracticality. Regardless of site considerations described in section 3115(a) 1., an accessible entrance on an accessible route is practical when:

A. There is an elevator connecting the parking area with the dwelling units on a ground floor. (In this case, those dwelling units on the ground floor served by an elevator, and at least one of each type of public- and common-use areas, would be subject to these guidelines.) However:

(i) Where a building elevator is provided only as a means of creating an accessible route to dwelling units on a ground floor, the building is not considered an elevator building for purposes of these guidelines; hence, only the ground floor dwelling units would be covered.

(ii) If the building elevator is provided as a means of access to dwelling units other than dwelling units on a ground floor, then the building is an elevator building which is a covered multifamily dwelling, and the elevator in that building must provide accessibility to all dwelling units in the building, regardless of the slope of the natural terrain; or

B. An elevated walkway is planned between a building entrance and a vehicular or pedestrian arrival point and the planned walkway has a slope no greater than 10 percent.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93115, filed 12/19/91, effective 7/1/92.]

DIVISION II

U.S. DEPARTMENT OF JUSTICE AMERICANS WITH DISABILITIES ACT GUIDELINES FOR READILY ACHIEVABLE BARRIER REMOVAL

WAC 51-20-93116 Section 3116. (a) Purpose. The purpose of this division is to provide the United States

Department of Justice, Americans with Disabilities Act Guidelines for readily achievable barrier removal in existing buildings.

(b) Scope

1. General. The provisions of this division may be used as a guideline for the removal of readily achievable barriers to accessibility in existing buildings, as required by the Americans with Disabilities Act of 1990.

2. Applicability of other provisions. Except as specifically allowed by this division, all buildings and portions thereof shall meet all applicable provisions of this code.

(c) Definitions. For the purpose of this division, certain terms are defined as follows:

Commerce is travel, trade, traffic, commerce, transportation or communication—

1. Among the several states;

2. Between any foreign country or any territory or possession and any state; or

3. Between points in the same state but through another state or foreign country.

Commercial facilities are facilities—

1. Whose operations will affect commerce;

2. That are intended for nonresidential use by a private entity; and

3. That are not—

A. Facilities that are covered or expressly exempted from coverage under the Fair Housing Act of 1968, as amended (42 U.S.C. 3601-3631);

B. Aircraft; or

C. Railroad locomotives, railroad freight cars, railroad cabooses, commuter or intercity passenger rail cars (including coaches, dining cars, sleeping cars, lounge cars, and food service cars), any other railroad cars described in section 242 of the American's with Disability Act or covered under title II of the American's with Disabilities Act, or railroad rights-of-way. For purposes of this definition, "rail" and "railroad" have the meaning given the term "railroad" in section 202(e) of the Federal Railroad Safety Act of 1970 (46 U.S.C. 431(e)).

Place of public accommodation is a facility, operated by a private entity, whose operations affect commerce and fall within at least one of the following categories—

1. An inn, hotel, motel, or other place of lodging, except for an establishment located within a building that contains not more than five rooms for rent or hire and that is actually occupied by the proprietor of the establishment as the residence of the proprietor;

2. A restaurant, bar, or other establishment serving food or drink;

3. A motion picture house, theater, concert hall, stadium, or other place of exhibition or entertainment;

4. An auditorium, convention center, lecture hall, or other place of public gathering;

5. A bakery, grocery store, clothing store, hardware store, shopping center, or other sales or rental establishment;

6. A laundromat, dry-cleaner, bank, barber shop, beauty shop, travel service, shoe repair service, funeral parlor, gas station, office of an accountant or lawyer, pharmacy, insurance office, professional office of a health care provider, hospital, or other service establishment;

7. A terminal, depot, or other station used for specified public transportation;

8. A museum, library, gallery, or other place of public display or collection;

9. A park, zoo, amusement park, or other place of recreation;

10. A nursery, elementary, secondary, undergraduate, or postgraduate private school, or other place of education;

11. A day care center, senior citizen center, homeless shelter, food bank, adoption agency, or other social service center establishment; and

12. A gymnasium, health spa, bowling alley, golf course, or other place of exercise or recreation.

Private entity is a person or entity other than a public entity.

Public accommodation is a private entity that owns, leases (or leases to), or operates a place of public accommodation.

Public entity is—

1. Any state or local government;

2. Any department, agency, special purpose district, or other instrumentality of a state or states or local government; and

3. The National Railroad Passenger Corporation, and any commuter authority (as defined in section 103(8) of the Rail Passenger Service Act).

Readily achievable is easily accomplishable and able to be carried out without much difficulty or expense. In determining whether an action is readily achievable, factors to be considered include—

1. The nature and cost of the action needed under this part;

2. The overall financial resources of the site or sites involved in the action; the number of persons employed at the site; the effect on expenses and resources, or the impact otherwise of the action upon the operation of the site;

3. The overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities;

4. The type of operation or operations of the parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity; and

5. The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to the parent corporation or entity.

(d) Removal of barriers.

1. General. A public accommodation shall remove architectural barriers in existing facilities, including communication barriers that are structural in nature, where such removal is readily achievable, i.e., easily accomplishable and able to be carried out without much difficulty or expense.

(e) Examples. Examples of steps to remove barriers include, but are not limited to, the following actions:

1. Installing ramps;

2. Making curb cuts in sidewalks and entrances;

3. Lowering shelves;

4. Rearranging tables, chairs, vending machines, display racks, and other furniture;

5. Lowering telephones;

6. Adding raised letter markings on elevator control buttons;

7. Installing flashing alarm lights;

8. Widening doors;

9. Installing offset hinges to widen doorways;

10. Eliminating a turnstile or providing an alternative accessible path;

11. Installing accessible door hardware;

12. Installing grab bars in toilet stalls;

13. Rearranging toilet partitions to increase maneuvering space;

14. Insulating lavatory pipes;

15. Installing a raised toilet seat;

16. Installing a full-length bathroom mirror;

17. Lowering the paper towel dispenser in a bathroom;

18. Creating a designated accessible parking space;

19. Installing an accessible paper cup dispenser at an existing inaccessible water fountain;

20. Removing high pile, low density carpeting; or

21. Modifying vehicle hand controls.

(f) Priorities. A public accommodation shall take measures to comply with the barrier removal requirements of this section in accordance with the following order of priorities:

1. First, a public accommodation shall take measures to provide access to a place of public accommodation from public sidewalks, parking, or public transportation. These measures include, for example, installing an entrance ramp, widening entrances, and providing accessible parking spaces.

2. Second, a public accommodation shall take measures to provide access to restroom facilities in places of public accommodation where restroom facilities are used by the public on more than an incidental basis. These measures include, for example, removal of obstructing furniture or vending machines, widening of doors, installations of ramps, providing accessible signage, widening of toilet stalls, and installations of grab bars.

3. Third, a public accommodation shall take measures to provide access to those areas of a place of public accommodation where goods and services are made available to the public. These measures include, for example, adjusting the layout of display racks, rearranging tables, widening doors, and installing ramps.

4. Fourth, a public accommodation shall take any other measures necessary to provide access to the goods, services, facilities, privileges, advantages, or accommodations of a place of public accommodations.

(g) Relationship to alterations requirements of section 3109 of this code. Measures taken solely to comply with the barrier removal requirements of this section are not required to conform to the requirements for alterations in section 3109 of this code. These measures include, for example, installing a ramp with a steeper slope or widening a doorway to a narrower width than that required by section 3109 of this code. No measure shall be taken, however, that poses a significant risk to the health or safety of individuals with disabilities or others.

(h) Portable ramps. Portable ramps should be used to comply with this division only when installation of a permanent ramp is not readily achievable. In order to avoid any significant risk to the health or safety of individuals with disabilities or others in using portable ramps, due consideration shall be given to safety features such as nonslip surfaces, railings, anchoring, and strength of materials.

(i) Interpretation of readily achievable.

1. Barrier removal is not readily achievable if it would result in significant loss of profit or significant loss of efficiency of operation.

(2) The rearrangement of temporary or movable structures, such as furniture, equipment, and display racks is not readily achievable to the extent that it results in a significant loss of selling or serving space.

(j) Alternatives to barrier removal.

1. General. Where a public accommodation can demonstrate that barrier removal is not readily achievable, a public accommodation shall not fail to make its goods, services, facilities, privileges, advantages, or accommodations available through alternative methods, if those methods are readily achievable.

2. Examples. Examples of alternatives to barrier removal include, but are not limited to, the following actions:

- A. Providing curb-service or home-delivery;
- B. Retrieving merchandise from inaccessible shelves or racks;
- C. Relocating activities to accessible locations;
- D. Providing refueling service at inaccessible self-service gas stations.

(k) Personal devices and services. This section does not require a public accommodation to provide its customers, clients, or participants with personal devices, such as wheelchairs, or services of a personal nature including assistance in eating, toileting, or dressing.

(l) Multiscreen cinemas. If it is not readily achievable to remove barriers to provide access by persons with mobility impairments to all of the theaters of a multiscreen cinema, the cinema shall establish a film rotation schedule that provides reasonable access for individuals who use wheelchairs to all films. Reasonable notice shall be provided to the public as to the location and time of accessible showings.

(m) Readily achievable and undue burden: Factors to be considered. In determining whether an action is readily achievable or would result in an undue burden, factors to be considered include:

1. The nature and cost of the action needed under this part;
2. The overall financial resources of the site or sites involved in the action; the number of persons employed at the site; the effect on expenses and resources, or the impact otherwise of the action upon the operation of the site;
3. The overall financial resources of any parent corporation or entity; the overall size of the parent corporation or entity with respect to the number of its employees; the number, type, and location of its facilities;
4. The type of operation or operations of the parent corporation or entity, including the composition, structure, and functions of the workforce of the parent corporation or entity; and
5. The geographic separateness, and the administrative or fiscal relationship of the site or sites in question to the parent corporation or entity.

(n) Accessible or special goods.

1. This part does not require a public accommodation to alter its inventory to include accessible or special goods that are designed for, or facilitate use by, individuals with disabilities.

2. A public accommodation shall order accessible or special goods at the request of an individual with disabilities, if, in the normal course of its operation, it makes special orders on request for institute goods, and if the accessible or special goods can be obtained from a supplier with whom the public accommodation customarily does business.

3. Examples of accessible or special goods include items such as brailled versions of books, books on audio cassettes, closed-captioned video tapes, special sizes or lines of clothing, and special foods to meet particular dietary needs.

(o) Seating in assembly areas.

1. To the extent that it is readily achievable, a public accommodation shall:

- A. Provide a reasonable number of wheelchair seating spaces in assembly areas; and,
- B. Locate the wheelchair seating spaces so that they:
 - (i) Are dispersed throughout the seating area;
 - (ii) Provide lines of sight comparable to those in all viewing areas;
 - (iii) Adjoin an accessible route of travel that also serves as a means of egress in case of emergency; and,
 - (iv) Permit individuals who use wheelchairs to sit with family members or other companions.

EXCEPTION: If removal of seats is not readily achievable, a public accommodation shall provide a portable chair or other means to permit a family member or other companion to sit with an individual who uses a wheelchair.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93116, filed 12/19/91, effective 7/1/92.]

DIVISION III U.S. ARCHITECTURAL AND BARRIERS COMPLIANCE BOARD AMERICANS WITH DISABILITIES ACT ALTERNATE GUIDELINES FOR DETECTABLE WARNINGS

WAC 51-20-93117 Section 3117. (a) General. The purpose of this division is to provide additional design guidelines for construction and installation of truncated domes as required by the Americans with Disabilities Act of 1990.

(b) Raised truncated domes. Raised truncated domes shall have a diameter of 0.9 inches nominal, a height of 0.2 inches nominal and a center-to-center spacing of 2.35 inches nominal. Raised truncated domes shall comply with appendix chapter 31, Division VII for visual contrast.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93117, filed 12/19/91, effective 7/1/92.]

DIVISION IV U.S. ARCHITECTURAL AND BARRIERS COMPLIANCE BOARD AMERICANS WITH DISABILITIES ACT ALTERNATE GUIDELINES FOR AUDIBLE ALARMS

WAC 51-20-93118 Section 3118. (a) Purpose. The purpose of this division is to provide the United States Department of Justice, Americans with Disabilities Act Guidelines for audible alarms.

(b) Audible alarms. Audible alarms shall exceed the prevailing equivalent sound level in the room or space by at least 15 decibels, or shall exceed any maximum sound level with a duration of 30 seconds by 5 decibels, whichever is louder. Sound levels for alarm signals shall not exceed 120 decibels.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93118, filed 12/19/91, effective 7/1/92.]

**DIVISION V
U.S. ARCHITECTURAL AND BARRIERS
COMPLIANCE BOARD AMERICANS WITH
DISABILITIES ACT ALTERNATE GUIDELINES
FOR VISUAL CONTRAST**

WAC 51-20-93119 Section 3119. (a) Purpose. The purpose of this division is to provide the United States Department of Justice, Americans with Disabilities Act Guidelines for visual contrast.

(b) Guidelines for visual contrast.

1. Raised truncated domes. Raised truncated domes used as detectable warnings shall contrast visually by 70 percent with adjoining surfaces. Contrast in percent shall be determined as follows:

$$\text{Contrast} = [(B^1 - B^2)/B^1] \times 100$$

where: B^1 = light reflectance value (LRV) of the lighter area; and,

B^2 = light reflectance value (LRV) of the darker area.

The material used to provide contrast shall be an integral part of the walking surface.

2. Signage. The characters and background of signs shall be eggshell (11 to 19 degree gloss on 60 degree glossimeter). Characters shall be light on a dark background (or dark on a light background) and contrast with their background by at least 70 percent. Contrast in percent shall be determined as follows:

$$\text{Contrast} = [(B^1 - B^2)/B^1] \times 100$$

where: B^1 = light reflectance value (LRV) of the lighter area; and,

B^2 = light reflectance value (LRV) of the darker area.

UNIFORM BUILDING CODE STANDARD NO. 31-1

Building and facility access specifications. U.B.C. No. 31-1 is deleted in its entirety.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-93119, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93119, filed 12/19/91, effective 7/1/92.]

**DIVISION VI
U.S. ARCHITECTURAL AND TRANSPORTATION
BARRIERS COMPLIANCE BOARD AMERICANS
WITH DISABILITIES ACT GUIDELINES FOR
AUTOMATED TELLER MACHINES**

WAC 51-20-93120 Section 3120. (a) Purpose. The purpose of this division is to provide the United States

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Architectural and Transportation Barriers Compliance Board Americans with Disabilities Act Guidelines for automated teller machines.

(b) Controls. Controls for user activation shall comply with Section 3106 (c).

(c) Clearance and Reach Range. Free standing or built-in units not having a clear floor space under them shall comply with Sections 3106 (c) 2 and 3., and provide for parallel approach and both a forward and side reach to the unit allowing a person in a wheelchair to access the controls.

(d) Equipment for Persons with Vision Impairments. Instructions and all information for use shall be made accessible to and independently usable by persons with vision impairments.

[Statutory Authority: RCW 19.27.074 and 70.92.140. 93-01-166, § 51-20-93120, filed 12/23/92, effective 7/1/93. Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-20-93120, filed 12/19/91, effective 7/1/92.]

Chapter 51-21 WAC

**STATE BUILDING CODE ADOPTION AND
AMENDMENT OF THE 1991 EDITION OF THE
UNIFORM BUILDING CODE STANDARDS**

WAC

51-21-001	Authority.
51-21-002	Purpose.
51-21-003	Uniform Building Code standards.
51-21-007	Exceptions.
51-21-008	Implementation.
51-21-31010	UBC Standards No. 31-1.
51-21-38030	UBC Standards No. 38-3.
51-21-38038	Table 1-5.1.
51-21-38039	Table 1-5.5.

WAC 51-21-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-001, filed 12/19/91, effective 7/1/92.]

WAC 51-21-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-002, filed 12/19/91, effective 7/1/92.]

WAC 51-21-003 Uniform Building Code standards. The 1991 edition of the Uniform Building Code standards as published by the International Conference of Building Officials is hereby adopted by reference with the following additions, deletions, and exceptions.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-003, filed 12/19/91, effective 7/1/92.]

WAC 51-21-007 Exceptions. The exceptions and amendments to the Uniform Building Code standards

contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-007, filed 12/19/91, effective 7/1/92.]

WAC 51-21-008 Implementation. The Uniform Building Code standards adopted by chapter 51-21 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-008, filed 12/19/91, effective 7/1/92.]

WAC 51-21-31010 UBC Standards No. 31-1. Building and facility access specifications. UBC Standard No. 31-1 is deleted in its entirety.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-31010, filed 12/19/91, effective 7/1/92.]

WAC 51-21-38030 UBC Standards No. 38-3. Installation of sprinkler systems in Group R Occupancies four stories or less. The following amendments are adopted to chapter 38-3 of the UBC standards.

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-38030, filed 12/19/91, effective 7/1/92.]

WAC 51-21-38038 Table 1-5.1. Table 1-5.1 is amended to read as follows:

Table 1-5.1

Materials and Dimensions	Standard
Spec. for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use	ASTM A795
Specification for Welded and Seamless Steel Pipe	ASTM A53
Wrought-Steel Pipe	ANSI B36.10M
Specification for Electric-Resistance Welded Steel Pipe	ASTM A135
Copper Tube (Drawn, Seamless) Specification for Seamless Copper Tube	ASTM B88
Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube	ASTM B251
Brazing Filler Metal (Classification BCuP-3 or BCuP-4)	AWS A5.8
Specification for Solder Metal, 95-5 (Tin-Antimony-Grade 95TA)	ASTM B32
Specifications for CPVC Pipe	ASTM F437 ASTM F438 ASTM F439 ASTM F442
Specification for Polybutylene Tube	ASTM D 3309

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-38038, filed 12/19/91, effective 7/1/92.]

WAC 51-21-38039 Table 1-5.5. Table 1-5.5 is amended to read as follows:

Table 1-5.5

Materials and Dimensions	Standard
Cast Iron	
Cast Iron Threaded Fittings, Class 125 and 250	ANSI B16.4
Cast Iron Pipe Flanges and Flanged Fittings	ANSI B16.1
Malleable Iron	
Malleable Iron Threaded Fittings, Class 150 and 300	ANSI B16.3
Steel	
Factory-made Threaded Fittings Class 150 and 300	ANSI B16.9
Buttwelding ends for Pipe, Valves, Flanges, and Fittings	ANSI B16.25
Spec. for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures	ASTM A234
Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys	ANSI B16.5
Forged Steel Fittings, Socket Welded and Threaded	ANSI B16.11
Copper	
Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings	ANSI B16.22
Cast Copper Alloy Solder-Joint Pressure fittings	ANSI B16.18
Plastic Fittings for CPVC Pipe	ASTM F437 ASTM F438 ASTM F439 ASTM F442
Plastic Fittings for Polybutylene Tube	ASTM D 3309

[Statutory Authority: Chapters 70.92 and 19.27 RCW. 92-01-145, § 51-21-38039, filed 12/19/91, effective 7/1/92.]

Chapter 51-22 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1991 EDITION OF THE UNIFORM MECHANICAL CODE

WAC

- 51-22-001 Authority.
- 51-22-002 Purpose.
- 51-22-003 Uniform Mechanical Code.
- 51-22-004 Conflict between Uniform Mechanical Code and State Energy Code chapter 51-11 WAC.
- 51-22-005 Conflict between Uniform Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC.
- 51-22-007 Exceptions.

- 51-22-008 Implementation.
 51-22-0400 Chapter 4—Definitions and abbreviations.
 51-22-0423 U.
 51-22-0500 Chapter 5—Equipment—General.
 51-22-0504 Installation.
 51-22-0800 Chapter 8—Vented decorative appliances, floor furnaces, vented wall furnaces, unit heaters and room heaters.
 51-22-0807 Room heaters.
 51-22-1000 Chapter 10—Ducts.
 51-22-1002 Material.
 51-22-1100 Chapter 11—Ventilation systems and product-conveying systems.
 51-22-1104 Environmental air ducts.
 51-22-1500 Chapter 15—Mechanical refrigerating equipment.
 51-22-1508 Refrigeration machinery room ventilation.
 51-22-1900 Chapter 19—Miscellaneous heat-producing appliances.
 51-22-1903 Clothes dryers.

WAC 51-22-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-001, filed 12/13/91, effective 7/1/92.]

WAC 51-22-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-002, filed 12/13/91, effective 7/1/92.]

WAC 51-22-003 Uniform Mechanical Code. The 1991 edition of the Uniform Mechanical Code, including chapter 22, Fuel gas piping, Appendix B, published by the International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials is hereby adopted by reference with the exceptions noted in this WAC.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-003, filed 12/13/91, effective 7/1/92.]

WAC 51-22-004 Conflict between Uniform Mechanical Code and State Energy Code chapter 51-11 WAC. In the case of conflict between the duct sealing or insulation requirements of section 1002 or section 1005 of this code and the duct sealing or insulation requirements of chapter 51-11 WAC, the Washington State Energy Code, or where applicable, a local jurisdiction's energy code, the provisions of such energy codes shall govern.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-004, filed 12/13/91, effective 7/1/92.]

WAC 51-22-005 Conflict between Uniform Mechanical Code and State Ventilation and Indoor Air Quality Code chapter 51-13 WAC. In the case of conflict between the Group R ventilation requirements of this code and the

Group R ventilation requirements of chapter 51-13 WAC, the Washington State Ventilation and Indoor Air Quality Code, the provisions of the Ventilation and Indoor Air Quality Code shall govern.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-005, filed 12/13/91, effective 7/1/92.]

WAC 51-22-007 Exceptions. The exceptions and amendments to the Uniform Mechanical Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-007, filed 12/13/91, effective 7/1/92.]

WAC 51-22-008 Implementation. The Uniform Mechanical Code adopted by chapter 51-22 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-008, filed 12/13/91, effective 7/1/92.]

WAC 51-22-0400 Chapter 4—Definitions and abbreviations.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0400, filed 12/13/91, effective 7/1/92.]

WAC 51-22-0423 U. Section 423. U.B.C. standards is the Uniform Building Code Standards promulgated by the International Conference of Building Officials, as adopted by this jurisdiction.

Unconfined space is a room or space having a volume equal to at least 50 cubic feet per 1000 Btu/h of the aggregate input rating of all fuel-burning appliances installed in that space. Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space.

Unit heater is a heating appliance designed for nonresidential space heating and equipped with an integral means for circulation of air.

Unit refrigeration system is a refrigerating unit not to exceed three-horsepower rating and which has been factory assembled and tested prior to its installation. Such unit shall not be connected to any ductwork. The unit shall be a complete one-unit package without remote parts.

Unusually tight construction is construction where:

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

(b) Weatherstripping on openable windows and doors, and

(c) Caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels

and at penetrations for plumbing, electrical and gas lines and at other openings, and

(d) Any building built using the 1986 or 1991 Washington State Energy Code, 1986 or 1990 Northwest Energy Code, or Super Good Cents weatherization standards or equivalent.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0423, filed 12/13/91, effective 7/1/92.]

WAC 51-22-0500 Chapter 5—Equipment—General.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0500, filed 12/13/91, effective 7/1/92.]

WAC 51-22-0504 Installation. Section 504.

(a) Listed appliances. Except as otherwise provided in the code, the installation of appliances regulated by this code shall conform to the conditions of listing. The appliance installer shall leave the manufacturer's installation and operating instructions attached to the appliance. Clearances of listed appliances from combustible materials shall be as specified in the listing or on the rating plate.

(b) Room large in comparison to size of equipment. Central heating furnaces not listed for closet or alcove installation shall be installed in a room or space having a volume at least 12 times the total volume of the furnace; central heating boilers not listed for closet or alcove installation shall be installed in a room or space having a volume 16 times the volume of the boiler. If the ceiling height of the room or space is greater than 8 feet, the volume shall be calculated on the basis of 8-foot height.

(c) Unlisted appliances. Unlisted appliances shall be installed with the standard clearances from combustible construction specified in Table No. 5-A. Unlisted appliances may have the standard clearances of Table No. 5-A reduced by employing the forms of protection specified in Table No. 5-B. Forms of protection specified in Table No. 5-B may be utilized to reduce clearances to combustible construction for all applicable appliances.

(d) Anchorage of appliances. Appliances designed to be fixed in position shall be securely fastened in place. Supports for appliances shall be designed and constructed to sustain vertical and horizontal loads within the stress limitations specified in the Building Code. All floor supported mechanical equipment and fixed appliances shall be anchored to the structure to resist displacement vertically and on both horizontal axis due to seismic motion. Suspended mechanical equipment and appliances shall have rigid vertical hangers and be braced in both horizontal directions. Connections by pipes or ducts which are or contain nonrigid elements, are not of inherent sufficient strength, or which are not themselves adequately anchored shall not be acceptable as equipment or appliance anchors. Approved, factory-fabricated isolation cushions and dampers are permitted between supports or braces and the equipment housing. In no case shall flues or vents be used to support or restrain equipment or appliances.

(e) Identification of equipment. When more than one heating, cooling, ventilating or refrigerating system is

installed on the roof of a building or within the building, it shall be permanently identified as to the area or space served by the equipment.

(f) LPG appliances. Liquefied petroleum gas-burning appliances shall not be installed in a pit, basement or similar location where heavier-than-air gas might collect. Appliances so fueled shall not be installed in an above-grade under-floor space or basement unless such location is provided with an approved means for removal of unburned gas.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0504, filed 12/13/91, effective 7/1/92.]

WAC 51-22-0800 Chapter 8—Vented decorative appliances, floor furnaces, vented wall furnaces, unit heaters and room heaters.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0800, filed 12/13/91, effective 7/1/92.]

WAC 51-22-0807 Room heaters. Section 807.

(a) Vented freestanding. Vented freestanding room heaters shall be installed with clearances from combustible material as set forth in Table No. 5-A.

EXCEPTION: Heaters listed for reduced clearances may be installed at the clearances specified on the required manufacturer's label.

Vented freestanding room heaters shall not be located so that a door can swing within less than 12 inches of a warm-air outlet of the heater, measured at right angles to the outlet. Doorstops or door closers shall not be installed to obtain such clearance.

Vented freestanding room heaters shall be located at least 36 inches below any part of a structure projecting over the heater. This projection shall include doors or windows that could project over the heater.

Vented freestanding room heaters shall be safely and securely installed to prevent accidental displacement.

(b) Vented overhead. Vented overhead room heaters shall be safely and securely supported with hangers and brackets of noncombustible material and shall be installed with clearances from combustible material as specified on the required manufacturer's label.

EXCEPTION: Installation of overhead heaters in aircraft storage or servicing areas of Group B, Division 3 Occupancies shall comply with the requirements of section 802.

(c) Unvented. Unvented fuel-burning room heaters shall not be installed, used, maintained or permitted to exist in a Group I Occupancy nor shall an unvented heater be installed in any building, whether as a new or as a replacement installation, unless permitted by this section. This subsection shall not apply to portable oil-fired unvented heating appliances used as supplemental heating in Group B and M Occupancies and regulated by the Fire Code.

Approved, unvented portable oil-fueled heaters may be used as a supplemental heat source in any Group M, R, B-2, or B-4 Occupancy provided that such heaters shall not be located in any sleeping room or bathroom, and shall comply with RCW 19.27A.080, 19.27A.090, 19.27A.100, 19.27A.110, and 19.27A.120.

(d) Overhead radiant heaters. Listed or approved unvented overhead room heaters may be installed in Group A, Division 2, 2.1, 3, or 4; Groups B, H, Division 4; Group H, Division 5, or Group M Occupancy, provided the installation conforms to all of the following requirements:

1. All portions of the heater are located at least 8 feet above the floor.

2. At least two unobstructed permanent openings are provided to the room or space containing such heaters. These openings shall open directly to the outside of the building through the floor, roof or wall. The minimum combined total area of these openings shall be at least 1 square inch for each 1000 Btu/h input of the heater or heaters, with a minimum total area of 100 square inches. One half of the required openings shall be above the heater or heaters and one half shall be located below the heater or heaters.

EXCEPTION: When approved by the building official, provisions may be made to exhaust the products of combustion to the exterior by mechanical means.

3. Heaters shall be safely and securely supported with hangers and brackets of noncombustible material and installed with clearances from combustible material as specified on the required manufacturer's label.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-0807, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1000 Chapter 10—Ducts.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1000, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1002 Material. Section 1002.

(a) General. 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 Tables Nos. 10-A, 10-B and 10-C; metal ducts complying with U.M.C. Standard No. 10-2 with prior approval; or factory-made air ducts complying with U.M.C. Standard No. 10-1. Ducts, plenums and fittings may be constructed of concrete, clay, ceramics or other approved nonmetallic materials when installed in the ground or in a concrete slab, provided the joints are tightly sealed.

Corridors shall not be used to convey air to or from rooms if the corridor is required to be of fire-resistive construction by section 3305(g) of the U.B.C.

EXCEPTIONS:

1. Where such air is part of an engineered smoke control system.
2. Corridors conforming to section 3320(c) of the Uniform Building Code in Group I Occupancies.
3. Corridors serving residential occupancies may be supplied without specific mechanical exhaust subject to the following:
 - A. The supply air is 100% outside air, and
 - B. The units served by the corridor have conforming ventilation independent of the air supplied to the corridor, and
 - C. For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than 30 feet on center along the corridor, or
 - D. For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the

supply inlet to the corridor at the floor receiving the alarm.

Concealed building spaces or independent construction within buildings may be used as ducts or plenums.

When gypsum products are exposed in ducts or plenums, the air temperature shall be restricted to a range from 50°F. to 125°F. and moisture content shall be controlled so that the material is not adversely affected. For the purpose of this section, gypsum products shall not be exposed in ducts serving the direct exhaust from evaporative coolers, and in other air-handling systems regulated by this chapter where the design engineer determines that the temperature of the gypsum product will be below the dew point temperature under normal operating conditions.

See section 904 for limitations on combustion products venting systems extending into or through duct or plenums.

See section 1104 for limitations on environmental air systems exhaust ducts extending into or through ducts or plenums.

(b) Combustibles within ducts or plenums. Materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed rating of not more than 50 when tested in accordance with the test for Surface Burning Characteristics of Building Materials, U.B.C. Standard No. 42-1.

EXCEPTIONS:

1. Return-air and outside-air ducts, plenums or concealed spaces which serve a dwelling unit may be of combustible construction.
2. Air filters serving a dwelling unit.
3. Air filters listed by an approved testing agency as complying with reference standards included in Appendix C.
4. Air filters used as water evaporation medium in an evaporative cooler.
5. Charcoal filters when protected with an approved fire suppression system.
6. Electrical wiring in plenums shall comply with the Electrical Code. Flame propagation and smoke production characteristics of exposed electric cables installed in concealed space used as air plenums shall:
 - A. Exhibit a flame travel of 5 feet or less, and
 - B. Produce smoke having an average optical density not greater than 0.15 and having a peak optical density of 0.5 or less when tested in accordance with U.M.C. Standard No. 10-3.
 - C. Wiring meeting these requirements shall be listed and labeled as plenum cable as required by the Electrical Code.
7. Nonmetallic fire sprinkler piping in plenums shall be listed and shall meet the following requirements:
 - A. Exhibit flame travel of 5 feet or less, and
 - B. Produce smoke having an average optical density not greater than 0.15 and having a peak optical density of 0.5 or less when tested in accordance with U.M.C. Standard No. 10-3.

(b) Factory-made air ducts. Factory-made air ducts shall be approved for the use intended or shall conform to the requirements of U.M.C. Standard No. 10-1. Each portion of a factory-made air duct system shall be identified by the manufacturer with a label or other suitable identification indicating compliance with U.M.C. Standard No. 10-1 and its class designation. These ducts shall be listed and shall be installed in accordance with the terms of their listing, and the requirements of U.M.C. Standard No. 10-5.

(c) Joints and seams of ducts. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, gasketing or other means.

Crimp joints for residential round ducts shall have a contact lap of at least 1 1/2 inch and shall be mechanically fastened by means of at least three sheet-metal screws equally spaced around the joint, or an equivalent fastening method.

Joints and seams for 0.016-inch (No. 28 gage) and 0.013-inch (No. 30 gage) residential rectangular ducts shall be as specified in Table No. 10-A for 0.019-inch (No. 26 gage) material.

Joints and seams for rectangular duct systems shall be as specified in Table No. 10-A.

Joints and seams for flat oval ducts and round ducts in other than single dwelling units shall be as specified in Table No. 10-B.

Joints and seams and all reinforcements for factory-made air ducts and plenums shall meet with the conditions of prior approval in accordance with the installation instructions that shall accompany the product.

(d) Metal. Every duct, plenum or fitting of metal shall comply with Table No. 10-A or Table No. 10-B.

EXCEPTIONS:

1. Ducts, plenums and fittings for systems serving single dwelling units may comply with Table No. 10-C.
2. Duct systems complying with U.M.C. Standard No. 10-1.

(e) Tin. Existing tin ducts may be used when cooling coils are added to a heating system, provided the first 10 feet of the duct or plenum measured from the cooling coil discharge are constructed of metal of the gage thickness set forth in Table No. 10-A, No. 10-B or No. 10-C of this chapter or are of approved material and construction. Tin ducts completely enclosed in inaccessible concealed areas need not be replaced. All accessible ducts shall be insulated to comply with Table No. 10-D of this chapter. For the purpose of this subsection, ducts shall be considered accessible where the access space is 30 inches or greater in height.

(f) Vibration isolators. Vibration isolators installed between mechanical equipment and metal ducts (or casings) shall be made of an approved material and shall not exceed 10 inches in length.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1002, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1100 Chapter 11—Ventilation systems and product-conveying systems.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1100, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1104 Environmental air ducts. Section 1104. Environmental air ducts not regulated by other provisions of this code shall comply with this section. Ducts shall be substantially airtight and shall comply with the provisions of chapter 10. Exhaust ducts shall terminate outside the building and shall be equipped with back-draft dampers. Environmental air ducts which have an alternate function as a part of an approved smoke-control system do not require design as Class 1 product-conveying ducts.

Ducts used for domestic kitchen range ventilation and domestic clothes dryers shall be of metal and shall have smooth interior surfaces. Commercial dryer exhaust ducts shall be installed in accordance with their listing. For additional requirements for domestic dryer exhaust systems, see section 1903.

EXCEPTION: Approved flexible duct connectors not more than 6 feet in length may be used in connection with domestic dryer exhausts. Flexible duct connectors shall not be concealed within construction.

Bathroom and laundry room exhaust ducts may be of gypsum wallboard subject to the limitations of section 1002(a).

When gypsum products are exposed in ducts and plenums, the air temperature shall be restricted to a range from 50°F to 125°F and moisture content shall be controlled so that the material is not adversely affected. For the purpose of this section, gypsum products shall not be exposed in ducts serving exhaust from public showers, swimming pools, jacuzzi rooms and in other air-handling systems where the design engineer determines that the temperature of the gypsum product will be below the dew point temperature under normal operating conditions.

Exhaust ducts shall not extend into or through ducts or plenums.

EXCEPTIONS: Exhaust ducts conveying environmental air may pass through a duct or plenum provided that:

1. The duct is maintained under sufficient negative pressure to prevent leakage of the exhaust air to the surrounding duct or plenum; or
2. If maintained under a positive pressure with respect to the surrounding duct or plenum, the exhaust duct will be sealed to prevent leakage; or
3. The surrounding air stream is an exhaust air stream not intended for recirculation to the building and cross contamination of the two air streams will not create a hazardous condition.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1104, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1500 Chapter 15—Mechanical refrigerating equipment.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1500, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1508 Refrigeration machinery room ventilation. Section 1508. Refrigeration machinery rooms shall be provided with means of ventilation to the outside of the building. Such ventilation shall also incorporate provisions for emergency ventilation. The two requirements may be combined in one system, conforming to the following requirements:

1. An emergency exhaust system serving no other area and having the capacity to provide a complete change of air in such room at least once every five minutes and discharge to the outside of the building at a location not less than 20 feet from any exterior door, window or any operable opening in any building. Provisions shall be made for makeup air to replace that being exhausted. Each exhaust ventilation system shall be controlled by a readily accessible emergency ventilation switch located within 2 feet of the switch

specified in section 1509, and the switch shall be labeled to comply with section 1519. Operating status indicator shall be provided at the switch and at the fire control center.

2. A mechanical ventilation system or gravity ventilation openings to the outside of the building shall be sized in accordance with Table No. 15-B based on accumulated horsepower in the rooms with refrigeration units and shall operate continuously.

Gravity openings shall be so installed that approximately one-half of the required area is located within 12 inches of the ceiling and one-half of the required area is located within 12 inches of the floor of the room. Every portion of the lower opening shall be horizontal or slope downward from the opening in the refrigeration machinery room to the exterior of the building at or above the adjacent ground level.

Equipment and components located in a refrigeration machinery room shall be protected from freezing or other low temperature damage.

3. Where gravity ventilation is not provided, operation of the mechanical ventilation shall occur anytime the space is occupied, or operations or maintenance personnel are present.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1508, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1900 Chapter 19—Miscellaneous heat-producing appliances.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1900, filed 12/13/91, effective 7/1/92.]

WAC 51-22-1903 Clothes dryers. Section 1903.

(a) Moisture exhaust ducts. Moisture exhaust ducts shall terminate on the outside of the building and shall be equipped with a back-draft damper. Screens shall not be installed at the duct termination. Ducts for exhausting clothes dryers shall not be connected or installed with sheet metal screws or other fasteners which will obstruct the flow. Clothes dryer moisture-exhaust ducts shall not be connected to a gas vent connector, gas vent or chimney. Clothes dryer moisture-exhaust ducts shall not extend into or through ducts or plenums. Clothes dryer exhaust ducts shall be protected by a steel plate or clip not less than 1/16 inch (1.59 mm) in thickness and of sufficient width to fully protect the duct. Plates or clips shall be placed on the finish face of all framing members which the clothes dryer exhaust duct passes through when there is less than one-and-one-quarter inch of framing material between the duct and the finish face. Plates or clips shall also be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct.

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

(c) Domestic clothes dryers. When a compartment or space for a domestic clothes dryer is provided, a minimum 4-inch-diameter moisture-exhaust duct of approved material shall be installed in accordance with this section and section 1104.

(d) Commercial clothes dryers. The installation of commercial clothes dryer exhaust ducts shall comply with the appliance manufacturer's installation instructions.

[Statutory Authority: RCW 19.27.074, 19.27.031, 19.27A.070 through 19.27A.100, and chapters 19.27 and 19.27A RCW. 92-01-064, § 51-22-1903, filed 12/13/91, effective 7/1/92.]

Chapter 51-24 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1991 EDITION OF THE UNIFORM FIRE CODE

WAC

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DIVISION II

FIRE APPARATUS ACCESS ROADS

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51-24-99500 Division V. Standards.
51-24-99510 Appendix V-A. Nationally recognized standards of
good practice.

WAC 51-24-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-001, filed 12/13/91, effective 7/1/92.]

WAC 51-24-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-002, filed 12/13/91, effective 7/1/92.]

WAC 51-24-003 Uniform Fire Code. The 1991 edition of the Uniform Fire Code published by the International Conference of Building Officials and the Western Fire Chiefs Association is hereby adopted by reference with the following additions, deletions, and exceptions.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-003, filed 12/13/91, effective 7/1/92.]

WAC 51-24-007 Exceptions. The exceptions and amendments to the Uniform Fire Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-007, filed 12/13/91, effective 7/1/92.]

WAC 51-24-008 Implementation. The Uniform Fire Code adopted by chapter 51-24 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-008, filed 12/13/91, effective 7/1/92.]

WAC 51-24-04000 Article 4. Permits.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-04000, filed 12/13/91, effective 7/1/92.]

WAC 51-24-04123 Table No. 4.108-C, Permit amounts for hazardous materials.

TABLE NO. 4.108-C

PERMIT AMOUNTS FOR HAZARDOUS MATERIALS¹

TYPE OF MATERIAL	AMOUNT
Cellulose nitrate	See No. c.4
Combustible fiber	See No. c.5
Combustible liquids	See No. f.3
Corrosive gases	See No. c.7
Corrosive liquids	55 gallons
Cryogens	See No. c.8
Explosives	See No. e.1
Flammable gases	See No. c.7
Flammable liquids	See No. f.3
Flammable solids	100 pounds
Highly toxic gases (including pesticides and fumigants)	See No. c.7
Highly toxic liquids and solids (including pesticides and fumigants)	Any amount
Liquified petroleum gases	See No. l.1
Magnesium	See No. m.1
Nitrate film	See No. c.3
Oxidizing gases	See No. c.7
Oxidizing liquids:	
Class 4	Any amount
Class 3	1 gallon
Class 2	10 gallons
Class 1	55 gallons
Oxidizing solids:	
Class 4	Any amount
Class 3	10 pounds
Class 2	100 pounds
Class 1	500 pounds
Organic peroxide liquids and solids:	
Class I	Any amount
Class II	Any amount
Class III	10 pounds
Class IV	20 pounds
Pyrophoric gases	See No. c.7
Pyrophoric liquids	Any amount
Pyrophoric solids	Any amount
Radioactive materials (including gases, liquids and solids)	See No. r.1
Toxic gases	See No. c.7
Toxic liquids	50 gallons
Toxic solids	500 pounds

TABLE NO. 4.108-C--PERMIT AMOUNTS FOR HAZARDOUS MATERIALS¹
(continued)

TYPE OF MATERIAL		AMOUNT
Unstable (reactive) gases		See No. c.7
Unstable (reactive) liquids:	Class 4	Any amount
	Class 3	Any amount
	Class 2	5 gallons
	Class 1	10 gallons
Unstable (reactive) solids:	Class 4	Any amount
	Class 3	Any amount
	Class 2	50 pounds
	Class 1	100 pounds
Water-reactive liquids:	Class 3	Any amount
	Class 2	5 gallons
	Class 1	10 gallons
Water-reactive solids:	Class 3	Any amount
	Class 2	50 pounds
	Class 1	100 pounds

¹ See Article 80 for additional requirements and exceptions.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-04123, filed 12/13/91, effective 7/1/92.]

WAC 51-24-09000 Article 9. Definitions and abbreviations.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09000, filed 12/13/91, effective 7/1/92.]

WAC 51-24-09105 Section 9.105. Carcinogen is a substance that causes the development of cancerous growths in living tissue. A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen, or

(b) It is listed as a carcinogen or potential carcinogen in the latest edition of the Annual Report on Carcinogens published by the National Toxicology Program, or

(c) It is regulated by OSHA as a carcinogen.

Cargo tank is a container having a liquid capacity in excess of 110 gallons used for carrying flammable or combustible liquids, LP-gas, or hazardous chemicals and mounted permanently or otherwise upon a tank vehicle. The term "cargo tank" does not apply to containers solely for the purpose of supplying fuel for propulsion of the vehicle upon which it is mounted.

Carnival is a mobile enterprise principally devoted to offering amusement or entertainment to the public in, upon

or by means of portable amusement rides or devices or temporary structures in any number or combination, whether or not associated with other structures or forms of public attraction.

Ceiling limit is the maximum concentration of an airborne contaminant to which one may be exposed. The ceiling limits utilized are to be those published in 29 CFR 1910.1000.

Cellulose nitrate plastics (Pyroxylin) is a plastic substance, material or compound, other than cellulose nitrate film, covered by article 33, or guncotton or other explosive covered by article 77, having cellulose nitrate as a base, or whatever name known, when in the form of blocks, slabs, sheets, tubes or fabricated shapes. For requirements, see article 27.

Central supply is that portion of system which normally supplies piping systems.

CGA is the Compressed Gas Association.

CFR is the Code of Federal Regulations of the United States Government.

Chemical is any element, chemical compound or mixture of elements or compounds or both.

Chemical name is the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry, the Chemical Abstracts Service rules of nomenclature, or a name which will clearly identify a chemical for the purpose of conducting an evaluation.

Chemical plant is a plant or that portion of a plant other than a refinery or distillery where flammable or combustible liquids are produced by chemical reactions or used in chemical reactions.

Chief or chief of the fire department is the chief officer of the fire department serving the jurisdiction or the chief officer's authorized representative.

Chief engineer is the chief.

Chief of the police or police department is the chief law enforcement officer of the jurisdiction or the chief law enforcement officer's authorized representative.

Chief of the bureau of fire prevention is the head of the fire prevention bureau.

Classified product is a product that has been evaluated with respect to (a) the properties of the product, (b) a limited spectrum of hazards to life or property, (c) suitability of the product for certain uses and (d) other conditions by a nationally recognized testing laboratory or approved organization.

Closed container is a container sealed by means of a lid or other device such that liquid, vapor or dusts will not escape from it under ordinary conditions of use or handling.

Combustible fibers are readily ignitable and free-burning fibers, such as cotton, sisal, henequen, ixtle, jute, hemp, tow, cocoa fiber, oakum, baled waste, baled wastepaper, kapok, hay, straw, excelsior, Spanish moss or other like materials.

Combustible fiber storage bin is a metal or metal-lined container with a capacity not exceeding 100 cubic feet and equipped with a self-closing cover.

Combustible fiber storage room is a room with a capacity not exceeding 500 cubic feet separated from the remainder of a building by not less than a one-hour occupancy separation constructed in accordance with the Building Code.

Combustible fiber storage vault, protected, is a room with a capacity exceeding 1,000 cubic feet separated from a remainder of a building by not less than a two-hour occupancy separation constructed in accordance with the Building Code and provided with an approved automatic sprinkler system.

Combustible fiber storage vault, unprotected, is a room with a capacity not exceeding 1,000 cubic feet separated from the remainder of the building by a two-hour occupancy separation constructed in accordance with the Building Code and provided with approved safety vents to the outside.

Combustible liquid is a liquid having a flash point at or above 100°F. Combustible liquids are subdivided as follows:

Class II liquids are those having flash points at or above 100°F. and below 140°F.

Class III-A liquids are those having flash points at or above 140°F. and below 200°F.

Class III-B liquids are those liquids having flash points at or above 200°F.

Combustible waste matter includes magazines; books; trimmings from lawns, trees or flower gardens; pasteboard boxes; rags; paper; straw; sawdust; packing material; shavings; boxes; rubbish; and refuse that will ignite through contact with flames of ordinary temperatures.

Commodity is a combination of products, packing materials and containers.

Compressed gas is (a) a gas or mixture of gases having an absolute pressure exceeding 40 psi at 70°F. in a container, or

(b) A gas or mixture of gases having an absolute pressure exceeding 104 psi in a container at 130°F., regardless of the pressure at 70°F., or

(c) A liquid having a vapor pressure exceeding 40 psi at 100°F. as determined by UFC Standard No. 9-5.

Condensate tank is a tank which is installed in the vapor-return piping of a vapor-recovery system to collect condensed gasoline and is capable of being emptied of liquids without opening.

Congregate residence is any building or portion thereof which contains facilities for living, sleeping and sanitation, as required by the Building Code, and may include facilities for eating and cooking, for occupancy by other than a family. A congregate residence may be a shelter, convent, monastery, dormitory, fraternity or sorority house but does not include jails, hospitals, nursing homes, hotels or lodging houses.

Container. See Articles 79 and 80.

Continuous gas-detection system is a gas-detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis may be performed on a cyclical basis at intervals not to exceed 30 minutes.

Control area is a space within a building where the exempt amounts may be stored, dispensed, used or handled. Storage or use of quantities in excess of those listed in the tables are required by UBC 901 to be rated as the appropriate Group H Occupancy.

Conversion oil burner is a burner for field installation in heating appliances such as boilers and furnaces. It may be furnished with or without a primary safety control. Under special circumstances, it may be installed for firing ovens, water heaters, ranges, special furnaces and the like. A burner of this type may be a pressure-atomizing gun type, a horizontal or vertical rotary type, or a mechanical or natural draft-vaporizing type.

Conversion range oil burner is an oil burner designed to burn kerosene, range oil or similar fuel. It is intended primarily for installation in a stove or range, a portion or all of which was originally designed to utilize solid fuel and to which a flue is connected.

Corrosive is a chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. A chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described in Appendix A to CFR 49 Part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term does not refer to action on inanimate surfaces.

Corrosive liquid is a liquid which, when in contact with living tissue, will cause destruction or irreversible alteration of such tissue by chemical action. Examples include acidic, alkaline or caustic materials.

Covered mall building is a single building enclosing a number of tenants and occupancies such as retail stores, drinking and dining establishments, entertainment and

amusement facilities, offices, and other similar uses wherein two or more tenants have a main entrance into one or more malls.

Crude petroleum is a hydrocarbon mixture that has a flash point below 150°F. and which has not been processed in a refinery.

Cryogenic fluid is a fluid that has a normal boiling point below 150°F.

Cryogenic in-ground container is a container in which the maximum liquid level is below the normal surrounding grade and is constructed essentially of natural materials such as earth and rock and dependent upon the freezing of water-saturated earth materials for its tightness or impervious nature.

Cryogenic vessel is a pressure vessel, low-pressure tank or atmospheric tank designed to contain a cryogenic fluid on which venting, insulation, refrigeration or a combination of these is used in order to maintain the operating pressure within the design pressure and the contents in a liquid phase.

Cut-off storage is indoor storage which is separated from other building areas by not less than a two-hour fire-resistive occupancy separation.

Cylinder is a pressure vessel designed for pressures higher than 40 pounds per square inch, absolute and having a circular cross section. It does not include a portable tank, multiunit tank car tank, cargo tank or tank car.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-09105, filed 12/13/91, effective 7/1/92.]

WAC 51-24-09107 Section 9.107. Electrical blasting cap is a shell containing a charge of detonating compound designed to be fired by an electric current.

Electrical code is the National Electrical Code, promulgated by the National Fire Protection Association, as adopted by the Washington state department of labor and industries, electrical section.

Electrical firing unit is the source of electrical current used to ignite electric matches. Generally, the firing unit will have switches to control the routing of the current to various firework items and will have a test circuit and warning indicators.

Electrostatic fluidized bed is a container holding powder coating material which is aerated from below so as to form an air-supported expanded cloud of such material which is electrically charged with a charge opposite to the charge of the object to be coated. Such object is transported through the container immediately above the charged and aerated materials in order to be coated.

Encapsulated is a method of packaging consisting of a plastic sheet completely enclosing the sides and top of a pallet load. The term "encapsulated" does not apply to banding or individual plastic-enclosed items inside a large nonplastic-enclosed container.

Excess flow control is a fail-safe system designed to shut off flow due to a rupture in pressurized piping systems.

Excess flow valve is a valve inserted into a compressed gas cylinder, portable tank or stationary tank that is designed to positively shut off the flow of gas in the event that its predetermined flow is exceeded.

Executive body is the governing body of the jurisdiction adopting this code.

Exit is a continuous and unobstructed means of egress to a public way, and shall include aisles, doors, doorways, gates, corridors, exterior exit balconies, ramps, stairways, smokeproof enclosures, horizontal exits, exit passageways, exit courts and yards.

Exit court is a yard or court providing egress to a public way for one or more required exits.

Exit passageway is an enclosed means of egress connecting a required exit or exit court with a public way.

Explosion is an effect produced by the sudden violent expansion of gases, which may be accompanied by a shock wave or disruption, or both, of enclosing materials or structures. An explosion may result from (a) chemical changes such as rapid oxidation, deflagration or detonation, decomposition of molecules and runaway polymerization (usually detonations); (b) physical changes such as pressure tank ruptures; or (c) atomic changes (nuclear fission or fusion).

Explosive is (a) a chemical that causes a sudden, almost instantaneous release of pressure, gas and heat when subjected to sudden shock, pressure, or high temperatures or (b) a material or chemical, other than a blasting agent, that is commonly used or intended to be used for the purpose of producing an explosive effect and is regulated by article 77.

Explosive materials are explosives, blasting agents and detonators including, but not limited to, dynamite and other high explosives; slurries, emulsions and water gels; black powder and pellet powder; initiating explosives; detonators or blasting caps; safety fuses; squibs; detonating cord; igniter cord; igniters and Class B special fireworks.

Extension cord and portable flexible cord is flexible cord of any length which has one male connector on one end and one or more female connectors on the other, and no built-in overcurrent protection.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-09107, filed 12/13/91, effective 7/1/92.]

WAC 51-24-09110 Section 9.110. Handling is the deliberate transport of material by any means to a point of storage or use.

Hazardous chemical reaction is a reaction which generates pressure or byproducts which may cause injury, illness or harm to humans, domestic animals, livestock or wildlife.

Hazardous fire area is land which is covered with grass, grain brush or forest, whether privately or publicly owned, which is so situated or is of such inaccessible location that a fire originating upon such land would present an abnormally difficult job of suppression or would result in great and unusual damage through fire or resulting erosion. Such areas are designated by the chief on a map maintained in the office of the chief.

Hazardous materials are those chemicals or substances which are physical hazards or health hazards as defined and classified in article 80 whether the materials are in usable or waste condition.

Hazardous production material (HPM) is a solid, liquid or gas that has a degree-of-hazard rating in health, flammability or reactivity of Class 3 or 4 as ranked by UFC Standard No. 79-3 and which is used directly in research,

laboratory or production processes which have as their end product materials which are not hazardous.

Hazardous watershed fire area is a location within 500 feet of a forest or brush-, grass- or grain-covered land, exclusive of small individual lots or parcels of land located outside of a brush, forest or grass-covered area.

Health hazard is a classification of a chemical for which there is statistically significant evidence based on at least one reproducible study conducted in accordance with established scientific principles that acute health effects may occur in exposed persons. The term "health hazard" includes chemicals which are toxic or highly toxic agents, irritants, corrosives, hepatotoxins, nephrotoxins, neurotoxins, agents which can have an acute effect on the hematopoietic system, and agents that have acute effects on the lungs, skin, eyes or mucous membranes.

Heating and cooking appliance is an electric, gas or oil-fired appliance not intended for central heating.

High explosive is explosive material, such as dynamite, which can be caused to detonate by means of a No. 8 test blasting cap when unconfined.

Highly toxic material is a material which produces a lethal dose or lethal concentration which falls within any of the following categories:

(a) A chemical that has a median lethal dose (LD₅₀) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD₅₀) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours, or less if death occurs within 24 hours, with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.

(c) A chemical that has a median lethal concentration (LC₅₀) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume or dust, when administered by continuous inhalation for one hour, or less if death occurs within one hour, to albino rats weighing between 200 and 300 grams each.

Mixtures of these materials with ordinary materials, such as water, may not warrant classification as highly toxic. While this system is basically simple in application, any hazard evaluation which is required for the precise categorization of this type of material shall be performed by experienced, technically competent persons.

Highly toxic pesticide is a pesticide which is required by federal regulation to bear a skull and crossbones and be labeled with the word "poison."

Highly volatile liquid is a liquid with a boiling point of less than 68°F.

High-piled combustible storage is combustible materials in closely packed piles more than 15 feet in height or combustible materials on pallets or in racks more than 12 feet in height. For certain special-hazard commodities such as rubber tires, plastics, some flammable liquids, idle pallets, etc., the critical pile height may be as low as 6 feet.

High-rack storage system is a system located in an area having no occupant load that has storage over 40 feet in height, racks placed such that aisles are not provided as required by section 81.108, and automated stock handling.

Highway is a public street or public road.

Horizontal exit is an exit from one building into another building on approximately the same level, or through or around a wall constructed as required in the Building Code for a two-hour occupancy separation and which completely divides a floor into two or more separate areas so as to establish an area of refuge affording safety from fire or smoke coming from the area from which escape is made.

Hotel is any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied for sleeping purposes by guests.

HPM flammable liquid is an HPM liquid that is defined as being either a flammable or combustible liquid.

HPM storage room is a room used for the storage or dispensing of HPM and which is classified as a Group H, Division 2, 3 or 7 Occupancy.

Hypergolic material is a material which is capable of igniting spontaneously upon contact with another substance.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09110, filed 12/13/91, effective 7/1/92.]

WAC 51-24-09117 Section 9.117. Occupancy is the purpose for which a building or part thereof is used or intended to be used.

Occupancy classification. For the purpose of this code, certain occupancies are defined as follows:

Group A Occupancies:

Division 1. Any assembly building or portion of a building with a legitimate stage and an occupant load of 1,000 or more.

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

Division 2.1. Any building or portion of a building having an assembly room with an occupant load of 300 or more without a legitimate stage, including such buildings used for educational purposes and not classed as a Group E or Group B, Division 2 Occupancy.

Division 3. Any building or portion of a building having an assembly room with an occupant load of less than 300 without a legitimate stage, including such buildings used for educational purposes and not classed as a Group E or Group B, Division 2 Occupancy.

Division 4. Stadiums, reviewing stands and amusement park structures not included within other Group A Occupancies.

For amusement buildings, see Building Code requirements for Group A Occupancies.

Group B Occupancies:

Division 1. Repair garages where work is limited to exchange of parts and maintenance requiring no open flame, welding or use Class I, II or III-A liquids, motor vehicle fuel-dispensing stations and parking garages not classified as Group B, Division 3 open parking garages or Group M, Division 1 private garages.

Division 2. Drinking and dining establishments having an occupant load of less than 50, wholesale and retail stores, office buildings, printing plants, police and fire stations, factories and workshops using materials not highly flammable or combustible, storage and sales rooms for combustible

goods, paint stores without bulk handling. Building or portions of buildings having rooms used for educational purposes beyond the 12th grade with less than 50 occupants in any room.

Division 3. Aircraft hangars where no repair work is done except exchange of parts and maintenance requiring no open flame welding or the use of Class I or II flammable liquids.

Open parking garages.

Helistops.

Division 4. Ice plants, power plants, pumping plants, cold storage, creameries.

Factories and workshops using noncombustible and nonexplosive materials.

Storage and sales rooms containing only noncombustible and nonexplosive materials that are not packaged or crated in or supported by combustible material.

Group E Occupancies:

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

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

Division 3. Any building or portion thereof used for day-care purposes for more than six children.

EXCEPTION: Family child day-care homes shall be considered Group R, Division 3 Occupancies.

Group H Occupancies:

Division 1. Occupancies with quantity of material in the building in excess of the exempt amounts listed in the Building Code (see UBC Table No. 9-A) which present a high explosion hazard, including but not limited to:

(a) Explosives, blasting agents, fireworks and black powder.

EXCEPTION: Storage and the use of pyrotechnic special effect materials in motion picture, television, theatrical and group entertainment production when under permit as required in the Fire Code. The time period for storage shall not exceed 90 days.

(b) Unclassified detonatable organic peroxides.

(c) Class 4 oxidizers.

(d) Class 3 or 4 detonatable unstable (reactive) materials.

Division 2. Occupancies with quantity of material in the building in excess of the exempt amounts listed in the Building Code (see UBC Table No. 9-A) which present a moderate explosion hazard or a hazard from accelerated burning, including but not limited to:

(a) Class I organic peroxides.

(b) Class 3 nondetonatable unstable (reactive) materials.

(c) Pyrophoric gases.

(d) Flammable or oxidizing gases.

(e) Class I, II or III-A flammable or combustible liquids which are used in normally open containers or systems or in closed containers pressurized at more than 15-pounds-per-square-inch gage.

EXCEPTION: Aerosols.

(f) Combustible dusts in suspension or capable of being put into suspension in the atmosphere of the room or area.

EXCEPTIONS: 1. Rooms or areas used for woodworking where no more than three fixed in-place woodworking appliances are utilized may be classified as a Group B, Division 2 Occupancy, provided the appliances are equipped with dust collectors sufficient to remove dust generated by the appliances.

2. Lumberyards and similar retail stores utilizing only power saws may be classified as Group B, Division 2 Occupancies.

The building official may revoke the use of these exceptions for due cause.

(g) Class 3 oxidizers.

Division 3. Occupancies with quantity of material in the building in excess of the exempt amounts listed in the Building Code (see UBC Table No. 9-A) which present a high fire or physical hazard, including but not limited to:

(a) Class II, III or IV organic peroxides.

(b) Class 1 or 2 oxidizers.

(c) Class I, II or III-A flammable liquids or combustible liquids which are utilized or stored in normally closed containers or systems and containers pressurized at 15-pounds-per-square-inch gage or less and aerosols.

(d) Class III-B combustible liquids.

(e) Pyrophoric liquids or solids.

(f) Water reactives.

(g) Flammable solids, including combustible fibers or dusts, except for dusts included in Division 2.

(h) Flammable or oxidizing cryogenic fluids (other than inert).

(i) Class 1 unstable (reactive) gas or Class 2 unstable (reactive) materials.

Division 4. Repair garages not classified as a Group B, Division 1.

Division 5. Aircraft repair hangars and heliports not classified as Group B, Division 3.

Division 6. Semiconductor fabrication facilities and comparable research and development areas when the facilities in which hazardous production materials (HPM) are used and the aggregate quantity of materials are in excess of the exempt amounts listed in the Building Code (see UBC Table No. 9-A or 9-B). Such facilities and areas shall be designed and constructed in accordance with the Building Code. See UBC section 911.

Division 7. Occupancies having quantities of materials in excess of those listed in Table No. 9-B that are health hazards, including:

(a) Corrosives.

(b) Highly toxic materials.

(c) Irritants.

Group I Occupancies:

Division 1.1. Nurseries for the full-time care of children under the age of six (each accommodating more than five persons). Hospitals, sanitariums, nursing homes with nonambulatory patients and similar buildings (each accommodating more than five persons).

Division 1.2. Health-care centers for ambulatory patients receiving outpatient medical care which may render the patient incapable of unassisted self-preservation. (Each tenant space accommodating more than five persons.)

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

Division 3. Mental hospitals, mental sanitariums, jails, reformatories and buildings where personal liberties of inmates are similarly restrained.

EXCEPTION: Group I Occupancies shall not include buildings used only for private residential purposes or for a family group.

Group M Occupancies:

Division 1. Private garages, sheds and agricultural buildings when not over 1,000 square feet in area.

Division 2. Fences, tanks and towers.

Group R Occupancies:

Division 1. Hotels and apartments. Congregate residences (each accommodating more than 10 persons).

Division 2. Not used.

Division 3. Dwellings, family child day care homes and lodging houses. Congregate residences (each accommodating 10 persons or less).

Oil-burning equipment is an oil burner of any type together with its tank, piping, wiring, controls and related devices. Oil-burning equipment includes oil burners, oil-fired units and heating and cooking appliances but does not include equipment exempted by section 61.101.

Oil-fired unit is a heating appliance equipped with one or more oil burners and the necessary safety controls, electrical equipment and related equipment manufactured for assembly as a complete unit. Oil-fired unit does not include kerosene stoves or oil stoves.

Open-air grandstands and bleachers are seating facilities which are located so that the side toward which the audience faces is unroofed and without an enclosing wall.

Open burning is the burning of a bonfire, rubbish fire or other fire in an outdoor location where fuel being burned is not contained in an incinerator, outdoor fireplace or barbecue pit.

Operating line is a group of separated operating buildings of specific arrangement used in the assembly, modification, reconditioning, renovation, maintenance, inspection, surveillance, testing or manufacturing of explosives.

Organic coating is a liquid mixture of binders, such as alkyd, nitrocellulose, acrylic or oil and flammable and combustible solvents such as hydrocarbon, ester, ketone or alcohol, which when spread in a thin film converts to a durable protective and decorative finish.

Organic peroxide is an organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides may present an explosion hazard (detonation or deflagration) or they may be shock sensitive. They may also decompose into various unstable compounds over an extended period of time.

OSHA is the Occupational Safety and Health Administration.

Owner includes persons having vested or contingent interest in the property in question and their duly authorized agents or attorneys, purchasers, devisees and fiduciaries.

Oxidizer is a chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-09117, filed 12/13/91, effective 7/1/92.]

WAC 51-24-10000 Article 10. Fire protection.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-10000, filed 12/13/91, effective 7/1/92.]

**DIVISION II
FIRE APPARATUS ACCESS ROADS**

WAC 51-24-10201 Section 10.201. General. Fire apparatus access roads shall be provided and maintained in accordance with locally adopted street, road, and access standards. Delete sections 10.202, 10.203, 10.204, 10.205, and 10.206 entirely.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-10201, filed 12/13/91, effective 7/1/92.]

WAC 51-24-10507 Required installations of automatic fire-extinguishing systems. Section 10.507. (a) General. An automatic fire-extinguishing system shall be installed in the occupancies and locations as set forth in this section.

For provisions on special hazards and hazardous materials, see sections 10.501 and articles 45, 48, 49 and 80.

(b) All occupancies except Group R, Division 3 and Group M. Except for Group R, Division 3 and Group M Occupancies, an automatic sprinkler system shall be installed:

1. In every story or basement of all buildings when the floor area exceeds 1,500 square feet and there is not provided at least 20 square feet of opening entirely above the adjoining ground level in each 50 lineal feet or fraction thereof of exterior wall in the story or basement on at least one side of the building. Openings shall have a minimum dimension of not less than 30 inches. Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that firefighting or rescue cannot be accomplished from the exterior.

When openings in a story are provided on only one side and the opposite wall of such story is more than 75 feet from such openings, the story shall be provided with an approved automatic sprinkler system, or openings as specified above shall be provided on at least two sides of an exterior wall of the story.

If any portion of a basement is located more than 75 feet from openings required in this section, the basement shall be provided with an approved automatic sprinkler system.

2. At the top of rubbish and linen chutes and in their terminal rooms. Chutes extending through three or more floors shall have additional sprinkler heads installed within such chutes at alternate floors. Sprinkler heads shall be accessible for servicing.

3. In rooms where nitrate film is stored or handled.

4. In protected combustible fiber storage vaults as defined in this code.

(c) Group A Occupancies.

1. Drinking establishments. An automatic sprinkler system shall be installed in rooms used by the occupants for the consumption of alcoholic beverages and unseparated

accessory uses where the total area of such unseparated rooms and assembly uses exceeds 5,000 square feet. For uses to be considered as separated, the separation shall not be less than as required for a one-hour occupancy separation. The area of other uses shall be included unless separated by at least a one-hour occupancy separation.

2. Basements. An automatic sprinkler system shall be installed in basements classified as a Group A Occupancy when the basement is larger than 1,500 square feet in floor area.

3. Exhibition and display rooms. An automatic sprinkler system shall be installed in Group A Occupancies which have more than 12,000 square feet of floor area which can be used for exhibition or display purposes.

4. Stairs. An automatic sprinkler system shall be installed in enclosed usable space below or over a stairway in Group A, Divisions 2, 2.1, 3 and 4 Occupancies.

5. Multitheater complexes. Every building containing a multitheater complex.

6. Amusement buildings. An automatic sprinkler system shall be installed in all amusement buildings. The main water-flow switch shall be electrically supervised. The sprinkler main cutoff valve shall be supervised. When the amusement building is temporary, the sprinkler water-supply may be of an approved temporary type.

EXCEPTION: An automatic sprinkler system need not be provided when the floor area of a temporary amusement building is less than 1,000 square feet and the exit travel distance from any point is less than 50 feet.

7. Other areas. An automatic sprinkler system shall be installed under the roof and gridiron, in the tie and fly galleries, and in all places behind the proscenium wall of stages; over and within permanent platforms in excess of 500 square feet in area; and in dressing rooms, workshops and storerooms accessory to such stages or permanent platforms.

EXCEPTIONS:

1. Stages or platforms open to the auditorium room on three or more sides.
2. Altars, pulpits or similar platforms and their accessory rooms.
3. Stage gridirons when side-wall sprinklers with 135°F. rated heads with heat-baffle plates are installed around the entire perimeter of the stage except for the proscenium opening at points not more than 30 inches below the gridiron or more than 6 inches below the baffle plate.
4. Under stage or under platform areas less than 4 feet in clear height used exclusively for chair or table storage and lined on the inside with materials approved for one-hour fire-resistive construction.

(d) Group B, Division 2 Occupancies. An automatic sprinkler system shall be installed in retail sales rooms classified as Group B, Division 2 Occupancies where the floor area exceeds 12,000 square feet on any floor or 24,000 square feet on all floors or in Group B, Division 2 retail sales occupancies more than three stories in height. The area of mezzanines shall be included in determining the areas where sprinklers are required.

(e) Group E Occupancies.

1. Basements. An automatic sprinkler system shall be installed in basements classified as a Group E Occupancy when the basement is larger than 1,500 square feet in floor area.

2. Stairs. An automatic sprinkler system shall be installed in enclosed usable space below or over a stairway in Group E Occupancies.

3. Division 1. An approved automatic fire-extinguishing system shall be installed in all newly constructed buildings classified as E-1 Occupancies constructed after July 1, 1992.

NOTE: For the purpose of this section, structural additions exceeding 60% of the appraised value of such building or structure, or alterations and repairs to any portion of a building or structure within a twelve-month period that exceeds 100% of the appraised value of such building or structure shall be considered new construction. In the case of structural additions, separation walls shall define separate buildings.

EXCEPTION: Portable school classrooms, provided:

- A. Aggregate area of clusters of portable school classrooms does not exceed 5,000 square feet; and
- B. Clusters of portable school classrooms separated as required in chapter 5 of the Building Code.

When not required by other provisions of this chapter, a fire-extinguishing system installed in accordance with UBC Standard No. 38-1 may be used for area and height increases and substitution for one-hour construction as allowed by the Building Code.

(f) Group H Occupancies.

1. Divisions 1, 2, 3 and 7. An automatic fire-extinguishing system shall be installed in Group H, Divisions 1, 2, 3 and 7 Occupancies.

2. Division 4. An automatic fire-extinguishing system shall be installed in Group H, Division 4 Occupancies having a floor area of more than 3,000 square feet.

3. Division 6. An automatic fire-extinguishing system shall be installed throughout buildings containing Group H, Division 6 Occupancies. The design of the sprinkler system shall not be less than that required by the Building Code for the occupancy hazard classifications as follows:

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 3
Service corridors	Ordinary Hazard Group 3
Storage rooms without dispensing	Ordinary Hazard Group 3
Storage rooms with dispensing	Extra Hazard Group 2
Exit corridors	Ordinary Hazard Group 3 ¹

¹ When the design area of the sprinkler system consists of a corridor protected by one row of sprinklers, the maximum number of sprinklers that need to be calculated is 13.

(g) Group I Occupancies. An automatic sprinkler system shall be installed in Group I Occupancies.

EXCEPTION: In jails, prisons and reformatories, the piping system may be dry, provided a manually operated valve is installed at a continuously monitored location. Opening of the valve will cause the piping system to be charged. Sprinkler heads in such systems shall be equipped with fusible elements or the system shall be designed as required for deluge systems by the Building Code. See UBC Standard No. 38-1.

(h) Group R, Division 1 Occupancies. An automatic sprinkler system shall be installed throughout apartment houses three or more stories in height or containing 16 or more dwelling units, in congregate residences three or more stories in height and having an occupant load of 50 or more, and in hotels three or more stories in height or containing 20 or more guest rooms.

Residential or quick-response standard sprinkler heads shall be used in the dwelling units and guest room portions of the building.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-10507, filed 12/13/91, effective 7/1/92.]

WAC 51-24-25000 Article 25. Places of assembly.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-25000, filed 12/13/91, effective 7/1/92.]

WAC 51-24-25107 Aisles. Section 25.107. (a) General. Aisles leading to required exits shall be provided from all portions of buildings. Aisles located within an accessible route of travel shall also comply with the Building Code for accessibility.

(b) Width in occupancies without fixed seats. The width of aisles in occupancies without fixed seats shall comply with this section. Aisle widths shall be provided in accordance with the following:

1. In areas serving employees only, the minimum aisle width may be 24 inches but not less than the width required by the number of employees served.

2. In public areas of Group B, Division 2 Occupancies, and in assembly occupancies without fixed seats, the minimum clear aisle width shall be 36 inches where tables, counters, furnishings, merchandise or other similar obstructions are placed on one side of the aisle only and 44 inches when such obstructions are placed on both sides of the aisle.

(c) Width in assembly occupancies with fixed seats. Aisles in assembly occupancies with fixed seats shall comply with this section. The clear width of aisles shall be based on the number of occupants within the portion of the seating areas served by the aisle.

The clear width of an aisle in inches shall not be less than the occupant load served by the aisle multiplied by 0.3 for aisles with slopes greater than 1 vertical to 8 horizontal and not less than 0.2 for aisles with slopes of 1 vertical to 8 horizontal or less. In addition, when the rise of steps in aisles exceeds 7 inches, the aisle clear width shall be increased by 1 1/4 inches for each 100 occupants or fraction thereof served for each 1/4 inch of riser height above 7 inches.

Where exiting is possible in two directions, the width of such aisles shall be uniform throughout their length.

When aisles converge to form a single path of exit travel, the aisle width shall not be less than the combined required width of the converging aisle.

In assembly rooms with fixed seats arranged in rows, the clear width of aisles shall not be less than set forth above and not less than the following:

48 inches for stairs having seating on both sides.

36 inches for stairs having seating on one side.

23 inches between a stair handrail and seating when the aisles are subdivided by the handrail.

42 inches for level or ramped aisles having seating on both sides.

36 inches for level or ramped aisles having seating on one side.

23 inches between a stair handrail and seating when an aisle does not serve more than five rows on one side.

(d) Aisle termination. Aisles shall terminate at a cross aisle, foyer, doorway or vomitory. Aisles shall not have a dead end greater than 20 feet in length.

EXCEPTION: A longer dead-end aisle is permitted when seats served by the dead-end aisle are not more than 24 seats from another aisle measured along a row of seats having a minimum clear width of 12 inches plus 0.6 inch for each additional seat above seven in a row.

Each end of a cross aisle shall terminate at an aisle, foyer, doorway or vomitory.

(e) Ramp slope. The slope of ramped aisles shall not be more than 1 vertical in 8 horizontal. Ramped aisles shall have a slip-resistant surface.

EXCEPTION: When provided with fixed seating, theaters may have a slope not steeper than 1 vertical to 5 horizontal.

(f) Aisle steps.

1. When prohibited. Steps shall not be used in aisles having a slope of 1 vertical to 8 horizontal or less.

2. When required. Aisles with a slope steeper than 1 vertical to 8 horizontal shall consist of a series of risers and treads extending across the entire width of the aisle, except as provided in subsection (e).

The height of risers shall not be more than 7 inches and not less than 4 inches and the tread run shall not be less than 11 inches. The riser height shall be uniform within each flight and the tread run shall be uniform throughout the aisle. Variations in run or height between adjacent treads or risers shall not exceed 3/16 inch. A contrasting marking stripe or other approved marking shall be provided on each tread at the nosing or leading edge such that the location of each tread is readily apparent when viewed in descent. Such stripe shall be a minimum of 1 inch wide and a maximum of 2 inches wide.

EXCEPTION: When the slope of aisle steps and the adjoining seating area is the same, the riser heights may be increased to a maximum of 9 inches and may be nonuniform but only to the extent necessitated by changes in the slope of the adjoining seating area to maintain adequate sightlines. Variations may exceed 3/16 inch between adjacent risers provided the exact location or such variations is identified with a marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform riser. The marking stripe shall be distinctively different from the contrasting marking stripe.

(g) Handrails. Handrails shall comply with the height, size and shape dimensions set forth in the Building Code (See UBC section 3306(i)) and shall have rounded terminations or bends. Ramped aisles having a slope steeper than 1 vertical to 15 horizontal and aisle stairs (two or more adjacent steps) shall have handrails located either at the side or within the aisle width. Handrails may project into the required aisle width a distance of 3 1/2 inches.

EXCEPTIONS: 1. Handrails may be omitted on ramped aisles having a slope not greater than 1 vertical in 8 horizontal when fixed seating is on both sides of the aisle.

2. Handrails may be omitted when a guardrail is at the side of an aisle which conforms to the size and shape requirements for handrails.

Handrails located within the aisle width shall be discontinuous with gaps or breaks at intervals not to exceed five rows. These gaps or breaks shall have a clear width of not less than 22 inches and not more than 36 inches mea-

sured horizontally. Such handrails shall have an additional intermediate handrail located 12 inches below the main handrail.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-25107, filed 12/13/91, effective 7/1/92.]

WAC 51-24-45000 Article 45. Application of flammable finishes.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-45000, filed 12/13/91, effective 7/1/92.]

WAC 51-24-45211 Drying apparatus. Section 45.211. (a) General. Drying apparatus shall be in accordance with this section and article 62.

(b) Spray booths and spraying rooms.

1. General. Spray booths and spraying rooms shall not be alternately used for the purpose of drying by arrangements which could cause a material increase in the surface temperature of the spray booth or spraying room unless such spray booths or spraying rooms are used for automobile refinishing in accordance with section 45.211(b) 2.

2. Automobile refinishing.

A. General. Spray booths and spraying rooms which are used for automobile refinishing with drying conducted therein using drying apparatus shall be in accordance with this subsection.

B. Drying apparatus. Drying apparatus used in spraying rooms shall be of the portable infrared type.

Drying apparatus used in spray booths shall be of the portable infrared type, or if other types of drying apparatus are used, the spray booth, including drying apparatus, shall be listed and approved for use with flammable vapors and combustible residues and shall be provided with explosion control.

C. Spraying procedure. The procedure shall be restricted to low-volume, occasional spray application.

D. Housekeeping. The interior of the spray booth or spraying room shall be kept free of overspray deposits.

E. Interlocks. The spraying apparatus, drying apparatus and ventilating system for the spray booth or spraying room shall be equipped with suitable interlocks arranged to:

(i) Prevent operation of spraying apparatus while drying operations are in progress,

(ii) Purge spray vapors from the spray booth or spraying room for a period of not less than three minutes before drying apparatus can be operated.

(iii) Have the ventilating system maintain a safe atmosphere within the spray booth or spraying room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system, and

(iv) Automatically shut off the drying apparatus if the air temperature exceeds 125°F. when other than portable infrared drying apparatus is used.

F. Portable infrared apparatus. When portable infrared drying apparatus is used, electrical wiring and portable infrared drying equipment shall comply with this article and the Electrical Code. Electrical equipment located within 18 inches of floor level shall be approved for Class I, Division 2 hazardous locations. Metallic parts of drying apparatus shall be properly electrically bonded and grounded.

During spraying operations, portable drying apparatus and electrical connections and wiring thereto shall not be located within spray booths, spraying rooms or other areas where spray residue could be deposited thereon.

(c) Spraying areas. Drying or baking units using a heating system having open flames or which could produce sparks shall not be installed in a spraying area.

When such units are installed adjacent to a spraying area, they shall be equipped with an interlocked ventilating system arranged to:

1. Thoroughly ventilate the drying space before the heating system can be started,

2. Maintain a safe atmosphere at any source of ignition, and

3. Automatically shut down the heating system in the event of a failure of the ventilating system.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-45211, filed 12/13/91, effective 7/1/92.]

WAC 51-24-78000 Article 78. Fireworks and Pyrotechnic Special Effects Material.

Division II

Fireworks

[Statutory Authority: Chapter 19.27 RCW. 93-01-162, § 51-24-78000, filed 12/23/92, effective 7/1/93.]

WAC 51-24-78201 General. Sec. 78.201. Storage, use and handling of fireworks shall be in accordance with chapter 70.77 RCW and local ordinances consistent with chapter 70.77 RCW.

Delete sections 78.202 and 78.203 entirely.

[Statutory Authority: Chapter 19.27 RCW. 93-01-162, § 51-24-78201, filed 12/23/92, effective 7/1/93.]

WAC 51-24-79000 Article 79. Flammable and combustible liquids.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-79000, filed 12/13/91, effective 7/1/92.]

WAC 51-24-79601 General. Section 79.601. (a) Location. Flammable and combustible liquid storage tanks located underground, outside of or under buildings, shall be in accordance with this section. Tanks shall be located with respect to existing foundations and supports such that the loads carried by the latter cannot be transmitted to the tank. The distance from any part of a tank storing liquids to the nearest wall of a basement, pit, cellar or property line shall not be less than 3 feet. A minimum distance of 1 foot, shell to shell, shall be maintained between underground tanks.

(b) Depth and cover. Excavation for underground storage tanks shall be made with due care to avoid undermining of foundations of existing structures. Underground tanks shall be set on firm foundations and surrounded with at least 6 inches of noncorrosive inert material such as clean sand or gravel well-tamped in place or in accordance with the manufacturer's installation instructions. Tanks shall be covered with a minimum of 2 feet of earth or shall be covered by not less than 1 foot of earth, on top of which shall be placed a slab of reinforced concrete not less than 4

inches thick. When underground tanks are or are likely to be subjected to traffic, they shall be protected against damage from vehicles passing over them by at least 3 feet of earth cover, or 18 inches of well-tamped earth plus 6 inches of reinforced concrete, or 8 inches of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 1 foot horizontally beyond the outline of the tank in all directions.

For tanks built in accordance with section 79.106, the burial depth and the height of the vent line shall be such that the static head imposed at the bottom of the tank will not exceed 10 psig if the fill or vent pipe is filled with liquid.

If the depth of cover exceeds 7 feet or the manufacturer's specifications, reinforcements shall be provided in accordance with the tank manufacturer's recommendations.

Nonmetallic underground tanks shall be installed in accordance with manufacturer's instructions. The minimum depth of cover shall be as specified in this subsection.

(c) Locations Subject to Flooding. Where a tank could become buoyant due to a rise in the level of the water table or due to location in an area that is subject to flooding, the tank shall be anchored in place. See Appendix II-B or manufacturer's installation instructions.

(d) Leaking tanks. Leaking tanks shall be either promptly emptied and removed from the ground or repaired in accordance with WAC 173-360-325.

(e) Used tanks. Reinstallation of used tanks is allowed when such tanks comply with the requirements of sections 79.106 and 79.603. See section 2.304(b).

(f) Tank lining. Steel tanks are allowed to be lined only for the purpose of protecting the interior from corrosion or providing compatibility with a material to be stored. Only those liquids tested for compatibility with the lining material are allowed to be stored in lined tanks. Lining of leaking underground storage tanks shall be done in accordance with the provisions of WAC 173-360-325.

Tank opening, cleaning, preparation, inspection, lining, closing and testing shall be in accordance with UFC Standard No. 79-6.

For permits to alter a tank, see section 4.108.

Interior-lined underground tanks shall be protected from corrosion in accordance with section 79.603.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-79601, filed 12/13/91, effective 7/1/92.]

WAC 51-24-79603 Corrosion protection. Section 79.603. Underground tanks and piping shall be properly designed, installed and maintained, and protected from corrosion by either of the following methods:

(a) Through the use of cathodic protection systems in accordance with recognized standards of design. See section 2.304(b), WAC 173-360-320, or

(b) Through the use of approved corrosion-resistant materials of construction such as special alloys; nonmetallic, reinforced plastic coatings; composites; or equivalent systems.

If conditions, based on adequate proof, warrant the deletion of the corrosion-protection requirements, the chief may waive the corrosion-protection requirements.

New underground steel tanks and piping shall be tested by the structure-to-soil-potential method after the system is in operation. The tank manufacturer shall provide a structure lead and a test station. The criteria for adequate corrosion protection shall be in accordance with recognized standards. Testing shall be done at installation and not less than once every five years thereafter by qualified persons approved by the chief.

EXCEPTION: Approved and listed composite fiberglass-reinforced plastic tanks.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-79603, filed 12/13/91, effective 7/1/92.]

WAC 51-24-79809 Unloading operations. Sec. 79.809. (a) Transfer Apparatus. Transfer apparatus shall be of an approved type.

(b) Storage Tanks. Class I, II or III liquids shall be transferred from a tank vehicle or tank car only into an approved atmospheric tank or approved portable tank.

EXCEPTIONS:

1. Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment under the following conditions and when approved by the chief, and when:

A. The Tank Vehicle's specific function is that of supplying fuel to fuel tanks and each premises shall require a separate permit issued in accordance with Article 4,

B. The operation shall be performed only where the general public has no access or where there is no unusual exposure to life and property,

C. The dispensing line shall not exceed 50 feet in length, and

D. The dispensing nozzle is approved.

2. Transfer of liquids from tank vehicles to the fuel tanks of aircraft in accordance with Article 24, Division II and motor vehicles in accordance with Article 79, Division IX and X.

3. When a tank vehicle or tank is disabled through accident or mechanical failure and it becomes necessary to remove the cargo at that location, such cargo is allowed to be transferred to another tank vehicle or tank car.

(c) Time Limit. Tank vehicles and tank cars shall be unloaded as soon as possible after arrival at point of delivery and shall not be used as storage tanks. Tank cars shall be unloaded only on private sidings or railroad siding facilities equipped for transferring the liquid between tank cars and permanent storage tanks. Unless otherwise approved by the chief, a tank car shall not be allowed to remain on a siding at point of delivery for more than 24 hours while connected for transfer operations.

(d) Inside Buildings. Tank vehicles or tank cars shall not be located inside a building while unloading Class I, II or III-A liquids, unless approved by the chief.

EXCEPTION: Tank vehicles are allowed under canopies of automotive motor vehicle fuel-dispensing stations.

(e) Vehicle Motors. Motors of tank vehicles shall be shut off during the making and breaking of hose connections and during the unloading operation.

EXCEPTION: When unloading is performed with a pump deriving its power from the tank vehicle motor,

(f) Attendant. The operator or other competent person shall be in attendance at all times while a tank vehicle or

tank car is discharging cargo. When practical, the tank vehicle or tank car shall be positioned such that the operating controls and the discharging end of the hoses are both in view of the operator or other competent person.

[Statutory Authority: RCW 19.27.074, 93-01-163, § 51-24-79809, filed 12/23/92, effective 7/1/93.]

WAC 51-24-79901 General. Section 79.901. (a) Applicability. Automotive, marine and aircraft motor vehicles fuel-dispensing stations shall be in accordance with this division.

EXCEPTION: Class II or III liquids may be transferred from tank vehicles into the fuel tanks of motor vehicles when approved by the chief, and under the following conditions:

A. Only diesel fuel will be allowed and each premises shall require a separate permit issued in accordance with Article 4,

B. Tank vehicles shall meet the requirements of D.O.T. and UFC Standard 79-4 and as approved by the chief,

C. The tank vehicle, while in service, shall not be left unattended,

D. A fire extinguisher with a classification of 2A-20BC shall be readily available at the fueling site,

E. There shall be signs stating "NO SMOKING OR OPEN FLAME WITHIN 25 FEET" readily visible at the fueling site,

F. There shall be adequate lighting for night time operations,

G. For other than marine motor vehicles, the fuel hose shall not exceed 50 feet in length,

H. Approved automatic closing nozzles without a latch open device shall be used,

I. Communication devices shall be available in accordance with Section 79.903 (f) 2 D,

J. Tank vehicle's shall have emergency shut off valves as approved by the chief.

K. Dispensing shall be done in accordance with Section 79.807 (c),

L. At least 20 feet from any source of ignition,

M. The applicant shall comply with all applicable federal, state and local environmental laws and regulations as a condition of permit,

N. The private fueling area shall be located on an area graded in a manner to direct the spill away from buildings, storage and property lines.

(b) Bulk Plants. Motor vehicle fuel-dispensing stations are prohibited at bulk plants unless such use is in compliance with the provisions of this division and is completely separated by a fence or similar barrier from the area in which bulk operations are conducted.

(c) Sources of Ignition in Vehicle Repair and Fuel Receiving Areas. Smoking and open flames shall be prohibited in areas used for servicing internal combustion engines and areas where fuel is received.

[Statutory Authority: RCW 19.27.074, 93-01-163, § 51-24-79901, filed 12/23/92, effective 7/1/93.]

WAC 51-24-80000 Article 80. Hazardous materials.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80000, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80101 Scope. Section 80.101. (a) General. Prevention, control and mitigation of physical hazards and health hazards related to storage, dispensing, use

and handling of hazardous materials and information needed by emergency response personnel shall be in accordance with this article.

EXCEPTIONS: 1. Off-site hazardous materials transportation in accordance DOT requirements.

2. The quantities of alcoholic beverages, medicines, foodstuffs and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, in retail sales occupancies are unlimited when packaged in individual containers not exceeding 4 liters.

(b) Material classification. Hazardous materials are those chemicals or substances defined as such in article 9. See Appendix VI-A for the classification of hazard categories and hazard evaluations.

EXCEPTION: For the purpose of this article, carcinogens, irritants and sensitizers do not include commonly used building materials and consumer products which are not otherwise regulated by this code.

The classification system referenced in Division II shall apply to all hazardous materials, including those materials regulated elsewhere in this code.

(c) Application. Division I shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that when specific requirements are provided in other articles, those specific requirements shall apply.

When a material has multiple hazards, all hazards shall be addressed.

The provisions of this article are waived when such provisions are preempted by other codes, statutes or ordinances. The details of any action granting any such waiver shall be recorded and entered in the files of the code enforcement agency.

(d) Existing buildings. For existing buildings, see section 1.103(b).

(e) Retail sales and display. For retail display of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in Group B, Division 2 retail sales occupancies, see section 80.112.

(f) Notwithstanding any other language to the contrary, article 80 is adopted in the state of Washington for the purpose to provide requirements for the prevention, control and mitigation of physical hazards and health hazards only.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80101, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80103 Permits. Section 80.103. (a) General. Where required by the chief:

1. Permits are required to store, dispense, use or handle hazardous material in excess of quantities specified in section 4.108.

2. A permit is required when a material is classified as having more than one hazard category if the quantity limits are exceeded in any category.

3. Permits are required to install, repair, abandon, remove, place temporarily out of service, close or substantially modify a storage facility or other area regulated by this article. See also sections 80.110 and 80.111.

EXCEPTIONS: 1. Routine maintenance.

2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

Permittee shall apply for approval to close storage, use or handling facilities at least 30 days prior to the termination of the storage, use or handling of hazardous materials. Such application shall include any change or alteration of the facility closure plan filed pursuant to section 80.110. This 30-day period may be waived by the chief if there are special circumstances requiring such waiver.

(b) Hazardous materials management plan. When required by the chief, each application for a permit pursuant to this article shall include a Hazardous Materials Management Plan (HMMP) in accordance with Appendix II-E.

EXCEPTION: Compliance with requirements of 40 CFR "Hazardous Chemical Reporting and Community Right-To-Know Regulations" under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) will satisfy the requirement of this subsection.

(c) Hazardous materials inventory statement. When required by the chief, each application for a permit pursuant to this article shall include a hazardous materials inventory statement (HMIS) in accordance with Appendix II-E.

EXCEPTION: Compliance with requirements of 40 CFR "Hazardous Chemical Reporting and Community Right-To-Know Regulations" under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) will satisfy the requirement of this subsection.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80103, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80108 Construction requirements. Section 80.108. (a) General. Buildings or portions thereof, in which hazardous materials are stored, handled or used shall be constructed in accordance with the Building Code, as specified in U.B.C. Chapter 9.

(b) Control areas.

1. Boundaries. Boundaries of a control area shall be formed by one or more of the following:

A. An occupancy separation with a minimum one-hour fire-resistive rating, or

B. The exterior wall, roof or foundation of the building.

2. Number. The number of control areas in buildings or portions of buildings used for retail sales shall not exceed two. The number of control areas in buildings used for other than retail sales shall not exceed four.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80108, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80109 Personnel training and written procedures. Section 80.109. Persons responsible for the operation of areas in which hazardous materials are stored, dispensed, handled or used shall be familiar with the chemical nature of the materials and the appropriate mitigating actions necessary in the event of fire, leak or spill.

Responsible persons shall be designated and trained to be liaison personnel for the fire department. These persons shall aid the fire department in preplanning emergency responses and identification of the locations where hazardous materials are located and shall have access to material safety data sheets and be knowledgeable in the site emergency response procedures.

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EXCEPTION: Compliance with requirements of 40 CFR "Hazardous Chemical Reporting and Community Right-To-Know Regulations" under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) will satisfy the requirements of this section.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80109, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80110 Section 80.110. Facility closure or placement out-of-service notification. Section 80.110. The permit holder or applicant shall notify the fire department of its intent to terminate storage, dispensing, handling or use of hazardous materials at least 30 days prior to facility closure or placing facility out of service.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80110, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80111 Section 80.111. Delete section 80.111 out-of-service facilities entirely.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80111, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80113 Section 80.113. Notwithstanding section 1.103(b) conditions in existence at the time of the adoption of this article may continue if such condition was legal at the time of the adoption of this code, provided such condition is not dangerous to life or does not present a distinct and substantial hazard to property.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80113, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80114 Section 80.114. Section 80.114. The intent of this article is to promote compliance with nationally recognized standards, including those identified in Appendix V-A and any guidance or directives from nationally recognized standards development organizations. Compliance with such standards shall be considered by the chief in judging compliance with the intent of this article.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80114, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80120 Table No. 80.112-A.

TABLE NO. 80.112-A
DENSITY FACTORS FOR EXEMPT AMOUNTS IN RETAIL SALES

HAZARD CATEGORIES ¹	CLASS	DENSITY FACTOR (p)
Physical Hazards:		
Oxidizers; unstable (reactive) materials; water-reactive materials	Class 4	N.P.
	Class 3	0.075
	Class 2	0.006
	Class 1	0.003
Health Hazards:		
Highly toxic solids and liquids; corrosives; other health hazard solids, liquids and gases	All	0.0013

NP = Not permitted

¹ Hazard categories are as specified in Division II. Density factors shall not apply to categories other than those listed.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80120, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80202 Hazard categories. Section 80.202. (a) Physical hazards. The materials listed in this subsection are classified as physical hazards. A material with a primary classification as a physical hazard can also present a health hazard.

1. Explosives and blasting agents, regulated elsewhere in this code.
2. Compressed gases, regulated in this article and elsewhere in this code.
3. Flammable and combustible liquids regulated elsewhere in this code.
4. Flammable solids.
5. Organic peroxides.
6. Oxidizers.
7. Pyrophoric materials.
8. Unstable (reactive) materials.
9. Water-reactive solids and liquids.
10. Cryogenic fluids, regulated under this article and elsewhere in this code.

(b) Health hazards. The materials listed in this subsection are classified as health hazards. A material with a primary classification as a health hazard can also present a physical hazard.

1. Highly toxic or toxic materials, including highly toxic or toxic compressed gases.
2. Radioactive materials.
3. Corrosives.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80202, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80301 General. Section 80.301. (a) Applicability.

1. General. Application of this division shall be in accordance with this subsection.

2. Quantities exceeding exempt amounts. Storage of hazardous materials, in containers, cylinders and tanks, in excess of the exempt amounts specified in sections 80.302 through 80.314 shall be in accordance with this division.

3. Quantities not exceeding exempt amounts.

A. General. Storage of hazardous materials, in containers, cylinders and tanks, not exceeding the exempt amounts specified in sections 80.302 through 80.314 is not required to be in accordance with this division except as provided in this subsection.

B. Storage conditions. Storage conditions for liquid and solid oxidizers, organic peroxides, and unstable (reactive) and water-reactive materials shall be as set forth in sections 80.306 (a)2, 80.307 (a)2, 80.309 (a)2 and 80.310 (a)2.

C. Contamination prevention. Contamination prevention for organic peroxides shall be as set forth in section 80.307 (a)2.

D. Separation. Separation of incompatible hazardous materials shall be in accordance with section 80.301(n).

4. Materials regulated by other articles. Hazardous materials regulated by other articles are not required to be in accordance with this division unless specifically indicated in this division.

(b) Containers and tanks.

1. Design and construction. Containers and tanks shall be designed and constructed in accordance with nationally recognized standards. See section 2.304(b).

2. Tanks out-of-service for 90 days. Stationary tanks not used for a period of 90 days shall be properly safeguarded or removed in a manner approved by the chief. Such tanks shall have the fill line, gauge opening and pump connection secured against tampering. Vent lines shall be properly maintained.

Tanks which are to be placed back in service shall be tested in a manner approved by the chief.

3. Defective containers and tanks. Defective containers and tanks shall be removed from service, repaired, or disposed of in accordance with nationally recognized standards of good practice such as the American Petroleum Institute (API) or American Society of Mechanical Engineers (ASME). See section 2.304(b).

4. Empty containers and tanks. Empty containers and tanks previously used for the storage of hazardous materials shall be free from residual material and vapor as defined by DOT, the Resource Conservation and Recovery Act (RCRA) or other regulating authority or maintained as specified for the storage of the hazardous material.

5. Underground tanks. Underground tanks not otherwise excepted by this section used for the storage of hazardous materials shall be located and protected in accordance with sections 79.601 and 79.603 of this code. Secondary containment shall be provided for all new installations of underground tanks.

EXCEPTION: Underground storage tanks regulated by 40 CFR 280 or state law.

6. Aboveground tanks. Aboveground stationary tanks used for the storage of hazardous materials shall be located and protected in accordance with the provisions for exterior storage of the particular material involved and shall be marked as required by section 80.301(d).

(c) Piping, valves and fittings. Piping, valves, fittings and related components appurtenant to or intended for the storage of hazardous materials shall be designed and fabricated from materials compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress, and exposure to which they could be subjected.

(d) Signage. In addition to the hazard identification signs required by section 80.107, stationary aboveground tanks shall be placarded with hazard identification signs as specified in U.F.C. Standard No. 79-3 for the specific material contained.

Signs prohibiting smoking shall be provided in storage areas and within 25 feet of outdoor storage areas.

Signs shall not be obscured or removed.

Signs shall be in English as a primary language or in symbols allowed by this code.

Signs shall be durable. The size, color and lettering shall be in accordance with nationally recognized standards.

(e) Security. The storage of hazardous materials shall be protected against tampering or trespassers by fencing or other control measures.

(f) Ignition sources. Smoking, use of open flames or high-temperature devices in a manner which creates a hazardous condition shall not be permitted.

EXCEPTION: Energy-consuming equipment listed for use with the hazardous material stored.

(g) Protection from light. Materials which are sensitive to light shall be stored in containers designed to protect them from such exposure.

(h) Shock padding. Materials which are shock sensitive shall be padded, suspended or otherwise protected against accidental dislodgement and dislodgement during seismic

activity. For seismic requirements and the seismic zone in which the material is located, see the Building Code.

(i) Shelf storage. Shelving shall be of substantial construction, adequately braced and anchored. For seismic requirements and the seismic zone in which the material is located, see the Building Code.

Shelves shall be provided with a lip or guard when used for the storage of individual containers.

EXCEPTION: Storage in hazardous materials storage cabinets or laboratory furniture specifically designed for such use.
Shelf storage of hazardous materials shall be maintained in an orderly manner.

(j) Maximum quantity on site. The storage of hazardous materials shall be in accordance with the local zoning ordinance.

(k) Storage plan. A storage plan shall be provided for all storage facilities. The plan shall indicate the intended storage arrangement, including the location and dimensions of aisles. Compliance with requirements of 40 CFR "Hazardous Chemical Reporting and Community Right-To-Know Regulations" under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) will satisfy the requirements of this subsection.

(l) Spill control, drainage control and secondary containment. 1. General. Unless exempted or otherwise provided for in sections 80.302 through 80.314, rooms, buildings or areas used for the storage of solid and liquid hazardous materials shall be provided with a means to control spillage and to contain or drain off spillage and fire-protection water discharged in the storage area in accordance with this subsection.

2. Spill control. Floors shall be recessed a minimum of 4 inches or shall be provided with liquid-tight raised sill to a minimum height of 4 inches so as to prevent the flow of liquid to adjoining areas. When liquid-tight sills are provided, they are not required at door openings which are provided with an open-grate trench which connects to the room drainage system.

3. Drainage control. A. General. The room, building or area shall be provided with a drainage system to direct the flow of liquids to an approved location, or, when required in sections 80.302 through 80.314, the room, building or area shall be designed to provide secondary containment for the hazardous materials and fire-protection water.

B. Slope. A slope to drain not less than 1 percent shall be provided.

C. Capacity for fire-extinguishing water. Drains from the area shall be sized to carry the automatic fire-extinguishing system design flow rate over the system design area.

D. Materials. Materials of construction for the drainage system shall be compatible with the stored materials.

E. Incompatible materials. Incompatible materials shall be separated from each other in drain systems. They may be combined when they have been rendered acceptable by an approved means for discharge into the public sewer.

F. Termination. Flow from the drainage system shall be directed to an approved location.

Drainage of spillage and fire-protection water may be directed to a neutralizer or treatment system which complies with the following:

(i) The system shall be designed to handle the maximum worst case spill from the single largest container plus the volume of fire-protection water from the system over the minimum design area for a period of 20 minutes, and

(ii) The system shall be designed to overflow from the neutralizer or treatment system so that liquid leakage and fire-protection water is directed to a safe location away from the building, valves, means of egress, adjoining property and fire department access roadways.

4. Secondary containment. When required in sections 80.302 through 80.314, drains shall be directed to a containment system or other location designed as secondary containment for the hazardous materials liquids and fire-protection water, or the building, room or area shall be designed to provide secondary containment of hazardous material liquids and fire-protection water through the use of recessed floors or liquid-tight raised sills.

EXCEPTION: The provisions of this subsection may be waived when the chief has determined that such enforcement is preempted by other codes, statutes or ordinances. See section 80.101.

Secondary containment shall be designed to retain the spill from the largest single container plus the design flow rate of the automatic fire-extinguishing system for the area of the room or area in which the storage is located or the system design area, whichever is smaller. The containment capacity shall be capable of containing the flow for a period of 20 minutes.

Overflow from the secondary containment system shall be provided to direct liquid leakage and fire-protection water to a safe location away from the building, valves, means of egress, fire access roadway, adjoining property or storm drains.

If the storage area is open to rainfall, the secondary containment shall be designed to accommodate the volume of a 24-hour rainfall as determined by a 25-year storm. When curbs are used, provisions shall be made for draining accumulations of groundwater or rainwater.

When secondary containment is required, a monitoring method capable of detecting hazardous material leakage from the primary containment into the secondary containment shall be provided. Visual inspection of the primary containment is the preferred method; however, other means of monitoring is approved by the chief. Where secondary containment is subject to the intrusion of water, a monitoring method for such water shall be provided. When monitoring devices are provided, they shall be connected to distinct visual or audible alarms.

(m) Ventilation. Unless exempted or otherwise provided for in sections 80.302 through 80.314, indoor storage areas and storage buildings shall be provided with mechanical exhaust ventilation. Threshold limit values (TLV) as established by the American Conference of Governmental and Industrial Hygienists (ACGIH), OSHA or Washington Industrial Safety and Health Act - chapter 296-62 WAC will be utilized for establishing minimum standards where ventilation is required.

EXCEPTION: Where natural ventilation can be shown to be acceptable for the materials as stored.

Exhaust ventilation systems shall comply with the following:

1. Installation shall be in accordance with the provisions of the Mechanical Code.

2. Mechanical ventilation shall be at a rate of not less than 1 cubic foot per minute per square foot of floor area over the storage area.

3. Systems shall operate continuously. Alternate designs may be approved by the chief.

4. A manual shutoff control shall be provided outside the room adjacent to the access door into the room or in a location approved by the chief. The switch shall be of the break-glass type and shall be labeled "ventilation system emergency shutoff."

5. Exhaust ventilation shall be arranged to consider the density of the potential fumes or vapors released. For fumes or vapors that are heavier than air, exhaust shall be taken from a point within 12 inches of the floor.

6. The location of both the exhaust and inlet air openings shall be arranged to provide air movement across all portions of the floor or room to prevent the accumulation of vapors.

7. Exhaust ventilation shall not be recirculated within the room or building if the materials stored are capable of emitting hazardous vapors.

(n) Separation of incompatible hazardous materials. Storage of incompatible hazardous materials shall be separated.

EXCEPTION: Containers of solids or liquids having a capacity of less than 5 pounds or 1/2 gallon when stored in quantities not exceeding exempt amounts.

Separation shall be accomplished by:

1. Segregating incompatible hazardous materials storage by a distance of not less than 20 feet,

2. Isolating incompatible hazardous materials storage by a noncombustible partition extending not less than 18 inches above and to the sides of the stored material, or

3. Storing in hazardous materials storage cabinets or gas cabinets. Materials which are incompatible shall not be stored within the same cabinet.

(o) Hazardous materials storage cabinets.

1. General. When storage cabinets are used to comply with this article, such cabinets shall be in accordance with this subsection.

EXCEPTION: Compressed gases shall be stored in cabinets designed in accordance with section 80.303.

Cabinets shall be conspicuously labeled in red letters on contrasting background "Hazardous—Keep fire away."

2. Construction. The interior of cabinets shall be treated, coated or constructed of materials that are nonreactive with the hazardous material stored. Such treatment, coating or construction shall include the entire interior of the cabinet. Cabinets shall either be listed as suitable for the intended storage or constructed in accordance with the following:

A. Cabinets shall be of steel having a thickness of not less than 0.044 inch (18 gage). The cabinet, including the door, shall be double walled with 1 1/2-inch airspace between the walls. Joints shall be riveted or welded and shall be tight-fitting. Doors shall be well fitted, self-closing and equipped with a self-latching device.

B. The bottoms of cabinets utilized for the storage of liquids shall be liquid-tight to a minimum height of 2 inches.

For requirements regarding electrical equipment and devices within cabinets used for the storage of hazardous gases or liquids, see the Electrical Code.

(p) Fire-extinguishing systems. Unless exempted or otherwise provided for in sections 80.302 through 80.314, indoor storage areas and storage buildings shall be protected by an automatic sprinkler system. The design of the sprinkler system shall not be less than that required by the Building Code for Ordinary Hazard Group 3 with a minimum design area of 3,000 square feet. See UBC Standard No. 38-1. Where the materials or storage arrangement require a higher level of sprinkler system protection in accordance with nationally recognized standards, the higher level of sprinkler system protection shall be provided.

EXCEPTION: Approved alternate automatic fire-extinguishing systems are allowed.

(q) Explosion control. Unless exempted or otherwise provided for in sections 80.302 through 80.314, indoor storage areas and storage buildings shall be provided with explosion control in accordance with the Building Code.

(r) Electrical wiring and equipment. Electrical wiring and equipment shall be installed in accordance with the Washington state Electrical Code chapter 296-46 WAC.

(s) Standby power. When mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be connected to a secondary source of power to automatically supply electrical power in the event of loss of power from the primary source. See the Washington state Electrical Code chapter 296-46 WAC.

(t) Limit controls.

1. General. Unless exempted or otherwise provided for in sections 80.302 through 80.314, limit controls shall be provided in accordance with this subsection.

2. Liquid-level limit control. Atmospheric tanks with a capacity exceeding 500 gallons used for the storage of hazardous materials liquids shall be equipped with a liquid-level limit control to prevent overfilling of the tank.

EXCEPTION: Tanks monitored by a system which will limit net contents by weight.

3. Temperature control. Materials which must be stored at temperatures other than normal ambient temperatures to prevent a hazardous reaction shall be stored in an area provided with a means to maintain the temperature within a safe range. Redundant temperature control equipment which will operate upon failure of the primary temperature control system shall be provided. Alternate means which prevent a hazardous reaction are allowed.

4. Pressure control. Stationary tanks used for the storage of hazardous materials liquids which can generate pressures exceeding the tank design limits due to exposure fires or internal reaction shall have some form of construction or device that will relieve excessive internal pressure. Such relief devices shall vent to an approved location or to an exhaust scrubber or treatment system when specified in sections 80.302 through 80.314.

(u) Emergency alarm. An approved emergency alarm system shall be provided in buildings, rooms or areas used for the storage of hazardous materials. Emergency alarm signal devices shall be installed outside of each interior exit door of storage buildings, rooms or areas. Activation of the

emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials.

(v) Supervision. When emergency alarm, detection or automatic fire-extinguishing systems are required in sections 80.302 through 80.314, such systems shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

(w) Protection from vehicles. Guard posts or other means shall be provided to protect exterior storage tanks from vehicular damage. When guard posts are installed, the posts shall be:

1. Constructed of steel not less than 4 inches in diameter and concrete filled,
2. Spaced not more than 4 feet between posts on center,
3. Set not less than 3 feet deep in a concrete footing of not less than a 15-inch diameter,
4. Set with the top of the posts not less than 3 feet above ground, and
5. Located not less than 5 feet from the tank.

(x) Clearance from combustibles. The area surrounding an exterior storage area or tank shall be kept clear of combustible materials and vegetation for a minimum distance of 30 feet.

(y) Noncombustible floor. Except for surfacing, floors of storage areas shall be of noncombustible construction.

(z) Professional engineer. The chief is authorized to require design submittals to bear the stamp of a professional engineer.

(aa) Weather protection. When overhead noncombustible construction is provided for sheltering exterior hazardous material storage areas, such storage shall not be considered indoor storage when all of the following conditions are met:

1. Supports shall be of noncombustible construction.
2. Supports and walls shall not obstruct more than 25 percent of the perimeter of the storage area.
3. The distance to buildings, property lines, streets, alleys, public ways or exits to a public way shall not be less than the distance required for an exterior hazardous material storage area without weather protection.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-80301, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80303 Toxic and highly toxic compressed gases. Section 80.303. (a) Indoor storage.

1. General. Indoor storage of toxic and highly toxic compressed gases shall be in accordance with this subsection, and sections 80.301 and 80.303(c).

2. Exempt amounts. When the amount of highly toxic or toxic compressed gases stored in one control area exceeds that specified in Table No. 80.303-A, such storage shall be within a room or building conforming with the Building Code requirements for a Group H, Division 7 Occupancy.

3. Fire-extinguishing system. In addition to section 80.301(p), the following requirements shall apply:

A. Gas cabinets or exhausted enclosures for the storage of cylinders shall be internally sprinklered.

B. Alternate fire-extinguishing systems shall not be used for either storage areas, gas cabinets or exhausted enclosures.

EXCEPTION: Where water is incompatible with the hazardous material stored, the chief may approve alternate fire suppression methods to an automatic sprinkler system.

4. Explosion venting or suppression. When flammable gases which are toxic or highly toxic are stored in rooms outside of gas cabinets or exhausted enclosures, the storage rooms shall be provided with explosion venting or suppression in accordance with the provisions of section 80.301(q).

5. Spill control, drainage control and secondary containment. Spill control, drainage control and secondary containment are not required for the storage of highly toxic or toxic compressed gases.

6. Ventilation and storage arrangement.

A. Ventilated area. Storage of cylinders shall be within ventilated gas cabinets, exhausted enclosures or within a ventilated separate gas storage room. Storage of portable and stationary tanks shall be within a separate ventilated room without other occupancy or use. If gas cabinets are provided, the room or area in which they are located shall have independent exhaust ventilation.

B. Gas cabinets. When gas cabinets are provided they shall be:

(i) Operated at negative pressure in relation to the surrounding area,

(ii) Provided with self-closing limited access ports or noncombustible windows to give access to equipment controls. The average velocity of ventilation at the face of access ports or windows shall be not less than 200 feet per minute with a minimum of 150 feet per minute at any point of the access port or window,

(iii) Connected to an exhaust system,

(iv) Provided with self-closing doors, and

(v) Constructed of not less than 0.097-inch (12 gage) steel.

C. Separate gas storage rooms. When separate gas storage rooms are provided, they shall be designed to:

(i) Operate at a negative pressure in relation to the surrounding area, and

(ii) Direct the exhaust ventilation to an exhaust system.

D. Treatment systems.

(i) General. Treatment systems shall be utilized to handle the accidental release of gas. Treatment systems shall be utilized to process all exhaust ventilation to be discharged from gas cabinets, exhausted enclosures or separate gas storage rooms.

(ii) Design. Treatment systems shall be capable of diluting, adsorbing, absorbing, containing, neutralizing, burning or otherwise processing the entire contents of the largest single tank or cylinder of gas stored or used. When a total containment system is utilized, the system shall be designed to handle the maximum anticipated pressure of release to the system when it reaches equilibrium.

(iii) Performance. Treatment systems shall be designed to reduce the maximum allowable discharge concentration of the gas to one-half IDLH at the point of discharge to the atmosphere. When more than one gas is emitted to the treatment system, the treatment system shall be designed to handle the worst-case release based on the release rate, the quantity and the IDLH for all the gases stored or used.

(iv) Sizing. Treatment systems shall be sized to process the maximum worst-case release of gas based on the maximum flow rate of release from the largest cylinder or

tank utilized. The entire contents of tanks and cylinders shall be considered.

(v) Stationary tanks. Stationary tanks shall be labeled with the maximum rate of release for the gas contained based on valves or fittings that are inserted directly into the tank. If multiple valves or fittings are provided, the maximum flow rate of release for the valve or fitting with the highest flow rate shall be indicated. If liquefied gases are in contact with valves or fittings, the liquid flow rate shall be utilized for purposes of computation. Flow rates indicated on the label shall be converted to cubic feet per minute of gas at normal temperature and pressure.

(vi) Portable tanks and cylinders. For portable tanks and cylinders, the maximum flow rate of release shall be calculated based on assuming the total release from the cylinder or tank within the time specified in Table No. 80.303-B. When portable tanks or cylinders are equipped with approved excess flow or reduced flow valves, the worst-case release will be determined by the maximum achievable flow from the valve as determined by the valve manufacturer or the gas supplier. Reduced flow and excess flow valves shall be permanently marked by the manufacturer to indicate the maximum design flow rate. Such markings shall indicate the flow rate for air under standard conditions.

7. Emergency power. Emergency power shall be provided in lieu of standby power for:

A. Exhaust ventilation, including the power supply for treatment systems,

B. Gas-detection systems,

C. Emergency alarm systems, and

D. Temperature-control systems.

8. Limit controls. In addition to the limit controls required by section 80.301(t), excess flow control shall be provided for stationary tanks which are piped for filling or dispensing.

9. Gas detection. A continuous gas-detection system shall be provided to detect the presence of gas at or below the permissible exposure limit or ceiling limit. The detection system shall initiate a local alarm and transmit a signal to a constantly attended control station. The alarm shall be both visual and audible and shall be designed to provide warning both inside and outside of the storage area. The audible alarm shall be distinct from all other alarms.

EXCEPTIONS: 1. Signal transmission to a constantly attended control station need not be provided when not more than one cylinder is stored.

2. A continuous gas-detection system need not be provided for toxic gases when the physiological warning properties for the gas are at a level below the accepted permissible exposure limit for the gas.

The gas-detection system shall be capable of monitoring the room or area in which the gas is stored at or below the permissible exposure limit or ceiling limit and the discharge from the treatment system at or below one-half the IDLH limit.

10. Smoke detection. An approved supervised smoke-detection system shall be provided in rooms or areas where highly toxic compressed gases are stored indoors. Activation of the detection systems shall sound a local alarm.

11. Storage conditions. The number of cylinders contained in a single gas cabinet shall not exceed three.

EXCEPTION: Cabinets containing cylinders not exceeding 1 pound net contents each shall be limited to a maximum of 100 cylinders.

(b) Exterior storage.

1. General. Exterior storage of highly toxic or toxic compressed gases shall be in accordance with this subsection and section 80.301 and 80.303(c).

2. Distance from storage to exposures. Exterior storage of highly toxic or toxic compressed gases shall comply with the Building Code and the following:

A. Distance limitation to exposures. The exterior storage of highly toxic or toxic compressed gases shall not be within 75 feet of a building, property line, street, alley, public way or exit to a public way unless the storage is shielded by a structure having a minimum fire-resistive rating of two hours and which interrupts the line of sight between the storage and the exposure. The protective structure shall be at least 5 feet from exposures. The protective structure shall not have more than two sides at approximately 90-degree directions, or three sides with connecting angles of approximately 135 degrees.

B. Openings in exposure buildings. When the storage area is located closer than 75 feet to a building, openings into a building other than piping shall not be above the height of the top of the shielding structure or within 50 feet horizontally from the storage area whether or not shielded by a protective structure.

C. Air intakes. The storage area shall not be within 75 feet of air intakes.

3. Canopies. Portable tanks and cylinders stored outside of buildings shall be stored under a canopy of noncombustible construction. Such storage shall not be considered indoor storage.

EXCEPTION: Portable tanks and cylinders used for storing anhydrous ammonia (fertilizer grade).

An automatic fire-sprinkler system shall be provided for canopies provided for the storage of highly toxic or toxic compressed gases.

EXCEPTION: Where water is incompatible with the hazardous material stored, the chief may approve alternate fire-suppression methods to an automatic sprinkler system.

4. Piping and controls. In addition to the requirements of section 80.301(c), piping and controls on stationary tanks shall be in accordance with the following:

A. Pressure-relief devices shall be vented to a treatment system designed in accordance with section 80.303(a) 6 D.

B. Where filling or dispensing connections are provided, they shall be provided with a means of local exhaust. Such exhaust shall be designed to capture fumes and vapors. The exhaust shall be directed to a treatment system designed in accordance with section 80.303(a) 6 D.

C. Stationary tanks shall be provided with a means of excess flow control on tank inlet and outlet connections.

EXCEPTIONS: 1. Inlet connections that are designed to preclude backflow.
2. Pressure-relief devices.

5. Spill control, drainage control and secondary containment. Spill control, drainage control and secondary containment are not required for the exterior storage of highly toxic or toxic compressed gases.

(c) Special provisions.

1. Seismic protection. Stationary tanks and associated piping systems shall be seismically braced in accordance with the Building Code.

2. Security. Storage areas shall be secured against unauthorized entry.

3. Gas cabinets for leaking cylinders. At least one gas cabinet or exhausted enclosure shall be provided for the handling of leaking cylinders.

EXCEPTIONS:

1. A cabinet or exhausted enclosure need not be provided for leaking cylinders if all cylinders are stored within gas cabinets or exhausted enclosures.

2. A cabinet or exhausted enclosure need not be provided for leaking cylinders if a U.S. DOT approved cylinder containment vessel is provided.

The cabinet or enclosure shall be located as follows:

A. Within or adjacent to exterior storage areas, or

B. Within separate gas storage rooms used for cylinders.

The gas cabinet or exhausted enclosure shall be connected to an exhaust system. See section 80.303(a) 6 D.

4. Local exhaust for leaking portable tanks. A means of local exhaust shall be provided to capture leaks from portable tanks. Portable ducts or collection systems designed to be applied to the site of a leak in a valve or fitting on the tank are acceptable. The local exhaust system shall be connected to a treatment system as specified in section 80.303(a) 6 D. The local exhaust system shall be provided:

A. Within or immediately adjacent to exterior storage areas, or

B. Within separate gas storage rooms used for portable or stationary tanks.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80303, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80305 Flammable solids and combustible dusts. Section 80.305. (a) Indoor storage.

1. General. Indoor storage of flammable solids shall be in accordance with this subsection and section 80.301. Storage of combustible fibers shall be in accordance with article 28.

2. Exempt amounts. When the amount of flammable solids stored in one control area exceeds that specified in Table No. 80.305-A, such storage shall be within a room or building conforming to the Building Code requirements for a Group H, Division 3 Occupancy, or a Group H, Division 2 Occupancy when combustible dusts are stored in piles or within open containers.

3. Spill control, drainage control and secondary containment. Spill control, drainage control and secondary containment are not required for the storage of flammable solids.

4. Explosion venting or suppression. Rooms, buildings or equipment used for the storage of combustible dusts shall be provided with explosion venting, equivalent protective devices or suppression in accordance with the provisions of section 80.301(q).

5. Ventilation. Mechanical exhaust ventilation is not required.

6. Storage conditions. Flammable solids stored in quantities greater than 1,000 cubic feet shall be separated into piles each not larger than 1,000 cubic feet. Aisle widths between piles shall be equal to not less than the height of the piles or 4 feet, whichever is greater.

Flammable solids shall not be stored in basements.

(b) Exterior storage.

1. General. Exterior storage of flammable solids shall be in accordance with this subsection and section 80.301. Storage of combustible fibers shall be in accordance with article 28.

2. Distance from storage to exposures. Exterior storage of flammable solids shall not be within 20 feet of any building, property line, street, alley, public way, or exit to a public way. An unpierced two-hour fire-resistive wall extending not less than 30 inches above and to the sides of the storage area is allowed in lieu of such distance.

3. Spill control, drainage control and secondary containment. Spill control, drainage control and secondary containment are not required for exterior storage of flammable solids.

4. Storage conditions. Exterior storage of flammable solids shall be separated into piles not larger than 5,000 cubic feet each. Aisle widths between piles shall be not less than one-half the height of the piles or 10 feet, whichever is greater.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80305, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80315 Delete section 80.315 Carcinogens, irritants, sensitizers and other health hazard solids, liquids and gases entirely.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80315, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80401 Section 80.401. General.

(a) Applicability. Dispensing, use and handling of hazardous materials in excess of the exempt amounts specified in Tables Nos. 80.402-A and 80.402-B shall be in accordance with this division.

EXCEPTIONS:

1. Hazardous materials regulated by other articles in this code.
2. Underground storage tanks regulated by 40 CFR 280 or state law.

The provisions for toxic compressed gases shall apply only after consideration of the hazard potential, alternatives for controlling the hazard, and the cost and benefits of the alternatives.

(b) Containers, cylinders and tanks.

1. General. Containers, cylinders and tanks utilized for the dispensing, use or handling of hazardous materials shall be in accordance with this subsection.

2. Design and construction. Containers, cylinders and tanks shall be designed and constructed in accordance with nationally recognized standards. See section 2.304(b).

3. Tanks out of service for 90 days. Stationary tanks not used for a period of 90 days shall be properly safeguarded or removed in a manner approved by the chief. Such tanks shall have the fill line, gage opening and pump connection secured against tampering. Vent lines shall be properly maintained.

4. Defective containers, cylinders and tanks. Defective containers, cylinders and tanks shall be removed from service, repaired, or disposed of in accordance with nationally recognized standards of good practice.

5. Empty containers, cylinders and tanks. Empty containers, cylinders and tanks previously containing hazardous materials shall be free from residual material and vapor or stored as specified for the storage of hazardous material in accordance with Division III.

6. Underground tanks. Underground tanks not otherwise excepted by this section containing hazardous materials shall be located and protected in accordance with sections 79.601 and 79.603 of this code. Secondary containment shall be provided for all new underground tanks.

7. Aboveground tanks. Aboveground tanks containing hazardous materials shall be located and protected in accordance with the provisions for exterior storage of the particular materials as specified in Division III. Such tanks shall be marked as required by section 80.401(n).

(c) Piping, tubing, valves and fittings.

1. General. Piping, tubing, valves and fittings conveying hazardous materials shall be installed in accordance with approved standards and shall be in accordance with this subsection.

2. Design and construction. Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

A. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.

B. Piping and tubing shall be identified in accordance with nationally recognized standards to indicate the material conveyed.

C. Emergency shutoff valves shall be identified and the location shall be clearly visible and indicated by means of a sign, and

D. Backflow-prevention or check valves shall be provided when the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

3. Supply piping. Supply piping and tubing for gases and liquids having a health hazard ranking of 3 or 4 in accordance with UFC Standard No. 79-3 shall also be in accordance with the following:

A. Piping and tubing utilized for the transmission of highly toxic or toxic materials shall have welded or brazed connections throughout unless an exhausted enclosure is provided if the material is a gas, or the piping is provided with a receptor for containment if the material is a liquid,

EXCEPTIONS:

1. Nonmetallic piping with approved connections.
2. Nationally recognized standards shall be deemed to be in compliance with this section.

B. Piping and tubing shall not be located within exit corridors, within any portion of an exit required to be enclosed in fire-resistive construction, or above areas not classified as Group H Occupancies,

EXCEPTION: Piping and tubing within the space defined by the walls of exit corridors and floor or roof above or in concealed space above other occupancies when installed in accordance with the Building Code as required for Group H, Division 6 Occupancies. See UBC section 911(f) 2.

C. Where gases or liquids are carried in pressurized piping above 15 psig, excess flow control shall be provided. Where the piping originates from within a hazardous material storage room or area, the excess flow control shall be located within the storage room or area. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical, and

EXCEPTION: Where excess flow control is not appropriate according to nationally recognized standards of good practice.

D. Readily accessible manual or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing at the following locations:

- (i) The point of use, and
- (ii) The tank, cylinder or bulk source.

(d) Equipment. Equipment, machinery and processes utilized for dispensing, use or handling of hazardous materials shall be suitable for the intended use. Such equipment, machinery and processes shall be maintained in an operable condition and shall be replaced, repaired or removed from service when found to be defective.

(e) Separation from storage of hazardous materials. Dispensing, use and handling of hazardous materials having a reactivity hazard ranking of 3 or 4 in accordance with UFC Standard No. 79-3 shall be separated from storage of incompatible materials when the quantity in storage exceeds the exempt amounts specified in sections 80.302 through 80.314. The separation shall be provided by one of the following:

1. Segregated from incompatible hazardous materials storage by a distance of not less than 20 feet,
2. Isolated from incompatible hazardous materials storage by a noncombustible partition extending not less than 18 inches above and to the front and sides of the stored material,
3. Storage of hazardous materials in hazardous materials storage cabinets in accordance with section 80.301(o), or
4. Storage of compressed gases in gas cabinets or exhausted enclosures in accordance with section 80.303(a) 6 B.

(f) Noncombustible floor. Except for surfacing, floors of areas where liquid or solid hazardous materials are dispensed or used in open systems shall be of noncombustible, liquid-tight construction.

(g) Spill control, drainage control and secondary containment. When required by other provisions of this division, spill control, drainage control and secondary containment shall be provided in accordance with section 80.301(l).

(h) Sources of ignition. Smoking shall be prohibited in rooms or areas where hazardous materials are dispensed or used in open systems and within 25 feet of outdoor dispensing areas.

Open-flame and other heat-producing equipment shall be located a safe distance from areas where temperature-sensitive materials, flammable materials and compressed gases are dispensed, used or handled.

(i) Static accumulation. When processes or conditions exist where a flammable mixture could be ignited by static electricity, means shall be provided to prevent the accumulation of a static charge.

(j) Electrical equipment and wiring. Electrical equipment and wiring in dispensing and use areas shall be installed in accordance with the provisions of the Washington state Electrical Code chapter 296-46 WAC.

(k) Limit controls.

1. General. Limit controls shall be provided in accordance with this subsection.

2. Liquid level. Open tanks in which hazardous materials are used shall be equipped with a liquid level limit control or other means to prevent overfilling of the tank.

3. Temperature. Process tanks and equipment which involve temperature control of the material shall be provided with limit controls to maintain the temperature within a safe range.

4. Pressure. Stationary tanks and equipment containing materials which can generate pressures exceeding the tank or equipment design limits due to exposure fires or internal reaction shall be equipped with pressure-limiting or relief devices. Relief devices for stationary tanks or equipment for highly toxic or corrosive materials shall vent to an exhaust scrubber or treatment system for processing of vapors or gases. Relief devices for flammable or explosive vapors or gases shall vent to an approved location.

(l) Standby power. When mechanical ventilation, treatment systems, temperature control, manual alarm, detection or other electrically operated systems are required by other provisions of this division, such systems shall be connected to a standby source of power to automatically supply electrical power in the event of loss of power from the primary source. See the Washington state Electrical Code chapter 296-46 WAC.

(m) Supervision. Manual alarm, detection, and automatic fire-extinguishing systems required by other provisions of this division shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

(n) Signage. In addition to the hazard identification signs required by section 80.107, additional hazard identification and warning signs shall be provided as follows:

1. Signs prohibiting smoking shall be provided in dispensing and open-use areas and within 25 feet of outdoor dispensing or open-use areas, and

2. Stationary containers and tanks shall be placarded with hazard identification signs as specified in UFC Standard No. 79-3 for the specific material contained.

(o) Security. Dispensing, use, and handling areas shall be protected against tampering or trespassing by fencing or other control measures.

(p) Seismic protection. Machinery and equipment utilizing hazardous materials shall be seismically anchored in accordance with the Building Code.

(q) Lighting. Adequate lighting by natural or artificial means shall be provided. Artificial lighting shall be in accordance with the recommendations of the Illuminating Engineering Society Handbook or other nationally recognized standards.

(r) Fire-extinguishing systems. Indoor rooms or areas in which hazardous materials are dispensed or used shall be protected by an automatic fire-extinguishing system. Sprinkler system design shall not be less than that required by the Building Code for ordinary hazard, Group 3, with a

minimum design area of 3,000 square feet. See UBC Standard No. 38-1. Where the materials or storage arrangement require a higher level of sprinkler system protection in accordance with nationally recognized standards, the higher level of sprinkler system protection shall be provided.

EXCEPTION: Approved alternate automatic fire-extinguishing systems are allowed.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW, 92-01-065, § 51-24-80401, filed 12/13/91, effective 7/1/92.]

WAC 51-24-80402 Dispensing and use. Section 80.402. (a) General. When the amount of hazardous materials dispensed or used in one control area exceeds that specified in Table No. 80.402-A or 80.402-B, such dispensing or use shall either be located in a room or area complying with this section and constructed in accordance with the Building Code, or shall be located in an exterior dispensing, use or handling area located as required for exterior storage in sections 80.301 through 80.314.

(b) Indoor dispensing and use.

1. General. Indoor dispensing and use of hazardous materials shall be in accordance with this subsection and section 80.401.

2. Open systems.

A. General. Dispensing and use of hazardous materials in open containers or systems shall be in accordance with this subsection.

B. Dispensing. When liquids having a hazard ranking of 3 or 4 in accordance with U.F.C. Standard No. 79-3 are dispensed from tanks or drums, dispensing shall be only by approved pumps taking suction from the top or by other methods in accordance with nationally recognized standards of good practice.

C. Ventilation. When gases, liquids or solids having a hazard ranking of 3 or 4 in accordance with U.F.C. Standard No. 79-3 are dispensed or used, approved ventilation shall be provided to control fumes, mists or vapors at the point of generation.

EXCEPTION: Gases, liquids or solids which can be demonstrated not to create harmful fumes, mists or vapors based on applicable recognized standards.

D. Fire-extinguishing system. In addition to the provisions of section 80.401(r), laboratory fume hoods and spray booths where flammable materials are dispensed or used shall be protected by an automatic fire-extinguishing system.

E. Explosion venting or suppression. Explosion venting or suppression shall be provided in accordance with the provisions of section 80.301(q) when an explosion hazard can occur because of the characteristics or nature of the hazardous materials dispensed or used, or as a result of the dispensing or use process.

F. Spill control, drainage and containment. Rooms or areas where hazardous material liquids are dispensed into containers exceeding 1-gallon capacity or used in open containers or systems exceeding a 5-gallon capacity shall be provided with a means to control spills. Secondary containment shall be provided when the capacity of an individual container exceeds 55 gallons or the aggregate capacity of multiple containers exceeds 100 gallons.

3. Closed systems.

A. General. Use of hazardous materials in closed containers or systems shall be in accordance with this subsection.

B. Use. Systems shall be suitable for the use intended and shall be designed by persons competent in such design. Where nationally recognized good practices or standards have been established for the processes employed, they shall be followed in the design. Controls shall be designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. When automatic controls are provided, they shall be designed to be fail safe.

C. Ventilation. If closed systems are designed to be opened as part of normal operations, ventilation shall be provided in accordance with section 80.402(b) 2 C.

D. Fire-extinguishing system. In addition to section 80.401 (r), laboratory fume hoods and spray booths where flammable materials are used shall be protected by an automatic fire-extinguishing system.

E. Explosion venting or suppression. Explosion venting or suppression shall be provided in accordance with the provisions of section 80.301(q) when an explosion hazard can occur because of the hazardous materials dispensed or used, or as a result of the dispensing or use process.

F. Spill control, drainage control and secondary containment. Rooms or areas where hazardous material liquids are used in individual tanks or containers exceeding 55 gallons shall be provided with a means to control spills. Secondary containment shall be provided if the aggregate capacity of multiple tanks or containers exceeds 1,000 gallons.

G. Special requirements for highly toxic and toxic compressed gases.

(i) Ventilation and storage arrangement. Compressed gas cylinders in use shall be within ventilated gas cabinets, laboratory fume hoods, exhausted enclosures or separate gas storage rooms. When portable or stationary tanks are utilized in use or dispensing, they shall be within a ventilated separate gas storage room or placed within an exhausted enclosure.

(ii) Gas cabinets and exhausted enclosures. When gas cabinets or exhausted enclosures are provided, they shall be in accordance with section 80.303(a) 6 B. Gas cabinets and exhausted enclosures shall be internally sprinklered.

(iii) Separate gas storage rooms. When separate gas storage rooms are provided, they shall be in accordance with section 80.303 (a) 6 C.

(iv) Treatment systems. Treatment systems shall be provided in accordance with section 80.303(a) 6 D.

(v) Gas detection. Gas detection shall be provided in accordance with section 80.303(a) 9. Activation of the monitoring system shall automatically close the shutoff valve on highly toxic or toxic gas supply lines related to the system being monitored.

EXCEPTION: Automatic shutdown need not be provided for reactors utilized for the production of toxic or highly toxic gases when such reactors are:

1. Operated at pressures less than 15 psig,
2. Constantly attended, and
3. Provided with readily accessible emergency shutoff valves.

(vi) Smoke detection. Smoke detection shall be provided in accordance with section 80.303(a) 10.

(vii) Storage conditions. The number of cylinders contained in a single gas cabinet shall not exceed three.

(c) Exterior dispensing and use.

1. General. Exterior dispensing or use of hazardous materials in either closed or open containers or systems shall be in accordance with this subsection and section 80.401.

2. Dispensing. When liquids having a hazard ranking of 3 or 4 in accordance with U.F.C. Standard No. 79-3 are dispensed from tanks or drums, dispensing shall be by approved pumps taking suction from the top or by other methods in accordance with nationally recognized standards of good practice.

3. Fire-extinguishing system. Flammable hazardous materials dispensing or use areas located within 50 feet of either a storage area or building, and vehicle loading racks where flammable hazardous materials are dispensed, shall be protected by an approved fire-extinguishing system.

4. Spill control, drainage control and secondary containment.

A. Open systems. Exterior areas where hazardous materials liquids are dispensed into containers exceeding a 1-gallon capacity or used in open containers or systems exceeding a 5-gallon capacity shall be provided with a means to control spills. Secondary containment shall be provided when the capacity of an individual container exceeds 55 gallons or the aggregate capacity of multiple containers exceeds 100 gallons.

B. Closed systems. Exterior areas where hazardous materials liquids are used in individual tanks or containers exceeding 55 gallons shall be provided with a means to control spills. Secondary containment shall be provided when the aggregate capacity of multiple tanks or containers exceeds 1,000 gallons.

5. Clearance from combustibles. The area surrounding an exterior dispensing or use area shall be kept clear of combustible materials and vegetation for a minimum distance of 30 feet.

6. Fire access roadways and water supply.

A. General. Fire access roadways and approved water supplies shall be provided for exterior dispensing or use areas in accordance with this subsection.

B. Fire access roadways. Fire apparatus access roadways shall be provided to within 150 feet of all portions of an exterior dispensing or use area. Such access roadways shall comply with article 10, Division II.

C. Water supply. An approved water supply shall be provided. Fire hydrants or other approved means capable of supplying the required fire flow shall be provided to within 150 feet of all portions of an exterior dispensing or use area. The water supply and fire hydrants shall comply with article 10, Division IV.

7. Protection from vehicles. Guard posts or other means shall be provided to protect exterior dispensing or use areas from vehicular damage. When guard posts are installed, the posts shall be in accordance with section 80.301(w).

8. Special requirements for highly toxic or toxic compressed gases.

A. Ventilation and storage arrangement. When cylinders or portable containers are used out-of-doors, gas cabinets or a locally exhausted enclosure shall be provided.

B. Gas cabinets. When gas cabinets are provided, the installation shall be in accordance with section 80.303(a) 6 B.

C. Treatment systems. Treatment systems shall be provided in accordance with section 80.303(a) 6 D.

D. Gas detection. Gas detection shall be provided in gas cabinets and exhausted enclosures in accordance with section 80.303(a) 9. Activation of the monitoring system shall automatically close the shutoff valve on highly toxic or toxic gas supply lines related to the system being monitored.

EXCEPTION: Automatic shutdown need not be provided for reactors utilized for the production of toxic or highly toxic gases when such reactors are:

1. Operated at pressures less than 15 psig,
2. Constantly attended, and
3. Provided with readily accessible emergency shutoff valves.

E. Fire-extinguishing system. Gas cabinets and exhausted enclosures shall be internally sprinklered.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW 92-01-065, § 51-24-80402, filed 12/13/91, effective 7/1/92.]

WAC 51-24-99500 Division V. Standards.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW 92-01-065, § 51-24-99500, filed 12/13/91, effective 7/1/92.]

WAC 51-24-99510 Appendix V-A. Nationally recognized standards of good practice. 1. Scope. The following standards and publications are intended for use as a guide to attain a reasonable level of safety where specific requirements are not stated or specific standards are not adopted or referenced in the code.

2. American Gas Association Laboratories

8501 East Pleasant Road, Cleveland, OH 44131
1425 Grande Vista Avenue, Los Angeles, CA 90023

**Directory of certified appliances and accessories
Compressed Gas Association, Inc.**

1235 Jefferson Davis Highway, Arlington, VA 22202

CGA pamphlets

G-1 Acetylene.

G-2 Anhydrous Ammonia.

G-3 Sulphur Dioxide.

G-4 Oxygen.

G-5 Hydrogen.

P-1 Safe Handling of Compressed Gases.

P-2 Characteristics and Safe Handling of Medical Gases.

V-5 Diameter-Index Safety System.

Factory Mutual Engineering and Research

1151 Boston-Providence Turnpike, Norwood, MA 02062

Institute of Makers of Explosives

1120 19th Street, N.W., Suite 310, Washington, D.C.
20036-3605

IME pamphlets

No. 1 Construction Guide for Storage Magazines

No. 20 Radio Frequency Radiation Hazard in Use of Electric Blasting Caps

National Fire Protection Association

Batterymarch Park, Quincy, MA 02269

NFPA National Fire Codes

Underwriters Laboratories Inc.

333 Pflugsten Road, Northbrook, IL 60062

1655 Scott Blvd., Santa Clara, CA 95050

U.I. Inc. directories

Automotive, Burglary Protection and Mechanical Equipment.

Building Materials.

Electrical Appliance and Utilization Equipment.

Electrical Construction Materials.

Fire Protection Equipment.

Fire Resistance.

Gas and Oil Equipment.

General Information from Electrical Construction Materials and Hazardous Location Equipment Directories.

Hazardous Location Equipment.

Marine Products.

Recognized Component.

United States government agencies

Code of Federal Regulations (CFR), Titles 1-50, Superintendent of Documents

U.S. Government Printing Office, Washington, DC 20402

The Chlorine Institute, Inc.

2001 L Street, NW, Washington, DC 20036

The Chlorine Manual.

Instruction Booklet Chlorine Institute Emergency Kit

"A" for 100-pound and 150-pound Chlorine Cylinders.

Instruction Booklet Chlorine Institute Emergency Kit

"B" for Chlorine Ton Containers.

Instruction Booklet Chlorine Institute Emergency Kit

"C" for Chlorine Tank Cars/Tank Trucks.

Chlorine Institute Drawing 188, Chlorine Cylinder Recovery Vessel.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-24-99510, filed 12/13/91, effective 7/1/92.]

Chapter 51-25 WAC

STATE BUILDING CODE ADOPTION OF THE 1991 EDITION OF THE UNIFORM FIRE CODE STANDARDS

WAC

- 51-25-001 Authority.
- 51-25-002 Purpose.
- 51-25-003 Uniform Fire Code standards.
- 51-25-007 Exceptions.
- 51-25-008 Implementation.

WAC 51-25-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-001, filed 12/13/91, effective 7/1/92.]

WAC 51-25-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-002, filed 12/13/91, effective 7/1/92.]

WAC 51-25-003 Uniform Fire Code standards. The 1991 edition of the Uniform Fire Code standards published by the International Conference of Building Officials, and the Western Fire Chiefs Association is hereby adopted by reference.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-003, filed 12/13/91, effective 7/1/92.]

WAC 51-25-007 Exceptions. The exceptions and amendments to the Uniform Fire Code standards contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-007, filed 12/13/91, effective 7/1/92.]

WAC 51-25-008 Implementation. The Uniform Fire Code standards adopted by chapter 51-25 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-065, § 51-25-008, filed 12/13/91, effective 7/1/92.]

Chapter 51-26 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 1991 EDITION OF THE UNIFORM PLUMBING CODE

WAC

- 51-26-001 Authority.
- 51-26-002 Purpose.
- 51-26-003 Uniform Plumbing Code.
- 51-26-004 Exceptions.
- 51-26-008 Implementation.
- 51-26-0300 Chapter 3—General instructions and regulations.
- 51-26-0310 Prohibited fittings and practices.
- 51-26-0315 Protection of piping, materials, and structures.
- 51-26-0400 Chapter 4—Drainage systems.
- 51-26-0401 Materials.
- 51-26-0500 Chapter 5—Vents and venting.
- 51-26-0503 Materials.
- 51-26-1000 Chapter 10—Water distribution.
- 51-26-1004 Materials.
- 51-26-1800 Chapter 18—Water conservation performance standards.
- 51-26-1801 Declaration of purpose.
- 51-26-1802 Application.
- 51-26-1803 Water efficiency standards.
- 51-26-1804 Metering valves.
- 51-26-1810 Marking requirements for vitreous china plumbing fixtures.
- 51-26-1820 Marking requirements for plumbing fixture fittings.
- 51-26-1830 Accepted plumbing fixtures and fixture fittings.
- 51-26-1840 Implementation.
- 51-26-1845 Amendments.
- 51-26-2200 Chapter 22—Minimum plumbing facilities.
- 51-26-2300 Chapter 23—Rainwater systems.
- 51-26-2301 D1 materials.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 51-26-1805 Implementation. [Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1805, filed 12/13/91, effective 7/1/92.] Repealed by 93-

01-164, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.170.

WAC 51-26-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-001, filed 12/13/91, effective 7/1/92.]

WAC 51-26-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes, the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-002, filed 12/13/91, effective 7/1/92.]

WAC 51-26-003 Uniform Plumbing Code. The 1991 edition of the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, is hereby adopted by reference with the following additions, deletions, and exceptions: *Provided*, That chapters 11 and 12 of this code are not adopted: *Provided further*, That those requirements of the Uniform Plumbing Code relating to venting of appliances as found in chapter 13 are not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-003, filed 12/13/91, effective 7/1/92.]

WAC 51-26-004 Exceptions. The exceptions and amendments to the uniform codes contained in the provisions of chapter 19.27 RCW shall apply in cases of conflict with any of the provisions of these rules.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-004, filed 12/13/91, effective 7/1/92.]

WAC 51-26-008 Implementation. The Uniform Plumbing Code adopted by chapter 51-26 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-008, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0300 Chapter 3—General instructions and regulations.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0300, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0310 Prohibited fittings and practices. Section 310.

(a) No double hub fitting, single or double tee branch, single or double tapped tee branch, side inlet quarter bend, running thread, band, or saddle shall be used as a drainage fitting, except that a double hub sanitary tapped tee may be used on a vertical line as a fixture connection.

(b) No drainage or vent piping shall be drilled and tapped for the purpose of making connections thereto, and no cast iron soil pipe shall be threaded.

(c) No waste connection shall be made to a closet bend or stub of a water closet or similar fixture.

(d) Except as hereinafter provided in sections 613, 614, and 615, no vent pipe shall be used as a soil or waste pipe, nor shall any soil or waste pipe be used as a vent.

(e) No fitting, fixture and piping connection, appliance, device or method of installation which obstructs or retards the flow of water, wastes, sewage or air in the drainage or venting systems in an amount greater than the normal frictional resistance to flow, shall be used unless it is indicated as acceptable in this code or is approved by the administrative authority as having a desirable and acceptable function and of ultimate benefit to the proper and continuing functioning of the plumbing system. The enlargement of a three inch (76.2 mm) closet bend or stub to four inches (101.6 mm) shall not be considered an obstruction.

(f) Except for necessary valves, where intermembering or mixing of dissimilar metals occur, the point of connection shall be confined to exposed or accessible locations.

(g) All valves, pipes, and fittings shall be installed in correct relationship to the direction of flow.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0310, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0315 Protection of piping, materials, and structures. Section 315.

(a) All piping passing under or through walls shall be protected from breakage. All piping passing through or under cinders or other corrosive materials shall be protected from external corrosion in an approved manner. Approved provisions shall be made for expansion of hot water piping. Voids around piping passing through concrete floors on the ground shall be appropriately sealed.

(b) All piping in connection with a plumbing system shall be so installed that piping or connections will not be subject to undue strains or stresses, and provisions shall be made for expansion, contraction, and structural settlement. No piping shall be directly embedded in concrete or masonry walls or footings. No structural member shall be seriously weakened or impaired by cutting, notching, or otherwise.

(c) All trenches deeper than the footing of any building or structure and paralleling the same must be at least forty-five degrees therefrom, unless permission be otherwise granted by the administrative authority.

(d) No building sewer or other drainage piping or part thereof, constructed of materials other than those approved for use under or within a building, shall be installed under or within two feet (.6 m) of any building or structure, or less than one foot (.3 m) below the surface of the ground.

(e) Piping subject to undue corrosion, erosion, or mechanical damage shall be protected in an approved manner.

(f) No water, soil, or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing. All hot and cold water pipes installed outside the conditioned space shall be insulated to a minimum R-3.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0315, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0400 Chapter 4—Drainage systems.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0400, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0401 Materials. Section 401.

(a) Drainage piping shall be cast iron, galvanized steel, galvanized wrought iron, lead, copper, brass, Schedule 40 ABS DWV, Schedule 40 PVC DWV, extra strength vitrified clay pipe, or other approved materials having a smooth and uniform bore, except that:

(1) No galvanized wrought iron or galvanized steel pipe shall be used underground and shall be kept at least six inches (152.4 mm) above ground.

(2) No vitrified clay pipe or fittings shall be used above ground or where pressurized by a pump or ejector. They shall be kept at least twelve inches (.3 m) below ground.

(b) Drainage fittings shall be of cast iron, malleable iron, lead, brass, copper, ABS, PVC, vitrified clay, or other approved materials having a smooth interior waterway of the same diameter as the piping served and all such fittings shall be compatible with the type of pipe used.

(1) Fittings on screwed pipe shall be of the recessed drainage type. Burred ends shall be reamed to the full bore of the pipe.

(2) The threads of drainage fittings shall be tapped so as to allow one-fourth inch per foot (20.9 mm/m) grade.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0401, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0500 Chapter 5—Vents and venting.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0500, filed 12/13/91, effective 7/1/92.]

WAC 51-26-0503 Materials. Section 503.

(a) Vent pipe shall be cast iron, galvanized steel, galvanized wrought iron, lead, copper, brass, Schedule 40 ABS DWV, Schedule 40 PVC DWV or other approved materials having a smooth and uniform bore except that:

(1) No galvanized wrought iron or galvanized steel pipe shall be used underground and shall be kept at least six inches above ground.

(b) Vent fittings shall be cast iron, galvanized malleable iron or galvanized steel, lead, copper, brass, ABS, PVC, or other approved materials, except that no galvanized malleable iron or galvanized steel fittings shall be used underground and shall be kept at least six inches (152.4 mm) above ground.

(c) Changes in direction of vent piping shall be made by the appropriate use of approved fittings and no such pipe shall be strained or bent. Burred ends shall be reamed to the full bore of the pipe.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-0503, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1000 Chapter 10—Water distribution.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1000, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1004 Materials. Section 1004.

(a) Water pipe and fittings shall be of brass, copper, cast iron, galvanized malleable iron, galvanized wrought iron, galvanized steel, or other approved materials. Asbestos-cement, CPVC, PB, PE, or PVC water pipe manufactured to recognized standards may be used for cold water distribution systems outside a building. CPVC and PB water pipe and tubing may be used for hot and cold water distribution systems within a building. All materials used in the water supply system, except valves and similar devices shall be of a like material, except where otherwise approved by the administrative authority.

(b) Cast iron fittings up to and including two inches (50.8 mm) in size, when used in connection with potable water piping shall be galvanized.

(c) All malleable iron water fittings shall be galvanized.

(d) Piping and tubing which has previously been used for any purpose other than for potable water systems shall not be used.

(e) Approved plastic materials may be used in water service piping, provided that where metal water service piping is used for electrical grounding purposes, replacement piping therefore shall be of like materials.

EXCEPTION: Where a grounding system, acceptable to the administrative authority is installed, inspected, and approved, metallic pipe may be replaced with nonmetallic pipe.

(f) Solder shall conform to the requirements of section 802(d).

(g) Water pipe and fittings with a lead content which exceeds eight percent shall be prohibited in piping systems used to convey potable water.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1004, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1800 Chapter 18—Water conservation performance standards.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1800, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1801 Declaration of purpose. Sec. 1801. The purpose of this chapter shall be to implement water conservation performance standards in accordance with RCW 19.27.170.

[Statutory Authority: RCW 19.27.170, 93-01-164, § 51-26-1801, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1801, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1802 Application. Sec. 1802. This chapter shall apply to all new construction and all remodeling involving replacement of plumbing fixtures and fittings in all residential, hotel, motel, school, industrial, commercial use, or other occupancies determined by the council to use significant quantities of water. Plumbing fixtures, fittings and appurtenances shall conform to the standards specified

in this chapter and shall be provided with an adequate supply of potable water to flush and keep the fixtures in a clean and sanitary condition without danger of backflow or cross-connection.

[Statutory Authority: RCW 19.27.170, 93-01-164, § 51-26-1802, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1802, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1803 Water efficiency standards. Sec. 1803. (a) Standards for Vitreous China Plumbing Fixtures. 1. The following standards shall be adopted as plumbing materials, performance standards, and labeling standards for water closets and urinals. Water closets and urinals shall meet either the ANSI/ASME standards or the CSA standard.

ANSI/ASME A112.19.2M-1990	Vitreous China Plumbing Fixtures
ANSI/ASME A112.19.6-1990	Hydraulic Requirements for Water Closets and Urinals
CSA B45	CSA Standards on Plumbing Fixtures with the provisions found in WAC 51-26-1810.

2. The maximum water use allowed in gallons per flush (gpf) or liters per flush (lpf) for any of the following water closets shall be the following:

Tank-type toilets	1.6 gpf/6.0 lpf
Flushometer-valve toilets	1.6 gpf/6.0 lpf
Flushometer-tank toilets	1.6 gpf/6.0 lpf
Electromechanical hydraulic toilets	1.6 gpf/6.0 lpf

- EXCEPTIONS:
1. Water closets located in day care centers, intended for use by young children, may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
 2. Water closets with bed pan washers may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
 3. Blow out bowls, as defined in ANSI/ASME A112.19.2M, Section 5.1.2.3 may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.

3. The maximum water use allowed for any urinal shall be 1.0 gallons per flush or 3.78 liters per flush.

4. No urinal or water closet that operates on a continuous flow or continuous flush basis shall be permitted.

5. This section does not apply to fixtures installed before the effective date of this chapter, that are removed and relocated to another room or area of the same building after the effective date of this chapter.

(b) Standards for Plumbing Fixture Fittings. 1. The following standards are adopted as plumbing material, performance requirements, and labeling standards for plumbing fixture fittings. Faucets, aerators, and shower heads shall meet either the ANSI/ASME standard or the CSA standard.

ANSI/ASME A112.18.1M-1989	Plumbing Fixture Fittings
CSA B125	Plumbing Fittings, with the provisions of WAC 51-26-1820.

2. The maximum water use allowed for any shower head is 2.5 gallons per minute or 9.5 liters per minute.

EXCEPTION: Emergency use showers shall be exempt from the maximum water usage rates.

3. The maximum water use allowed in gallons per minute (gpm) or liters per minute (lpm) for any of the following faucets and replacement aerators is the following:

Lavatory faucets	2.5 gpm/9.5 lpm
Kitchen faucets	2.5 gpm/9.5 lpm
Replacement aerators	2.5 gpm/9.5 lpm
Public lavatory faucets other than metering	0.5 gpm/1.9 lpm

[Statutory Authority: RCW 19.27.170, 93-01-164, § 51-26-1803, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1803, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1804 Metering valves. Sec. 1804. Lavatory faucets located in restrooms intended for use by the general public shall be equipped with a metering valve designed to close by spring or water pressure when left unattended (self-closing).

- EXCEPTION:
1. Where designed and installed for use by persons with a disability.
 2. Where installed in day care centers, for use primarily by children under the age of 6 years of age.

[Statutory Authority: RCW 19.27.170, 93-01-164, § 51-26-1804, filed 12/23/92, effective 7/1/93. Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-1804, filed 12/13/91, effective 7/1/92.]

WAC 51-26-1810 Marking requirements for vitreous china plumbing fixtures. Sec. 1810. (a) The marking requirements for vitreous china plumbing fixtures contained in this section shall apply to fixtures tested in accordance with CSA B45. These requirements are consistent with the marking requirements mandated in ANSI/ASME A112.19.2.

(b) General. 1. Permanent Marking. Each fixture meeting this Standard (or each fixture component, if fixture is comprised of 2 or more components) shall be marked with the manufacturer's name or registered trademark, or in the case of private labeling, of the customer for whom the unit was manufactured. This mark shall be legible, readily identified, and applied so as to be permanent. The mark shall be located so as to be visible after the fixture is installed, except for fixtures built into or for a counter or cabinet.

2. Compliance with Standard. Each fixture shall be marked at a location determined by the manufacturer with the designation CSA B45 to signify compliance with this Standard. This mark need not be permanent, but shall be visible after installation.

3. Other Markings. Markings for specific products shall be per subsections (c) through (e).

(c) Seconds. All second grade ware shall be indelibly marked by the manufacturer with 2 parallel lines cut through the glaze into the body of the ware at the locations shown in Fig. 39 of ANSI/ASME A112.19.2M-1990. These cuts shall be filled with a bright red permanent marking which is resistant to the action of hot water. No label shall be placed on seconds. Manufacturer's name, trademark, or private brand name or trademark shall be permanently placed on the fixture as described in subsection (b).

1. All packages containing seconds ("B" grade) shall be clearly identified with 2 red marks adjacent to fixture identification.

(d) Water Closets. 1. Permanent Markings. Tanks and bowls, when sold as a combination, shall be permanently marked both on the bowl and tank with the manufacturer's name or trademark, or private brand name or trademark.

2. Compliance with Standard. Marking shall be per subsection (b) 2.

3. Water Consumption. Water closets, both box and product, shall be labeled in accordance with its consumption classification and the average water consumption in liters for that classification. The fixture label shall be intended for removal by the occupant only, and so state on the label. The minimum wording on the label shall be as follows.

"This fixture qualifies according to CSA test procedures as a low-consumption water closet with an average consumption per flush of 6.0 liters or less."

4. Model Numbers. At the manufacturer's option, water closets may be marked with model numbers.

(e) Urinals. 1. Permanent Marking. See subsection (b) 1.

2. Compliance with Standard. See subsection (b) 2.

3. Water Consumption. Urinals, both box and product, shall be labeled in accordance with its consumption classification and the average water consumption in liters for that classification (See ANSI/ASME A112.19.2M-1990, paragraphs 5.3.3.1, 5.3.3.2, and 5.3.3.3). The fixture label shall be intended for removal by the occupant only, and so state on the label. The minimum wording on the label shall be as follows.

"This fixture qualifies according to CSA test procedures as a low-consumption urinal with an average consumption per flush of 3.78 liters or less."

[Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1810, filed 12/23/92, effective 7/1/93.]

WAC 51-26-1820 Marking requirements for plumbing fixture fittings. Sec. 1820. (a) The marking requirements for plumbing fixture fittings contained in this section shall apply to fixtures tested in accordance with CSA B125. These requirements are consistent with the marking requirements mandated in ANSI/ASME A112.18.1.

(b) Product. 1. Each fitting shall bear permanent legible markings to identify the manufacturer. This marking shall be the trade name, trademark, or other mark known to identify the manufacturer. Such marking shall be located where it can be seen after installation.

2. Each shower head, sink faucet, and lavatory faucet shall be marked "CSA B125" to demonstrate compliance with this Standard. The marking shall be by means of either a permanent mark on the product, a label on the product, or a tag attached to the product.

(c) Package. 1. The package shall be marked with the manufacturer's name and model number.

2. The package or any label attached to the package for shower heads, sink faucets, and lavatory faucets shall contain at least the following: "CSA B125" and "9.5 lpm." The

flow rate values shall be the actual flow rate or 9.5 lpm (2.5 gpm) in the case of shower heads, sink faucets, and lavatory faucets; or the actual flow rate or 1.9 lpm (0.5 gpm) in the case of public lavatory faucets (other than metering faucets).

3. For other products, it is recommended that the package or package label be marked with "CSA B125."

[Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1820, filed 12/23/92, effective 7/1/93.]

WAC 51-26-1830 Accepted plumbing fixtures and fixture fittings. Sec. 1830. Plumbing fixtures and fixture fittings which are tested in accordance with the standards listed herein and listed by either the International Association of Plumbing and Mechanical Officials or the Canadian Standards Association may be approved by the Administrative Authority for installation. Under Section 201, the Administrative Authority may approve plumbing fixtures and fixture fittings, not listed by either the International Association of Plumbing and Mechanical Officials or the Canadian Standards Association, PROVIDED the products meet the testing, and marking and labeling requirements listed in WAC 51-26-1803, 1810, and 1820.

The State Building Code Council will publish and distribute a current list of fixtures and fixture fittings that meet the standards listed within Chapter 18 and have been listed with either the International Association of Mechanical and Plumbing Officials or the Canadian Standards Association.

[Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1830, filed 12/23/92, effective 7/1/93.]

WAC 51-26-1840 Implementation. Sec. 1840. (a) The standards for water efficiency and labeling contained within WAC 51-26-1803, 51-26-1810, and 51-26-1820 shall be in effect as of July 1, 1993, as provided in RCW 19.27.170.

(b) No individual, public or private corporation, firm, political subdivision, government agency, or other legal entity, may, for purposes of use in the state of Washington, distribute, sell, offer for sale, import, install, or approve for installation any plumbing fixtures or fittings unless the fixtures or fittings meet the standards as provided for in this chapter.

[Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1840, filed 12/23/92, effective 7/1/93.]

WAC 51-26-1845 Amendments. Sec. 1845. The water conservation performance standards contained within this chapter supersede all local government codes. Towns and counties shall not amend the code revisions and standards established herein.

[Statutory Authority: RCW 19.27.170. 93-01-164, § 51-26-1845, filed 12/23/92, effective 7/1/93.]

WAC 51-26-2200 Chapter 22—Minimum plumbing facilities.

Each building shall be provided with sanitary facilities, including provisions for the physically handicapped as prescribed by the Department having jurisdiction. In the absence of such requirements, this Appendix--which provides a guideline for the minimum facilities for the various types of occupancies (see Section 910, Plumbing Fixtures Required, of the Uniform Plumbing Code) may be used. For handicapped requirements ANSI A117.1-1961 (R1971), Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped, may be used.

The number of occupants shall be that determined by minimum exiting requirements.

Type of Building or Occupancy	Water Closets (Fixtures per Person)		Urinals ¹⁰ (Fixtures per Person)	Lavatories (Fixtures per Person)		Bathtubs or Showers (Fixtures per Person)	Drinking Fountains ^{3,13} (Fixtures per Person)
	Male	Female ¹⁴		Male	Female		
Assembly Places--Theaters, Auditoriums, Convention Halls, etc.--for permanent employee use	1:1-15 2:16-35 3:36-55	1:1-15 3:16-35 4:36-55	0:1-9 1:10-50	1 per 40	1 per 40		
	Over 55, add 1 fixture for each additional 40 persons.		Add one fixture for each additional 50 males.				
Assembly Places--Theatres, Auditoriums, Convention Halls, etc.--for public use	1:1-100 2:101-200 3:201-400	3:1-50 4:51-100 8:101-200 11:201-400	1:1-100 2:101-200 3:201-400 4:401-600	1:1-200 2:201-400 3:401-750	1:1-200 2:201-400 3:401-750		1 per 75 ¹²
	Over 400, add one fixture for each additional 500 males and 2 for each 300 females.		Over 600, add 1 fixture for each additional 500 males.		Over 750, add one fixture for each additional 500 persons.		
Dormitories ⁹ School or Labor	1 per 10	1 per 8	1 per 25	1 per 12	1 per 12	1 per 8	1 per 75 ¹²
	Add 1 fixture for each additional 25 males (over 10) and 1 for each additional 20 females (over 8).		Over 150, add 1 fixture for each additional 50 males.		Over 12 add one fixture for each additional 20 males and 1 for each 15 additional females.		For females, add 1 bathtub per 30. Over 150, add 1 per 20.
Dormitories for staff use	1:1-15 2:16-35 3:36-55	1:1-15 3:16-35 4:36-55	1 per 50	1 per 40	1 per 40	1 per 8	
	Over 55, add 1 fixture for each additional 40 persons.						
Dwellings ⁴ Single Dwelling	1 per dwelling			1 per dwelling		1 per dwelling	
Multiple Dwelling or Apartment House	1 per dwelling or apartment unit			1 per dwelling or apartment unit		1 per dwelling or apartment unit	

Uniform Plumbing Code

51-26-2200

Type of Building or Occupancy	Water Closets (Fixtures per Person)	Urinals ¹⁰ (Fixtures per Person)	Lavatories (Fixtures per Person)	Bathtubs or Showers (Fixtures per Person)	Drinking Fountains ^{3,13} (Fixtures per Person)
Hospital Waiting rooms	1 per room		1 per room		1 per 75 ¹²
Hospital for employee use	Male 1:1-15 Female 1:1-15 2:16-35 3:16-35 3:36-55 4:36-55 Over 55, add 1 fixture for each additional 40 persons.	0:1-9 1:10-50 Add one fixture for each additional 50 males.	Male 1 per 40 Female 1 per 40		
Hospitals Individual Room	1 per room		1 per room	1 per room	
Ward Room	1 per 8 patients		1 per 10 patients	1 per 20 patients	1 per 75 ¹²
Industrial ⁶ Warehouses	Male 1:1-10 Female 1:1-10 2:11-25 2:11-25 3:26-50 3:26-50 4:51-75 4:51-75 5:76-100 5:76-100 Over 100, add 1 fixture for each additional 30 persons		Up to 100, 1 per 10 persons Over 100, 1 per 15 persons ^{7,8}	1 shower for each 15 persons exposed to excessive heat or to skin contamination with poisonous, infectious, or irritating material	1 per 75 ¹²
Industrial- Other than Hospitals or Penal Institutions (on each occupied floor)	Male 1 per 25 Female 1 per 20 ¹⁴	0:1-9 1:10-50 Add one fixture for each additional 50 males.	Male 1 per 10 Female 1 per 10	1 per 8	1 per 75 ¹²
Institutional- Other than Hospitals or Penal Institutions (on each occupied floor) For employee use	Male 1:1-15 Female 1:1-15 2:16-35 3:16-35 3:36-55 4:36-55 Over 55, add 1 fixture for each additional 40 persons	0:1-9 1:10-50 Add one fixture for each additional 50 males.	Male 1 per 40 Female 1 per 40	1 per 8	1 per 75 ¹²
Office or Public Buildings	Male 1:1-100 Female 3:1-50 ¹⁴ 2:101-200 4:51-100 3:201-400 8:101-200 4:401-600 11:201-400 Over 400, add one fixture for each additional 500 males and 2 for each 300 females.	1:1-100 2:101-200 3:201-400 4:401-600 Over 600, add 1 fixture for each additional 300 males.	Male 1:1-200 Female 1:1-200 2:201-400 2:201-400 3:401-750 3:401-750 Over 750, add one fixture fore each additional 500 persons.		1 per 75 ¹²
Office or Public buildings- For employee use	Male 1:1-15 Female 1:1-15 2:16-35 3:16-35 3:36-55 4:36-55	Over 55, add 1 fixture for each additional 40 persons.	0:1-9 1:10-50	Add one fixture for each additional 50 males.	Male 1 per 40 Female 1 per 40

Type of Building or Occupancy	Water Closets (Fixtures per Person)		Urinals ¹⁰ (Fixtures per Person)	Lavatories (Fixtures per Person)		Bathtubs or Showers (Fixtures per Person)	Drinking Fountains ^{3,13} (Fixtures per Person)
	Male	Female		Male	Female		
Penal Institutions- For employee use	Male 1:1-15 2:16-35 3:36-55	Female 1:1-15 3:16-35 4:36-55	0:1-9 1:10-50	Male 1 per 40	Female 1 per 40		1 per 75 ¹²
	Over 55, add 1 fixture for each additional 40 persons.		Add one fixture for each additional 50 males.				
Penal Institutions- For prison use							
Cell	1 per cell			1 per cell			1 per cell block floor
Exercise room	1 per exercise room		1 per exercise room	1 per exercise room			1 per exercise room
Restaurants, Pubs and Lounges ¹¹	Male 1:1-50 2:51-150 3:151-300	Female 1:1-50 2:51-150 4:151-300	1:1-150	Male 1:1-150 2:151-200 3:201-400	Female 1:1-150 2:151-200 3:201-400		
	Over 300, add 1 fixture for each additional 200 persons		Over 150, add 1 fixture for each additional 150 males	Over 400, add 1 fixture for each additional 400 persons			
Schools-For staff use	Male 1:1-15 2:16-35 3:36-55	Female 1:1-15 2:16-35 3:36-55	1 per 50	Male 1 per 40	Female 1 per 40		
All schools	Over 55, add 1 fixture for each additional 40 persons						
Schools-For student use	Male 1:1-20 2:21-50	Female 1:1-20 2:21-50		Male 1:1-25 2:26-50	Female 1:1-25 2:26-50		1 per 75 ¹²
Nursery	Over 50, add 1 fixture for each additional 50 persons			Over 50, add 1 fixture for each additional 50 persons			
Elementary	Male 1 per 30	Female 1 per 25	1 per 75	Male 1 per 35	Female 1 per 35		1 per 75 ¹²
Secondary	Male 1 per 40	Female 1 per 30	1 per 35	Male 1 per 40	Female 1 per 40		1 per 75 ¹²
Others (Colleges, Universities, Adult Centers, etc.)	Male 1 per 40	Female 1 per 30	1 per 35	Male 1 per 40	Female 1 per 40		1 per 75 ¹²
Worship Places Educational and Activities Unit	Male 1 per 125 2:126-250	Female ¹⁴ 1 per 75 2:76-125 3:126-250	1 per 125	1 per 2 water closets			1 per 75 ¹²
Worship Places Principal Assembly Place	Male 1 per 150 2:151-300	Female ¹⁴ 1 per 75 2:76-150 3:151-300	1 per 150	1 per 2 water closets			1 per 75 ¹²

Whenever urinals are provided, one (1) water closet less than the number specified may be provided for each urinal installed, except the number of water closets in such cases shall not be reduced to less than two-thirds (2/3) of the minimum specified.

1. The figures shown are based upon one (1) fixture being the minimum required for the number of persons indicated or any fraction thereof.
2. Building categories not shown on this table shall be considered separately by the Administrative Authority.
3. Drinking fountains shall not be installed in toilet rooms.
4. Laundry trays. One (1) laundry tray or one (1) automatic washer standpipe for each dwelling unit or two (2) laundry trays or two (2) automatic washer standpipes, or combination thereof, for each ten (10) apartments. Kitchen sinks, one (1) for each dwelling or apartment unit.
5. Deleted.
6. As required by ANSI Z4.1-1968, Sanitation in Places of Employment.
7. Where there is exposure to skin contamination with poisonous, infectious, or irritating materials, provide one (1) lavatory for each five (5) persons.
8. Twenty-four (24) lineal inches (609.6 mm) of wash sink or eighteen (18) inches (457.2 mm) of a circular basin, when provided with water outlets for such space, shall be considered equivalent to one (1) lavatory.
9. Laundry trays, one (1) for each fifty (50) persons. Slop sinks, one (1) for each hundred (100) persons.
10. General. In applying this schedule of facilities, consideration must be given to the accessibility of fixtures. Conformity purely on a numerical basis may not result in an installation suited to the need of the individual establishment. For example, schools should be provided with toilet facilities on each floor having classrooms. Temporary workmen facilities, one (1) water closet and one (1) urinal for each thirty (30) workmen.
 - a. Surrounding materials, wall and floor space to a point two (2) feet (0.6 m) in front of urinal lip and four (4) feet (1.2 m) above the floor, and at least two (2) feet (0.6 m) to each side of the urinal shall be lined with non-absorbent materials.
 - b. Trough urinals are prohibited.
11. A restaurant is defined as a business which sells food to be consumed on the premises.
 - a. The number of occupants for a drive-in restaurant shall be considered as equal to the number of parking stalls.
 - b. Employee toilet facilities are not to be included in the above restaurant requirements. Hand washing facilities must be available in the kitchen for employees.
12. Where food is consumed indoors, water stations may be substituted for drinking fountains. Theatres, auditoriums, dormitories, offices, or public buildings for use by more than six (6) persons shall have one (1) drinking fountain for the first seventy-five (75) persons and one (1) additional fountain for each one hundred and fifty (150) persons thereafter.
13. There shall be a minimum of one (1) drinking fountain per occupied floor in schools, theatres, auditoriums, dormitories, offices or public building.
14. The total number of water closets for females shall be at least equal to the total number of water closets and urinals required for males.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-2200, filed 12/13/91, effective 7/1/92.]

WAC 51-26-2300 Chapter 23—Rainwater systems.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-2300, filed 12/13/91, effective 7/1/92.]

WAC 51-26-2301 D1 materials. (a) Rainwater piping placed within the interior of a building or run within a vent or shaft shall be of cast iron, galvanized steel, wrought iron, brass, copper, lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV or other approved materials.

(b) Rainwater piping located on the exterior of a building shall be not less than 26 ga. galvanized sheet metal. When the conductor is connected to a building storm drain or storm sewer, a drain connection shall be extended above the finished grade and jointed at a point protected from injury.

(c) Rainwater piping located underground within a building shall be of service weight cast iron soil pipe, Type DWV copper tube, Schedule 40 ABS DWV, Schedule 40 PVC DWV, extra strength vitrified clay pipe, or other approved materials.

(d) Rainwater piping commencing two feet (.6 m) from the exterior of a building may be of any approved material permitted in the installation requirements of this code.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-066, § 51-26-2301, filed 12/13/91, effective 7/1/92.]

Chapter 51-27 WAC

STATE BUILDING CODE ADOPTION OF THE 1991
EDITION OF THE UNIFORM PLUMBING CODE
STANDARDS

WAC

- 51-27-001 Authority.
- 51-27-002 Purpose.
- 51-27-003 Uniform Plumbing Code standards.
- 51-27-004 Exceptions.
- 51-27-008 Implementation.

WAC 51-27-001 Authority. These rules are adopted under the authority of chapter 19.27 RCW.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-001, filed 12/13/91, effective 7/1/92.]

WAC 51-27-002 Purpose. The purpose of these rules is to implement the provisions of chapter 19.27 RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes, the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, shall amend the codes as deemed appropriate by the council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-002, filed 12/13/91, effective 7/1/92.]

WAC 51-27-003 Uniform Plumbing Code standards. The 1991 edition of the Uniform Plumbing Code Standards, published by the International Association of Plumbing and Mechanical Officials is hereby adopted by reference.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-003, filed 12/13/91, effective 7/1/92.]

WAC 51-27-004 Exceptions. The exceptions and amendments to the uniform codes contained in the provisions of chapter 19.27 RCW shall apply in cases of conflict with any of the provisions of these rules.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-004, filed 12/13/91, effective 7/1/92.]

WAC 51-27-008 Implementation. The Uniform Plumbing Code standards adopted by chapter 51-27 WAC shall become effective in all counties and cities of this state on July 1, 1992, unless local amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapter 19.27 RCW. 92-01-067, § 51-27-008, filed 12/13/91, effective 7/1/92.]