
State of Oregon
Department of Geology and Mineral Industries
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Open-File Report

OFR O-04-16

**EARTHQUAKE SAFETY AND SIDEWALK SURVEY
SCORES IN CLACKAMAS COUNTY SCHOOLS,
CLACKAMAS COUNTY, OREGON**

By

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2004

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Oregon Department of Geology and Mineral Industries Open-File Report
Published in conformance with ORS 516.030

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EARTHQUAKE SAFETY AND SIDEWALK SURVEY SCORES IN CLACKAMAS COUNTY

Executive Summary

Oregon is characterized by a beautiful and geographically diverse landscape. The intriguing geology of the area is associated with a variety of natural hazards. The earthquake hazard is one that affects the entire state, and although the seismic risk in California may be higher than that in Oregon, the buildings have a greater risk of failure due to earthquakes in Oregon due to the number of structures that are not earthquake resistant. Because Oregon faces a serious statewide threat from earthquakes, major federal, state, and local government agencies and private organizations have been supporting earthquake risk reduction, and have made significant contributions in reducing the adverse impacts of earthquakes.

The Oregon Department of Geologic and Mineral Industries is working with many stakeholders to meet Oregon Revised Statute (ORS) 455.400 <<http://www.leg.state.or.us/ors/455.html>>, which requires Kindergarten—12th grade (K-12) and higher education facilities as well as emergency service facilities to improve life safety standards (building specifics) in the next thirty years for buildings with 250 occupants or more.

Many of Oregon's schools were built long before the 1993 statewide building code change that specifically mandates seismic (earthquake) design. Consequently, a number of schools have serious structural deficiencies and are prone to collapse during earthquakes. The K-12 schools in Clackamas County were selected as a pilot study for the State of Oregon. Clackamas County Emergency Management and the Oregon Department of Geology and Mineral Industries (DOGAMI) have completed preliminary earthquake vulnerability screenings (or sidewalk surveys) of the K-12 school buildings in Clackamas County. This study is part of a FEMA-funded project for earthquake mitigation of K-12, community colleges and public universities in Oregon. This study has been described in this report and on page 2 of *Attachment 1: Partnerships in Action Newsletter* (Spring 2004) provided as background information.

School District Superintendents in Clackamas County were sent a letter from Clackamas County Emergency Management and DOGAMI that introduced the pilot study, *Attachment 2*. The letter included building scores for schools in their district and the District Superintendents were asked to review the building scores.

As the scores increase, buildings have a lower likelihood of collapse (from earthquake shaking). In using the Federal Emergency Management Agency's (FEMA) method, FEMA states, "The estimates of the score are based on limited observed and analytical data, and the probability of collapse is therefore approximate." FEMA continues to state that a score of "about 2 is a reasonable preliminary value to use ... to differentiate adequate buildings from those potentially inadequate and thus requiring detailed review." For school buildings with scores below 2, Clackamas County Emergency Management and DOGAMI recommend that the school districts obtain engineering studies to evaluate the building's seismic deficiencies. For any buildings that the school districts determine that further studies should be performed, Clackamas County Emergency Management and DOGAMI encouraged

the school districts to use the methods outlined in American Society of Civil Engineers (ASCE 31, 2003), which is the standard of practice method for detailed engineering studies.

Although extremely valuable, the sidewalk surveys are not explicitly accurate, that is, there may be some buildings that rate 2 or lower that are not as seismically deficient as some rating higher than 2. The sidewalk surveys are intended to be a prioritization tool for identifying those structures that are in need of further evaluation by a structural engineer.

A cost effective, mitigation approach that the District Superintendents were encouraged to consider adopting is termed “incremental seismic rehabilitation.” In this approach, one of the first mitigation actions that often require little-to-no engineering is securing the non-structural elements of a school (e.g., parapets, bookcases, etc). Clackamas County Emergency Management and DOGAMI recommended the following references, which can be obtained from FEMA:

- FEMA 395- Incremental Seismic Rehabilitation of School Buildings (K-12), 2003;
- FEMA 241- Identification and Reduction of Nonstructural Earthquake Hazards in Schools, 18 pp, 1993; and
- FEMA 74- Earthquake Hazard Mitigation for Nonstructural Elements Field Manual, 52 pp, (Contract EMW-2000-CO-0247).

In the letter to the District Superintendents, Clackamas County Emergency Management and DOGAMI attached a Questionnaire to gather information to determine if the District Superintendents or designated personnel are interested in attending an educational workshop on earthquake mitigation in K-12 schools, *Attachment 3*.

DOGAMI and interested stakeholders are seeking outside funding to help accommodate seismic surveys and upgrades of school buildings.

Survey of Oregon Schools for Earthquake Preparedness¹

Recently, Oregon K-12 schools, community colleges, and universities have been evaluating school buildings for earthquake stability. A new project was recently initiated by the Oregon Department of Geology and Mineral Industries (DOGAMI) to gather the available information on the earthquake integrity of school buildings as the basis for further analysis into statewide preparedness. This work is especially important because some school facilities were constructed in the decades prior to implementation of a state building code that reflected modern interpretation of the size and intensity of expected future earthquakes.

Beginning in fall 2003, DOGAMI, with financial support from the U.S. Department of Homeland Security’s Federal Emergency Management Agency (FEMA), began an effort designed to compile available seismic safety information on school buildings as the basis for subsequent analysis of the statewide need to strengthen vulnerable buildings. The focus of this project is to work with school officials to compile earthquake survey data prepared under the methodology of the FEMA 154

¹Partnerships in Action Newsletter (Spring 2004), page 2.

manual, so-called “sidewalk surveys”. DOGAMI is partnering with state agencies, school facility managers, university faculty, the Portland-based nonprofit organization - Partners for Loss Prevention (PLP), and others to conduct the compilation of inventories of the three classes of schools: K-12, community college, and university (K-20). PLP is compiling the inventory of K-12 school buildings in cooperation with school associations, state agencies, and various school districts.

The K-12 compilation by PLP began in February 2004. The school inventory to be provided to DOGAMI will be a compendium of FEMA 154 and equivalent reports on the earthquake integrity of K-12 school buildings.

Earthquake Sidewalk Survey Scores for Clackamas County Schools

The Earthquake Sidewalk Survey Scores for Clackamas County Schools provides the results of the pilot study in both tables and figures. *Tables 1 through 3 and Figure 1* include summary data and locations of the schools in the ten districts located in Clackamas County. The sidewalk survey scores, which were obtained using FEMA 154 methods, are grouped in four numerical categories shown on *Figures 2 and 3*. *Figures 2 and 3* show the “sidewalk survey” scores plotted on geologic hazard maps showing poor soil conditions and liquefaction susceptibility for over 200 school buildings. *Figure 4* is the Legend that provides an explanation for *Figures 2 and 3*.

The buildings listed in *Table 1* are K-12 public school buildings located in Clackamas County, Oregon and were obtained from the Oregon Department of Education Database Initiative. The asterisk (*) denotes that this information was not available in the School Database Initiative. Names of the buildings are listed in the first column of the table, with district name in the second column. The sixth column is the building structure type, which indicates the construction of the lateral force (i.e., earthquake and wind) resisting system of the building. Building structure types are key indicators of building performance, along with building age, geometry, condition, and adjacent soil profile. The building structure types are described in *Table 2*. The building properties were determined by sidewalk surveys, building walk-throughs, and/or conversation with school facilities personnel. Column eight, number of students was calculated based on 2002-2003 enrollment and weighted by building area, and does not include school employees.

The sidewalk survey score, which were obtained using FEMA 154 methods, is listed in the 3rd column from the right. The building scores were obtained from the 2002, updated FEMA 154 scoring system for buildings in an area of high seismicity. The idea behind the scoring systems was to identify buildings that by virtue of their structure type, building age, geometry, condition, and adjacent soil profile, are likely to be at risk in an earthquake. A score of 2 or lower is recommended to indicate that the building is likely at risk and should be further evaluated. The soil amplification and liquefaction susceptibilities are qualified in the columns following the scores. Liquefaction occurs in loose, granular, saturated soils in earthquakes and may create permanent ground deformations, which in turn affect buildings. Although landslide hazards are not listed, landslides may be triggered by ground shaking and result in building damage.

Table 1. Clackamas County Public K-12 school buildings.

NAME OF BUILDING	DISTRICT	School number on map	Year Building Built	Area of Building in Square Feet	Structure Type (per FEMA 154)	Number of Stories	Number of Students	Building student count exceeds 250	Year Building Seismically Upgraded	Sidewalk Survey SCORE	Soil amplification of earthquake shaking	Soil liquefaction potential
Ackerman MS – Main	CANBY 086	1	1970	91,000	W2	1	587	Y		2.9	LOW	LOW
Ackerman MS – Gym	CANBY 086	1	1970	16,900	PC1	1	109			1.7	LOW	LOW
Ackerman MS - Philander Lee Gym	CANBY 086	1	1976	10,200	PC1	1	66		2001	3.7	LOW	LOW
Ackerman MS - Philander Lee Ma	CANBY 086	1	1976	47,200	W2	1	305	Y	2001	4.9	LOW	LOW
Canby HS - Fine Arts	CANBY 086	2	1993	37,893	RM1L		196			1.2	MED	LOW
Canby HS – Main	CANBY 086	2	1954	191,000	W2	1	990	Y		0.5	MED	LOW
Canby HS - Main old Gym	CANBY 086	2	1954	19,000	C2L	1	98			0.7	MED	LOW
Canby HS - Pro/Tech	CANBY 086	2	2002	32,800	S2L	1	170			4.4	MED	LOW
Canby HS – Gym	CANBY 086	2	2002	41,600	RM1L	1	216			4.2	MED	LOW
Cecile B Trost Elem	CANBY 086	4	1993	65,740	S2L	2	582	Y		0.6	LOW	LOW
Howard Eccles Elem	CANBY 086	5	1956	75,000	W2	1	466	Y		0.9	LOW	LOW
W.M. Knight Elem - Main	CANBY 086	7	1948	55,000	W2	1	427	Y		0.9	LOW	LOW
W.M. Knight Elem - Music	CANBY 086	7	1955	3,000	W1	1	23			4.4	LOW	LOW
W.M. Knight Elem - Modulares	CANBY 086	7	1980	2,800	W1	1	22			4.4	LOW	LOW
W.M. Knight Elem - Main Gym	CANBY 086	7	1948	10,000	RM1L	1	78			0.9	LOW	LOW
Ninety One School - Main	CANBY 086	6	1945	34,000	RM1L	1	272	Y	2001	2.9	LOW	LOW
Ninety One School - Gym	CANBY 086	6	1970	2,400	PC1	1	19		2001	3.7	LOW	LOW
Ninety One School - Newer buil	CANBY 086	6	1980	30,000	W2	1	240			3.4	LOW	LOW
Carus Elem - Main	CANBY 086	3	1960	40,000	W2	2	264	Y	2001	3.3	NONE	NONE
Carus Elem - Gym	CANBY 086	3	1960	19,000	W2	1	126		2001	3.3	NONE	NONE
Colton Elem - Kindergarten	COLTON 53	8	1975	11,250		1	59				NONE	NONE
Colton Elem - Main	COLTON 53	8	1975	51,085		1	269	Y			NONE	NONE
Colton HS - Gym	COLTON 53	9	1954	22,500		1	87				NONE	NONE
Colton HS - Main	COLTON 53	9	1960	20,000	RM1L	1	78			2.3	NONE	NONE
Colton HS - Media Addition	COLTON 53	9	1995	4,500	W2	1	17			5.3	NONE	NONE
Colton HS - Media Center	COLTON 53	9	1986	6,600	W2	1	26			3.3	NONE	NONE
Colton HS - Shop	COLTON 53	9	1975	8,166	W2	1	32			3.3	NONE	NONE
Colton MS	COLTON 53	10	1994	43,000		2	216				NONE	NONE
Eagle Creek Elem - Main	ESTACADA 108	11	1968	39,000	W2	1	143			0.9	LOW	NONE
Eagle Creek Elem - Gym	ESTACADA 108	11	1980	6,500	PC1	1	24			1.7	LOW	NONE
Eagle Creek Elem - Modular	ESTACADA 108	11	1995	1,792	W1	1	7			6.4	LOW	NONE
Eagle Creek Elem - Addition	ESTACADA 108	11	2003	57,000	W2	1	210			5.4	LOW	NONE
Eagle Creek Elem - Addition	ESTACADA 108	11	2003	2,000	RM1L	1	7			4.4	LOW	NONE
Eagle Creek Elem - Old	ESTACADA 108	11	1925	7,092	W2	1	26			2.4	LOW	NONE
Estacada HS - Agri Shop	ESTACADA 108	12	1962	6,000	RM1L	1	10			2.4	LOW	NONE

NAME OF BUILDING	DISTRICT	School number on map	Year Building Built	Area of Building in Square Feet	Structure Type (per FEMA 154)	Number of Stories	Number of Students	Building student count exceeds 250	Year Building Seismically Upgraded	Sidewalk Survey SCORE	Soil amplification of earthquake shaking	Soil liquefaction potential
Estacada HS - Auto Shop	ESTACADA 108	12	1981	5,690	RM1L	1	10			2.4	LOW	NONE
Estacada HS - Main	ESTACADA 108	12	1962	121,000	RM1L	1	207			0.9	LOW	NONE
Estacada HS - Main	ESTACADA 108	12	1962	28,500	W2	1	49			0.9	LOW	NONE
Estacada HS - Modulares	ESTACADA 108	12	1962	7,500	W1	1	13			4.4	LOW	NONE
Estacada HS - Voc Ed	ESTACADA 108	12	1962	9,234	W2	1	16			3.4	LOW	NONE
Estacada Jr HS	ESTACADA 108	13	1936	70,288	URML	2	417	Y	2002	-0.1	LOW	NONE
River Mill Elem - Main	ESTACADA 108	14	1970	40,262	W2	1	400	Y		1.4	LOW	NONE
Gladstone HS - Modular	GLADSTONE 115	15	1965	2,400	W1	1	14			4.4	LOW	NONE
Gladstone HS - Main	GLADSTONE 115	15	1965	140,000	RM1L	1	808	Y		0.9	LOW	NONE
Gladstone HS - Modular	GLADSTONE 115	15	1965	2,400	W1	1	14			4.4	LOW	NONE
Gladstone HS - Shop	GLADSTONE 115	15	1965	13,000	S3	1	75			2.3	LOW	NONE
John Wetten Elem	GLADSTONE 115	16	1958	87,500	RM1L	1	767	Y		1.9	LOW	NONE
Kraxberger MS - Classroom	GLADSTONE 115	17	1969	55,800	RM1L	1	689	Y		0.9	LOW	NONE
Kraxberger MS - Admin	GLADSTONE 115	17	1969	3,320	W1	1	41			1.4	LOW	NONE
Bryant Elem	LAKE OSWEGO 7J	19	1967	7,825	RM1L	1	52			1.7	MED	NONE
Bryant Elem	LAKE OSWEGO 7J	19	1967	24,200	RM1L	1	161			0.7	MED	NONE
Bryant Elem	LAKE OSWEGO 7J	19	1967	2,816	RM1L	1	19			1.7	MED	NONE
Bryant Elem	LAKE OSWEGO 7J	19	1967	7,825	RM1L	1	52			1.7	MED	NONE
Bryant Elem	LAKE OSWEGO 7J	19	1967	7,825	RM1L	1	52			1.7	MED	NONE
Forest Hills Elem	LAKE OSWEGO 7J	20	1949	50,567	W2	1	430	Y		0.5	MED	LOW
Hallinan Elem	LAKE OSWEGO 7J	21	1981	43,705	W2	1	366	Y		0.5	MED	LOW
Lake Grove Elem	LAKE OSWEGO 7J	22	1949	61,000	W2	1	475	Y		0.5	MED	LOW
Lake Oswego JHS	LAKE OSWEGO 7J	23	1956	106,474	W2	1	630	Y		0.9	LOW	NONE
Lake Oswego Senior HS	LAKE OSWEGO 7J	24	1951	193,588			1221	Y			MED	NONE
Lakeridge HS - Gym	LAKE OSWEGO 7J	25	1971	25,000	PC1	1	144			2.1	NONE	NONE
Lakeridge HS	LAKE OSWEGO 7J	25	1971	160,000	PC1	2	925	Y		2.1	NONE	NONE
Oak Creek Elem	LAKE OSWEGO 7J	26	1991	57,700	S4L	2	442	Y		0.9	LOW	NONE
Palisades Elem	LAKE OSWEGO 7J	27	1959	42,846			327	Y			NONE	NONE
Rivergrove Elem	LAKE OSWEGO 7J	28	1968	7,015	W2	1	45			2.5	MED	NONE
Rivergrove Elem	LAKE OSWEGO 7J	28	1968	37,800	W2	1	244			2.5	MED	NONE
Rivergrove Elem	LAKE OSWEGO 7J	28	1968	7,015	W2	1	45			2.5	MED	NONE
Uplands Elem	LAKE OSWEGO 7J	29	1961	58,500	C2L	1	476	Y		0.9	LOW	NONE
Waluga JHS	LAKE OSWEGO 7J	30	1964	89,075	RM1L	1	568	Y		0.7	MED	NONE
Waluga JHS	LAKE OSWEGO 7J	30	1964	2,040	S1L	1	13			1.7	MED	NONE
Westridge Elem	LAKE OSWEGO 7J	31	1980	50,000	C2L	1	318	Y		0.9	LOW	NONE
Dickey Prairie Elem - New Buil	MOLALLA RIVER 35	33	1993	11,800	W2	1	70			2.9	LOW	NONE

NAME OF BUILDING	DISTRICT	School number on map	Year Building Built	Area of Building in Square Feet	Structure Type (per FEMA 154)	Number of Stories	Number of Students	Building student count exceeds 250	Year Building Seismically Upgraded	Sidewalk Survey SCORE	Soil amplification of earthquake shaking	Soil liquefaction potential
Dickey Prairie Elem - Gym Quon	MOLALLA RIVER 35	33	1955	2,432	S3	1	14			2.8	LOW	NONE
Dickey Prairie Elem - Main	MOLALLA RIVER 35	33	1928	5,700	W2	1	34			1.9	LOW	NONE
Maple Grove Elem - New Buildin	MOLALLA RIVER 35	34	1993	2,876	W1	1	16			4.4	NONE	NONE
Maple Grove Elem - Gym Additio	MOLALLA RIVER 35	34	1970	2,443	W2	1	13			3.3	NONE	NONE
Maple Grove Elem - Original	MOLALLA RIVER 35	34	1928	4,896	W2	1	27			2.3	NONE	NONE
Molalla Elem	MOLALLA RIVER 35	35	1980	49,393	W2	2	433	Y		0.9	LOW	NONE
Molalla HS - New Building	MOLALLA RIVER 35	36	1997	107,320	W2	2	443	Y		4.9	LOW	NONE
Molalla HS - Original	MOLALLA RIVER 35	36	1976	64,340	W2	1	266	Y		0.9	LOW	NONE
Molalla HS - Gym Addition	MOLALLA RIVER 35	36	1988	36,912	W2	1	152			0.9	LOW	NONE
Molalla MS - Modulares	MOLALLA RIVER 35	37	1992	3,940	W1	1	27			4.4	LOW	NONE
Molalla MS - Gym	MOLALLA RIVER 35	37	1968	9,400	PC1	1	65			1.7	LOW	NONE
Molalla MS - Modular	MOLALLA RIVER 35	37	1971	8,070	W2	1	56			3.4	LOW	NONE
Molalla MS - Main	MOLALLA RIVER 35	37	1954	79,200	W2	1	548	Y		0.9	LOW	NONE
Mulino Elem - South Building	MOLALLA RIVER 35	38	1970	9,500	RM1L	1	84			2.4	LOW	LOW
Mulino Elem - Main	MOLALLA RIVER 35	38	1952	11,300	W2	1	100			0.9	LOW	LOW
Mulino Elem - Cafeteria	MOLALLA RIVER 35	38	1960	4,000	RM1L	1	35			0.9	LOW	LOW
Mulino Elem - Modular	MOLALLA RIVER 35	38	1977	1,700	W1	1	15			4.4	LOW	LOW
Mulino Elem - Main	MOLALLA RIVER 35	38	1952	3,000	C2L	1	26			0.9	LOW	LOW
Rural Dell Elem - Main	MOLALLA RIVER 35	39	1952	17,200	W2	1	133			2.9	LOW	NONE
Rural Dell Elem - Addition	MOLALLA RIVER 35	39	1952	9,400	W2	1	73			2.9	LOW	NONE
Rural Dell Elem - Old	MOLALLA RIVER 35	39	1938	3,296	W1	1	25			3.9	LOW	NONE
Clarkes Elem - Add1	MOLALLA RIVER 35	32	1965	6,500	W2	1	35			3.3	NONE	NONE
Clarkes Elem - Add2	MOLALLA RIVER 35	32	1990	2,161	W2	1	12			3.3	NONE	NONE
Clarkes Elem - Main	MOLALLA RIVER 35	32	1952	10,000	W2	1	54			1.3	NONE	NONE
Clarkes Elem - Class/Hall	MOLALLA RIVER 35	32	1954	1,800	W2	1	10			3.3	NONE	NONE
Clarkes Elem - Enclosed Hall	MOLALLA RIVER 35	32	1977	1,443	W2	1	8			3.3	NONE	NONE

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Clarkes Elem - Gym	MOLALLA RIVER 35	32	1976	8,331	RM1L	1	45			2.8	NONE	NONE
Clarkes Elem - Library	MOLALLA RIVER 35	32	1986	6,776	W2	1	37			3.3	NONE	NONE
Clarkes Elem - Locker Rooms	MOLALLA RIVER 35	32	1985	1,464	W2	1	8			3.3	NONE	NONE
Clackamas Elem	NORTH CLACKAMAS 12	43	1939	23,000	C2L	1	218			-0.1	LOW	NONE
Clackamas Elem	NORTH CLACKAMAS 12	43	1930	15,000	C2L	1	142			-0.1	LOW	NONE
Clackamas HS	NORTH CLACKAMAS 12	44	1957	324,000	C2L	1	1798	Y		0.7	MED	NONE
Clackamas HS	NORTH CLACKAMAS 12	44	1957	875	W1	1	5			4.4	MED	NONE
Clackamas HS	NORTH CLACKAMAS 12	44	1957	875	W1	1	5			4.4	MED	NONE
Clackamas HS	NORTH CLACKAMAS 12	44	1957	875	W1	1	5			4.4	MED	NONE
Oregon Trail Elem	NORTH CLACKAMAS 12	54	1993	48,000	RM1L		749	Y		2.4	LOW	LOW
Sunnyside Elem	NORTH CLACKAMAS 12	61	1949	60,000	RM1L	1	509	Y		0.9	LOW	NONE
Sunnyside Elem - Annex	NORTH CLACKAMAS 12	61	1972	3,000	W1	1	25			4.4	LOW	NONE
Sunrise MS	NORTH CLACKAMAS 12	62	1991	82,000	RM1L		1061	Y		2.4	LOW	LOW
Ardenwald Elem	NORTH CLACKAMAS 12	40	1924	9,600	W2	1	87			1.5	MED	LOW
Ardenwald Elem	NORTH CLACKAMAS 12	40	1924	23,550	C2L	1	213			-0.3	MED	LOW
Bilquist Elem	NORTH CLACKAMAS 12	41	1960	100,000	W2	1	500	Y		0.9	LOW	HIGH
Bilquist Elem	NORTH CLACKAMAS 12	41	1993	900	W1	1	5			4.4	LOW	HIGH
Campbell Elem	NORTH CLACKAMAS 12	42	1970	5,400	RM1L	1	45			1.9	LOW	LOW
Campbell Elem	NORTH CLACKAMAS 12	42	1956	20,000	S4L	1	168			0.9	LOW	LOW
Campbell Elem	NORTH CLACKAMAS 12	42	1970	9,200	RM1L	1	77			2.4	LOW	LOW
Campbell Elem	NORTH CLACKAMAS 12	42	1970	3,150	RM1L	1	26			1.9	LOW	LOW
Campbell Elem	NORTH CLACKAMAS 12	42	1970	5,625	RM1L	1	47			1.9	LOW	LOW
Concord Elem	NORTH CLACKAMAS 12	45	1936	55,000	C2L	2	376	Y		1.3	NONE	NONE
Lewelling Elem	NORTH CLACKAMAS 12	47	1998	8,500	W2	1	83			5.4	LOW	LOW
Lewelling Elem	NORTH CLACKAMAS 12	47	1998	8,500	W2	1	83			5.4	LOW	LOW
Lewelling Elem	NORTH CLACKAMAS 12	47	1998	8,500	W2	1	83			5.4	LOW	LOW

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Lewelling Elem	NORTH CLACKAMAS 12	47	1998	8,500	W2	1	83			5.4	LOW	LOW
Lewelling Elem - Admin	NORTH CLACKAMAS 12	47	1953	10,500	W2	1	102			3.4	LOW	LOW
Linwood Elem	NORTH CLACKAMAS 12	48	1963	24,000	W2	1	401	Y		0.9	LOW	HIGH
McLoughlin MS	NORTH CLACKAMAS 12	49	1968	59,900	C1L	1		Y		-0.1	MED	HIGH
Milwaukie Elem	NORTH CLACKAMAS 12	50	1916	49,000	C2L	2	345	Y		0.7	MED	LOW
Milwaukie HS	NORTH CLACKAMAS 12	51	1925	21,500	C2L	2	220			0.7	MED	MED
Milwaukie HS	NORTH CLACKAMAS 12	51	1925	14,400	C2L	1	147			-0.3	MED	MED
Milwaukie HS	NORTH CLACKAMAS 12	51	1925	75,300	C2L	2	771	Y		-0.3	MED	MED
Milwaukie HS	NORTH CLACKAMAS 12	51	1994	8,000	C2L	2	82			0.7	MED	MED
Milwaukie HS	NORTH CLACKAMAS 12	51	1925	12,600	S4L	2	129			-0.1	MED	MED
Milwaukie MS	NORTH CLACKAMAS 12	52	1936	13,725	C2L	1		Y		-0.3	MED	HIGH
Milwaukie MS	NORTH CLACKAMAS 12	52	1936	43,800	C2L	2		Y		-0.3	MED	HIGH
Rex Putnam HS	NORTH CLACKAMAS 12	55	1963	217,525	PC1		1464	Y		2.2	LOW	NONE
Riverside Elem	NORTH CLACKAMAS 12	56	1971	3,500	W1		25			4.4	NONE	NONE
Riverside Elem	NORTH CLACKAMAS 12	56	1955	55,000	PC1		397	Y		2.6	NONE	NONE
Rowe MS	NORTH CLACKAMAS 12	57	1963	70,000	C2L		760	Y		2.2	MED	HIGH
Sabin Skills Center	NORTH CLACKAMAS 12	58	1996	1,875	W1	1		Y		6.4	LOW	HIGH
Sabin Skills Center	NORTH CLACKAMAS 12	58	1967	22,500	PC1	1		Y		2.2	LOW	HIGH
Sabin Skills Center	NORTH CLACKAMAS 12	58	1967	70,500	PC1	1		Y		1.7	LOW	HIGH
Sabin Skills Center	NORTH CLACKAMAS 12	58	1996	7,500	W2	1		Y		5.4	LOW	HIGH
Sabin Skills Center	NORTH CLACKAMAS 12	58	1996	7,500	W2	1		Y		4.9	LOW	HIGH
The Academy	NORTH CLACKAMAS 12	63	1925	73,000	C2L	2		Y		0.7	MED	NONE
The Academy - Gym	NORTH CLACKAMAS 12	63	1950	12,800	W2	1		Y		1	MED	NONE
Sojourner Elementary	NORTH CLACKAMAS 12	59	1963	24,300	C2L	2	172			2.2	MED	NONE
View Acres Elem	NORTH CLACKAMAS 12	64	1964	42,400	C2L	1	474	Y		1.3	NONE	NONE
Whitcomb Elem - Main	NORTH CLACKAMAS 12	65	1958	54,000	C2L	1	575	Y		1.4	LOW	MED

NAME OF BUILDING	DISTRICT	School number on map	Year Building Built	Area of Building in Square Feet	Structure Type (per FEMA 154)	Number of Stories	Number of Students	Building student count exceeds 250	Year Building Seismically Upgraded	Sidewalk Survey SCORE	Soil amplification of earthquake shaking	Soil liquefaction potential
Whitcomb Elem - Modulares	NORTH CLACKAMAS 12	65	1993	3,240	W1		34			4.4	LOW	MED
Wichita Elem	NORTH CLACKAMAS 12	66	1941	22,200	W2	1	322	Y		0.9	LOW	NONE
Happy Valley Elem	NORTH CLACKAMAS 12	46	1951	21,400	RM1L	1	216			0.9	LOW	NONE
Happy Valley Elem	NORTH CLACKAMAS 12	46	1951	29,500	RM1L	1	297	Y		0.9	LOW	NONE
Mt. Scott Elem	NORTH CLACKAMAS 12	53	1989	59,000	W2	2	460	Y		3.3	NONE	NONE
Spring Mountain Elem	NORTH CLACKAMAS 12	60	0	0				Y			NONE	NONE
Beavercreek Elem - Main	OREGON CITY 62	67	1948	39,250	RM1L	1	322	Y		2.3	NONE	NONE
Beavercreek Elem - Main	OREGON CITY 62	67	1970	15,600	W2	1	128			3.3	NONE	NONE
Beavercreek Elem - New Addition	OREGON CITY 62	67	2002	5,900	W2	1	48			5.3	NONE	NONE
Candy Lane Elem	OREGON CITY 62	68	1969	32,800	RM1L	1	218			0.9	LOW	NONE
Jennings Lodge Elem	OREGON CITY 62	71	1938	40,000	W2	1	315	Y		-0.5	MED	MED
Gaffney Lane Elem - Main	OREGON CITY 62	69	1965	45,000	RM1L	1	656	Y		1.3	NONE	NONE
Gaffney Lane Elem - Portable	OREGON CITY 62	69	1999	1,848	W1		27			6.4	NONE	NONE
Holcomb Elem	OREGON CITY 62	70	1965	1,000	W1	1	3			4.4	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1965	80,000	RM1L	1	270	Y		0.9	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1991	800	W1	1	3			4.4	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1991	1,000	W1	1	3			4.4	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1991	900	W1		3			4.4	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1966	40,000	C2L		135			2.4	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1991	1,000	W1		3			4.4	LOW	NONE
Holcomb Elem	OREGON CITY 62	70	1991	1,000	W1		3			4.4	LOW	NONE
John McLoughlin Elem	OREGON CITY 62	72	1975	55,000	C2L	1	558	Y		2.3	NONE	NONE
King Elem	OREGON CITY 62	73	1958	40,000	RM1L	1	413	Y		1.3	NONE	NONE
Mt. Pleasant Elem	OREGON CITY 62	74	1929	42,150	RM1L	1	379	Y		0.3	NONE	NONE
Ogden JHS	OREGON CITY 62	75	1965	89,000	PC1	1	654	Y		1.5	MED	NONE
Oregon City HS/Moss Campus	OREGON CITY 62	76	1976	15,000	PC1	1	564	Y		2.1	NONE	NONE
Oregon City HS/Moss Campus	OREGON CITY 62	76	1974	37,500	PC1	1	1410	Y		2.1	NONE	NONE
Park Place Elem	OREGON CITY 62	77	1981	4,800	W1	1	16			3.9	MED	LOW
Park Place Elem	OREGON CITY 62	77	1946	46,000	W2	2	152			0.5	MED	LOW
Park Place Elem	OREGON CITY 62	77	1946	43,000	C2L	2	142			0.7	MED	LOW
Redland Elem - Main	OREGON CITY 62	78	1948	55,000	RM1L	1	613	Y		1.3	NONE	NONE
Sage Alternative School	OREGON CITY 62	79	0	2,450	W1	1		Y		3.9	LOW	NONE
Thora B. Gardiner MS	OREGON CITY 62	80	1954	97,500	C2L	1	614	Y		1.3	NONE	NONE
Thora B. Gardiner MS	OREGON CITY 62	80	1955	1,200	C2L	1	8			2.8	NONE	NONE

NAME OF BUILDING	DISTRICT	School number on map	Year Building Built	Area of Building in Square Feet	Structure Type (per FEMA 154)	Number of Stories	Number of Students	Building student count exceeds 250	Year Building Seismically Upgraded	Sidewalk Survey SCORE	Soil amplification of earthquake shaking	Soil liquefaction potential
Boring MS - Modular	OREGON TRAIL 046	81	1992	1,680	W1	1	10			4.4	LOW	NONE
Boring MS - Old Gym	OREGON TRAIL 046	81	1948	9,500	RM1L	1	55			0.4	LOW	NONE
Boring MS - Main	OREGON TRAIL 046	81	1948	50,000	C2L	1	291	Y		0.9	LOW	NONE
Boring MS - New Gym	OREGON TRAIL 046	81	1963	10,000	RM1L	1	58			1.9	LOW	NONE
Cottrell Elem - Main	OREGON TRAIL 046	84	1949	13,800	W2	1	120			1.4	LOW	NONE
Cottrell Elem -Music	OREGON TRAIL 046	84	1961	720	W2	1	6			3.4	LOW	NONE
Kelso Elem	OREGON TRAIL 046	86	1978	39,268	W2	2	275	Y		0.9	LOW	NONE
Naas Elem	OREGON TRAIL 046	87	1968	44,936	W2	1	212			2.9	LOW	NONE
Bull Run Elem - CafT/Class/Off	OREGON TRAIL 046	82	1972	4,813	W2	1	37			3.4	LOW	NONE
Bull Run Elem - Gym	OREGON TRAIL 046	82	1929	3,320	W2	1	26			2.4	LOW	NONE
Bull Run Elem - Old Wood Bldg	OREGON TRAIL 046	82	1929	3,931	W2	2	31			2.4	LOW	NONE
Bull Run Elem -Brick Classrom	OREGON TRAIL 046	82	1961	2,325	W2	1	18			3.4	LOW	NONE
Cedar Ridge MS - Lower	OREGON TRAIL 046	83	1974	26,012	RM1L	2	206			2.4	LOW	NONE
Cedar Ridge MS - Upper	OREGON TRAIL 046	83	1955	29,260	RM1L	2	231			0.9	LOW	NONE
Firwood Elem - A	OREGON TRAIL 046	85	1966	9,882	W2	1	60			0.9	LOW	NONE
Firwood Elem - B	OREGON TRAIL 046	85	1966	9,882	W2	1	60			0.9	LOW	NONE
Firwood Elem - C	OREGON TRAIL 046	85	1973	9,054	W2	1	55			0.9	LOW	NONE
Firwood Elem - D	OREGON TRAIL 046	85	1978	18,162	W2	1	110			0.9	LOW	NONE
Firwood Elem - Office	OREGON TRAIL 046	85	1966	2,993	W2	1	18			1.4	LOW	NONE
Sandy Grade School - Main	OREGON TRAIL 046	88	1930	26,772	C2L	2	276	Y		0.9	LOW	NONE
Sandy Grade School - N Wing	OREGON TRAIL 046	88	1952	15,350	C2L	1	158			1.9	LOW	NONE
Sandy HS School - 70S Classro	OREGON TRAIL 046	89	1988	2,100	W1	1	18			4.4	LOW	NONE
Sandy HS School - Frazier	OREGON TRAIL 046	89	1969	16,048	W2	1	141			2.9	LOW	NONE
Sandy HS School - Main	OREGON TRAIL 046	89	1937	121,666	PC1	2	1068	Y		0.9	LOW	NONE
Sandy HS School - North	OREGON TRAIL 046	89	1923	16,600	RM1L	1	146			-0.1	LOW	NONE
Welches Elem	OREGON TRAIL 046	90	1980	31,294	RM1L	1	306	Y		0.7	MED	MED

NAME OF BUILDING	DISTRICT	School number on map	Year Building Built	Area of Building in Square Feet	Structure Type (per FEMA 154)	Number of Stories	Number of Students	Building student count exceeds 250	Year Building Seismically Upgraded	Sidewalk Survey SCORE	Soil amplification of earthquake shaking	Soil liquefaction potential
Welches MS	OREGON TRAIL 046	91	1968	32,205	W2	1	197			0.5	MED	MED
Athey Creek MS	WEST LINN 3J	93	1990	100,000	C2L	2	558	Y		0.7	MED	HIGH
Bolton MS	WEST LINN 3J	95	1955	2,400	RM1L		13			2.8	NONE	NONE
Boekman Creek Primary School	WEST LINN 3J	94	1989	72,000	RM1L	1	544	Y		0.7	MED	LOW
Bolton MS	WEST LINN 3J	95	1955	36,500	RM1L	2	199			1.3	NONE	NONE
Bolton MS	WEST LINN 3J	95	1955	11,650	RM1L	1	64			1.3	NONE	NONE
Boones Ferry Primary - Main	WEST LINN 3J	96	1950	50,600	C2L	1	655	Y		0.7	MED	MED
Boones Ferry Primary - Mod1	WEST LINN 3J	96	1976	750	W1	1	10			4.4	MED	MED
Boones Ferry Primary - Mod2	WEST LINN 3J	96	1976	750	W1	1	10			4.4	MED	MED
Boones Ferry Primary - Mod3	WEST LINN 3J	96	0	1,200	W1		16			4.4	MED	MED
Cedaroak Park Primary - 12-16	WEST LINN 3J	97	1966	2,016	W1		12			4.4	MED	HIGH
Cedaroak Park Primary - 1-3	WEST LINN 3J	97	1962	1,024	W1		6			4.4	MED	HIGH
Cedaroak Park Primary - 17-22	WEST LINN 3J	97	1966	2,016	W1		12			4.4	MED	HIGH
Cedaroak Park Primary - 4-9	WEST LINN 3J	97	1958	1,536	W1		9			4.4	MED	HIGH
Cedaroak Park Primary - Main	WEST LINN 3J	97	1966	63,500	PC1	1	365	Y		1.5	MED	HIGH
Inza Wood MS	WEST LINN 3J	98	1980	75,000	C2L	1	642	Y		0.7	MED	MED
Rosemont Ridge MS	WEST LINN 3J	99	1999	96,000	S2L		720	Y		5	NONE	NONE
Stafford Primary	WEST LINN 3J	100	0	2,100	W1	1	13			4.4	MED	HIGH
Stafford Primary	WEST LINN 3J	100	1967	81,000	RM1L	1	507	Y		0.7	MED	HIGH
Sunset Elem	WEST LINN 3J	101	1941	41,000	W2	2	449	Y		1.3	NONE	NONE
Three Rivers Charter School	WEST LINN 3J	102	1958	6,500	W2	2	97			1.3	NONE	NONE
West Linn HS - Main	WEST LINN 3J	103	1924	139,250	C2L	2	1373	Y		0.3	NONE	NONE
West Linn HS	WEST LINN 3J	103	0	11,000	C1L	2	108			0.8	NONE	NONE
West Linn HS	WEST LINN 3J	103	0	6,500	C2L	1	64			0.3	NONE	NONE
Willamette Primary School	WEST LINN 3J	104	1949	86,000	C2L	2	506	Y		0.9	LOW	LOW
Wilsonville HS	WEST LINN 3J	105	1992	157,169	RM1L	2	870	Y		0.7	MED	LOW
Butte Creek Elem - Main	SILVER FALLS 4J	92	1949	13,500	C2L	1	104			1.9	LOW	NONE
Butte Creek Elem - 1970s Addit	SILVER FALLS 4J	92	1970	9,800	W2	1	75			2.9	LOW	NONE
Butte Creek Elem - Gym	SILVER FALLS 4J	92	1970	5,500	PC1	1	42			2.2	LOW	NONE
Butte Creek Elem - 1980 Additi	SILVER FALLS 4J	92	1980	9,800	W2	1	75			3.4	LOW	NONE

Table 2. FEMA 154 Building Structure Type descriptions.

FEMA 154 Structure Type	Short Description
W	Wood frame; W1 is light wood framing and W2 is heavy timber framing or a large sized building (>5000 s.f.) in the 2002 system
S1	Steel moment resisting frame
S2	Steel braced frame
S3	Light metal frame
S4	Steel gravity frame with concrete shear walls
C1	Reinforced concrete moment resisting frame
C2	Reinforced concrete shear walls
PC1	Precast concrete tilt-up
PC2	Precast concrete frame
RM	Reinforced masonry; RM1 has flexible floor framing and RM2 has rigid floor framing in the 2002 system
URM	Unreinforced masonry
C3/S5	Steel or concrete moment resisting frame with URM infill panels

Data Collection for Clackamas County K-12 Schools

Clackamas County K-12 Schools within the METRO Boundary – The schools were surveyed by Portland State University (PSU) Civil Engineering students between 1995 and 1997 in an inventory conducted by faculty and students from PSU Civil Engineering Department for Metro Regional Services. An important factor in assessing the seismic hazard is the age of the building. This data was obtained either from the tax assessor data or from the Oregon Database Initiative school data available online.

It is important to consider that results of these surveys are based on the screeners' judgment and that:

- School buildings are among the most difficult buildings to survey. Many school buildings have been added over a number of years with varying construction types. The framing is usually covered with a finish material, often brick veneer. Connections between various additions are unknown.
- Most of the buildings would have been surveyed only from the exterior or a brief glance into the interior of the building. The framing or plans will not have been examined, nor will facilities personnel have been contacted.

Clackamas County K-12 Schools outside the METRO Boundary – These schools were surveyed during the summer of 2002 by Carol Hasenberg, Instructor in the PSU Civil and Environmental Engineering Department, as part of a DOGAMI study for Clackamas County Emergency Management. The level of accuracy is higher than that of the previous group as Ms. Hasenberg is a registered structural engineer with several years' experience in seismic rehabilitation of buildings. Ms. Hasenberg is very familiar with typical construction types for various age buildings in the local area. In addition to personally visiting the schools, Ms. Hasenberg was able to interview the facilities personnel for most of the buildings with questionable construction types.

The age data for the buildings were obtained from the Oregon Database Initiative school data available online. The ages were confirmed by facilities personnel. The method for categorizing the school buildings by Ms. Hasenberg was to count portions of the school of the same construction, same age and connected together as one “building.” As a result, one large school building composed of an original structure and several additions is likely to be listed as several buildings in the database.

Table 3. School name and number shown in Figure 1.

SCHOOL NAME	NUMBER
Ackerman MS	1
Canby HS	2
Carus Elem	3
Cecile B Trost Elem	4
Howard Eccles Elem	5
Ninety One School	6
W.M. Knight Elem	7
Colton Elem	8
Colton HS	9
Colton MS	10
Eagle Creek Elem	11
Estacada HS	12
Estacada Jr HS	13
River Mill Elem	14
Gladstone HS	15
John Wetten Elem	16
Kraxberger MS	17
Clackamas Community College	18
Bryant Elem	19
Forest Hills Elem	20
Hallinan Elem	21
Lake Grove Elem	22
Lake Oswego JHS	23
Lake Oswego Senior HS	24
Lakeridge HS	25
Oak Creek Elem	26
Palisades Elem	27
Rivergrove Elem	28
Uplands Elem	29
Waluga JHS	30
Westridge Elem	31
Clarkes Elem	32
Dickey Prairie Elem	33
Maple Grove Elem	34
Molalla Elem	35
Molalla HS	36
Molalla MS	37
Mulino Elem	38
Rural Dell Elem	39
Ardenwald Elem	40
Bilquist Elem	41
Campbell Elem	42
Clackamas Elem	43
Clackamas HS	44
Concord Elem	45
Happy Valley Elem	46
Lewelling Elem	47
Linwood Elem	48
McLoughlin MS	49
Milwaukie Elem	50
Milwaukie HS	51
Milwaukie MS	52
Mt. Scott Elem	53
Oregon Trail Elem	54
Rex Putnam HS	55
Riverside Elem	56
Rowe MS	57
Sabin Skills Center	58

Sojourner Elementary	59
Spring Mountain Elem	60
Sunnyside Elem	61
Sunrise MS	62
The Academy	63
View Acres Elem	64
Whitcomb Elem	65
Wichita Elem	66
Beavercreek Elem	67
Candy Lane Elem	68
Gaffney Lane Elem	69
Holcomb Elem	70
Jennings Lodge Elem	71
John McLoughlin Elem	72
King Elem	73
Mt. Pleasant Elem	74
Ogden JHS	75
Oregon City HS/Moss Campus	76
Park Place Elem	77
Redland Elem	78
Sage Alternative School	79
Thora B. Gardiner MS	80
Boring MS	81
Bull Run Elem	82
Cedar Ridge MS	83
Cottrell Elem	84
Firwood Elem	85
Kelso Elem	86
Naas Elem	87
Sandy Grade School	88
Sandy HS School	89
Welches Elem	90
Welches MS	91
Butte Creek Elem	92
Athey Creek MS	93
Boekman Creek Primary School	94
Bolton MS	95
Boones Ferry Primary	96
CedarOak Park Primary	97
Inza Wood MS	98
Rosemont Ridge MS	99
Stafford Primary	100
Sunset Elem	101
Three Rivers Charter School	102
West Linn HS	103
Willamette Primary School	104
Wilsonville HS	105

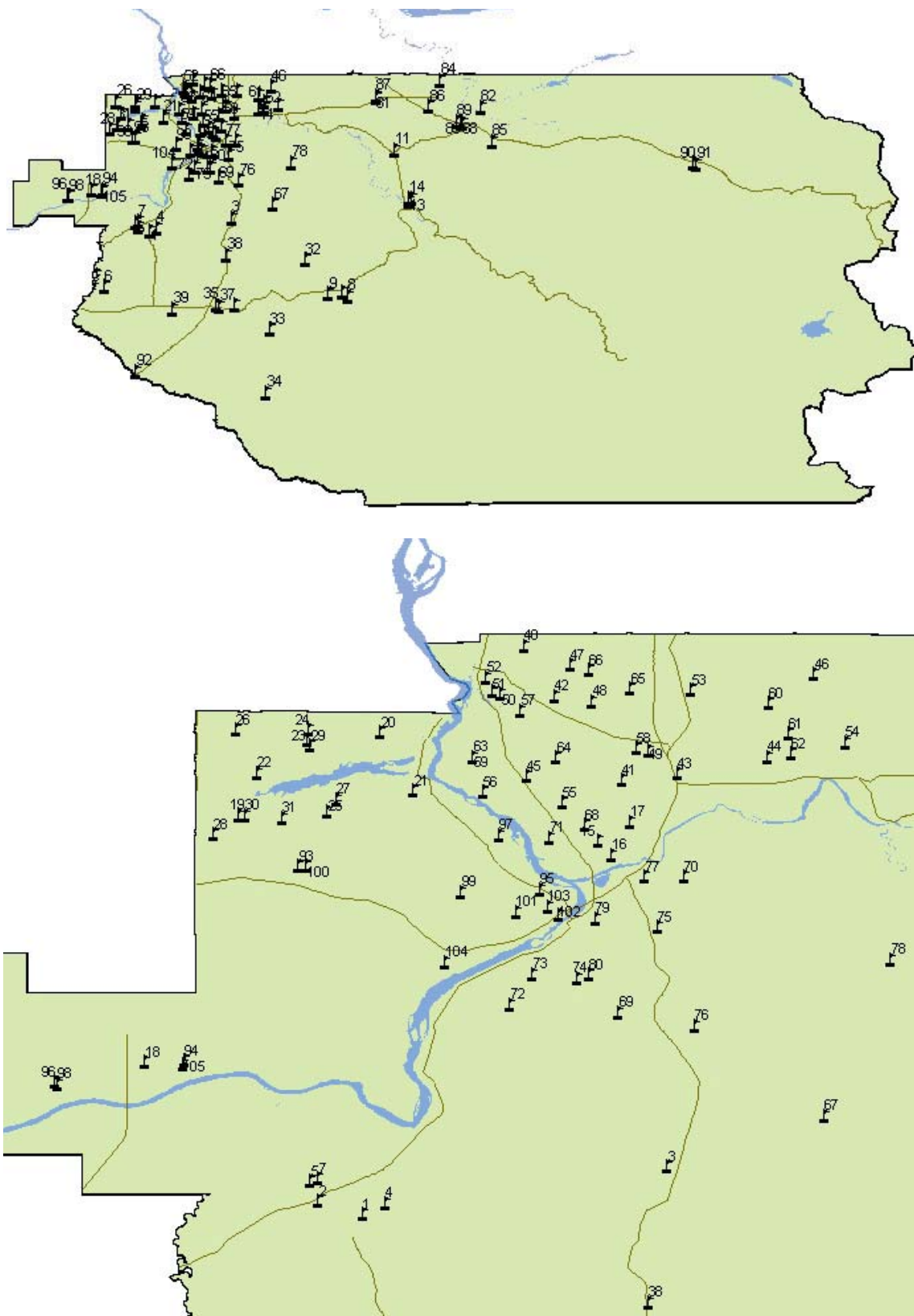
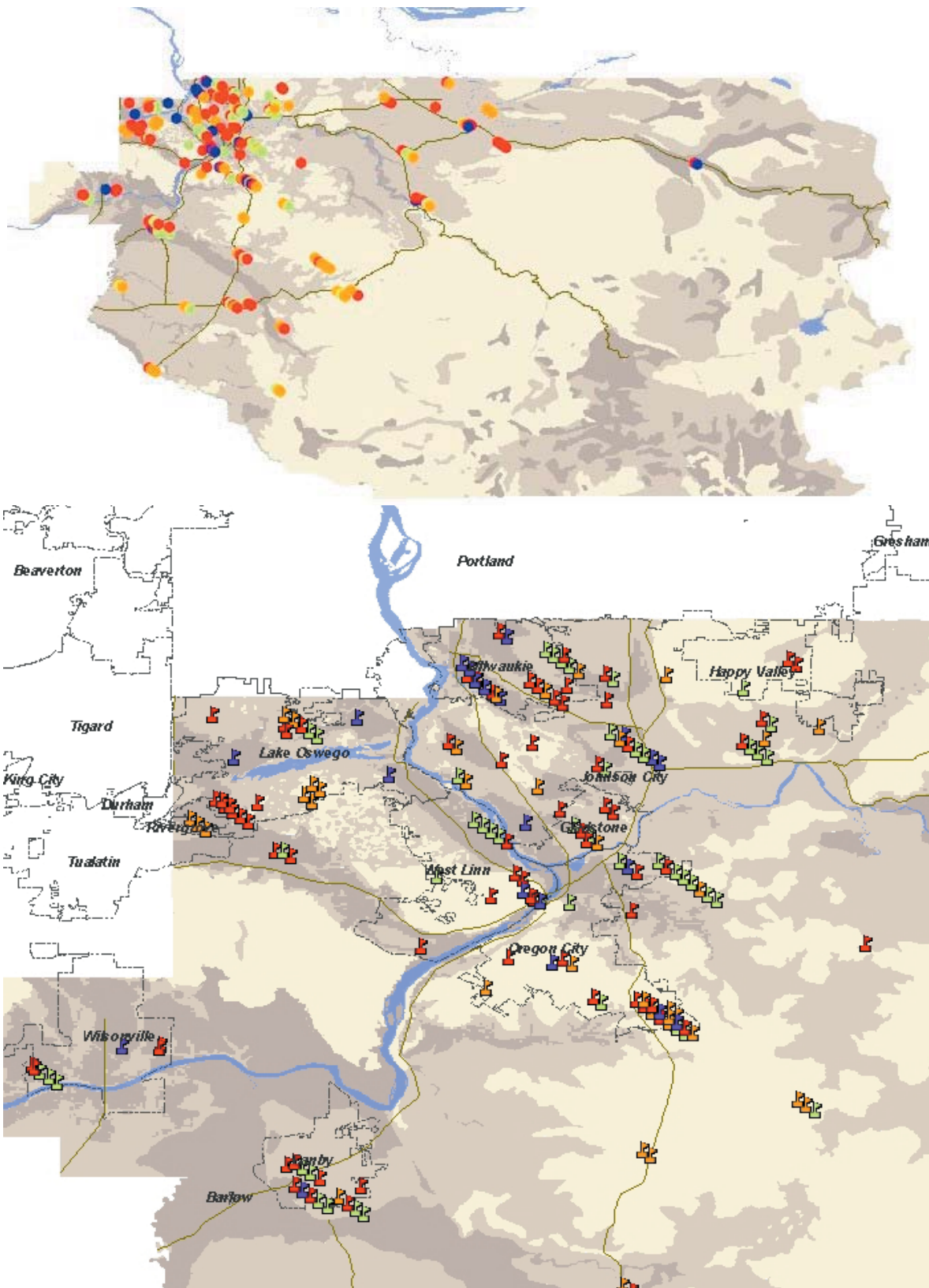
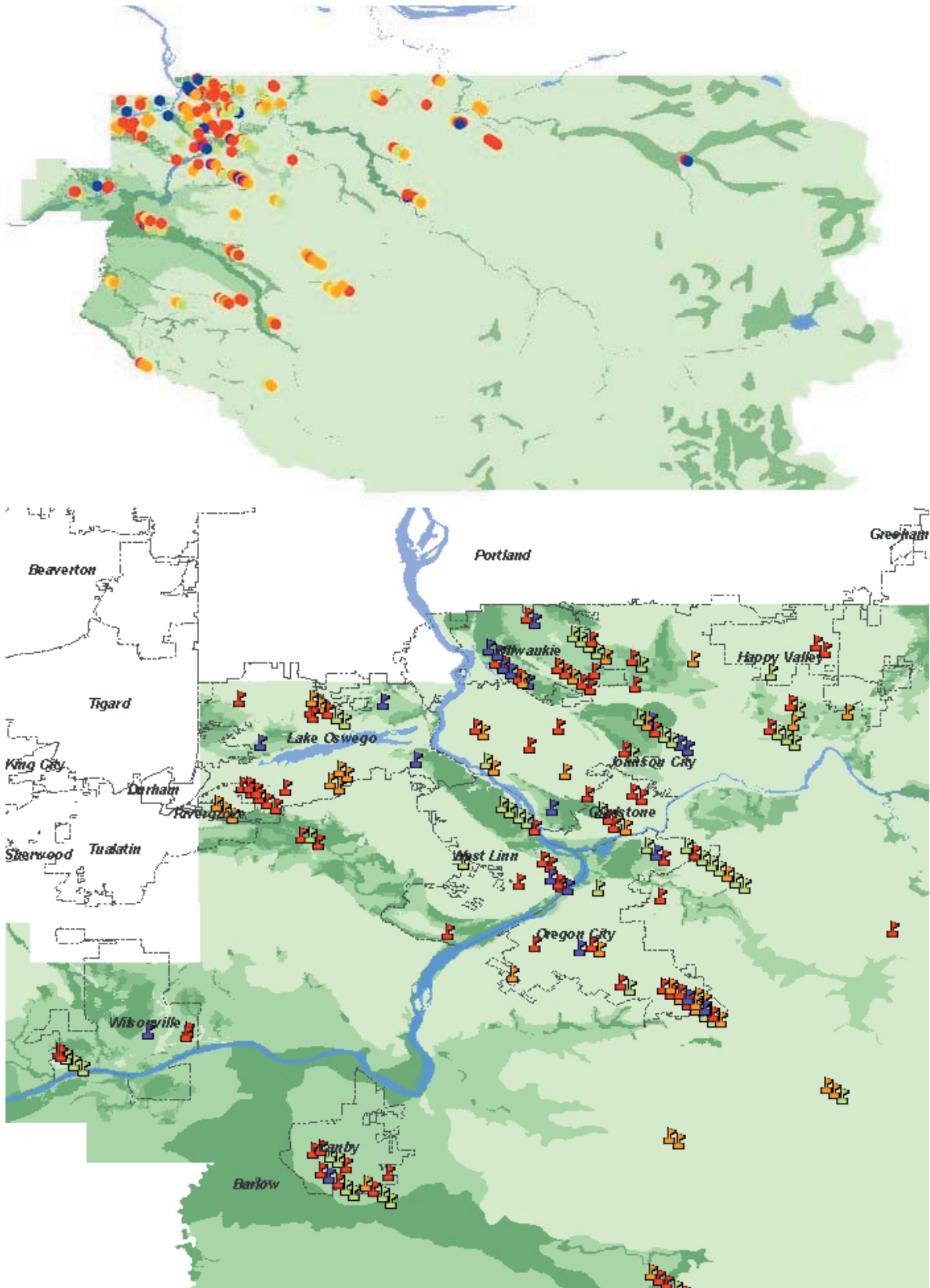


Figure 1. Clackamas County schools, including close up view. See Table 1 for school name keyed to school number.




Figures 2. FEMA scores for K-20 public schools in Clackamas County. Background is UBC soil classification (soil amplification). See Figure 4 for explanation of colors and symbols.




Figures 3. FEMA scores for K-20 public schools in Clackamas County. Background is liquefaction potential. See Figure 4 for explanation of colors and symbols.


Legend

 CC K20 School Locations

CC K20 New Scores Including Soil Amplification


 -0.500000 - 0.500000

 0.500001 - 2.000000

 2.000001 - 3.500000

 3.500001 - 6.400000


CC K20 New Scores Including Soil Amplification

 -0.500000 - 0.500000

 0.500001 - 2.000000

 2.000001 - 3.500000

 3.500001 - 6.400000

 CC Highways

 Water Features

 Cities

Liquefaction Potential of Soil


 None

 Low

 Medium

 High

Amplification of Earthquake Shaking

 Low

 Medium

 High

Figure 4. Explanation for Figures 2 and 3.

Attachment 1

Survey of Oregon Schools for Earthquake Preparedness

STATE HAZARD PLANNING

Survey of Oregon Schools for Earthquake Preparedness

By Yumei Wang and Angie Karel

Introduction

Recently, Oregon K-12 schools, community colleges, and universities have been evaluating school buildings for earthquake stability. A new project was recently initiated by the Oregon Department of Geology and Mineral Industries (DOGAMI) to gather the available information on the earthquake integrity of school buildings as the basis for further analysis into statewide preparedness. This work is especially important because some school facilities were constructed in the decades prior to implementation of a state building code that reflected modern interpretation of the size and intensity of expected future earthquakes.



Structural Damage, Molalla High School, 1993
Photo provided by: DOGAMI

Background

Beginning in 1989, the Oregon Legislature enacted a series of new laws intended to prepare the state for infrequent, but potentially devastating, earthquakes. In 2001, the Legislature approved Senate Bill 14 (ORS 455.400; www.leg.state.or.us/ors/455.html) to support surveys of schools and Senate Joint Resolution No. 21 that, upon voter approval in 2002, amended the Oregon constitution to provide for funding through general obligation bonds that would be utilized to strengthen unsafe schools vis-à-vis earthquake dangers.

Scope

Beginning in fall 2003, DOGAMI, with financial support from the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA), began an effort designed to compile available seismic safety information on school buildings as the basis for subsequent analysis of the statewide need to strengthen vulnerable buildings. The focus of this project is to work with school officials to compile earthquake survey data prepared under the methodology of

the FEMA 154 manual, so-called "sidewalk surveys".

DOGAMI is partnering with state agencies, school facility managers, university faculty, the Portland-based nonprofit organization - Partners for Loss Prevention (PLP), and others to conduct the compilation of inventories of the three classes of schools—K-12, community college, and university (K-20). PLP is compiling the inventory of K-12 school buildings in cooperation with school associations, state agencies, and various school districts.

School Inventory

The K-12 compilation by PLP began in February 2004. The school inventory to be provided to DOGAMI will be a compendium of FEMA 154 and equivalent reports on the earthquake integrity of K-12 school buildings.

DOGAMI is working closely with the facility managers from the 17 community colleges and seven public universities. Oregon University System has taken a leadership role in reducing earthquake risk by initiating surveys and developing a mitigation plan. The State Department of Community Colleges & Workforce Development; Oregon State University Department of Civil, Construction and Environmental Engineering; and Portland State University Department of Civil and Environmental Engineering are assisting with this project.

These initial efforts to develop K-20 school building inventories will create a statewide database which can be used for further analysis by DOGAMI and various partners.

Yumei Wang is a Geotechnical Engineer for DOGAMI. Angie Karel is the Director of Education for PLP.

For more information on the K-12 school project contact Partners for Loss Prevention at 503-292-5167 or PLPAK@msn.com. For information on universities and community colleges, contact Bob Simonton at the Oregon University System at Bob_Simonton@ous.edu and Al Newnam at the Department of Community Colleges and Workforce Development at al.h.newnam@state.or.us. For project information, contact Yumei Wang at DOGAMI at yumei.wang@dogami.state.or.us.

Attachment 2
**Letter to District Superintendents Concerning Earthquake Safety
and Sidewalk Surveys Scores in Clackamas County**



Oregon

Theodore R. Kulongoski, Governor

Department of Geology & Mineral Industries

Administrative Office

800 NE Oregon Street #28, Suite 965

Portland, OR 97232

503-731-4100

FAX 503-731-4066



Clackamas County

May 6, 2004

Roger Woehl
West Linn-Wilsonville Service District
PO Box 35
West Linn OR 97068-0035

Subject: Earthquake Safety and Sidewalk Survey Scores
in Clackamas County Schools

Dear Superintendent Woehl:

As you know, Oregon is characterized by a beautiful and geographically diverse landscape. The intriguing geology of the area is associated with a variety of natural hazards. The earthquake hazard is one that affects the entire state, and although the seismic risk in California may be higher than that in Oregon, the actual life safety risk to earthquakes is higher in Oregon due to the number of structures that are not earthquake resistant. Because Oregon faces a serious statewide threat from earthquakes, major federal, state, and local government agencies and private organizations have been supporting earthquake risk reduction, and have made significant contributions in reducing the adverse impacts of earthquakes.

The Oregon Department of Geologic and Mineral Industries is working with many stakeholders to meet Oregon Revised Statute 455.400, which requires Kindergarten-12th grade (K-12) and higher education facilities as well as emergency service facilities to improve life safety standards (building specifics) in the next thirty years (for those buildings with 250 occupants or more). *Attachment 1*, a copy of ORS 455.400, has been provided for your review.

Many of Oregon's schools were built long before the 1993 statewide building code increase that specifically mandates seismic (earthquake) design. Consequently, a number of schools have serious structural deficiencies and are prone to collapse during earthquakes. The K-12 schools in Clackamas County have been selected as a pilot study for the State of Oregon. Clackamas County Emergency Management and the Oregon Department of Geology and Mineral Industries (DOGAMI) have completed preliminary earthquake vulnerability screenings (or sidewalk

surveys) of the K-12 school buildings in Clackamas County. This study is part of a FEMA-funded project for earthquake mitigation of K- 12, community colleges and public universities in Oregon. This study has been described on page 2 of *Attachment 2: Partnerships in Action Newsletter* (Spring 2004) and is provided as background information.

We encourage you to review the sidewalk survey scores for the schools in your district (*see Appendix A*). In a general sense, buildings have a lower likelihood of collapse (from earthquake shaking) as the scores increase. In using FEMA's method, FEMA states, "The estimates of the score are based on limited observed and analytical data, and the probability of collapse is therefore approximate." FEMA continues that a score of "about 2 is a reasonable preliminary value to use ... to differentiate adequate buildings from those potentially inadequate and thus requiring detailed review." Therefore, for school buildings with scores below 2, we encourage you to obtain engineering studies to evaluate the building's seismic deficiencies. If you choose to have further studies performed, we encourage that the methods outlined in American Society of Civil Engineers (ASCE 31, 2003), which is the standard of practice method for detailed engineering studies, are used.

It is important to note that the sidewalk surveys are not explicitly accurate, that is, there may be some buildings that rate 2 or lower that are not as seismically deficient as some rating higher than 2. The sidewalk surveys are intended to be a prioritization tool for identifying those structures that are in need of structural seismic upgrades.

A cost effective, mitigation approach that you may consider adopting is termed "incremental seismic rehabilitation." In this approach, one of the first mitigation actions that often require little-to-no engineering is securing the non-structural elements of your schools (e.g., parapets, bookcases, etc). We are providing you the below references that may assist you in any future efforts.

- *Attachment 3: FEMA 395- Incremental Seismic Rehabilitation of School Buildings (K-12), 2003*
- *Attachment 4: FEMA 241- Identification and Reduction of Nonstructural Earthquake Hazards in Schools, 18 pp, 1993*
- *Attachment 5: FEMA 74- Earthquake Hazard Mitigation for Nonstructural Elements Field Manual, 52 pp, (Contract EMW-2000-CO-0247)*

We have communicated the earthquake risks with all K-12 school district superintendents in Clackamas County. Please distribute this information to school officials and Board members as you deem appropriate. If you would like for us to assist you with technical resources, please fill out the

attached questionnaire (Attachment 6). We will seek outside funding to help accommodate your resource requests based on responses to this questionnaire. If you are interested in helping to obtain a statewide general obligation bond for K-12 seismic upgrades, which may serve as a future funding source to you, please send your contact information to yumei.wang@dogami.state.or.us.

Thank you for the opportunity to discuss earthquake safety risks in our schools and methods to improve safety. Please contact Vicki Harguth at (503) 650-3933 or Yumei Wang at (503) 731-4100 extension 226 if you have any questions or ideas you would like to discuss.

Sincerely,



Vicki Harguth
Clackamas Co Emergency Manager



Yumei Wang, PE
Geohazard Section Supervisor

APPENDIX A: Earthquake Sidewalk Survey Scores for Clackamas County Schools

Cc: Chris Jonientz-Trisler, FEMA Region X
Vicki McConnell, DOGAMI
Jim Green, Oregon School Board Association
Ed Dennis, Oregon Dept of Education
Carol Hasenberg, Portland State University

ATTACHMENTS:

- Attachment 1: ORS 455.400
- Attachment 2: Partnerships in Action article (page 2)
- Attachment 3: FEMA 395- Incremental Seismic Rehabilitation of School Buildings
- Attachment 4: FEMA 241- Identification and Reduction of Nonstructural Earthquake Hazards in Schools
- Attachment 5: FEMA 74- Earthquake Hazard Mitigation for Nonstructural Elements Field Manual
- Attachment 6: District Superintendents Questionnaire

This letter was sent to these Clackamas
County Superintendents:

David Campbell
Clackamas Education Service District
Marian Hall, Marylhurst Campus
PO Box 216
Marylhurst OR 97036-0216

Deborah Sommer
Canby Service District
1110 S. Ivy
Canby OR 97013-4298

Steve Dickenson
Colton Service District
30429 S. Grays Hill Rd.
Colton OR 97017-9796

Michael Call
Estacada Service District
255 NE 6th Ave.
Estacada OR 97023-9719

Bob Stewart
Gladstone Service District
17789 Webster Rd.
Gladstone OR 97027-1498

William Korach
Lake Oswego Service District
2455 SW Country Club Rd.
PO Box 70
Lake Oswego OR 97034-0070

Wayne Kostur
Molalla Service District
412 Sweigle
PO Box 188
Molalla OR 97038-0188

Ron Naso
North Clackamas Service District
4444 SE Lake Rd.
Milwaukie OR 97222-4799

Richard Newman
Oregon City Service District
1417 12th St.
PO Box 2110

Clementina Salinas
Oregon Trail Service District
36525 SE Industrial Way
PO Box 547
Sandy OR 97055-0547

Roger Woehl
West Linn-Wilsonville Service District
PO Box 35
West Linn OR 97068-0035

Attachment 3

Questionnaire to District Superintendents in Clackamas County

Note: This questionnaire is intended to gather information to determine if there is a strong interest and/or need to host educational workshop(s) on earthquake mitigation in K-12 schools.

1. Would you or your staff attend a ½ day workshop on earthquake mitigation?
Y N
2. Are you interested in learning about earthquake hazards in Clackamas County?
Y N
3. Are you interested in learning to conduct non-structural mitigation (identifying hazards, bracing parapets, anchoring equipment, etc)? Y N
4. Are you interested in incorporating incremental structural mitigation into facilities maintenance and upgrade plans? Y N
5. Are you interested in partnering with the County to reduce seismic hazards in our communities? Y N

District Name _____

District Contact Person Information _____

Return form by May 28th to: Vicki Harguth
Clackamas County Emergency Manager
2200 Kaen Road
Oregon City, OR 97045
(503) 650-3933

Oregon Revised Statutes 455.400

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Chapter 455 — Building Code

2003 EDITION

BUILDING CODE

PUBLIC HEALTH AND SAFETY

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- 455.035 Effective date of rules
- 455.040 State building code preempts local ordinances and rules; exemptions; criteria
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- 455.210 Fees; appeal of fees; surcharge; reduced fees
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- 455.450 Prohibited acts

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ADMINISTRATION

(Generally)

455.010 Definitions for ORS chapter 455. As used in this chapter, unless the context requires otherwise:

(1)(a) “Advisory board” means the board with responsibility for assisting in the adoption, amendment or administration of a specialty code, specifically:

(A) The Building Codes Structures Board established under ORS 455.132;

(B) The Electrical and Elevator Board established under ORS 455.138;

(C) The State Plumbing Board established under ORS 693.115;

(D) The Manufactured Structures and Parks Advisory Board established under ORS 446.280;

(E) The Board of Boiler Rules established under ORS 480.535;

(F) The Residential Structures Board established under ORS 455.135; or

(G) The Mechanical Board established under ORS 455.140.

(b) “Appropriate advisory board” means the advisory board that has jurisdiction over a particular code, standard, license, certification or matter.

(2) “Department” means the Department of Consumer and Business Services.

(3) “Director” means the Director of the Department of Consumer and Business Services.

(4) “Low-Rise Residential Dwelling Code” means the adopted specialty code prescribing standards for the construction of residential dwellings that are three stories or less above grade and have an exterior door for each dwelling unit, but are not facilities or homes described in ORS 443.400 or transient lodging.

(5) “Municipality” means a city, county or other unit of local government otherwise authorized by law to administer a building code.

(6) “Prefabricated structure” means a building or subassembly which has been in whole or substantial part manufactured or assembled using closed construction at an off-site location to be wholly or partially assembled on-site; but does not include a manufactured structure.

(7) “Specialty code” means a code of regulations adopted under ORS 446.062, 446.185, 447.020 (2), 455.020 (2), 455.610, 455.680, 460.085, 460.360, 479.730 (1) or 480.545; but does not include regulations adopted by the State Fire Marshal pursuant to ORS chapter 476 or ORS 479.010 to 479.200 and 479.210 to 479.220.

(8) “State building code” means the combined specialty codes.

(9) “Structural code” means the specialty code prescribing structural standards for building construction.

(10) “Unsafe condition” means a condition caused by earthquake which is determined by the department or any representative of the department to be dangerous to life and property. “Unsafe condition” includes but is not limited to:

(a) Any portion, member or appurtenance of a building that has become detached or dislodged or appears likely to fail or collapse and thereby injure persons or damage property; or

(b) Any portion, of a building or structure that has been damaged by earthquake, or by fire or explosion resulting from an earthquake, to the extent that the structural strength or stability of the building is substantially less than it was prior to the earthquake. [Formerly 456.750; 1991 c.227 §1; 1991 c.310 §1; 1993 c.18 §112; 1993 c.744 §85; 1997 c.259 §3; 1999 c.484 §1; 1999 c.1045 §12; 2003 c.675 §§10,11]

Note 1: The amendments to 455.010 by section 11, chapter 675, Oregon Laws 2003, become operative July 1, 2004. See section 53, chapter 675, Oregon Laws 2003. The text that is operative until July 1, 2004, including amendments by section 10, chapter 675, Oregon Laws 2003, is set forth for the user’s convenience.

455.010. As used in this chapter, unless the context requires otherwise:

(1)(a) “Advisory board” means the board with responsibility for assisting in the adoption, amendment or administration of a specialty code, specifically:

(A) The Building Codes Structures Board established under ORS 455.132;

(B) The Electrical and Elevator Board established under ORS 455.138;

(C) The State Plumbing Board established under ORS 693.115;

(D) The Manufactured Structures and Parks Advisory Board established under ORS 446.280;

(E) The Board of Boiler Rules established under ORS 480.535; or

(F) The Residential Structures Board established under ORS 455.135.

(b) “Appropriate advisory board” means the advisory board that has jurisdiction over a particular code, standard, license, certification or matter.

(2) “Department” means the Department of Consumer and Business Services.

(3) “Director” means the Director of the Department of Consumer and Business Services.

(4) “Low-Rise Residential Dwelling Code” means the adopted specialty code prescribing standards for the construction of residential dwellings that are three stories or less above grade and have an exterior door for each dwelling unit, but are not facilities or homes described in ORS 443.400 or transient lodging.

(5) “Municipality” means a city, county or other unit of local government otherwise authorized by law to administer a building code.

(6) “Prefabricated structure” means a building or subassembly which has been in whole or substantial part manufactured or assembled using closed construction at an off-site location to be wholly or partially assembled on-site; but does not include a manufactured structure.

(7) “Specialty code” means a code of regulations adopted under ORS 446.062, 446.185, 447.020 (2), 455.020 (2), 455.610, 455.680, 460.085, 460.360, 479.730 (1) or 480.545; but does not include regulations adopted by the State Fire Marshal pursuant to ORS chapter 476 or ORS 479.010 to 479.200 and 479.210 to 479.220.

(8) “State building code” means the combined specialty codes.

(9) “Structural code” means the specialty code prescribing structural standards for building construction.

(10) “Unsafe condition” means a condition caused by earthquake which is determined by the department or

any representative of the department to be dangerous to life and property. “Unsafe condition” includes but is not limited to:

- (a) Any portion, member or appurtenance of a building that has become detached or dislodged or appears likely to fail or collapse and thereby injure persons or damage property; or
- (b) Any portion, of a building or structure that has been damaged by earthquake, or by fire or explosion resulting from an earthquake, to the extent that the structural strength or stability of the building is substantially less than it was prior to the earthquake.

Note 2: The amendments to 455.010 by section 75, chapter 655, Oregon Laws 2003, become operative May 1, 2005. See section 147, chapter 655, Oregon Laws 2003. The text that is operative on and after May 1, 2005, is set forth for the user’s convenience.

455.010. As used in this chapter, unless the context requires otherwise:

(1)(a) “Advisory board” means the board with responsibility for assisting in the adoption, amendment or administration of a specialty code, specifically:

- (A) The Building Codes Structures Board established under ORS 455.132;
- (B) The Electrical and Elevator Board established under ORS 455.138;
- (C) The State Plumbing Board established under ORS 693.115;
- (D) The Manufactured Structures and Parks Advisory Board established under ORS 446.280;
- (E) The Board of Boiler Rules established under ORS 480.535;
- (F) The Residential Structures Board established under ORS 455.135; or
- (G) The Mechanical Board established under ORS 455.140.

(b) “Appropriate advisory board” means the advisory board that has jurisdiction over a particular code, standard, license, certification or matter.

(2) “Department” means the Department of Consumer and Business Services.

(3) “Director” means the Director of the Department of Consumer and Business Services.

(4) “Low-Rise Residential Dwelling Code” means the adopted specialty code prescribing standards for the construction of residential dwellings that are three stories or less above grade and have an exterior door for each dwelling unit, but are not facilities or homes described in ORS 443.400 or transient lodging.

(5) “Municipality” means a city, county or other unit of local government otherwise authorized by law to

administer a building code.

(6) “Prefabricated structure” means a building or subassembly that has been in whole or substantial part manufactured or assembled using closed construction at an off-site location to be wholly or partially assembled on-site. “Prefabricated structure” does not include a manufactured dwelling, recreational structure or recreational vehicle, as those terms are defined in ORS 446.003.

(7) “Specialty code” means a code of regulations adopted under ORS 446.062, 446.185, 447.020 (2), 455.020 (2), 455.610, 455.680, 460.085, 460.360, 479.730 (1) or 480.545; but does not include regulations adopted by the State Fire Marshal pursuant to ORS chapter 476 or ORS 479.010 to 479.200 and 479.210 to 479.220.

(8) “State building code” means the combined specialty codes.

(9) “Structural code” means the specialty code prescribing structural standards for building construction.

(10) “Unsafe condition” means a condition caused by earthquake which is determined by the department or any representative of the department to be dangerous to life and property. “Unsafe condition” includes but is not limited to:

(a) Any portion, member or appurtenance of a building that has become detached or dislodged or appears likely to fail or collapse and thereby injure persons or damage property; or

(b) Any portion, of a building or structure that has been damaged by earthquake, or by fire or explosion resulting from an earthquake, to the extent that the structural strength or stability of the building is substantially less than it was prior to the earthquake.

455.020 Purpose; scope of application; exceptions; scope of rules; fees by rule. (1) This chapter is enacted to enable the Director of the Department of Consumer and Business Services to promulgate a state building code to govern the construction, reconstruction, alteration and repair of buildings and other structures and the installation of mechanical devices and equipment therein, and to require the correction of unsafe conditions caused by earthquakes in existing buildings. The state building code shall establish uniform performance standards providing reasonable safeguards for health, safety, welfare, comfort and security of the residents of this state who are occupants and users of buildings, and will provide for the use of modern methods, devices, materials, techniques and practicable maximum energy conservation.

(2) The rules adopted pursuant to this chapter shall include structural standards; standards for the installation and use of mechanical, heating and ventilating devices and equipment; and standards for prefabricated structures; and shall, subject to ORS 455.210, prescribe reasonable fees for the issuance of building permits and similar documents, inspections and plan review services by the Department of Consumer and Business Services. The department may also establish, by rule, the amount of any fee pertaining to the state building code or any specialty code that is authorized by statute, but for which an amount is not specified by statute.

(3) This chapter does not affect the statutory jurisdiction and authority of the Workers’ Compensation Board, under ORS chapter 654, to promulgate occupational safety and health standards relating to places of em-

ployment, and to administer and enforce all state laws, regulations, rules, standards and lawful orders requiring places of employment to be safe and healthful.

(4) This chapter and any specialty code does not limit the authority of a municipality to enact regulations providing for local administration of the state building code; local appeal boards; fees and other charges; abatement of nuisances and dangerous buildings; enforcement through penalties, stop-work orders or other means; or minimum health, sanitation and safety standards for governing the use of structures for housing, except where the power of municipalities to enact any such regulations is expressly withheld or otherwise provided for by statute. Pursuant to the regulation of dangerous buildings, a municipality may adopt seismic rehabilitation plans that provide for phased completion of repairs that are designed to provide improved life safety but that may be less than the standards for new buildings. [Formerly 456.755; 1991 c.227 §2; 1991 c.310 §2; 1995 c.304 §1; 1995 c.400 §5; 1999 c.1045 §13; 1999 c.1082 §11; 2001 c.710 §8]

455.022 Appropriation of program fees established by department rule. All moneys deposited to the Consumer and Business Services Fund that are derived pursuant to ORS 455.240 or 460.370, or from state building code or specialty code program fees for which the amounts are established by Department of Consumer and Business Services rule pursuant to ORS 455.020 (2), are continuously appropriated to the department for carrying out any of the duties, functions and powers of the department under ORS 455.240 or 460.310 to 460.370 or under a program for which a fee amount is established by department rule pursuant to ORS 455.020 (2), without regard to the source of the moneys. [2001 c.710 §2]

Note: 455.022 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.030 Rulemaking; notice; content; code distribution; amendment process. (1) Subject to any requirement for approval by the appropriate advisory boards, the Director of the Department of Consumer and Business Services may adopt, amend or repeal rules for carrying out the responsibilities of the Department of Consumer and Business Services to develop, implement, administer and enforce a program that relates to the state building code or a specialty code. Except as otherwise provided by this section, the director shall be subject to ORS chapter 183 in the adoption, amendment or repeal of regulations authorized by, and in the issuance of orders in contested cases arising under, this chapter.

(2)(a) In addition to the notice requirements of ORS 183.335, notice of a public hearing on adoption, amendment or repeal of a specialty code shall be given to the governing bodies of all municipalities and the notice shall state that copies of the proposed action may be obtained from the department.

(b) The notice of proposed rule change shall include a finding by the advisory board that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

(c) The director shall maintain a roster of individuals who wish to be notified of any changes to or interpretations of the Low-Rise Residential Dwelling Code. Subscribers to the list may be charged a reasonable amount necessary to defray the cost of maintaining the list and advising the subscribers of changes in the code.

(3) The director is not required to publish or distribute those parts of a specialty code of regulations adopted by reference. However, the director shall publish with a specialty code and annually thereafter a list of places where copies of those parts of the specialty code adopted by reference may be obtained together with the approximate cost thereof. The director shall file one copy of the rule with the Secretary of State. All standards referred to in any specialty code or any of the modifications thereto need not be so filed. All standards and specialty codes referred to in the specialty code shall be kept on file and available for inspection in the offices of the department.

(4) Any interested person may propose amendments to the state building code, which proposed amendments may be either applicable to all municipalities or, where it is alleged and established that conditions exist within a municipality or some municipalities that are not generally found within other municipalities, amendments may be restricted in application to such municipalities. Amendments proposed to the state building code under this subsection shall be in conformity with the policy and purpose prescribed by ORS 455.020. The justification and the particular circumstances requiring the proposed amendments shall be fully stated in the proposal. The director shall submit all proposed amendments to the appropriate advisory board. The board shall review and report its recommendations to the director on the amendments within 180 days after the date of submission by the director.

(5) The director, with the approval of the advisory board, may adopt or modify and adopt any amendments proposed to the director under subsection (4) of this section. The director shall, within 30 days after the date of receipt of the recommendations of the advisory board, notify the person proposing the amendments of the adoption, modification and adoption or denial of the proposed amendments. Upon adoption, a copy of each amendment shall be distributed to the governing bodies of all municipalities affected thereby.

(6) The director shall from time to time make or cause to be made investigations, or may accept authenticated reports from authoritative sources, concerning new materials or modes of construction intended for use in the construction of buildings or structures, or intended for use in other activity regulated by the state building code, and shall, where necessary, propose amendments to the code setting forth the conditions under which the materials or modes may be used, in accordance with the standards and procedures of this chapter. [Formerly 456.785; 1991 c.94 §2; 1993 c.744 §86; 1997 c.227 §1; 2003 c.368 §3; 2003 c.675 §12]

455.035 Effective date of rules. (1) Any rule adopted under this chapter or ORS 447.010 to 447.156 and 447.992 or 479.510 to 479.945 and 479.995 shall not become effective on a date other than January 1, April 1, July 1 or October 1.

(2) The provisions of subsection (1) of this section do not apply to temporary rules adopted under ORS 183.335 (5). [1995 c.553 §11; 1999 c.116 §1]

Note: 455.035 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.040 State building code preempts local ordinances and rules; exemptions; criteria. (1) The state building code shall be applicable and uniform throughout this state and in all municipalities, and no municipality shall enact or enforce any ordinance, rule or regulation relating to the same matters encompassed by the state building code but which provides different requirements unless authorized by the Director of the

Department of Consumer and Business Services. The director's authorization shall not be considered an amendment to the state building code under ORS 455.030. The director shall encourage experimentation, innovation and cost effectiveness by municipalities in the adoption of ordinances, rules or regulations which conflict with the state building code.

(2) Subsection (1) of this section is operative:

(a) With regard to the state structural code, July 1, 1974.

(b) With regard to the state mechanical, heating and ventilating code, on the effective date of such code as determined under ORS 183.355.

(c) With regard to each specialty code not named by paragraphs (a) and (b) of this subsection, on the effective date, as determined under ORS 183.355, of the first amendments to such code adopted pursuant to this chapter. [Formerly 456.775]

455.050 Building permits; content. All building permits issued in this state shall contain the following information:

(1) The name and address of the owner of the building or structure to be constructed or altered under the permit;

(2) The name and address of the builder or contractor, if known, who will perform the construction or alteration; and

(3) The street address and legal description or tax lot number of the property on which construction or alteration will occur. [Formerly 456.887]

Note: 455.050 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.060 Rulings on acceptability of material, design or method of construction; effect of approval. (1) Any person who desires to use or furnish any material, design or method of construction or installation in the state, or any building official, may request the Director of the Department of Consumer and Business Services to issue a ruling with respect to the acceptability of any material, design or method of construction about which there is a question under any provision of the state building code. Requests shall be in writing and, if made by anyone other than a building official, shall be made and the ruling issued prior to the use or attempted use of such questioned material, design or method.

(2) In making rulings, the director shall obtain the approval of the appropriate advisory board as to technical and scientific facts and shall consider the standards and interpretations published by the body that promulgated any nationally recognized model code adopted as a specialty code of this state.

(3) A copy of the ruling issued by the director shall be certified to the person making the request. Additional

copies shall be transmitted to all building officials in the state. The director shall keep a permanent record of all such rulings, and shall furnish copies thereof to any interested person upon payment of such fees as the director may prescribe.

(4) A building official or inspector shall approve the use of any material, design or method of construction approved by the director pursuant to this section if the requirements of all other local ordinances are satisfied. [Formerly 456.845]

455.070 Report of suspected code violation; rules; form; appeal. Any person may report a suspected violation of the state building code, which poses an imminent threat to public health or safety, to the local building official or, where the code is state-administered, to the Department of Consumer and Business Services. The complaint shall be in writing and submitted under rules adopted by the department. The rules of the department shall provide for the disposition of frivolous or harassing complaints by requiring detailed descriptions of the alleged violation and reference to the code sections allegedly violated. A copy of the complaint shall be given by the municipality or agency to the contractor, building owner and subcontractor, if any, involved in the project alleged to be in violation. The municipality or agency may charge the complainant for the necessary costs of supplying, copying and distributing the complaint form. If, after five working days, no remedial action has taken place, the complainant has standing to appeal the matter to the appeals board of the municipality, where one is established, or directly to the applicable state advisory board where there is no local appeals board. The municipal appeals board or state advisory board shall reach a final decision within 14 days of the complainant's appeal. A municipal appeals board decision shall then be subject to appeal to a state advisory board under ORS 455.690, provided that the state advisory board shall reach a final determination within 14 days of notice of an appeal. A record of the written complaint and the findings of the appeals and advisory boards may be introduced into evidence in any judicial proceeding for damages brought against the complainant by any person suffering damages as a result of the complaint. [Formerly 456.842; 1993 c.744 §87]

455.080 Inspector may require proof of compliance. Notwithstanding ORS 455.630 (2), any inspector, including a specialty code inspector licensed under ORS 455.457, authorized by ORS 455.150 or 455.153 to determine compliance with the requirements of the state building code or any specialty code under this chapter may, in accordance with a compliance program as described in ORS 455.153 (2), require any person who is engaged in any activity regulated by the state building code to demonstrate proof of compliance with the applicable licensing, registration or certification requirements of ORS chapters 446, 447, 455, 460, 479, 480, 693 and 701. [Formerly 456.802; 1999 c.1045 §14; 2001 c.411 §16]

Note: 455.080 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.085 Publication; readability; funding. (1) The Director of the Department of Consumer and Business Services shall, upon receipt of adequate funds under subsection (2) of this section, publish all state building code provisions relating to the design, construction, prefabrication, equipment or appliance installation, quality of materials, use and occupancy location and repair of detached low-rise residential dwellings in two separate publications. One publication shall contain the applicable provisions of the specialty code adopted under ORS 479.730 (1) and the other publication shall contain the remaining applicable provisions of the

state building code. The text of the publications made under this section shall be readable at the ninth grade level of reading, as determined by the director under one or more standard recognized readability formulas, including, but not limited to, the Flesch, Fry or Dale Chall tests.

(2) The publications under subsection (1) of this section shall be paid for by funds donated by interested citizens, who shall be made aware of the project by the Department of Consumer and Business Services through public service announcements and other nominal-cost advertising. Funds shall be collected until sufficient funds are available to conduct the publication. Refunds shall be made to the donors if sufficient funds are not collected. [Formerly 456.787 and then 455.635; 2003 c.675 §13]

(Director; Boards)

455.100 Duties of director. The Director of the Department of Consumer and Business Services shall have general supervision over the administration of the state building code regulations, including providing state-wide interpretations for the plumbing, elevator, electrical, manufactured structures, boiler, amusement ride, structural, mechanical, low-rise residential dwelling and prefabricated structures codes. [Formerly 456.790; 1993 c.18 §113; 1993 c.744 §88; 2003 c.675 §§14,15]

Note: The amendments to 455.100 by section 15, chapter 675, Oregon Laws 2003, become operative July 1, 2004. See section 53, chapter 675, Oregon Laws 2003. The text that is operative until July 1, 2004, including amendments by section 14, chapter 675, Oregon Laws 2003, is set forth for the user's convenience.

455.100. The Director of the Department of Consumer and Business Services shall have general supervision over the administration of the state building code regulations, including providing statewide interpretations for the plumbing, elevator, electrical, manufactured structures, boiler, amusement ride, structural, mechanical, heating and ventilating, low-rise residential dwelling and prefabricated structures codes.

455.110 Other duties of director. Except as otherwise provided by ORS chapters 446, 447, 460, 476, ORS 479.010 to 479.220, 479.510 to 479.945, 479.990 and 479.995 and ORS chapter 480:

(1) The Director of the Department of Consumer and Business Services shall coordinate, interpret and generally supervise the adoption, administration and enforcement of the state building code.

(2) The director with the approval of the appropriate advisory boards shall adopt codes and standards, including regulations as authorized by ORS 455.020 governing the construction, reconstruction, alteration and repair of buildings and other structures and the installation of mechanical devices and equipment therein. The regulations may include rules for the administration and enforcement of a certification system for persons performing work under the codes and standards adopted under this subsection. However, this subsection does not authorize the establishment of a separate certification for performing work on low-rise residential dwellings.

(3) The director with the approval of the appropriate advisory boards may amend such codes from time to time. The codes of regulations and any amendment thereof shall conform in so far as practicable to model building codes generally accepted and in use throughout the United States. If there is no nationally recognized model code, consideration shall be given to the existing specialty codes presently in use in this state.

Such model codes with modifications considered necessary and specialty codes may be adopted by reference. The codes so promulgated and any amendments thereof shall be based on the application of scientific principles, approved tests and professional judgment and, to the extent that it is practical to do so, the codes shall be promulgated in terms of desired results instead of the means of achieving such results, avoiding wherever possible the incorporation of specifications of particular methods or materials. To that end the codes shall encourage the use of new methods, new materials and maximum energy conservation. [Formerly 456.770; 2003 c.675 §16]

455.112 Elimination of unclear, duplicative, conflicting or inadequate provisions; rules. Notwithstanding ORS 455.030 and 455.110, the Director of the Department of Consumer and Business Services may initiate the adoption of rules the director considers necessary to interpret, harmonize, streamline, adjust, administer or enforce the state building code when any provision of the state building code is unclear, duplicative or in conflict with another or when the code does not adequately address a project of a unique type or scope. The director must obtain the approval of the appropriate advisory boards prior to adopting a rule under this section. [2003 c.367 §2]

Note: 455.112 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.122 Combinations of licenses, certificates, registrations or other authorizations; rules. (1) The Director of the Department of Consumer and Business Services, with the approval of the appropriate advisory boards, shall establish a system that allows a contractor or business possessing two or more licenses, certificates, registrations or other authorizations described in subsection (2) of this section to have an approved combination of those licenses, certificates, registrations and other authorizations issued or renewed simultaneously.

(2) Notwithstanding any issuance or renewal dates established under ORS 479.510 to 479.945 and 480.510 to 480.670 and this chapter and ORS chapters 447 and 460, subsection (1) of this section applies to contractor or business licenses, certificates, registrations or other authorizations by the Electrical and Elevator Board, the Board of Boiler Rules or the State Plumbing Board.

(3) The director shall establish rules to implement the system described in this section. The rules must establish the combinations of licenses, certificates, registrations and other authorizations for which a simultaneous issuance or renewal is offered, the term and expiration date for the combination, the appropriate fees for administering the system, the criteria for issuance and renewal and the other standards and criteria deemed by the Department of Consumer and Business Services to be necessary to administer and enforce the system. [2003 c.136 §2]

Note: 455.122 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.125 Denial, suspension, conditioning or revocation of license, certificate, registration or other authorization. In addition to any other sanction, remedy or penalty provided by law, the Director of the Department of Consumer and Business Services or an appropriate advisory board may deny, suspend, condition or revoke a registration, certification, license or other authority to perform work or conduct business issued under laws

administered by the department or advisory board if the holder:

(1) Fails to comply with a provision of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.950 or 480.510 to 480.670 or ORS chapter 447, 455, 460 or 693, or with any rule adopted thereunder; or

(2) Engages in an act for which the Construction Contractors Board imposes a sanction on the holder under ORS 701.135. [2003 c.361 §2]

Note: 455.125 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.130 [Formerly 456.780; 1989 c.224 §118; repealed by 1993 c.744 §41]

455.132 Building Codes Structures Board; duties; membership. (1) There is established in the Department of Consumer and Business Services a Building Codes Structures Board consisting of nine members.

(2) The Building Codes Structures Board shall assist the Director of the Department of Consumer and Business Services in administering the structural, prefabricated structures and energy programs described in this chapter and the accessibility to persons with physical disabilities program described in ORS 447.210 to 447.280.

(3) The board shall consist of members broadly representative of the industries and professions involved in the development and construction of buildings and energy conservation, including:

(a) An architect or engineer;

(b) A general contractor, as defined in ORS 701.005, specializing in the construction of buildings more than three stories above grade;

(c) A contractor specializing in construction for heavy industry;

(d) A representative of the building trade;

(e) A representative of a utility or energy supplier;

(f) A representative of a fire protection agency;

(g) A building official;

(h) An owner or manager of a commercial office building; and

(i) A representative selected from individuals recommended by the Oregon Disabilities Commission. [1993 c.744 §80; 1995 c.249 §1; 2003 c.675 §§17,18,19]

Note: The amendments to 455.132 by section 19, chapter 675, Oregon Laws 2003, become operative July 1, 2004. See section 53, chapter 675, Oregon Laws 2003. The text that is operative until July 1, 2004, including amendments by sections 17 and 18, chapter 675, Oregon Laws 2003, is set forth for the user's convenience.

455.132. (1) There is established in the Department of Consumer and Business Services a Building Codes Structures Board consisting of nine members.

(2) The Building Codes Structures Board shall assist the Director of the Department of Consumer and Business Services in administering the structural, mechanical, prefabricated structures and energy programs described in this chapter and the accessibility to persons with physical disabilities program described in ORS 447.210 to 447.280.

(3) The board shall consist of members broadly representative of the industries and professions involved in the development and construction of buildings and energy conservation, including:

- (a) An architect or engineer;
- (b) A general contractor, as defined in ORS 701.005, specializing in the construction of buildings more than three stories above grade;
- (c) A contractor specializing in construction for heavy industry;
- (d) A representative of the building trade;
- (e) A representative of a utility or energy supplier;
- (f) A representative of a fire protection agency;
- (g) A building official;
- (h) An owner or manager of a commercial office building; and
- (i) A representative selected from individuals recommended by the Oregon Disabilities Commission.

Note: 455.132, 455.138 and 455.144 were added to and made a part of ORS chapter 455 by legislative action but were not added to any series therein. See Preface to Oregon Revised Statutes for further explanation.

455.135 Residential Structures Board; duties; membership. (1) There is established a Residential Structures Board consisting of nine members appointed by the Governor.

(2) The members of the board shall assist the Director of the Department of Consumer and Business Services in administering the low-rise residential dwelling program described in this chapter.

(3) The board must consist of:

- (a) One contractor specializing in the construction of residential structures;
- (b) One contractor specializing in the remodeling of residential structures;
- (c) One contractor specializing in building multifamily housing three stories or less above grade;
- (d) One home designer or architect;
- (e) One building official;
- (f) One representative of residential building trade subcontractors;
- (g) One structural engineer;
- (h) One representative of a utility or energy supplier; and
- (i) One public member who does not receive compensation from any interest represented under paragraphs (a) to (h) of this subsection. [2003 c.675 §2]

Note: 455.135 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.138 Electrical and Elevator Board; duties; membership. (1) There is established in the Department of Consumer and Business Services an Electrical and Elevator Board consisting of 15 members.

(2) The Electrical and Elevator Board shall assist the Director of the Department of Consumer and Business Services in administering the electrical program described in ORS 479.510 to 479.945 and 479.995 and the elevator program described in ORS 460.005 to 460.175.

(3) The board shall be composed of:

- (a) A fire and casualty underwriter;
- (b) A representative of industrial plants regularly employing licensed electricians;
- (c) A person representing the power and light industry;
- (d) An electrical equipment supplier who otherwise qualifies by experience in the industry;
- (e) An elevator manufacturing representative;
- (f) One member from the electrical equipment manufacturing industry who otherwise qualifies by experience and training in electricity;
- (g) Two journeyman electricians;

- (h) An electrical inspector;
- (i) Two electrical contractors;
- (j) A municipal building official;
- (k) A journeyman elevator installer;
- (L) An owner or manager of a commercial office building; and
- (m) A public member who does not receive compensation from any interest described in paragraphs (a) to (L) of this subsection. [1993 c.744 §81; 1995 c.249 §2]

Note: See second note under 455.132.

455.140 Mechanical Board; duties; membership. (1) There is established a Mechanical Board consisting of nine members appointed by the Governor.

(2) The members of the board shall assist the Director of the Department of Consumer and Business Services in administering the code adopted pursuant to ORS 455.020 for mechanical devices and equipment.

(3) The board must consist of:

- (a) One representative of the plumbing industry;
- (b) One sheet metal and air conditioner contractor;
- (c) One municipal mechanical inspector possessing the highest level of mechanical inspector certification issued by the Department of Consumer and Business Services;
- (d) One heating, venting and air conditioning contractor;
- (e) One heating, venting and air conditioning installer;
- (f) One sheet metal and air conditioner installer;
- (g) One representative of a natural gas company or other utility;
- (h) One building official; and
- (i) One public member who does not receive compensation from any interest represented under paragraphs (a) to (h) of this subsection.

(4) At least one of the board members described in subsection (3)(b) or (d) of this section must be an owner or operator of a contracting business employing 10 or fewer persons at the time of the member's appoint-

ment to the term. [2003 c.675 §4]

Note: 455.140 becomes operative July 1, 2004. See section 53, chapter 675, Oregon Laws 2003.

Note: 455.140 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.144 Terms; compensation; officers; quorum; meetings; rules; removal of members; confirmation. (1) The Building Codes Structures Board, the Electrical and Elevator Board, the Residential Structures Board and the Mechanical Board shall each be organized and governed as described in this section.

(2)(a) The term of office of each member is four years and no member shall be eligible for appointment to more than two full terms of office. The Governor shall appoint the members of each board and the board members shall serve at the pleasure of the Governor.

(b) Before the expiration of the term of a member, the Governor shall appoint a successor whose term begins on July 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the Governor shall make an appointment to become immediately effective for the unexpired term.

(3) A member of each board is entitled to compensation and expenses as provided in ORS 292.495.

(4) A board shall select one of its members as chairperson and another as vice chairperson, for such terms and with duties and powers necessary for the performance of the functions of such office as the board determines.

(5) A majority of the members of a board constitutes a quorum for the transaction of business.

(6) Each board shall meet once every three months at a place, day and hour determined by the board. A board shall also meet at other times and places specified by the call of the Director of the Department of Consumer and Business Services.

(7) In accordance with applicable provisions of ORS chapter 183, the director may adopt rules necessary for the administration of the laws that the Department of Consumer and Business Services is charged with administering.

(8) The Governor may remove a board member for good cause. "Good cause" for removal of a member includes, but is not limited to, three unexcused absences during any 12-month period from a regularly scheduled board meeting.

(9) The appointment of a member of a board is subject to confirmation by the Senate pursuant to section 4, Article III of the Oregon Constitution. [1993 c.744 §83; 2003 c.675 §§20,21]

Note: The amendments to 455.144 by section 21, chapter 675, Oregon Laws 2003, become operative July 1, 2004. See section 53, chapter 675, Oregon Laws 2003. The text that is operative until July 1, 2004, including

amendments by section 20, chapter 675, Oregon Laws 2003, is set forth for the user's convenience.

455.144. (1) The Building Codes Structures Board, the Electrical and Elevator Board and the Residential Structures Board shall each be organized and governed as described in this section.

(2)(a) The term of office of each member is four years and no member shall be eligible for appointment to more than two full terms of office. The Governor shall appoint the members of each board and the board members shall serve at the pleasure of the Governor.

(b) Before the expiration of the term of a member, the Governor shall appoint a successor whose term begins on July 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the Governor shall make an appointment to become immediately effective for the unexpired term.

(3) A member of each board is entitled to compensation and expenses as provided in ORS 292.495.

(4) A board shall select one of its members as chairperson and another as vice chairperson, for such terms and with duties and powers necessary for the performance of the functions of such office as the board determines.

(5) A majority of the members of a board constitutes a quorum for the transaction of business.

(6) Each board shall meet once every three months at a place, day and hour determined by the board. A board shall also meet at other times and places specified by the call of the Director of the Department of Consumer and Business Services.

(7) In accordance with applicable provisions of ORS chapter 183, the director may adopt rules necessary for the administration of the laws that the Department of Consumer and Business Services is charged with administering.

(8) The Governor may remove a board member for good cause. "Good cause" for removal of a member includes, but is not limited to, three unexcused absences during any 12-month period from a regularly scheduled board meeting.

(9) The appointment of a member of a board is subject to confirmation by the Senate pursuant to section 4, Article III of the Oregon Constitution.

Note: See second note under 455.132.

(Municipal Regulation)

455.148 Comprehensive municipal building inspection programs; building officials; rules; program duration, plan, failure, abandonment and resumption. (1)(a) A municipality that assumes the administration and enforcement of a building inspection program on or after January 1, 2002, must administer and enforce the program for all of the following:

(A) The state building code, as defined in ORS 455.010, except as set forth in paragraph (b) of this subsection;

(B) Manufactured structure installation requirements under ORS 446.155, 446.185 (1) and 446.230;

(C) Manufactured dwelling parks and mobile home parks under ORS chapter 446;

(D) Park and camp programs regulated under ORS 455.680;

(E) Tourist facilities regulated under ORS 446.310 to 446.350;

(F) Manufactured dwelling alterations regulated under ORS 446.155; and

(G) Manufactured structure accessory buildings and structures under ORS 446.253.

(b) A building inspection program of a municipality may not include:

(A) Boiler and pressure vessel programs under ORS 480.510 to 480.670;

(B) Elevator programs under ORS 460.005 to 460.175;

(C) Amusement ride regulation under ORS 460.310 to 460.370;

(D) Prefabricated structure regulation under ORS chapter 455;

(E) Manufacture of manufactured structures programs under ORS 446.155 to 446.285, including the administration and enforcement of federal manufactured dwelling construction and safety standards adopted under ORS 446.155 or the National Manufactured Housing Construction and Safety Standards Act of 1974;

(F) Licensing and certification, or the adoption of statewide codes and standards, under ORS chapter 446, 447, 455, 479 or 693; and

(G) Review of plans and specifications as provided in ORS 455.685.

(2) A municipality that administers a building inspection program as allowed under this section shall do so for periods of four years. The Department of Consumer and Business Services shall adopt rules to adjust time periods for administration of a building inspection program to allow for variations in the needs of the department and participants.

(3) When a municipality administers a building inspection program, the governing body of the municipality shall, unless other means are already provided, appoint a person to administer and enforce the building inspection program, who shall be known as the building official. A building official shall, in the municipality for which appointed, attend to all aspects of code enforcement, including the issuance of all building permits. Two or more municipalities may combine in the appointment of a single building official for the purpose of administering a building inspection program within their communities.

(4)(a) By January 1 of the year preceding the expiration of the four-year period described in subsection (2) of this section, the governing body of the municipality shall notify the Director of the Department of Consumer and Business Services and, if not a county, notify the county whether the municipality will continue to administer and enforce the building inspection program after expiration of the four-year period.

(b) Notwithstanding the January 1 date set forth in paragraph (a) of this subsection, the director and the municipality and, if the municipality is not a county, the county may by agreement extend that date to no later than March 1.

(5) If a city does not notify the director, or notifies the director that it will not administer the building inspection program, the county or counties in which the city is located shall administer and enforce the county program within the city in the same manner as the program is administered and enforced outside the city, except as provided by subsection (6) of this section.

(6) If a county does not notify the director, or notifies the director that it will not administer and enforce a building inspection program, the director shall contract with a municipality or other person or use such state employees or state agencies as are necessary to administer and enforce a building inspection program, and permit or other fees arising therefrom shall be paid into the Consumer and Business Services Fund created by ORS 705.145 and credited to the account responsible for paying the expenses thereof. A state employee may not be displaced as a result of using contract personnel.

(7) The governing body of a municipality may commence responsibility for the administration and enforcement of a building inspection program beginning July 1 of any year by notifying the director no later than January 1 of the same year and obtaining the director's approval of an assumption plan as described in subsection (11)(c) of this section.

(8) The department shall adopt rules to require the governing body of each municipality assuming or continuing a building inspection program under this section to submit a written plan with the notice required under subsection (4) or (7) of this section. If the department is the governing body, the department shall have a plan on file. The plan shall specify how cooperation with the State Fire Marshal or a designee of the State Fire Marshal will be achieved and how a uniform fire code will be considered in the review process of the design and construction phases of buildings or structures.

(9) A municipality that administers and enforces a building inspection plan pursuant to this section shall recognize and accept the performances of state building code activities by businesses and persons authorized under ORS 455.457 to perform the activities as if the activities were performed by the municipality. A municipality is not required to accept an inspection, a plan or a plan review that does not meet the requirements of the state building code.

(10) The department or a municipality that accepts an inspection or plan review as required by this section by a person licensed under ORS 455.457 has no responsibility or liability for the activities of the licensee.

(11) In addition to the requirements of ORS 455.100 and 455.110, the director shall regulate building inspection programs that municipalities assume on or after January 1, 2002. Regulation under this subsection

shall include but not be limited to:

- (a) Creating building inspection program application and amendment requirements and procedures;
 - (b) Granting or denying applications for building inspection program authority and amendments;
 - (c) Requiring a municipality assuming a building inspection program to submit with the notice given under subsection (7) of this section an assumption plan that includes, at a minimum:
 - (A) A description of the intended availability of program services, including proposed service agreements for carrying out the program during at least the first two years;
 - (B) Demonstration of the ability and intent to provide building inspection program services for at least two years;
 - (C) An estimate of proposed permit revenue and program operating expenses;
 - (D) Proposed staffing levels; and
 - (E) Proposed service levels;
 - (d) Reviewing procedures and program operations of municipalities;
 - (e) Creating standards for efficient, effective, timely and acceptable building inspection programs;
 - (f) Creating standards for justifying increases in building inspection program fees adopted by a municipality;
 - (g) Creating standards for determining whether a county or department building inspection program is economically impaired in its ability to reasonably continue providing the program throughout a county, if another municipality is allowed to provide a building inspection program within the same county; and
 - (h) Enforcing the requirements of this section.
- (12) The department may assume administration of a building inspection program:
- (a) During the pendency of activities under ORS 455.770;
 - (b) If a municipality abandons or is no longer able to administer the building inspection program; and
 - (c) If a municipality fails to substantially comply with any provision of this section or of ORS 455.465, 455.467 and 455.469.
- (13) A municipality that abandons or otherwise ceases to administer a building inspection program that the municipality assumed under this section may not resume the administration or enforcement of the program

for at least two years. The municipality may resume the administration and enforcement of the abandoned program only on July 1 of an odd-numbered year. Prior to resuming the administration and enforcement of the program, the municipality must follow the notification procedure set forth in subsection (7) of this section. [2001 c.573 §1]

Note: 455.148 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.150 Selective municipal building inspection programs; building officials; rules; program duration, plan, failure and abandonment; limitation on program resumption. (1) A municipality that assumes the administration and enforcement of a building inspection program prior to January 1, 2002, may administer and enforce all or part of a building inspection program. A building inspection program:

(a) Is a program that includes:

(A) The state building code, as defined in ORS 455.010, except as set forth in paragraph (b) of this subsection;

(B) Manufactured structure installation requirements under ORS 446.155, 446.185 (1) and 446.230;

(C) Manufactured dwelling parks and mobile home parks under ORS chapter 446;

(D) Park and camp programs regulated under ORS 455.680;

(E) Tourist facilities regulated under ORS 446.310 to 446.350;

(F) Manufactured dwelling alterations regulated under ORS 446.155; and

(G) Manufactured structure accessory buildings and structures under ORS 446.253.

(b) Is not a program that includes:

(A) Boiler and pressure vessel programs under ORS 480.510 to 480.670;

(B) Elevator programs under ORS 460.005 to 460.175;

(C) Amusement ride regulation under ORS 460.310 to 460.370;

(D) Prefabricated structure regulation under ORS chapter 455;

(E) Manufacture of manufactured structures programs under ORS 446.155 to 446.285, including the administration and enforcement of federal manufactured dwelling construction and safety standards adopted under ORS 446.155 or the National Manufactured Housing Construction and Safety Standards Act of 1974;

(F) Licensing and certification, or the adoption of statewide codes and standards, under ORS chapter 446,

447, 455, 479 or 693; and

(G) Review of plans and specifications as provided in ORS 455.685.

(2) A municipality that administers a building inspection program as allowed under this section shall do so for periods of four years. The Department of Consumer and Business Services shall adopt rules to adjust time periods for administration of a building inspection program to allow for variations in the needs of the department and participants.

(3) When a municipality administers a building inspection program, the governing body of the municipality shall, unless other means are already provided, appoint a person to administer and enforce the building inspection program or parts thereof, who shall be known as the building official. A building official shall, in the municipality for which appointed, attend to all aspects of code enforcement, including the issuance of all building permits. Two or more municipalities may combine in the appointment of a single building official for the purpose of administering a building inspection program within their communities.

(4)(a) By January 1 of the year preceding the expiration of the four-year period described in subsection (2) of this section, the governing body of the municipality shall notify the Director of the Department of Consumer and Business Services and, if not a county, notify the county whether the municipality will continue to administer the building inspection program, or parts thereof, after expiration of the four-year period. If parts of a building inspection program are to be administered and enforced by a municipality, the parts shall correspond to a classification designated by the director as reasonable divisions of work.

(b) Notwithstanding the January 1 date set forth in paragraph (a) of this subsection, the director and the municipality and, if the municipality is not a county, the county may by agreement extend that date to no later than March 1.

(5) If a city does not notify the director, or notifies the director that it will not administer certain specialty codes or parts thereof under the building inspection program, the county or counties in which the city is located shall administer and enforce those codes or parts thereof within the city in the same manner as it administers and enforces them outside the city, except as provided by subsection (6) of this section.

(6) If a county does not notify the director, or notifies the director that it will not administer and enforce certain specialty codes or parts thereof under the building inspection program, the director shall contract with a municipality or other person or use such state employees or state agencies as are necessary to administer and enforce those codes or parts thereof, and permit or other fees arising therefrom shall be paid into the Consumer and Business Services Fund created by ORS 705.145 and credited to the account responsible for paying such expenses. A state employee may not be displaced as a result of using contract personnel.

(7) If a municipality administering a building inspection program under this section seeks to administer additional parts of a program, the municipality must comply with ORS 455.148, including the requirement that the municipality administer and enforce all aspects of the building inspection program. Thereafter, the municipality is subject to ORS 455.148 and ceases to be subject to this section.

(8) The department shall adopt rules to require the governing body of each municipality to submit a written

plan with the notice required under subsection (4) of this section. If the department is the governing body, the department shall have a plan on file. The plan shall specify how cooperation with the State Fire Marshal or a designee of the State Fire Marshal will be achieved and how a uniform fire code will be considered in the review process of the design and construction phases of buildings or structures.

(9) A municipality that administers a code for which persons or businesses are authorized under ORS 455.457 to perform activities shall recognize and accept those activities as if performed by the municipality. A municipality is not required to accept an inspection, a plan or a plan review that does not meet the requirements of the state building code.

(10) The department or a municipality that accepts an inspection or plan review as required by this section by a person licensed under ORS 455.457 has no responsibility or liability for the activities of the licensee.

(11) In addition to the requirements of ORS 455.100 and 455.110, the director shall regulate building inspection programs of municipalities assumed prior to January 1, 2002. Regulation under this subsection shall include but not be limited to:

- (a) Creating building inspection program application and amendment requirements and procedures;
- (b) Granting or denying applications for building inspection program authority and amendments;
- (c) Reviewing procedures and program operations of municipalities;
- (d) Creating standards for efficient, effective, timely and acceptable building inspection programs;
- (e) Creating standards for justifying increases in building inspection program fees adopted by a municipality;
- (f) Creating standards for determining whether a county or department building inspection program is economically impaired in its ability to reasonably continue providing the program or part of the program throughout a county, if another municipality is allowed to provide a building inspection program or part of a program within the same county; and
- (g) Enforcing the requirements of this section.

(12) The department may assume administration of a building inspection program:

- (a) During the pendency of activities under ORS 455.770;
- (b) If a municipality abandons any part of the building inspection program or is no longer able to administer the building inspection program; and
- (c) If a municipality fails to substantially comply with any provision of this section or of ORS 455.465, 455.467 and 455.469.

(13) If a municipality abandons or otherwise ceases to administer all or part of a building inspection pro-

gram described in this section, the municipality may not resume the administration and enforcement of the abandoned program or part of a program for at least two years. The municipality may resume the administration and enforcement of the abandoned program or part of a program only on July 1 of an odd-numbered year. To resume the administration and enforcement of the abandoned program or part of a program, the municipality must comply with ORS 455.148, including the requirement that the municipality administer and enforce all aspects of the building inspection program. Thereafter, the municipality is subject to ORS 455.148 and ceases to be subject to this section. [Formerly 456.800; 1991 c.308 §1; 1991 c.410 §1; 1993 c.463 §1; 1993 c.744 §89; 1995 c.553 §1; 1999 c.1045 §15; 2001 c.573 §3]

455.152 Objections to municipal assumption of building inspection program. (1) A municipality, 10 or more persons or an association with 10 or more members may file objections to a municipality's assumption of a building inspection program. The objections must be filed within 30 days after the Director of the Department of Consumer and Business Services gives notice of the application.

(2) The director, by rule, shall establish a process for reviewing objections filed under subsection (1) of this section. The review process shall include but need not be limited to:

- (a) Identification of economic impairment, if any, affecting the municipality;
 - (b) Demonstration by the municipality that all building inspection program permits and services will be available, including any service agreements for carrying out building program services;
 - (c) Review of all elements of the assumption plan submitted by the municipality;
 - (d) Demonstration by the municipality of the ability to provide building inspection program services for at least two years; and
 - (e) Review of proposed levels of service, including the municipality's ability to maintain or improve upon existing service levels.
- (3) Upon completion of a review under subsection (2) of this section, the director shall issue a final agency order approving or disapproving the application. [2001 c.573 §2]

Note: 455.152 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.153 Municipality authority to administer specialty code or building requirements; effect on jurisdiction of agencies. (1) A municipality may administer any specialty code or building requirements as though the code or requirements were ordinances of the municipality if the municipality is authorized to administer:

- (a) The specialty code under ORS chapter 447 or 455 or ORS 479.510 to 479.945 and 479.995.
- (b) Mobile or manufactured dwelling parks requirements adopted under ORS 446.062.
- (c) Temporary parks requirements adopted under ORS 446.105.

(d) Manufactured dwelling installation, support and tiedown requirements adopted under ORS 446.230.

(e) Park or camp requirements adopted under ORS 455.680.

(2) Administration of any specialty code or building requirement includes establishing a program intended to verify compliance with state licensing requirements and all other administrative and judicial aspects of enforcement of the code or requirement. Nothing in this section affects the concurrent jurisdiction of the Director of the Department of Consumer and Business Services, the Building Codes Structures Board, the State Plumbing Board, the Manufactured Structures and Parks Advisory Board, the Electrical and Elevator Board, the Residential Structures Board or the Mechanical Board to impose civil penalties for violations committed within municipalities. [1995 c.190 §2; 2001 c.411 §17; 2003 c.675 §§22,23]

Note: The amendments to 455.153 by section 23, chapter 675, Oregon Laws 2003, become operative July 1, 2004. See section 53, chapter 675, Oregon Laws 2003. The text that is operative until July 1, 2004, including amendments by section 22, chapter 675, Oregon Laws 2003, is set forth for the user's convenience.

455.153. (1) A municipality may administer any specialty code or building requirements as though the code or requirements were ordinances of the municipality if the municipality is authorized to administer:

(a) The specialty code under ORS chapter 447 or 455 or ORS 479.510 to 479.945 and 479.995.

(b) Mobile or manufactured dwelling parks requirements adopted under ORS 446.062.

(c) Temporary parks requirements adopted under ORS 446.105.

(d) Manufactured dwelling installation, support and tiedown requirements adopted under ORS 446.230.

(e) Park or camp requirements adopted under ORS 455.680.

(2) Administration of any specialty code or building requirement includes establishing a program intended to verify compliance with state licensing requirements and all other administrative and judicial aspects of enforcement of the code or requirement. Nothing in this section affects the concurrent jurisdiction of the Director of the Department of Consumer and Business Services, the Building Codes Structures Board, the State Plumbing Board, the Manufactured Structures and Parks Advisory Board, the Electrical and Elevator Board or the Residential Structures Board to impose civil penalties for violations committed within municipalities.

Note: 455.153 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.154 Alternative permit and inspection program. (1) Notwithstanding ORS 447.076, 455.627, 479.560 and 479.565, the Department of Consumer and Business Services, in consultation with the appropriate advisory boards, may establish special alternative permit and inspection programs for any installations or equipment regulated under the state building code. The alternative programs may include, but need not be limited to:

(a) Programs for work, other than life-safety work, performed in commercial, manufacturing, industrial and institutional facilities; and

(b) Inspection programs for in-plant construction.

(2) Every municipality that administers and enforces a building program under ORS 455.148 or 455.150 shall administer and enforce within the municipality the special alternative permit and inspection program adopted under this section. [2003 c.368 §2]

Note: 455.154 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.155 Statewide permit and inspection system for minor construction work. Notwithstanding ORS 447.076, 455.627, 479.560 and 479.565, the Department of Consumer and Business Services, in consultation with the appropriate advisory boards, may establish a statewide permitting and inspection system for minor construction work. Every municipality that administers and enforces a building program under ORS 455.148 or 455.150 must recognize and accept permits issued by the department under this section. [2003 c.368 §1]

Note: 455.155 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.156 Municipal investigation and enforcement of certain violations; notice of civil penalty; department to develop programs; defense for violation of building inspection program. (1) Notwithstanding any other provision of this chapter, ORS chapter 693 or ORS 447.010 to 447.156, 447.992, 479.510 to 479.945, 479.990 or 479.995, the Department of Consumer and Business Services shall carry out the provisions of this section.

(2)(a) A municipality that establishes a building inspection program under ORS 455.148 or a plumbing inspection program under ORS 455.150 covering installations under the plumbing specialty code or Low-Rise Residential Dwelling Code may act on behalf of the State Plumbing Board to investigate violations of and enforce ORS 447.030, 447.040, 693.030 and 693.040 and to issue notices of proposed assessment of civil penalties for those violations.

(b) A municipality that establishes a building inspection program under ORS 455.148 or an electrical inspection program under ORS 455.150 covering installations under the electrical specialty code or Low-Rise Residential Dwelling Code may act on behalf of the Electrical and Elevator Board to investigate violations of and enforce ORS 479.550 (1) and 479.620 and to issue notices of proposed assessment of civil penalties for those violations.

(c) A municipality that establishes a building inspection program under ORS 455.148 or 455.150 may investigate violations and enforce any provisions of the program administered by the municipality.

(3) The department shall establish:

(a) Procedures, forms and standards to carry out the provisions of this section, including but not limited to creating preprinted notices of proposed assessment of penalties that can be completed and served by municipal inspectors;

(b) A program to provide that all of the moneys recovered by the department, less collection expenses, be paid to the municipality that initiated the charges when a person charged with a violation as provided in subsection (2) of this section, other than a violation of a licensing requirement, agrees to the entry of an assessment of civil penalty or does not request a hearing, and an order assessing a penalty is entered against the person;

(c) A uniform citation process to be used in all jurisdictions of the state for violation of a licensing requirement. The process may include but need not be limited to all program areas administered by a municipality under ORS 455.148 or 455.150 and may provide a uniform method for checking license status and issuing citations for violation of a licensing requirement, and a consistent basis for enforcement of licensing requirements and treatment of violations, including fine amounts;

(d) A program to provide a division of the moneys recovered by the department with the municipality that initiated the charges, when a person charged with a violation as provided in subsection (2) of this section, other than a violation of a licensing requirement, requests a hearing and is assessed a penalty. One-half of the amounts recovered shall be paid to the municipality. The department shall keep an amount equal to its costs of processing the proceeding and collection expenses out of the remaining one-half and remit the balance, if any, to the municipality; and

(e) A program to require municipalities to investigate violations of the department's permit requirements for plumbing installations and services under the plumbing specialty code and for plumbing and electrical installations and services under the Low-Rise Residential Dwelling Code, and to:

(A) Initiate notices of proposed assessment of civil penalties as agents of the boards designated in subsection (2) of this section; and

(B) Pay the agents of the boards out of net civil penalty recoveries as if the recoveries were under paragraphs (b) and (d) of this subsection.

(4) The assessment of a civil penalty under this section by a municipality is subject to the amount limitations set forth in ORS 455.895.

(5)(a) It shall be a defense for any person charged with a penalty for violation of a building inspection program permit requirement covering plumbing installations under the plumbing specialty code, electrical permit requirements under ORS 479.550 or plumbing or electrical requirements under the Low-Rise Residential Dwelling Code that the person was previously penalized for the same occurrence.

(b) A building inspection program permit requirement is a requirement contained in a specialty code or municipal ordinance or rule requiring a permit before the particular installations covered by the codes are commenced.

(c) A penalty for the same occurrence includes a combination of two or more of the following that are based on the same plumbing or electrical installation:

(A)(i) An investigative or other fee added to an electrical permit fee when a permit was obtained after the electrical installation was started;

(ii) A civil penalty pursuant to ORS 479.995 for violation of ORS 479.550 for failure to obtain an electrical permit;

(iii) A civil penalty pursuant to ORS 455.895 for failure to obtain an electrical permit under the Low-Rise Residential Dwelling Code; or

(iv) A municipal penalty, other than an investigative fee, for making an electrical installation under the electrical specialty code or the Low-Rise Residential Dwelling Code without a permit; or

(B)(i) An investigative or other fee added to a plumbing permit fee when a permit was obtained after the plumbing installation was started;

(ii) A civil penalty pursuant to ORS 447.992 for failure to obtain a plumbing permit as required under the plumbing specialty code;

(iii) A civil penalty pursuant to ORS 455.895 for failure to obtain a plumbing permit under the Low-Rise Residential Dwelling Code; or

(iv) A municipal penalty, other than an investigative fee, for making a plumbing installation under the plumbing specialty code or the Low-Rise Residential Dwelling Code without a permit. [1995 c.553 §12; 2001 c.411 §18; 2001 c.573 §6a; 2003 c.675 §24]

Note: 455.156 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.160 Failure to provide timely inspections or plan reviews prohibited; demand; mandamus. (1) The municipality that is responsible for state building code administration and enforcement in a municipality pursuant to ORS 455.148 or 455.150, or the Department of Consumer and Business Services if the department is responsible for state building code administration and enforcement pursuant to ORS 455.148 or 455.150, may not engage in a pattern of conduct of failing to provide timely inspections or plan reviews without reasonable cause.

(2) Any person adversely affected by a pattern of conduct prohibited in subsection (1) of this section may serve the municipality or the department with a written demand to provide timely inspections or plan reviews.

(3) If a municipality, within five days of receipt of the demand, fails to provide timely inspections or plan reviews without reasonable cause, the person who served the demand may seek to compel the inspections or plan reviews through a writ of mandamus pursuant to ORS 34.105 to 34.240. If the court finds that the

municipality has engaged in a pattern of conduct of failing to provide timely inspections or plan reviews without reasonable cause, it may direct the municipality to provide timely inspections or plan reviews or to transfer the administration and enforcement of the code in question under procedures outlined in ORS 455.148 (5) and (6) or 455.150 (5) and (6).

(4) If the department, within five days of receipt of the demand, fails to provide timely inspections or plan reviews without reasonable cause, the person who served the demand may seek to compel the inspections or plan reviews through a writ of mandamus pursuant to ORS 34.105 to 34.240. If the court finds that the department has engaged in a pattern of conduct of failing to provide timely inspections or plan reviews without reasonable cause, it may direct the department to provide timely inspections or plan reviews or to transfer the administration and enforcement of the code in question to an appropriate municipality, if the municipality accepts the responsibility. A municipality may accept the transfer of the administration and enforcement of a code under this subsection without becoming subject to ORS 455.148 as a result of accepting the transfer. [Formerly 456.803; 1995 c.553 §7; 2001 c.573 §7]

455.170 Director may delegate certain duties; fees. (1) The Director of the Department of Consumer and Business Services shall delegate to any municipality which requests any of the authority, responsibilities and functions of the director relating to recreational parks, organizational camps and picnic parks as defined in ORS 446.310, including but not limited to plan review and inspections, if the director determines that the municipality is willing and able to carry out the rules of the director relating to such authority, responsibilities and functions. The director shall review and monitor each municipality's performance under this subsection. In accordance with ORS chapter 183, the director may suspend or rescind a delegation under this subsection. If it is determined that a municipality is not carrying out such rules or the delegation is suspended, the unexpended portion of the fees collected under subsection (2) of this section shall be available to the director for carrying out the authority, responsibility and functions under this section.

(2) The director shall determine, by administrative rule, the amount of fee which the municipality may charge and retain for any function undertaken pursuant to subsection (1) of this section. The amount of the fees shall not exceed the costs of administering the delegated functions. The municipality, quarterly, shall remit 15 percent of the collected fees to the director for monitoring municipal programs and for providing informational material necessary to maintain a uniform state program.

(3) In any action, suit or proceeding arising out of municipal administration of functions pursuant to subsection (1) of this section and involving the validity of a rule adopted by the director, the director shall be made a party to the action, suit or proceeding. [1987 c.414 §36a; 1991 c.227 §3]

Note: 455.170 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.180 Duty of city, county to issue building permit; restriction. (1) A city or county shall not refuse to issue or otherwise deny a building permit, development permit, plumbing permit, electrical permit or other similar permit to any person applying for the permit solely because the applicant has contracted for the performance of services by a contractor, subcontractor, supplier or other person who is subject to the business license tax of the city or county and has failed to pay the tax when due.

(2) As used in this section, “business license tax” has the meaning given that term in ORS 701.015. [1987 c.581 §6]

455.190 [1993 c.429 §2; 1995 c.553 §2a; 1995 c.714 §1; 1999 c.59 §127; 1999 c.508 §1; 2001 c.573 §8; repealed by 2003 c.368 §4]

(Financial Administration)

455.210 Fees; appeal of fees; surcharge; reduced fees. (1) Fees shall be prescribed as required by ORS 455.020 for plan review and permits issued by the Department of Consumer and Business Services for the construction, reconstruction, alteration and repair of prefabricated structures and of buildings and other structures and the installation of mechanical heating and ventilating devices and equipment. The fees may not exceed 130 percent of the fee schedule printed in the “Uniform Building Code,” 1979 Edition, and in the “Uniform Mechanical Code,” 1979 Edition, both published by the International Conference of Building Officials. Fees are not effective until approved by the Oregon Department of Administrative Services.

(2) Notwithstanding subsection (1) of this section, the maximum fee the Director of the Department of Consumer and Business Services may prescribe for a limited plan review for fire and life safety as required under ORS 479.155 shall be 40 percent of the prescribed permit fee.

(3)(a) A municipality may adopt by ordinance or regulation such fees as may be necessary and reasonable to provide for the administration and enforcement of any specialty code or codes for which the municipality has assumed responsibility under ORS 455.148 or 455.150.

(b) Ten or more persons or an association with 10 or more members may, within 30 days of the adoption of a fee under paragraph (a) of this subsection, appeal the fee to the Director of the Department of Consumer and Business Services. Within 60 days of the receipt of the appeal, the director shall, after notice to affected parties and hearing, review the municipality’s costs of administering and enforcing the specialty code or codes referred to in paragraph (a) of this subsection and approve the fee if the director feels it is necessary and reasonable. If the director does not approve the fee upon appeal, the fee is not effective. The appeal process provided in this paragraph does not apply to fees that have been submitted for a vote and approved by a majority of the electors voting on the question.

(c) Fees collected by a municipality under this subsection shall be used for the administration and enforcement of a building inspection program for which the municipality has assumed responsibility under ORS 455.148 or 455.150.

(d) For purposes of paragraph (b) of this subsection, in determining whether a fee is reasonable the director shall consider whether:

(A) The fee is the same amount as or closely approximates the amount of the fee charged by other municipalities of a similar size and geographic location for the same level of service;

(B) The fee is calculated with the same or a similar calculation method as the fee charged by other municipalities for the same service; and

(C) The fee is the same type as the fee charged by other municipalities for the same level of service.

(4) Notwithstanding any other provision of ORS 455.010 to 455.315 and 455.410 to 455.740, for the purpose of partially defraying state administrative costs, there is hereby imposed a surcharge in the amount of four percent of the total permit fees and hourly charges collected when an applicant chooses to pay an hourly rate instead of purchasing a permit. Municipalities shall collect and remit to the director as provided in ORS 455.220.

(5) Notwithstanding any other provisions of ORS 455.010 to 455.315 and 455.410 to 455.740, for the purpose of partially defraying state inspection costs, there is hereby imposed a surcharge in the amount of two percent of the total permit fees and hourly charges collected when an applicant chooses to pay an hourly rate instead of purchasing a permit. Municipalities shall collect and remit to the director as provided in ORS 455.220.

(6) Notwithstanding any other provision of ORS 455.010 to 455.315 and 455.410 to 455.740 and in addition to the surcharges imposed under subsections (4) and (5) of this section, for the purpose of partially defraying administration and operation costs of the Tri-County Building Industry Service Center, there is hereby imposed a surcharge not to exceed one percent of the total permit fees collected in Clackamas, Multnomah and Washington Counties. Municipalities shall collect and remit surcharges to the director as provided in ORS 455.220.

(7) The director shall adopt administrative rules to allow reduced fees for review of plans that have been previously reviewed. [Subsections (1) to (5) formerly 456.760; subsection (6) enacted as 1987 c.604 §6; 1997 c.856 §1; 1999 c.432 §1; 1999 c.1045 §24; 1999 c.1082 §9; 2001 c.573 §9; 2001 c.673 §1]

455.220 Surcharge on building permit fees; collection; deposit; use. (1) There is hereby imposed a surcharge in the amount of one percent of the total building permit fees and hourly charges collected when an applicant chooses to pay an hourly rate instead of purchasing a permit in connection with the construction of, or addition or alteration to, buildings and equipment or appurtenances. Up to one-half of the surcharge collected under this subsection may be used to fund the activities of the Tri-County Building Industry Service Center. The remainder of the surcharge collected under this subsection shall be used for the purpose of defraying the costs of training and other educational programs administered by the Department of Consumer and Business Services under this chapter.

(2) Permit surcharges shall be collected by each municipality and remitted to the Director of the Department of Consumer and Business Services. Each municipality having a population greater than 40,000 shall, on a monthly basis, prepare and submit to the director a report of permits and certificates issued in each class or category and fees and surcharges thereon collected during the month, together with other statistical information as required by the director concerning construction activity regulated by the parts of the state building code administered by the municipality. All other municipalities shall submit such a report on a quarterly basis. The report shall be in a form prescribed by the director and shall be submitted, together with a remittance covering the surcharges collected, by no later than the 15th day following the month or quarter in which the surcharges are collected.

(3)(a) Except as provided in subsection (4) of this section, all surcharges and other fees prescribed by ORS

455.010 to 455.240 and 455.410 to 455.740 and payable to the department, except fees received under ORS 455.148 (6) or 455.150 (6), shall be deposited by the director in the Consumer and Business Services Fund created by ORS 705.145.

(b) Notwithstanding subsection (1) of this section, the surcharge imposed under subsection (1) of this section for permits established under ORS 446.062 (3), 446.176, 446.405 (2), 446.430 (2) and 455.170 (2) shall be deposited in the Consumer and Business Services Fund established under ORS 705.145 and is continuously appropriated to the department for use as provided in ORS 446.423.

(4) The director shall use funds received under ORS 455.210 (6) to fund the activities of the Tri-County Building Industry Service Center.

(5) The director shall administer training and other education programs under this chapter through contracts with local educational institutions, professional associations or other training providers. [Formerly 456.860; 1993 c.744 §90; 1995 c.553 §5; 1999 c.1045 §25; 1999 c.1082 §§10,10a; 2001 c.573 §10; 2001 c.710 §9; 2003 c.675 §25]

455.230 Use of Consumer and Business Services Fund moneys. (1) Except as otherwise provided by law, all moneys appropriated or credited to the Consumer and Business Services Fund and received under this chapter, ORS 447.010 to 447.156, 447.992, 460.005 to 460.175, 460.310 to 460.370, 479.510 to 479.945, 479.995, 480.510 to 480.670 and ORS chapter 693 hereby are appropriated continuously for and shall be used by the director for the purpose of carrying out the duties and responsibilities imposed upon the department under this chapter, ORS 446.566 to 446.646, 446.666 to 446.756, 447.010 to 447.156, 447.992, 460.005 to 460.175, 460.310 to 460.370, 479.510 to 479.945, 479.995 and 480.510 to 480.670 and ORS chapter 693.

(2) Except as otherwise provided by law, all moneys appropriated or credited to the Consumer and Business Services Fund and received under ORS 446.003 to 446.200, 446.210, 446.225 to 446.285, 446.395 to 446.420, 446.566 to 446.646, 446.666 to 446.756 and 455.220 (1) hereby are appropriated continuously for and shall be used by the director for the purpose of carrying out the duties and responsibilities imposed upon the department under ORS 446.003 to 446.200, 446.210, 446.225 to 446.285, 446.395 to 446.420, 446.566 to 446.646 and 446.666 to 446.756, and education and training programs pertaining thereto. [Formerly 456.890; 1989 c.683 §9; 1993 c.744 §91; 2001 c.710 §10; 2003 c.655 §75a]

Note: 455.230 and 455.240 (formerly 456.890 and 456.910) were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.240 Revenues from sales of building codes publications; use. (1) All revenues derived from the sale of publications of the Department of Consumer and Business Services relating to building codes shall be deposited in the Consumer and Business Services Fund.

(2) Moneys credited to the Consumer and Business Services Fund under subsection (1) of this section are continuously appropriated to the department for use as provided in ORS 455.022. [Formerly 456.910; 1993 c.744 §92; 2001 c.710 §11]

Note: See note under 455.230.

(Exemptions Generally)

455.310 Single-family residence repair and maintenance exempt from codes; exemption itemized. (1) It is not the purpose of this chapter to require that permits be obtained or fees be paid for repairs and maintenance that do not violate the intent of the structural and fire and life safety specialty provisions of the State of Oregon Structural Specialty Code and the Low-Rise Residential Dwelling Code, adopted pursuant to ORS 455.020 and 455.610, ORS chapter 476, ORS 479.010 to 479.200 and 479.210 to 479.220, when such repair or maintenance is done on a single-family residence, or a private garage, carport or storage shed that is accessory to a single-family residence.

(2) Items designated by the Director of the Department of Consumer and Business Services, with the advice of the Residential Structures Board, shall be exempt from permits and fees required under this chapter. The director shall, pursuant to ORS chapter 183, develop and maintain an applicable list of such exempt items, which shall include, but not be limited to, concrete slabs, driveways, sidewalks, masonry repair, porches, patio covers, painting, interior wall, floor or ceiling covering, nonbearing partitions, shelving, cabinet work, gutters, downspouts, small accessory buildings, door and window replacements, replacement or repair of siding and replacement or repair of roofing. In making the list of exempt items, the director shall further define the items on the list contained in this subsection so that no item which adversely affects the structural integrity of the dwelling shall be on the list. [Formerly 456.753 and then 456.915; 1993 c.744 §93; 2003 c.675 §26]

455.315 Exemption of agricultural buildings and equine facilities. (1) Nothing in this chapter is intended to authorize the application of a state structural specialty code to any agricultural building or equine facility.

(2) As used in this section:

(a) “Agricultural building” means a structure located on a farm and used in the operation of the farm for:

(A) Storage, maintenance or repair of farm machinery and equipment;

(B) The raising, harvesting and selling of crops;

(C) The feeding, breeding, management and sale of, or the produce of, livestock, poultry, fur-bearing animals or honeybees;

(D) Dairying and the sale of dairy products; or

(E) Any other agricultural or horticultural use or animal husbandry, or any combination thereof, including the preparation and storage of the produce raised on the farm for human use and animal use and disposal by marketing or otherwise.

(b) “Agricultural building” does not include:

(A) A dwelling;

(B) A structure used for a purpose other than growing plants in which 10 or more persons are present at any one time;

(C) A structure regulated by the State Fire Marshal pursuant to ORS chapter 476;

(D) A structure used by the public; or

(E) A structure subject to sections 4001 to 4127, title 42, United States Code (the National Flood Insurance Act of 1968) as amended, and regulations promulgated thereunder.

(c) “Equine facility” means a building located on a farm and used by the farm owner or the public for:

(A) Stabling or training equines; or

(B) Riding lessons and training clinics.

(d) “Equine facility” does not include:

(A) A dwelling;

(B) A structure in which more than 10 persons are present at any one time;

(C) A structure regulated by the State Fire Marshal pursuant to ORS chapter 476; or

(D) A structure subject to sections 4001 to 4127, title 42, United States Code (the National Flood Insurance Act of 1968) as amended, and regulations promulgated thereunder.

(3) Notwithstanding the provisions of subsection (1) of this section, incorporated cities may regulate agricultural buildings and equine facilities within their boundaries pursuant to this chapter. [Formerly 456.758 and then 456.917; 1995 c.783 §1; 2003 c.74 §1]

455.320 Owner-built dwellings exempt from certain structural code provisions; recording of exemption. (1) As used in this section, unless the context requires otherwise:

(a) “Owner” means the owner of the title to real property or the contract purchaser of real property, of record as shown on the last available complete assessment roll which person has not taken advantage of the exemptions under subsection (2) of this section during the five years prior to applying for an exemption under this section.

(b) “Owner-built dwelling and outbuildings” means a single-family residence and adjacent auxiliary structures the structural components of which are constructed entirely by the owner who intends to occupy the structures or by that owner and friends and relatives of the owner assisting on an unpaid basis.

(2) Owner-built dwellings and outbuildings shall be exempt from any requirements of the structural code for ceiling heights, room sizes and the maintenance of specific temperature levels in those structures. The exemption shall apply to the new construction, renovation, remodeling or alteration of an owner-built dwelling

or outbuilding.

(3) A building permit issued for an owner-built dwelling or outbuilding shall note whether the owner-built dwelling or outbuilding complies with the requirements it is exempted from under subsection (2) of this section. If the dwelling or other structure does not comply with these requirements, the owner-builder shall file a copy of the building permit with the county clerk, who shall make the permit a part of the permanent deed record of the property. The owner shall provide the county clerk with a description of the property sufficient if it were contained in a mortgage of the property to give constructive notice of the mortgage under the law of this state.

(4) Noncompliance with subsection (3) of this section shall not affect, in any manner, any conveyance of interest in property subject to this section. [Formerly 456.920]

(Exemptions in Rural Areas)

455.325 Definitions for ORS 455.325 to 455.350. As used in ORS 455.325 to 455.350, unless the context requires otherwise:

(1) “Owner” means the owner of the title to real property or the contract purchaser of real property, of record as shown on the last available complete assessment roll.

(2) “Owner-built dwelling and outbuildings” means a single-family residence and adjacent auxiliary structures the components of which, that are exempted from the structural code under ORS 455.330, are constructed entirely by the owner who intends to occupy the structures or by that owner and friends and relatives of the owner assisting on an unpaid basis.

(3) “Rural area” means any land in a county which is located outside city limits and any recognized urban growth boundaries under that county’s comprehensive plan and which are described by the ordinance allowed under ORS 455.330. [Formerly 456.925]

455.330 Counties authorized to exempt owner-built dwellings in rural areas from structural code. Notwithstanding ORS 455.040, a county may by ordinance:

(1) Exempt owner-built dwellings and outbuildings in any rural area within that county from compliance with the structural code, except as provided in ORS 455.340; and

(2) Establish maximum value or size limitations for structures exempted from the structural code under subsection (1) of this section. [Formerly 456.930]

455.335 Rural areas to be mapped; building permit issuance for exempt dwellings limited. (1) A county exempting owner-built dwellings and outbuildings in rural areas from the structural code under ORS 455.330 shall designate those rural areas upon publicly available maps of readable scale showing individual property lines.

(2) A county ordinance under ORS 455.330 shall provide that no person shall receive a building permit in

that county for an exempt owner-built dwelling and outbuildings more than once every five years. [Formerly 456.935]

455.340 Code requirements to which exemption may not apply. No county shall exempt any building from requirements of the structural code relating to:

- (1) Fire egress, fire retardant, smoke alarms and smoke detectors;
- (2) Maximum bending stress allowed by the structural code for structural members; or
- (3) Insulation and energy conservation. [Formerly 456.940; 1999 c.307 §22]

455.345 Permit, fee, plan check and inspection provisions apply; notice of noncompliance to owner-builder; recording of notice; notice to purchasers. (1) Permit, fee, plan check and inspection requirements required by ORS 455.210 shall apply to owner-built dwellings and outbuildings exempted from the structural code under ORS 455.330.

(2) Building officials or specialty code inspectors licensed under ORS 455.457 inspecting structures exempted from the structural code under ORS 455.325 to 455.350, shall:

(a) Require the owner-builder to comply with those structural code requirements listed under ORS 455.340; and

(b) Inform the owner-builder in writing of those items which fail to comply with code standards and are exempt from code standards and make that information part of the permanent inspection record on the structures.

(3) An owner-builder of a structure exempted from the structural code under ORS 455.325 to 455.350 shall file a notice with the county clerk who shall make the notice a part of the permanent deed record of the property. That notice shall contain the information provided to the owner-builder under subsection (2)(b) of this section and a description of the property sufficient if it were contained in a mortgage of the property to give constructive notice of the mortgage under the law of this state.

(4) Any person, or that person's agent, selling an owner-built dwelling or outbuilding exempted from the structural code under ORS 455.325 to 455.350 shall notify each potential buyer of the existence, location and contents of the notice filed under subsection (3) of this section prior to any commitment to purchase the property. [Formerly 456.945; 1999 c.1045 §16; 1999 c.1082 §12]

455.350 Purchaser's remedies. (1) An individual who purchases an owner-built dwelling or outbuilding exempted from the structural code under ORS 455.325 to 455.350 from an owner who has not complied with ORS 455.345 (3) or (4) shall have a cause of action against the seller, within two years of the date of making the sale contract, for actual damages, if any.

(2) Noncompliance with ORS 455.345 (3) or (4) shall not affect, in any manner, any conveyance of interest in property exempted from the structural code under ORS 455.330. [Formerly 456.950]

(Mercury Thermostats)

455.355 Rules governing mercury thermostats. (1) The Director of the Department of Consumer and Business Services shall, by rule:

(a) Prohibit the installation of thermostats that contain mercury in commercial and residential buildings. The director may not, under rules developed pursuant to this paragraph, prohibit the installation of thermostats that contain mercury on industrial equipment used for safety controls.

(b) Establish a uniform notification and process for disposal and delivery of mercury thermostats by persons installing heating, ventilation or air conditioning systems. Persons installing heating, ventilation or air conditioning systems shall dispose of mercury thermostats according to the process established pursuant to this paragraph.

(2) As used in this section, “thermostat” means a device commonly used to sense and, through electrical communication with heating, cooling or ventilation equipment, control room temperature. [2001 c.924 §3]

Note: 455.355 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

Note: Section 4, chapter 924, Oregon Laws 2001, provides:

Sec. 4. The Director of the Department of Consumer and Business Services shall make any rules adopted:

(1) Under section 3 (1)(a) of this 2001 Act [455.355 (1)(a)] effective on and after January 1, 2006; and

(2) Under section 3 (1)(b) of this 2001 Act [455.355 (1)(b)] effective on and after January 1, 2003. [2001 c.924 §4]

(Farmworker Housing)

455.380 Department as final authority on farmworker housing; rules; fees. (1) Notwithstanding the provisions of ORS 455.148 and 455.150, the Department of Consumer and Business Services is the final authority in interpretation, execution and enforcement of state and municipal administration of building codes and rules with respect to construction of farmworker housing as defined in ORS 315.163.

(2) The department shall provide for a statewide uniform application and method of calculating permit fees for farmworker housing as defined in ORS 315.163.

(3) The department shall adopt rules to carry out the provisions of subsections (1) and (2) of this section. [1989 c.964 §§16,17; 2001 c.573 §11; 2001 c.613 §16; 2003 c.588 §17]

(Seismic Rehabilitation)

455.390 Definitions for ORS 455.020, 455.390, 455.395 and 455.400. As used in ORS 455.020, 455.390,

455.395 and 455.400:

- (1) “Seismic rehabilitation” means construction of structural improvements to a building that result in the increased capability of the building to resist earthquake forces and that are based on standards adopted by the State of Oregon or by local governments.
- (2) “Seismic rehabilitation agreement” means an agreement between a local government entity and a building owner pursuant to a seismic rehabilitation program for the phased completion of structural improvements to the owner’s building.
- (3) “Seismic rehabilitation data” means data contained in any documents, reports, studies, test results, papers, files or other records that result from a seismic rehabilitation survey or are contained in a seismic rehabilitation agreement. “Seismic rehabilitation data” does not include data or reports required by ORS 455.447 or rules adopted pursuant thereto.
- (4) “Seismic rehabilitation program” means any program enacted under an ordinance of a local government entity that provides for the seismic rehabilitation of buildings within the jurisdiction of the entity and authorizes the rehabilitation to be phased over a period of time not to exceed 10 years.
- (5) “Seismic rehabilitation survey” means any investigation, survey, audit or other process for generating data from which the local government entity and the building owner may determine and agree upon the deficiencies that need to be addressed in a plan for the seismic rehabilitation of the owner’s building. [1995 c.400 §1]

Note: 455.390 to 455.400 were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.395 Admissibility of data or agreements as evidence; immunity from certain causes of action. (1) No seismic rehabilitation data or seismic rehabilitation agreement is admissible in evidence to prove negligence or culpable acts or omissions in connection with injury, death or loss that occurs in an owner’s building as a result of the failure of the building to adequately withstand a seismic event. Such data or agreements are considered privileged and are excluded from evidence admitted in any legal action for the recovery of damages arising from the building’s failure due to seismic activity.

(2) A person may not maintain a cause of action against a building owner for injury, death or loss that occurs in the owner’s building as a result of a failure of the building to adequately withstand a seismic event, provided the owner was in substantial compliance with the terms and conditions of a seismic rehabilitation agreement on the date of the seismic event.

(3) The provisions of subsection (2) of this section shall apply only for the period during which the seismic rehabilitation agreement is in effect. [1995 c.400 §2]

Note: See note under 455.390.

455.400 Effect of seismic rehabilitation provisions on exclusive remedy. Nothing in ORS 455.020, 455.390 and 455.395 and this section shall be construed as expanding or limiting the exclusive means by which subject workers and their beneficiaries are compensated for injury, death or disease arising out of and in the course of employment as provided in ORS chapter 656. [1995 c.400 §6]

Note: See note under 455.390.

(Educational Building Seismic Safety)

Note: Sections 1 to 5, chapter 797, Oregon Laws 2001, provide:

Sec. 1. (1) Subject to the provision of funding by the State Department of Geology and Mineral Industries from gifts, grants and donations made available for carrying out this section, the State Board of Higher Education shall provide for seismic safety surveys of buildings that have a capacity of 250 or more persons and are routinely used for student activities by public institutions or departments under the control of the board. For purposes of this section, the Oregon Health and Science University is not under the control of the board.

(2) Subject to the provision of funding by the State Department of Geology and Mineral Industries from gifts, grants and donations made available for carrying out this section, the State Board of Education shall provide for seismic safety surveys of buildings that have a capacity of 250 or more persons and are routinely used for student activities by kindergarten through grade 12 public schools, community colleges and education service districts.

(3) The boards shall ensure that the seismic safety surveys under subsection (1) or (2) of this section are conducted in accordance with the Federal Emergency Management Agency publication, "Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook," FEMA-154, 1988 Edition.

(4) A seismic safety survey under subsection (1) or (2) of this section is not required for any building that has previously undergone a seismic safety survey or that has been constructed to the state building code standards that are in effect for the seismic zone classification at the site on the effective date of this 2001 Act [July 19, 2001].

(5) The boards may, by rule, establish standards to identify which buildings are routinely used for student activities. The standards must provide for the inclusion of buildings not used as classrooms, including but not limited to libraries, auditoriums and dining facilities. The boards shall adopt rules for determining building capacity.

(6) To the extent practicable, the boards shall ensure that the seismic safety surveys required under subsections (1) and (2) of this section are completed by January 1, 2007. [2001 c.797 §1]

Sec. 2. (1) The State Board of Higher Education and the State Board of Education shall send surveys conducted pursuant to section 1 (1) and (2) of this 2001 Act to the State Department of Geology and Mineral Industries. Notwithstanding section 1 (6) of this 2001 Act, if the department determines that a survey is not fully and properly completed, the department may refuse to accept the survey and may return the survey to the appropriate board for correction or completion.

(2) The department may accept seismic safety surveys for buildings that are exempt under section 1 (4) of this 2001 Act if the department determines that the surveys are fully and properly completed and are sufficiently similar to other surveys to be useful. The surveys accepted by the department under this subsection do not need to be surveys conducted by the boards.

(3) The department shall use seismic safety surveys accepted under subsections (1) and (2) of this section to make an initial evaluation of the seismic safety of each surveyed building.

(4) Subject to available funding and after consultation with the department, the State Board of Higher Education, local school district board, community college board or education service district board shall conduct such additional seismic safety evaluations of buildings as each of those boards considers necessary. The boards shall conduct the evaluations using the life safety standard set forth in the Federal Emergency Management Agency publication, "Handbook for the Seismic Evaluation of Buildings: A Prestandard," FEMA-310, 1998 Edition, or a stricter standard selected by the board that conducts the survey. [2001 c.797 §2]

Sec. 3. Subject to available funding, if a building evaluated under section 2 (4) of this 2001 Act is found by a board to pose an undue risk to life safety during a seismic event, the State Board of Higher Education, local school district board, community college board or education service district board, as appropriate, shall develop a plan for seismic rehabilitation of the building or for other actions to reduce the risk. For a board that is subject to ORS 291.224, the board's plan to rehabilitate or take other action to reduce the seismic risk of a building must be included in the capital construction program of the board. A board that is subject to ORS 291.224 shall rank the relative benefit of projects to reduce seismic risk in comparison with other life safety and code requirement projects. Subject to availability of funding, all seismic rehabilitations or other actions to reduce seismic risk must be completed before January 1, 2032. If the building is listed on a national or state register of historic places or properties or is designated as a landmark by local ordinance, the plan for seismic rehabilitation or other action shall be developed in a manner that gives consideration to preserving the character of the building. [2001 c.797 §3]

Sec. 4. (1) The State Board of Higher Education shall report to an appropriate committee of the Seventy-second Legislative Assembly and an appropriate committee of the Seventy-third Legislative Assembly regarding the progress the board has made toward completion of the surveys described in section 1 of this 2001 Act.

(2) The State Board of Education shall report to an appropriate committee of the Seventy-second Legislative Assembly and an appropriate committee of the Seventy-third Legislative Assembly regarding the progress the board has made toward completion of the surveys described in section 1 of this 2001 Act. [2001 c.797 §4]

Sec. 5. For purposes of sections 2 (4) and 3 of this 2001 Act, funding is available only if the Legislative Assembly provides the funding pursuant to a grant of bonding authority approved by the people at the first general election held throughout the state on or after January 1, 2002. [2001 c.797 §5]

(Acute Inpatient Care Facility, Fire Station and Police Station Seismic Safety)

Note: Sections 1, 2, 3, 4 and 7, chapter 798, Oregon Laws 2001, provide:

Sec. 1. (1) Subject to the provision of funding by the State Department of Geology and Mineral Industries from gifts, grants and donations made available for carrying out this section, the Department of Human Services shall provide for seismic safety surveys of hospital buildings that contain an acute inpatient care facility. As used in this subsection, “acute inpatient care facility” has the meaning given that term in ORS 442.470. As used in this subsection, “acute inpatient care facility” includes the Oregon Health and Science University.

(2) Subject to available funding from gifts, grants and donations made available for carrying out this section, the State Department of Geology and Mineral Industries shall provide for seismic safety surveys of fire stations.

(3) Subject to available funding from gifts, grants and donations made available for carrying out this section, the State Department of Geology and Mineral Industries shall provide for seismic safety surveys of police stations, sheriffs’ offices and similar facilities used by state, county, district and municipal law enforcement agencies.

(4) The Department of Human Services and the State Department of Geology and Mineral Industries shall ensure that seismic safety surveys conducted under subsections (1) to (3) of this section are conducted in accordance with the Federal Emergency Management Agency publication, “Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook,” FEMA-154, 1988 Edition.

(5) A seismic safety survey under subsections (1) to (3) of this section is not required for any building that has previously undergone a seismic safety survey or that has been constructed to the state building code standards in effect for the seismic zone classification at the site on July 19, 2001.

(6) The Department of Human Services or the State Department of Geology and Mineral Industries, as appropriate, shall ensure that seismic safety surveys required under subsections (1) to (3) of this section are completed by January 1, 2007. [2001 c.798 §1; 2003 c.14 §280]

Sec. 2. (1) The Department of Human Services shall send the seismic safety surveys conducted pursuant to section 1 (1), chapter 798, Oregon Laws 2001, to the State Department of Geology and Mineral Industries. Notwithstanding section 1 (6), chapter 798, Oregon Laws 2001, if the State Department of Geology and Mineral Industries determines that a survey is not fully and properly completed, the State Department of Geology and Mineral Industries may refuse to accept the survey and may return the survey to the Department of Human Services for correction or completion.

(2) The State Department of Geology and Mineral Industries may accept seismic safety surveys for buildings that are exempt under section 1 (5), chapter 798, Oregon Laws 2001, if the State Department of Geology and Mineral Industries determines that the surveys are fully and properly completed and are sufficiently similar to other surveys to be useful. The surveys accepted by the State Department of Geology and Mineral Industries under this subsection do not need to be surveys conducted by the Department of Human Services or the State Department of Geology and Mineral Industries.

(3) The State Department of Geology and Mineral Industries shall use seismic safety surveys accepted under subsections (1) and (2) of this section or conducted pursuant to section 1 (2) or (3), chapter 798, Oregon

Laws 2001, to make an initial evaluation of the seismic safety of each surveyed building.

(4) Subject to available funding and after consultation with the State Department of Geology and Mineral Industries, the acute inpatient care facility, fire department or fire district or law enforcement agency shall conduct such additional seismic safety evaluations of buildings as the facility, fire department or fire district or law enforcement agency considers to be necessary. The facility, fire department or fire district or law enforcement agency shall conduct the evaluations using the life safety standard set forth in the Federal Emergency Management Agency publication, “Handbook for the Seismic Evaluation of Buildings: A Pres-standard,” FEMA-310, 1998 Edition, or a stricter standard selected by the acute inpatient care facility, fire department or fire district or law enforcement agency that conducts the survey. [2001 c.798 §2; 2003 c.14 §281]

Sec. 3. Subject to available funding, if a building evaluated under section 2 (4) of this 2001 Act is found to pose an undue risk to life safety during a seismic event, the acute inpatient care facility, fire department, fire district or law enforcement agency using the building shall develop a plan for seismic rehabilitation of the building or for other actions to reduce the risk. Subject to available funding, all seismic rehabilitations or other actions to reduce the risk must be completed before January 1, 2022. If the building is listed on a national or state register of historic places or properties or is designated as a landmark by local ordinance, the plan for seismic rehabilitation or other actions shall be developed in a manner that gives consideration to preserving the character of the building. [2001 c.798 §3]

Sec. 4. (1) The Department of Human Services shall report to an appropriate committee of the Seventy-second Legislative Assembly and an appropriate committee of the Seventy-third Legislative Assembly regarding the progress the Department of Human Services has made toward completion of the seismic safety surveys described in section 1, chapter 798, Oregon Laws 2001.

(2) The State Department of Geology and Mineral Industries shall report to an appropriate committee of the Seventy-second Legislative Assembly and an appropriate committee of the Seventy-third Legislative Assembly regarding the progress the State Department of Geology and Mineral Industries has made toward completion of the seismic safety surveys described in section 1, chapter 798, Oregon Laws 2001. [2001 c.798 §4; 2003 c.14 §282]

Sec. 7. For purposes of sections 2 (4) and 3 of this 2001 Act, funding is available only if the Legislative Assembly provides the funding pursuant to a grant of bonding authority approved by the people at the first general election held throughout the state on or after January 1, 2002. [2001 c.798 §7]

(Miscellaneous Provisions)

455.410 Relocated buildings; substantial compliance required; permits. (1) Existing buildings or structures which are removed from their foundation and relocated to another site within this state shall be in substantial compliance as defined in subsections (2) and (3) of this section.

(2) “Substantial compliance” means compliance with local construction codes in effect as of the original permit date of the building or structure, or where there was no permitting required at the time of original construction, with basic health and safety standards, as described in the closest dated Uniform Housing

Code, as published by the International Conference of Building Officials as of the date of construction. Only the insulation, overhead and underneath the structure, shall be upgraded to the current insulation requirements of the state building code, or to the maximum extent possible subject to the design of the structure. Nothing in this statute shall be construed to mean that all heating, plumbing and electrical systems shall be replaced with systems meeting current standards for new construction, except that any life-threatening deficiencies in those systems shall be repaired, notwithstanding that the cost of rehabilitation may exceed 50 percent of the value of the structure before rehabilitation.

(3) All foundation and basement construction on the structure and any remodeling at the new location shall be constructed subject to all applicable local current building and safety codes, or where none exist, with the applicable standards as described in the Uniform Housing Code described in subsection (2) of this section.

(4) All moved houses shall be provided with either battery-operated or hard-wired smoke detection devices located in accordance with the provisions of the state building code.

(5) Nothing in this section is intended to permit any person to move a structure unless the person first consults the appropriate building inspection authority and obtains all required permits. [Formerly 456.756; 1989 c.1068 §1]

455.412 Review of state building code provisions regarding certain smoke alarms and smoke detectors; rules. (1) The Department of Consumer and Business Services shall amend the state building code as necessary for the purpose of reducing the frequency of false alarms from smoke alarms and smoke detectors. Rules adopted under this section shall be designed to address smoke alarms and smoke detectors in single family and multifamily dwellings, hotels and lodging houses and shall not apply to recreational vehicles, commercial vehicles, railroad equipment, aircraft, marine vessels and manufactured dwellings.

(2) As used in this section, “smoke alarm” and “smoke detector” shall have the meanings provided in ORS 479.250. [1999 c.307 §18]

455.415 Identification badges. (1) A person who is registered, licensed or certified by the State Plumbing Board or the Director of the Department of Consumer and Business Services pursuant to ORS 460.057, 460.059, 479.630, 479.910, 480.630, 693.060, 693.103 or 693.111 must wear and visibly display an identification badge indicating the person’s current license, registration or certification status while performing work for which the license, registration or certification is required. The authority that registers, licenses or certifies the person shall specify the size and content of the identification badge and may establish such other specifications as the authority deems appropriate.

(2) Subsection (1) of this section does not apply under any circumstances in which wearing or displaying the identification badge may create a danger to the public health or safety of the person or the public.

(3) Nothing in this section is intended to require the display of a contractor or business license, registration, certification or other authorization. [2003 c.675 §62]

Note: 455.415 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.420 Individual electric meters required in multifamily residential buildings; exceptions; standards. (1) Each individual dwelling unit in a multifamily residential building constructed after October 4, 1977, shall have installed a separate, individual electrical meter for each such dwelling unit except where a building inspector certified under ORS 455.715 to 455.740 determines that pursuant to standards adopted by the Director of the Department of Consumer and Business Services the installation of a single, central electrical meter for all the dwelling units in such building would facilitate an overall reduction in electrical consumption by such units.

(2) For the purpose of carrying out the provisions of subsection (1) of this section, the director, based on recommendations of the Residential Structures Board, shall adopt by rule standards for determining whether the installation of a single electrical meter for all dwelling units in a multifamily residential building facilitates an overall reduction in electrical consumption by such units. [Formerly 456.763; 1993 c.744 §94; 2003 c.675 §27]

455.422 New construction; recycling containers. (1) Each multifamily residential dwelling with more than 10 individual residential units that is constructed after October 4, 1997, should include adequate space and access for collection of containers for solid waste and recyclable materials.

(2) Each commercial building and each industrial and institutional building that is constructed after October 4, 1997, should include adequate space and access for collection of containers for solid waste and recyclable materials.

(3) As used in this section, “commercial,” “recyclable material” and “solid waste” have the meanings given in ORS 459.005. [Formerly 215.620]

Note: 455.422 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.425 Low-income elderly housing multiservice rooms required; standards; exceptions. (1) Any low-income housing for the elderly on which construction begins after January 1, 1978, and which is financed in whole or in part by federal or state funds shall contain a multiservice room adequate in size to seat all of the tenants.

(2) The Director of the Department of Consumer and Business Services shall adopt rules, in accordance with the applicable provisions of ORS chapter 183, establishing standards and specifications for low-income elderly housing multiservice rooms required under subsection (1) of this section. In development of standards and specifications, the director may take into account any standards or specifications established pursuant to any federal program under which the construction of such housing is funded.

(3) No housing described in subsection (1) of this section that contains 20 or fewer units is required to provide a multiservice room. [Formerly 456.772; 1991 c.67 §127]

455.430 Reciprocity for prefabricated structures. If the Director of the Department of Consumer and Business Services determines that the standards for prefabricated structures prescribed by statute, rule or regulation of another state are at least equal to the regulations prescribed under this chapter, and that such stan-

dards are actually enforced by such other state, the director may provide by regulation that prefabricated structures approved by such other state shall be deemed to have been approved by the director. [Formerly 456.880]

455.440 When site soil analysis required; filing of report and notice; duty of transferor of property; effect of failure to comply. (1) If a city, county or government agency requires a site soil analysis and site recommendation report as a condition of approval for issuance of a building permit for a residence for human habitation, and the analysis and report identify the presence of highly expansive soils, then prior to issuance of the building permit the city, county or government agency shall:

(a) Include a copy of that report with the construction plans filed with the building permit issuing agency; and

(b) Record, in the County Clerk Lien Record in the county in which the property is located, a notice containing:

(A) The legal description of the property; and

(B) An informational notice in substantially the following form:

This property has been identified as having highly expansive soils. This condition may create special maintenance requirements. Before signing or accepting any instrument transferring title, persons acquiring title should check with the appropriate planning or building department.

(2) No action may be maintained against a city, county or government agency for failing to meet the requirements of subsections (1) and (2) of this section.

(3) If a report described in subsections (1) and (2) of this section identifies the presence of highly expansive soils, the first transferor shall supply to the first transferee written suggestions for care and maintenance of the residence to address problems associated with highly expansive soils.

(4) If the first transferor violates the provisions of subsection (3) of this section, the first transferee shall have a cause of action to recover damages of \$750 from the first transferor. The court may award reasonable attorney fees to the prevailing party in an action under this section. [1989 c.1026 §§1,2,3; 1995 c.618 §71]

Note: 455.440 and 455.445 were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.445 Indoor air quality standards for public areas and office workplaces. (1) After considering the recommendations of the Indoor Air Pollution Task Force, and as expeditiously as possible, the Director of the Department of Consumer and Business Services shall adopt ventilation standards for public areas and office workplaces that are at least equivalent to the most recent, nationally recognized ventilation standards gener-

ally accepted and in use throughout the United States.

(2) The director shall adopt building codes and building product standards to protect the indoor air quality of private residences but only as necessary to address serious or unique indoor air quality problems in Oregon when federal statutes, regulations and national codes fail to address building product and building code related indoor air quality problems.

(3) As expeditiously as possible, the director shall consider for adoption the ventilation standards recommended by the Indoor Air Pollution Task Force. [1989 c.1070 §10]

Note: See note under 455.440.

455.446 Construction of certain facilities and structures in tsunami inundation zone prohibited; establishment of zone; rules; exceptions. (1)(a) New essential facilities described in ORS 455.447 (1)(a)(A), (B) and (G) and new special occupancy structures described in ORS 455.447 (1)(e)(B), (C) and (E) shall not be constructed in the tsunami inundation zone established under paragraph (c) of this subsection. The provisions of this paragraph apply to buildings with a capacity greater than 50 individuals for every public, private or parochial school through secondary level and child care centers.

(b) The State Department of Geology and Mineral Industries shall establish the parameters of the area of expected tsunami inundation based on scientific evidence that may include geologic field data and tsunami modeling.

(c) The governing board of the State Department of Geology and Mineral Industries, by rule, shall determine the tsunami inundation zone based on the parameters established by the department. The board shall adopt the zone as determined by the department under paragraph (b) of this subsection except as modified by the board under paragraph (d) of this subsection.

(d) The board may grant exceptions to restrictions in the tsunami inundation zone established under paragraph (c) of this subsection after public hearing and a determination by the board that the applicant has demonstrated that the safety of building occupants will be ensured to the maximum reasonable extent:

(A) By addressing the relative risks within the zone.

(B) By balancing competing interests and other considerations.

(C) By considering mitigative construction strategies.

(D) By considering mitigative terrain modification.

(e) The provisions of paragraph (a) of this subsection do not apply:

(A) To fire or police stations where there is a need for strategic location; and

(B) To public schools if there is a need for the school to be within the boundaries of a school district and this

cannot otherwise be accomplished.

(f) All materials supporting an application for an exception to the tsunami inundation zone are public records under ORS 192.005 to 192.170 and shall be retained in the library of the department for periods of time determined by its governing board.

(g) The applicant for an exception to the tsunami inundation zone established under paragraph (c) of this subsection shall pay any costs for department review of the application and the costs, if any, of the approval process.

(2) The definitions in ORS 455.447 apply to this section.

(3) The provisions of this section do not apply to water-dependent and water-related facilities, including but not limited to docks, wharves, piers and marinas.

(4) Decisions made under this section are not land use decisions under ORS 197.015 (10). [1995 c.617 §2]

Note: 455.446 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.447 Regulation of certain structures vulnerable to earthquakes and tsunamis; rules. (1) As used in this section, unless the context requires otherwise:

(a) “Essential facility” means:

(A) Hospitals and other medical facilities having surgery and emergency treatment areas;

(B) Fire and police stations;

(C) Tanks or other structures containing, housing or supporting water or fire-suppression materials or equipment required for the protection of essential or hazardous facilities or special occupancy structures;

(D) Emergency vehicle shelters and garages;

(E) Structures and equipment in emergency-preparedness centers;

(F) Standby power generating equipment for essential facilities; and

(G) Structures and equipment in government communication centers and other facilities required for emergency response.

(b) “Hazardous facility” means structures housing, supporting or containing sufficient quantities of toxic or explosive substances to be of danger to the safety of the public if released.

(c) “Major structure” means a building over six stories in height with an aggregate floor area of 60,000 square feet or more, every building over 10 stories in height and parking structures as determined by Department of Consumer and Business Services rule.

(d) “Seismic hazard” means a geologic condition that is a potential danger to life and property that includes but is not limited to earthquake, landslide, liquefaction, tsunami inundation, fault displacement, and subsidence.

(e) “Special occupancy structure” means:

(A) Covered structures whose primary occupancy is public assembly with a capacity greater than 300 persons;

(B) Buildings with a capacity greater than 250 individuals for every public, private or parochial school through secondary level or child care centers;

(C) Buildings for colleges or adult education schools with a capacity greater than 500 persons;

(D) Medical facilities with 50 or more resident, incapacitated patients not included in subparagraphs (A) to (C) of this paragraph;

(E) Jails and detention facilities; and

(F) All structures and occupancies with a capacity greater than 5,000 persons.

(2) The Department of Consumer and Business Services shall consult with the Seismic Safety Policy Advisory Commission and the State Department of Geology and Mineral Industries prior to adopting rules. Thereafter, the Department of Consumer and Business Services may adopt rules as set forth in ORS 183.325 to 183.410 to amend the state building code to:

(a) Require new building sites for essential facilities, hazardous facilities, major structures and special occupancy structures to be evaluated on a site specific basis for vulnerability to seismic geologic hazards.

(b) Require a program for the installation of strong motions accelerographs in or near selected major buildings.

(c) Provide for the review of geologic and engineering reports for seismic design of new buildings of large size, high occupancy or critical use.

(d) Provide for filing of noninterpretive seismic data from site evaluation in a manner accessible to the public.

(3) For the purpose of defraying the cost of applying the regulations in subsection (2) of this section, there is hereby imposed a surcharge in the amount of one percent of the total fees collected under the structural and mechanical specialty codes for essential facilities, hazardous facilities, major structures and special oc-

cupancy structures, which fees shall be retained by the jurisdiction enforcing the particular specialty code as provided in ORS 455.150 or enforcing a building inspection program under ORS 455.148.

(4) Developers of new essential facilities, hazardous facilities and major structures described in subsection (1)(a)(E), (b) and (c) of this section and new special occupancy structures described in subsection (1)(e)(A), (D) and (F) of this section that are located in an identified tsunami inundation zone shall consult with the State Department of Geology and Mineral Industries for assistance in determining the impact of possible tsunamis on the proposed development and for assistance in preparing methods to mitigate risk at the site of a potential tsunami. Consultation shall take place prior to submittal of design plans to the building official for final approval. [1991 c.956 §12; 1995 c.79 §229; 1995 c.617 §1; 2001 c.573 §12]

Note: 455.447 was added to and made a part of 455.010 to 455.740 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.448 Entry and inspection of earthquake-damaged structures; warrant enforcement; order to vacate; rehabilitation of historic structures. (1) For the purposes of enforcement of this chapter the building inspector or any person appointed by the Department of Consumer and Business Services, after showing official identification and, if necessary, a warrant issued to the building owner or agent of the owner under subsection (2) of this section, may:

(a) Enter, at reasonable times, any property that is known to be damaged, or for which there are reasonable grounds to believe that the structure has been damaged, as a result of an earthquake.

(b) Inspect, at reasonable times, within reasonable limits and in a reasonable manner property that is known to be damaged, or for which there are reasonable grounds to believe that the structure has been damaged, as a result of an earthquake.

(2) If entry is refused, the building inspector or any duly appointed representative of the Department of Consumer and Business Services may appear before any magistrate empowered to issue warrants and request such magistrate to issue an inspection warrant, directing it to any peace officer, as defined in ORS 161.015 to enter the described property to remove any person or obstacle and assist the building inspector or representative of the department inspecting the property in any way necessary to complete the inspection. [Formerly 401.537]

Note: 455.448 and 455.449 were added to and made a part of 455.010 to 455.740 by legislative action but were not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.449 Unsafe condition resulting from earthquake damage; abatement of nuisance; rules. (1) All buildings or portions thereof which are determined after inspection by a building inspector or a representative of the Department of Consumer and Business Services to be in unsafe condition as a result of earthquake damage may be declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal in accordance with the procedure specified by rules adopted by the agency.

(2) Any building declared to be in unsafe condition under subsection (1) of this section shall be made to comply with one of the following:

- (a) The building shall be repaired in accordance with the current building code or other current code applicable to the type of substandard conditions requiring repair;
 - (b) The building shall be demolished if the owner of the building consents; or
 - (c) The building may be vacated, secured and maintained against entry if the building does not constitute an immediate danger to the life, limb, property or safety of the public.
- (3) If the building or structure is in such condition as to make it immediately dangerous to the life, limb, property or safety of the public or its occupants, the Department of Consumer and Business Services or representative of the department shall order it to be vacated.
- (4) If the structure, in whole or in part, is listed on or is eligible for listing on the National Register of Historic Places, established and maintained under the National Historic Preservation Act of 1966 (P.L. 89-665), or if the National Register of Historic Places ceases accepting nominations, is approved for listing on an Oregon register of historic places, or is a locally designated landmark protected by ordinance against demolition without due process, alternative compliance with the provisions of subsection (2)(a) and (c) of this section shall be allowed if the repaired or rehabilitated building is no more hazardous than it would be if repaired or rehabilitated in accordance with (2)(a) of this section. [Formerly 401.539]

Note: See note under 455.448.

(Prohibited Acts)

455.450 Prohibited acts. A person shall not:

- (1) Violate or procure, aid or abet in the violation of any final order concerning the application of a provision of the state building code in a particular case made by the Director of the Department of Consumer and Business Services, an advisory board, a state administrative officer or any local appeals board, building official or inspector.
- (2) Engage in or procure, aid or abet any other person to engage in any conduct or activity for which a permit, certificate, label or other formal authorization is required by any specialty code or other regulation promulgated pursuant to this chapter without first having obtained such permit, certificate, label or other formal authorization. [Formerly 456.885 (1)]

(Specialty Code Inspection and Building Plan Review)

455.455 Building inspection and plan review; license required; exception. (1)(a) A person may not employ an individual to perform specialty code inspections in any specialty area unless the individual has a license issued in that specialty area under ORS 455.457.

(b) A person may not engage in specialty code inspections without having a license issued under ORS 455.457 in the specialty area for which the inspection is provided.

(c) A person may not employ an individual to perform plan reviews unless the individual has a license is-

sued under ORS 455.457.

(d) A person may not engage in reviewing plans without having a license issued under ORS 455.457.

(2) The requirements in subsection (1) of this section do not apply to a person who is an employee of the state or of a municipality. [1999 c.1045 §2]

Note: 455.455 to 455.465, 455.467 and 455.469 to 455.477 were added to and made a part of ORS chapter 455 by legislative action but were not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.457 Licensing specialty code inspectors and plan reviewers; rules; contents. In accordance with the applicable provisions of ORS chapter 183, the Director of the Department of Consumer and Business Services by rule shall establish a licensing system for persons that perform specialty code inspections or plan reviews and for businesses that employ persons that perform specialty code inspections or plan reviews. Such a system shall include but not be limited to the following provisions:

(1) Prescribing the form and content of and the times and procedures for submitting an application for the issuance or renewal of a license.

(2) Prescribing the terms of the licenses and the fees for the original issue and renewal in amounts that do not exceed the cost to the Department of Consumer and Business Services of administering the licensing system.

(3) Prescribing the requirements for and the manner of testing the competency of applicants for the protection of the public health and safety.

(4) Prescribing the amounts and conditions of bonds and liability insurance.

(5) Setting forth those actions or circumstances that constitute failure to achieve or maintain licensing competency or that otherwise constitute a danger to the public health or safety and for which the director may refuse to issue or renew or may suspend or revoke a license or impose a civil penalty. [1999 c.1045 §3]

Note: See note under 455.455.

455.459 Specialty code inspection and plan review; conflict of interest. (1) A person shall not inspect or review any project or installation in which the person, employer of the person or relative of the person has any financial interest or business affiliation. A person designated under ORS 455.465 (1)(a) may not perform both the inspection and plan review for the same project or installation. A municipality or the state shall perform either the inspection, the plan review, or both.

(2) For purposes of this section, “relative” has the meaning given that term in ORS 95.200. [1999 c.1045 §4]

Note: See note under 455.455.

455.461 Specialty code inspectors and plan reviewers; quality control; rules. (1) The Director of the Depart-

ment of Consumer and Business Services, by rule, shall develop quality control procedures for the activities of specialty code inspectors, plan reviewers and businesses that employ specialty code inspectors and plan reviewers licensed under ORS 455.457. These procedures shall include but are not limited to random sampling of the work of such persons and businesses.

(2) The Director of the Department of Consumer and Business Services shall appoint by rule a chief inspector for each specialty code under this chapter. [1999 c.1045 §7]

Note: See note under 455.455.

455.463 Specialty code inspection and plan review; department enforcement authority; investigation. (1) In addition to any other authority and power granted to the Director of the Department of Consumer and Business Services under this chapter and ORS chapters 447 and 479, with respect to specialty code inspectors, plan reviewers and businesses that employ specialty code inspectors and plan reviewers licensed under ORS 455.457, if the director has reason to believe that there is a failure to enforce or there is a violation of any provision of this chapter or ORS chapters 447 and 479 or any rule adopted thereunder, the director may:

(a) Examine building code activities of specialty code inspectors, plan reviewers and businesses that employ specialty code inspectors and plan reviewers;

(b) Take sworn testimony; and

(c) With the authorization of the office of the Attorney General, subpoena persons and records to obtain testimony on official actions that were taken or omitted or to obtain documents otherwise subject to public inspection under ORS 192.410 to 192.505.

(2) The investigative authority authorized by subsection (1) of this section covers violations or omissions by specialty code inspectors, plan reviewers and businesses that employ specialty code inspectors and plan reviewers licensed under ORS 455.457 related to enforcement of codes or administrative rules, licensing of inspectors or financial transactions. [1999 c.1045 §8]

Note: See note under 455.455.

455.465 Department and municipalities to designate persons licensed to conduct specialty code inspection and plan review; fees; exception. (1) In administering a building inspection program, the Department of Consumer and Business Services or a municipality shall:

(a) Designate at least three persons licensed under ORS 455.457 from whom the department or municipality will accept plan reviews; or

(b) Contract with a person licensed under ORS 455.457 and may include as a term of the contract a process for collection of plan review fees.

(2) For plan reviews conducted under subsection (1) of this section, the department or a municipality may:

- (a) Establish the process for collecting fees from a person licensed under ORS 455.457; and
 - (b) Collect an administrative fee as provided in ORS 455.210.
- (3) The provisions of ORS 279.005 to 279.111 do not apply to a personal services contract between the department or a municipality and a person licensed under ORS 455.457. [1999 c.1045 §20]

Note: The amendments to 455.465 by section 284, chapter 794, Oregon Laws 2003, become operative March 1, 2005, and apply only to public contracts first advertised, but if not advertised then entered into, on or after March 1, 2005. See sections 336 and 337, chapter 794, Oregon Laws 2003. The text that is operative on and after March 1, 2005, is set forth for the user's convenience.

455.465. (1) In administering a building inspection program, the Department of Consumer and Business Services or a municipality shall:

- (a) Designate at least three persons licensed under ORS 455.457 from whom the department or municipality will accept plan reviews; or
- (b) Contract with a person licensed under ORS 455.457 and may include as a term of the contract a process for collection of plan review fees.

(2) For plan reviews conducted under subsection (1) of this section, the department or a municipality may:

- (a) Establish the process for collecting fees from a person licensed under ORS 455.457; and
 - (b) Collect an administrative fee as provided in ORS 455.210.
- (3) The provisions of ORS 279C.100 to 279C.125 and 279C.300 to 279C.470 and ORS chapters 279A and 279B, except ORS 279B.235, do not apply to a personal services contract between the department or a municipality and a person licensed under ORS 455.457.

Note: See note under 455.455.

455.466 Rapid approval assessment for essential projects. (1) As used in this section, "essential project" means a:

- (a) State owned or operated development;
- (b) Development of industries in the traded sector as defined in ORS 285A.010 for structures more than 100,000 square feet in size;
- (c) Project in an industrial site listed by the Economic and Community Development Department as ready for development and for which the project construction totals more than 100,000 square feet in size; or
- (d) Development designated by the Director of the Economic and Community Development Department as essential to the economic well-being of the state.

(2) Notwithstanding any municipal building inspection program under ORS 455.148 or 455.150, an applicant for a building permit for an essential project or the municipality having jurisdiction over an essential project may request in writing that the Department of Consumer and Business Services administer and enforce the state building code for the project.

(3) Upon receipt by the Department of Consumer and Business Services of a written request under this section, the Director of the Department of Consumer and Business Services shall assemble a rapid approval assessment team consisting of such department employees and other persons as the director considers appropriate. The purpose of the rapid approval assessment team shall be to provide assistance and advice to the director.

(4) The Director of the Department of Consumer and Business Services, in consultation with the rapid approval assessment team, shall determine whether adequate resources are available to ensure that an essential project may proceed in a timely, consistent and flexible manner. In determining the availability of resources under this subsection, the director and the rapid approval assessment team shall give first consideration to the availability of municipal resources. If the director determines that municipal resources may be inadequate for the essential project, the director may consider whether state resources or a combination of municipal and state resources is available to ensure that the essential project may proceed in a timely, consistent and flexible manner. A determination by the director under this subsection is not appealable.

(5) The Director of the Department of Consumer and Business Services may take all actions that the director considers reasonable and necessary to ensure that an essential project may proceed in a timely, consistent and flexible manner, including but not limited to:

- (a) Establishing policies, procedures and rules as necessary;
- (b) Working directly with local municipalities and other state agencies to resolve conflicts and disputes related to the state building code;
- (c) Encouraging cooperation between state and municipal building officials and inspectors;
- (d) Developing agreements;
- (e) Developing site-specific dispute resolution and appeals related to state building code requirements;
- (f) Expediting, coordinating or providing building inspection program plan review, permitting and inspection services;
- (g) Assisting a municipality or seeking assistance from a municipality; and
- (h) Establishing fees to cover the cost of provided services. [2003 c.369 §2]

Note: 455.466 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.467 Timelines for approval or disapproval of certain specialty code building plans; exceptions; phased permit systems; failure to adhere to timelines. (1) Except as provided in subsection (2) of this section, for specialty code plan reviews of simple low-rise residential dwellings, the Department of Consumer and Business Services or a municipality that administers a building inspection program under ORS 455.148 or 455.150 shall approve or disapprove the specialty code building plan:

(a) For a jurisdiction with a population that is less than 300,000, within 10 business days of receiving a complete application, or shall implement the process described in ORS 455.465.

(b) For a jurisdiction with a population that is 300,000 or more, within 15 business days of receiving a complete application, or shall implement the process described in ORS 455.465.

(2) The 10-day and 15-day requirements in subsection (1) of this section do not apply if:

(a) The plan requires approval by federal, state or local agencies outside the jurisdiction of the issuing agency;

(b) The plan is for a complex structure that requires additional review as determined by the department or municipality; or

(c) Based on conditions that exist in the affected municipality, the Director of the Department of Consumer and Business Services authorizes a different plan review schedule as described in a building inspection program submitted under ORS 455.148 or 455.150.

(3) For specialty code plan reviews of commercial structures, a municipality shall include in its building inspection program submitted under ORS 455.148 or 455.150 a process for plan review services. The municipality shall include in its program detailed reasons supporting the proposed plan review process. The plan review services provided by the municipality shall:

(a) Allow an applicant to defer the submittal of plans for one or more construction phases for a commercial construction project in accordance with the state building code; and

(b) Allow an applicant to receive permits for each of the phases of a commercial construction project as described in the state building code when the plan review for that phase is approved.

(4) For a phased commercial construction project as described in subsection (3) of this section, the municipality shall inform the applicant of the detailed plans necessary for each phase of the project and the estimated time for initial and phased review of the building plans for conformance with the state building code.

(5) An applicant submitting plans under subsection (3) of this section is responsible for ensuring that the project meets all specialty code requirements and that the project does not proceed beyond the level of approval authorized by the building official.

(6) A municipality that repeatedly fails to meet the plan review period described in this section or otherwise authorized in its building inspection program submitted under ORS 455.148 or 455.150 shall be considered

to be engaging in a pattern of conduct of failing to provide timely plan reviews under ORS 455.160. [1999 c.1045 §21; 2001 c.384 §1; 2001 c.573 §13; 2003 c.675 §28]

Note: See note under 455.455.

455.468 Electronic submission of application materials. A transaction conducted through a state or local system or network that provides electronic access to building codes information and services is exempt from any requirement under ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945 and 480.510 to 480.670 and ORS chapters 447, 455, 460 and 693, or rules adopted thereunder, requiring a signature or the submission of handwritten materials. [2003 c.336 §3]

Note: 455.468 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

Note: Sections 2 and 4, chapter 336, Oregon Laws 2003, provide:

Sec. 2. (1) The Department of Consumer and Business Services, in cooperation with local jurisdictions, may develop and implement a pilot program that provides electronic access to building codes information and services in Clackamas, Washington and Multnomah Counties. The building codes information and services available through the pilot program may include, but need not be limited to:

- (a) Licensing, permit, inspection and other relevant information;
- (b) Provision for the electronic submission of permit applications;
- (c) The electronic issuance of minor label or other appropriate permits;
- (d) Access to other permit and inspection processes; and
- (e) Scheduling of inspections, tracking of corrections and granting of approvals.

(2) The department shall report to the Seventy-third Legislative Assembly on or before January 31, 2005, regarding any implementation and administration of a pilot program under this section. [2003 c.336 §2]

Sec. 4. Sections 1 and 2 of this 2003 Act are repealed on January 2, 2006. [2003 c.336 §4]

455.469 Municipal building inspection program to include certain policies and ordinances. A municipality shall add to and make a part of its building inspection program under ORS 455.148 or 455.150 the policies and ordinances adopted by the municipality to implement ORS 455.465 and 455.467. [1999 c.1045 §22; 2001 c.573 §14]

Note: See note under 455.455.

455.471 Specialty code inspection and plan review fee authority; disposition of certain fee amounts. (1) Fee

amounts shall not be established by the Director of the Department of Consumer and Business Services or any municipality for fees charged by persons licensed under ORS 455.457.

(2) Fees charged by a person licensed under ORS 455.457 shall include a surcharge equal to the percentage amounts established for municipalities under ORS 455.210 (4) and (5) and 455.220 (1). The surcharges shall be remitted quarterly to the department to partially defray the department's administration, inspection and training costs incurred pursuant to ORS 455.455, 455.457, 455.461 and 455.463. Funds received by the department under this section shall be deposited in the Consumer and Business Services Fund created by ORS 705.145. [1999 c.1045 §6]

Note: See note under 455.455.

455.473 Disposition of certain fees received by department. All moneys received by the Department of Consumer and Business Services pursuant to ORS 455.457 and 455.471 shall be paid into the State Treasury and credited to the appropriate specialty code account under this chapter or ORS 479.510 to 479.945. All moneys deposited in the accounts under this section are continuously appropriated to the department to carry out the provisions of ORS 455.455 to 455.463, 455.471, 455.473, 455.477 and 455.897 and section 10, chapter 1045, Oregon Laws 1999. [1999 c.1045 §5; 2003 c.14 §283]

Note: See note under 455.455.

455.475 Appeal of decision of building official. A person aggrieved by a decision made by a building official under authority established pursuant to ORS 455.148, 455.150 or 455.467 may appeal the decision. The following apply to an appeal under this section:

(1) An appeal under this section shall be made first to the appropriate specialty code chief inspector of the Department of Consumer and Business Services. The decision of the department chief inspector may be appealed to the appropriate advisory board. The decision of the advisory board may only be appealed to the Director of the Department of Consumer and Business Services if codes in addition to the applicable specialty code are at issue.

(2) If the appropriate advisory board determines that a decision by the department chief inspector is a major code interpretation, then the inspector shall distribute the decision in writing to all applicable specialty code public and private inspection authorities in the state. The decision shall be distributed within 60 days after the board's determination, and there shall be no charge for the distribution of the decision. As used in this subsection, a "major code interpretation" means a code interpretation decision that affects or may affect more than one job site or more than one inspection jurisdiction.

(3) If an appeal is made under this section, an inspection authority shall extend the plan review deadline by the number of days it takes for a final decision to be issued for the appeal. [1999 c.1045 §23; 2001 c.573 §15]

Note: See note under 455.455.

455.477 Requirement for suit filed by licensed specialty code inspector or plan reviewer. A person carrying

on, conducting or transacting specialty code inspections or plan reviews or a business employing specialty code inspectors or plan reviewers may not maintain any suit or action relating to specialty code inspections or plan reviews in any of the courts of this state without alleging and proving that the person or business was licensed under ORS 455.457 at the time of performing such work. [1999 c.1045 §11]

Note: See note under 455.455.

455.479 Application to specialty inspections identified by department. Nothing in ORS 455.455 to 455.477 and 455.897 and section 10, chapter 1045, Oregon Laws 1999, applies to special inspections as described in each specialty code as adopted by the Director of the Department of Consumer and Business Services. [1999 c.1045 §27]

Note: 455.479 and 455.481 were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.481 Application to inspection and plan review for prefabricated structures. Nothing in ORS 455.455, 455.457, 455.459, 455.461, 455.467, 455.475 or 455.477 is intended to limit, supersede or otherwise affect the rights, obligations or professional activities of an inspector engaged in the business of providing prefabricated structure plan approvals and inspections, as defined in ORS 455.715, pursuant to ORS 455.715 to 455.740. [1999 c.1045 §28]

Note: See note under 455.479.

455.483 Electrical and plumbing code plan review; rules. (1) The Department of Consumer and Business Services, with the approval of the appropriate advisory boards, shall adopt rules applicable in all jurisdictions in the state to make electrical and plumbing code plan review mandatory only for complex structures.

(2) Notwithstanding any rules adopted pursuant to subsection (1) of this section, an owner of a complex structure or the owner's agent may request and receive plan review and inspections for any electrical and plumbing materials and installations that are subject to the state building code. [2003 c.367 §5]

Note: 455.483 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.510 [Formerly 456.730; repealed by 1993 c.744 §41]

455.520 [Formerly 456.735; repealed by 1993 c.744 §41]

ENERGY CONSERVATION

(Generally)

455.525 Rules for energy conservation and passive solar energy in structures; inclusion in building code; application of testing requirements to fenestration products; review of regulations. (1) In the manner provided

in ORS chapter 183 for the adoption of rules and after consideration of available technology and costs, the Building Codes Structures Board and the Residential Structures Board shall establish basic and uniform performance standards to provide maximum energy conservation and use of passive solar energy in the design, construction, reconstruction, alteration and repair of buildings and other structures. Such standards shall be submitted to the Director of the Department of Consumer and Business Services for proposed inclusion in the state building code as provided by ORS 455.030 (4).

(2) Any testing requirements adopted under subsection (1) of this section do not apply to fenestration products that are for use within residential structures if the fenestration products are:

(a) Used in the creation of sunrooms and solariums and constructed with a minimum of a one-half inch space between the panes; or

(b) Fenestration products used as skylights that constitute no more than 10 percent of the total glazing used in any dwelling unit.

(3) The Residential Structures Board and the director shall jointly adopt by rule default thermal performance values for residential fenestration products that are produced in low volume. Any testing requirements adopted under subsection (1) of this section or ORS 455.020 or 455.030 do not apply to residential fenestration products that are produced in low volume.

(4) Fenestration products manufactured for use as skylights that are subject to the provisions of subsection (1) of this section and have frames that are wood, thermal break aluminum or aluminum with vinyl shall be deemed to meet any performance standards included in the state building code when the following glazing configurations are used:

(a) A minimum one-half inch space between the panes and low-e (emissivity) glass; or

(b) Triple-layered acrylic.

(5) Regulations relating to the use and conservation of energy adopted pursuant to ORS 455.020 (2) shall be reviewed by the Building Codes Structures Board and the Residential Structures Board. [Formerly 456.740; 1993 c.744 §95; 1993 c.782 §1; 1999 c.59 §128; 2003 c.675 §29]

455.530 Authority to receive money and to contract. The Building Codes Structures Board and the Residential Structures Board may:

(1) Apply for and receive moneys from any person, from the federal government, from this state or from any state agency or department.

(2) Contract with any public agency for the performance of services or the exchange of employees or services by one to the other necessary in carrying out the purposes of ORS 455.525 and 455.530. [Formerly 456.745 and then 456.742; 2003 c.675 §30]

(

Energy Conservation Standards for Public Buildings)

455.560 Definitions for ORS 455.560 to 455.580. As used in ORS 455.560 to 455.580, unless the context requires otherwise:

- (1) “Department” means the Department of Consumer and Business Services.
- (2) “Director” means the Director of the Department of Consumer and Business Services.
- (3) “Person” means an individual, partnership, joint venture, private or public corporation, association, firm, public service company, political subdivision, municipal corporation, government agency, people’s utility district, or any other entity, public or private, however organized.
- (4) “Public buildings” means any building, including outdoor area adjacent thereto, which is open to the public during normal business hours, except exempted buildings. Each of the following is a public building within the meaning of ORS 455.560 to 455.580, unless it or any portion thereof is exempted by rule or order pursuant to ORS 455.570 (2), (3) and (4):
 - (a) Any building which provides facilities or shelter for public assembly, or which is used for educational, office or institutional purposes;
 - (b) Any inn, hotel, motel, sports arena, supermarket, transportation terminal, retail store, restaurant, or other commercial establishment which provides services or retails merchandise;
 - (c) Any portion of an industrial plant building used primarily as office space; or
 - (d) Any building owned by the state or political subdivision thereof, including libraries, museums, schools, hospitals, auditoriums, sports arenas and university buildings. [Formerly 456.746; 1993 c.744 §96]

455.565 Purpose of ORS 455.560 to 455.580. It is the purpose of ORS 455.560 to 455.580 to promote, encourage and require measures to conserve energy in public buildings. [Formerly 456.744]

455.570 Maximum lighting standards for new public buildings; exemptions. (1) After consultation with the Building Codes Structures Board and the State Department of Energy, the Director of the Department of Consumer and Business Services, as provided in this chapter, shall establish maximum lighting standards for public buildings constructed on or after July 1, 1978. Such standards may distinguish between type of design, the uses to which buildings are put, location, age or any other applicable classification.

(2) Such standards shall allow for:

- (a) Differences in lighting levels within public buildings for special areas and uses, including but not limited to hospital, drafting room, and advertising display, and for other areas and activities requiring special illumination.
- (b) The interaction between lighting and heating systems.

(c) Occupational safety and health standards.

(3) The director may by rule or order exempt from the maximum lighting standards, new public buildings or portions thereof that:

(a) Are of insufficient size to warrant maximum lighting standard regulations;

(b) Should be allowed a specific period of time before compliance with maximum lighting standards is required;

(c) Are difficult or impractical to regulate based upon location;

(d) Are not open to the public during normal business hours;

(e) Are impractical to regulate, based upon unique design; or

(f) Would not be benefited by regulation, based upon the insignificant amount of energy possible to conserve.

(4) Any person subject to ORS 455.560 to 455.580 may apply to the director for an exemption under this section. [Formerly 456.747]

455.575 Advisory lighting standards for public buildings constructed before July 1, 1978. After consultation with the Building Codes Structures Board and the State Department of Energy, the Director of the Department of Consumer and Business Services, as provided in ORS chapter 183, shall establish advisory maximum lighting standards for public buildings constructed before July 1, 1978, based on the factors set forth in ORS 455.570. [Formerly 456.748]

455.580 Status of powers of director. The powers and duties given the Director of the Department of Consumer and Business Services by ORS 455.560 to 455.580 shall be in addition to, and not in derogation of, all other powers, duties and responsibilities vested in the director. [Formerly 456.749]

455.595 Energy Efficient Construction Account. The State Treasurer is authorized to establish an Energy Efficient Construction Account for the purpose of providing energy engineering and technical assistance studies to state and other public buildings. Moneys credited to this account from payments for energy engineering or technical assistance studies and other revenues as authorized by the appropriate legislative review agency are continuously appropriated for the payment of these expenses. [1987 c.206 §6]

Note: 455.595 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

LOW-RISE RESIDENTIAL DWELLING CODE

455.610 Low-Rise Residential Dwelling Code; adoption; changes; alternative methods of construction;

rules. (1) The Director of the Department of Consumer and Business Services shall adopt, and amend as necessary, a Low-Rise Residential Dwelling Code that contains all requirements, including structural design provisions, related to the construction of residential dwellings three stories or less above grade. The code provisions for plumbing and electrical requirements must be compatible with other specialty codes adopted by the director. The Electrical and Elevator Board, the Mechanical Board and the State Plumbing Board shall review, respectively, amendments to the electrical, mechanical or plumbing provisions of the code.

(2) Changes or amendments to the code adopted under subsection (1) of this section may be made when:

(a) Required by geographic or climatic conditions unique to Oregon;

(b) Necessary to be compatible with other statutory provisions;

(c) Changes to the national codes are adopted in Oregon; or

(d) Necessary to authorize the use of building materials and techniques that are consistent with nationally recognized standards and building practices.

(3) The water conservation provisions for toilets, urinals, shower heads and interior faucets adopted in the Low-Rise Residential Dwelling Code shall be the same as those adopted under ORS 447.020 to meet the requirements of ORS 447.145.

(4) The Low-Rise Residential Dwelling Code shall be adopted and amended as provided by ORS 455.030 and 455.110.

(5) The director, by rule, shall establish uniform standards for a municipality to allow an alternate method of construction to the requirements for one and two family dwellings built to the Low-Rise Residential Dwelling Code in areas where the local jurisdiction determines that the fire apparatus means of approach to a property or water supply serving a property does not meet applicable fire code or state building code requirements. The alternate method of construction, which may include but is not limited to the installation of automatic fire sprinkler systems, must be approved in conjunction with the approval of an application under ORS 197.522.

(6) For lots of record existing before July 2, 2001, or property that receives any approval for partition, subdivision or construction under ORS 197.522 before July 2, 2001, a municipality allowing an alternate method of construction to the requirements for one and two family dwellings built to the Low-Rise Residential Dwelling Code may apply the uniform standards established by the director pursuant to subsection (5) of this section. For property that receives all approvals for partition, subdivision or construction under ORS 197.522 on or after July 2, 2001, a municipality allowing an alternate method of construction to the requirements for one and two family dwellings built to the Low-Rise Residential Dwelling Code must apply the uniform standards established by the director pursuant to subsection (5) of this section. [1987 c.604 §2; 1991 c.366 §1; 1991 c.558 §1; 1991 c.945 §6; 1993 c.419 §1; 1993 c.744 §97; 2001 c.702 §1; 2003 c.675 §§31,32]

Note: The amendments to 455.610 by section 32, chapter 675, Oregon Laws 2003, become operative July 1,

2004. See section 53, chapter 675, Oregon Laws 2003. The text that is operative until July 1, 2004, including amendments by section 31, chapter 675, Oregon Laws 2003, is set forth for the user's convenience.

455.610. (1) The Director of the Department of Consumer and Business Services shall adopt, and amend as necessary, a Low-Rise Residential Dwelling Code that contains all requirements, including structural design provisions, related to the construction of residential dwellings three stories or less above grade. The code provisions for plumbing and electrical requirements must be compatible with other specialty codes adopted by the director. The Electrical and Elevator Board, the Building Codes Structures Board and the State Plumbing Board shall review, respectively, amendments to the electrical, mechanical or plumbing provisions of the code.

(2) Changes or amendments to the code adopted under subsection (1) of this section may be made when:

(a) Required by geographic or climatic conditions unique to Oregon;

(b) Necessary to be compatible with other statutory provisions;

(c) Changes to the national codes are adopted in Oregon; or

(d) Necessary to authorize the use of building materials and techniques that are consistent with nationally recognized standards and building practices.

(3) The water conservation provisions for toilets, urinals, shower heads and interior faucets adopted in the Low-Rise Residential Dwelling Code shall be the same as those adopted under ORS 447.020 to meet the requirements of ORS 447.145.

(4) The Low-Rise Residential Dwelling Code shall be adopted and amended as provided by ORS 455.030 and 455.110.

(5) The director, by rule, shall establish uniform standards for a municipality to allow an alternate method of construction to the requirements for one and two family dwellings built to the Low-Rise Residential Dwelling Code in areas where the local jurisdiction determines that the fire apparatus means of approach to a property or water supply serving a property does not meet applicable fire code or state building code requirements. The alternate method of construction, which may include but is not limited to the installation of automatic fire sprinkler systems, must be approved in conjunction with the approval of an application under ORS 197.522.

(6) For lots of record existing before July 2, 2001, or property that receives any approval for partition, subdivision or construction under ORS 197.522 before July 2, 2001, a municipality allowing an alternate method of construction to the requirements for one and two family dwellings built to the Low-Rise Residential Dwelling Code may apply the uniform standards established by the director pursuant to subsection (5) of this section. For property that receives all approvals for partition, subdivision or construction under ORS 197.522 on or after July 2, 2001, a municipality allowing an alternate method of construction to the requirements for one and two family dwellings built to the Low-Rise Residential Dwelling Code must apply the uniform standards established by the director pursuant to subsection (5) of this section.

455.620 [1987 c.604 §3; repealed by 1991 c.366 §2]

455.622 Certification of inspectors; rules. Notwithstanding ORS 447.020, 455.715 to 455.740, 479.810 (3) or 479.855, the Department of Consumer and Business Services shall adopt education, training and examination requirements that allow certification of inspectors to perform inspections on one and two family dwellings under one or more aspects of the Low-Rise Residential Dwelling Code adopted under ORS 455.610 to 455.630. [1995 c.553 §10; 2003 c.675 §33]

Note: 455.622 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.625 Rules for permits; schedule of inspections. The Director of the Department of Consumer and Business Services shall, by rule, adopt:

(1) A list of information required for low-rise residential dwelling building permits; and

(2) A priority schedule for low-rise residential dwelling inspections and plan review requirements. [1987 c.604 §5; 1997 c.658 §3; 2003 c.675 §34]

455.626 Rules for accommodating technology. The Director of the Department of Consumer and Business Services shall adopt, amend or repeal the state building code as necessary to establish viable standards for providing advanced telecommunications and cable service technology to newly constructed low-rise residential dwellings. [1999 c.329 §2; 2003 c.675 §48]

Note: 455.626 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.627 Minor electrical installation inspection program; rules. The Department of Consumer and Business Services, in consultation with the Residential Structures Board, shall adopt rules to create a mandatory random inspection program for minor electrical installations made by electrical contractors in low-rise residential dwellings. [1995 c.53 §13; 2003 c.675 §35]

Note: 455.627 was enacted into law by the Legislative Assembly but was not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.628 Plan review exemption. (1) The Department of Consumer and Business Services or a municipality administering and enforcing a building inspection program under ORS 455.148 or 455.150 may not require a plan review for one and two family dwellings that are of conventional light frame construction, as defined by the department by rule, if:

(a) The plans for the dwelling are designed and stamped by a professional engineer registered under ORS 672.092 or an architect registered under ORS 671.060; and

(b) The engineer or architect is certified by the Director of the Department of Consumer and Business Ser-

vices under ORS 455.720 as a one and two family dwelling plans examiner.

(2) The department or municipality is exempt from liability for any damages arising from the nonperformance of a plan review pursuant to this section. [2003 c.367 §4]

Note: 455.628 was added to and made a part of ORS chapter 455 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.630 Enforcement. (1) The Low-Rise Residential Dwelling Code shall be enforced by inspectors and building officials qualified pursuant to ORS 455.715 to 455.740.

(2) Notwithstanding subsection (1) of this section, enforcement of electrical specialty code, permit and licensing provisions shall be under the sole authority of the Electrical and Elevator Board in the Department of Consumer and Business Services. [1987 c.604 §7; 1999 c.714 §1; 2003 c.675 §36]

455.635 [Formerly 456.787; renumbered 455.085 in 1991]

PUBLIC ASSEMBLY STRUCTURES

455.640 Definitions for ORS 455.640 to 455.645. (1) As used in ORS 455.640 to 455.645, unless the context otherwise requires, the words, terms and phrases defined in subsections (2) to (5) of this section shall have the meaning given them in those subsections.

(2) “Architect” means an architect as defined in ORS 671.010 in accordance with the rules and regulations of the State Board of Architect Examiners.

(3) “Certified structure” means a structure designed by a professional engineer or architect as defined in this section.

(4) “Professional engineer” means an engineer as defined in ORS 672.002 in accordance with the rules and regulations of the State Board of Examiners for Engineering and Land Surveying.

(5) “Structures of public assembly” means structures which the public may enter for such purposes as deliberation, education, worship, shopping, entertainment, amusement or awaiting transportation. [Formerly 456.965]

Note: 455.640, 455.642 and 455.645 were added to and made a part of ORS chapter 455 by legislative action but were not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

455.642 Application. The provisions of ORS 455.640 to 455.645 shall not be construed to apply to any building having a ground area of 4,000 square feet or less and which is not more than 20 feet in height from the top surface of lowest flooring to the highest interior overhead finish of the structure. [Formerly 456.970]

Note: See note under 455.640.

455.645 Certain plans for structures of public assembly to be certified. In order to safeguard life, health and property, all drawings and plans defining the framing systems, shoring systems and foundations for structures of public assembly shall be certified by a qualified professional engineer or qualified architect. The design of the certified structure of public assembly shall provide for resistance to lateral forces, including wind and earthquakes, as well as gravity loads, in accordance with accepted engineering practice and governing building codes. The design shall be accompanied by supporting lateral force calculations. [Formerly 456.975]

Note: See note under 455.640.

MUNICIPAL REVIEW AND INSPECTION

(Generally)

455.675 Authorized substitutions in codes adopted by reference. For the purposes of the codes of regulations adopted under this chapter, unless the context clearly indicates otherwise, the following substitutions shall be made in any code adopted by reference as part of the state building code:

(1) “Building official” for “administrative authority.”

(2) “Governing body” for “mayor” and “city council.”

(3) “Municipality” for “city,” “county” or other unit of local government. [Formerly 456.875; 1999 c.1045 §17]

455.680 Plan approval and permits for recreation or picnic park or camp; license; rules. (1) Plan approval and permits shall be obtained from the Department of Consumer and Business Services prior to construction, enlargement or alteration of any recreation park, picnic park or organizational camp as defined in ORS 446.310.

(2) If the department determines that the work conforms to the approved plans and specifications, it shall issue a final approval which shall, if all other conditions of ORS 455.010 to 455.240, 455.410 to 455.450 and 455.595 to 455.740 are met, authorize the issuance of a license by the Department of Human Services to operate the park or, in the case of then currently licensed parks, shall authorize continued operation for the remaining part of the licensing year.

(3) In accordance with ORS 455.010 to 455.240, 455.410 to 455.450 and 455.595 to 455.740 and in consultation and agreement with the Department of Human Services, the Department of Consumer and Business Services shall adopt rules to carry out this section. The rules adopted pursuant to this section shall be a specialty code as defined in ORS 455.010. [Formerly 446.337 and then 456.837; 1997 c.259 §2]

455.685 Review of plans and specifications to determine compliance; effect of approval; fees. The Director of the Department of Consumer and Business Services may, upon an application setting forth a set of plans and specifications that will be utilized in one or more municipalities to acquire building permits, review and approve the application for the construction or erection of any building or structure if such set of plans

meets the requirements of the state building code. All costs incurred by the director by virtue of the examination of such a set of plans and specifications shall be paid by the applicant. The plans and specifications or any plans and specifications required to be submitted to a state agency shall be submitted to the director who shall examine the instruments and if necessary distribute them to the appropriate state agencies for scrutiny regarding adequacy as to fire safety, life safety and all other appropriate features. The state agencies shall examine and promptly return the plans and specifications together with their certified statement as to the adequacy of the instruments regarding that agency's area of concern. The applicant shall submit the plans and specifications to a local building official prior to application for a building permit. The local building official shall review the plan for those features required by local ordinance or by any site-specific, geographic, geologic or climatic code requirements. A local building official shall issue a building permit upon application and presentation to the local building official of such a set of plans and specifications bearing the approval of the director if the requirements of all other local ordinances are satisfied. The director or local building official may assess such fees as necessary to recover the reasonable costs incurred to ensure the compliance of the plans and specifications with the state building code. [Formerly 456.840; 1997 c.856 §3]

455.690 Appeal to advisory boards. Any person aggrieved by the final decision of a municipal appeals board or a subordinate officer of the Department of Consumer and Business Services as to the application of any provision of a specialty code may, within 30 days after the date of the decision, appeal to the appropriate advisory board. The appellant shall submit a fee of \$20, payable to the department, with the request for appeal. The final decision of the involved municipality or state officer shall be subject to review and final determination by the appropriate advisory board as to technical and scientific determinations related to the application of the specialty code involved. [Formerly 456.850; 1993 c.744 §98]

455.700 Validity of certain building permits. Building permits or certificates of occupancy validly issued before July 1, 1974, regarding buildings or structures being constructed or altered pursuant thereto, shall be valid thereafter and the construction may be completed pursuant to the building permit, unless the building official determines that life or property is in jeopardy. [Formerly 456.855]

455.705 Prefabricated structures plan approval; certified inspector required; rules; fees; manufacturer compliance program; insignia of compliance or certification stamp required for certain transactions. (1) No manufacturer of prefabricated structures or manufacturer of prefabricated structure components may contract with a municipality or a person who does not have an approval issued under subsection (2) of this section to perform prefabricated structure plan approvals or inspections.

(2)(a) No person may engage in prefabricated structure plan approvals or inspections without being certified under ORS 455.715 to 455.740 or 479.810 (3).

(b) No person may engage in the business of providing prefabricated structure plan approvals or inspections without an approval issued by the Department of Consumer and Business Services.

(3) In accordance with any applicable provisions of ORS chapter 183, the Director of the Department of Consumer and Business Services shall establish by rule a system for approval and regulation of businesses and persons who perform prefabricated structure plan approvals or inspections. Such a system shall include but not be limited to the following provisions:

- (a) Prescribing the form and content of and the times and procedures for submitting an application for the issuance or renewal of an approval.
- (b) Prescribing the term of the approval and the fee for the original issue and renewal in an amount that does not exceed the cost of administering the approval system. The charge for review and approval of a third party inspection service shall not exceed, for the original issue, \$400 and for the renewal, \$200.
- (c) Prescribing the conditions for initial issuance, renewal and maintenance of the approval, including but not limited to the following provisions:
 - (A) Procedures and reports for plan approvals and inspections;
 - (B) Ethical practices and prohibitions of conflicts of interests with manufacturers of prefabricated structures and manufacturers and suppliers of parts and services;
 - (C) Insurance compliance requirements;
 - (D) Procedures for use and application of insignia of compliance; and
 - (E) Fees for and procedures for use and application of certification stamps.
- (d) Prescribing other actions or circumstances that constitute failure to achieve or maintain approval competency or that otherwise constitute a danger to the public health or safety and for which the director may refuse to issue or renew or may suspend or revoke a certification, permit or certificate.
- (e) Prescribing the authority of the department to perform oversight monitoring including but not limited to:
 - (A) Right of entry and access to third party records and information;
 - (B) Frequency, type and extent of the oversight monitoring and inspection of third party agencies and manufacturing facilities; and
 - (C) Frequency and description of information to be submitted as part of the monitoring process.
- (f) Prescribing fees for monitoring conducted by the department at the manufacturing plant site or at third party inspection service locations, which fees shall not exceed \$60 per hour.
- (4)(a) The department shall establish by rule a manufacturer compliance program to allow for plan approvals or inspections of prefabricated structures or prefabricated structure components at the facility at which the prefabrication takes place, including but not limited to the following provisions:
 - (A) Quality assurance programs;
 - (B) Procedures for use and application of insignia of compliance; and

(C) Fees for and procedures for use and application of certification stamps.

(b) A manufacturer of prefabricated structures shall provide the department with written notice at least 60 days before a manufacturer may provide for plan approval or inspection service as allowed under subsection (2) of this section.

(c) The department is not required to provide plan approval for or inspection of any prefabricated structure or prefabricated structure components unless the department has been notified in writing by the manufacturer of the prefabricated structure 180 days in advance of the proposed assumption of department inspections.

(5) No person shall rent, lease, sell, exchange or offer for rent, lease, sale or exchange within this state a prefabricated structure constructed on or after July 1, 1991, unless it bears an insignia of compliance or certification stamp issued by the department or a third party indicating compliance with this state's building regulations and standards for prefabricated structures. A prefabricated structure with an insignia of compliance or certification stamp shall be acceptable to municipalities as meeting the state building code regulations. Prefabricated structures constructed prior to July 1, 1991, are subject to the building code regulations in effect at the time of original construction.

(6) The provisions of this section do not apply to employees of the Department of Consumer and Business Services and testing laboratories approved under ORS chapters 447 and 479.

(7) For purposes of this section, "insignia of compliance" means the plate affixed to a structure by the Department of Consumer and Business Services or a third party to signify compliance with all state building code requirements for which the structure was inspected.

(8) Prefabricated structures or components found by the department or a third party to represent a danger to public health or safety shall be brought into compliance with building code regulations or removed from the state.

(9) All plan approvals and inspections of prefabricated structures and prefabricated components constructed at manufacturing plants outside of Oregon but intended for delivery into Oregon shall be performed by the department or conducted under ORS 455.430. [1995 c.304 §3]

Note: 455.705 was added to and made a part of 455.010 to 455.740 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

(Inspectors)

455.715 Definitions for ORS 455.715 to 455.740. As used in ORS 455.715 to 455.740, unless the context otherwise requires:

(1) "Building official" means a person charged by a municipality with responsibility for administration and enforcement of the state building code in the municipality.

(2) "Business of providing prefabricated structure plan approvals and inspections" means an independent

contractor providing prefabricated structure plan approval or inspection services, or both, under the following specialty codes, as provided in ORS 455.020, 455.705 and 455.715:

- (a) Structural;
- (b) Mechanical;
- (c) Plumbing;
- (d) Electrical; and
- (e) Low-rise residential dwelling.

(3) “Inspector” means:

- (a) A person, including a plans examiner, acting under the authority and direction of a building official and charged with the responsibility of routine enforcement of any specialty code; or
- (b) A person, including a plans examiner, who provides enforcement of any specialty code, who is personally in the business of providing prefabricated structure plan approvals or inspections or is employed by such a business. [Formerly 456.805; 1991 c.361 §1; 1995 c.304 §5; 2003 c.675 §37]

455.720 Standards and qualifications for personnel; rules. (1) In accordance with applicable provisions of ORS chapter 183, to promote effective and uniform enforcement of the state building code by improving the competence of building officials and inspectors, the Director of the Department of Consumer and Business Services, with the advice of the advisory boards, shall:

- (a) Establish for building officials and inspectors reasonable minimum training and experience standards, including but not limited to courses or subjects for instruction, facilities for instruction, qualification of instructors, methods of instruction and classification of responsibility. The standards shall include provisions for determining a practical experience equivalent.
- (b) Establish a procedure to be used by municipalities to determine whether a person meets minimum standards or has minimum training to be appointed or employed as a building official or inspector. The procedure shall allow for a field examination of a person to determine if the person meets the practical experience equivalent of a minimum standard.
- (c) Subject to such terms, conditions and classifications as the director may impose, certify building officials as being qualified, and revoke such certifications in the manner provided in ORS 455.740.
- (d) Subject to such terms, conditions and classifications as the director may impose, certify inspectors as being qualified to enforce one or more particular specialty codes, and revoke such certifications in the manner provided in ORS 455.740.
- (e) Require an applicant for a certificate as a building official or inspector to demonstrate knowledge of the

laws governing accessibility to buildings by disabled persons by passing an examination prescribed by the director.

(2) The director shall maintain and, upon request of municipalities, furnish information on applicants for appointment or employment as building officials or inspectors.

(3) Pursuant to ORS chapter 183, the director shall adopt rules necessary to carry out the certification programs provided by subsection (1) of this section.

(4) The director, by rule, may require evidence of completion of continuing education covering any certification created under this section as a condition of maintaining the certification. Nothing in this subsection shall prohibit the director from delegating any of this power to a municipality. [Formerly 456.810; 1989 c.224 §119; subsection (4) enacted as 1991 c.361 §5; 1999 c.527 §1; 2001 c.104 §197]

455.725 Certification of personnel training programs. (1) Upon application, the Director of the Department of Consumer and Business Services or an authorized representative shall examine and evaluate any program or facility established by a municipality or educational institution for the training of building officials, inspectors and specialty code inspectors and plan reviewers licensed under ORS 455.457.

(2) If the director finds that a training program is qualified under the minimum requirements established pursuant to ORS 455.720, the director shall, in writing, certify the training program as being qualified for such a period of time and upon such conditions as the director may prescribe. An individual complies with any minimum requirement for building officials or inspectors established pursuant to ORS 455.720 when the individual satisfactorily completes a training program certified under this section. [Formerly 456.815; 1999 c.1045 §18]

455.730 Certification of personnel required. No person shall be appointed or employed as a building official or inspector by any municipality unless the person has been certified as being qualified under ORS 455.715 to 455.740, and the certification has not lapsed or been revoked. [Formerly 456.820]

455.735 Application for certification; fee; certification content. (1) Any person desiring to be certified as a building official or inspector pursuant to ORS 455.715 to 455.740 shall make application to the Director of the Department of Consumer and Business Services upon such forms as the director may prescribe for such purpose.

(2)(a) Each person applying for certification pursuant to this section shall pay a fee of \$22.

(b) In the event the director requires, by rule, an applicant for a particular certification to pass an examination prepared by a national organization, the applicant shall pay in addition to the fee required in paragraph (a) of this subsection, the cost of the examination.

(3) Upon determining that the applicant is qualified under ORS 455.715 to 455.740, the director shall issue or cause to be issued to the applicant a certificate setting forth the class and any restrictions upon the certification, including, if the applicant is an inspector, the particular specialty codes which the applicant is certified to enforce. [Formerly 456.825; 1991 c.201 §1; 1991 c.361 §2]

455.737 Experience and training outside Oregon; certification; examination; rulemaking. (1) Notwithstanding ORS 455.720 (1), the Director of the Department of Consumer and Business Services, by rule, shall adopt criteria for review of the experience and training in building inspection and building plan review acquired by a person outside the State of Oregon. The criteria shall be adopted in a manner that facilitates review of a person's qualifications by a local building official.

(2)(a) A local building official who wishes to employ a person who is not certified under ORS 455.735 as an inspector shall submit the person's qualifications to the director. The director shall review the stated qualifications against the criteria adopted under subsection (1) of this section, including verification of experience and training. The director shall respond to the local building official in writing within 10 working days of receiving the applicant's qualifications, stating whether the person meets the applicable criteria.

(b) Upon application and payment of the required fee, the director shall allow a person whose qualifications meet the criteria adopted under subsection (1) of this section to sit for any examination necessary for the required certification. The application shall include a declaration, taken before a notary public, affirming the accuracy of the experience and training set forth in the application. [1997 c.677 §2]

Note: Section 4, chapter 677, Oregon Laws 1997, provides:

Sec. 4. The provisions of ORS 455.035 are waived with respect to any rules adopted under section 2 of this Act [455.737] or ORS 479.810 as amended by section 3 of this Act. [1997 c.677 §4]

455.740 Revocation of certification. (1) The Director of the Department of Consumer and Business Services may, upon notice and hearing, suspend or revoke the certification of any building official or inspector when it appears to the director by competent evidence that the building official or inspector:

- (a) Has consistently failed to act in the public interest in the performance of duties;
- (b) Failed to complete the continuing education requirements as required under ORS 455.720 (4); or
- (c) Provided false information to the department.

(2) In any revocation proceeding under this section, the municipality that employs the building official or inspector shall be entitled to appear as a party in interest, either for or against the revocation.

(3) When a certification is suspended or revoked under this section, the director may also suspend, deny or place conditions on that person's right to reapply for certification under ORS 455.735 for a period not to exceed 12 months.

(4) Nothing in this section shall be construed to limit or otherwise affect the authority of a municipality to dismiss or suspend a building official or inspector at its discretion.

(5) Notwithstanding the requirements of subsections (1) to (4) of this section, the director may adopt rules which:

(a) Allow certifications to be placed on inactive status; and

(b) Extend continuing education compliance requirements in case of illness or hardship. [Formerly 456.835; 1991 c.361 §3]

(Remedial Authority of Director)

455.770 Investigative authority of director over municipalities; corrective action; limitation. (1) In addition to any other authority and power granted to the Director of the Department of Consumer and Business Services under ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.995 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693, with respect to municipalities, building officials and inspectors, if the director has reason to believe that there is a failure to enforce or a violation of any provision of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.995 and 480.510 to 480.670 and this chapter or ORS chapter 447, 460 or 693 or any rule adopted thereunder, the director may:

(a) Examine building code activities of the municipality;

(b) Take sworn testimony; and

(c) With the authorization of the Office of the Attorney General, subpoena persons and records to obtain testimony on official actions that were taken or omitted or to obtain documents otherwise subject to public inspection under ORS 192.410 to 192.505.

(2) The investigative authority authorized in subsection (1) of this section covers the violation or omission by a municipality related to enforcement of codes or administrative rules, certification of inspectors or financial transactions dealing with permit fees and surcharges under any of the following circumstances when:

(a) The duties are clearly established by law, rule or agreement;

(b) The duty involves procedures for which the means and methods are clearly established by law, rule or agreement; or

(c) The duty is described by clear performance standards.

(3) Prior to starting an investigation under subsection (1) of this section, the director shall notify the municipality in writing setting forth the allegation and the rules or statutes pertaining to the allegation and give the municipality 30 days to respond to the allegation. If the municipality does not satisfy the director's concerns, the director may then commence an investigation.

(4) If the Department of Consumer and Business Services directs corrective action the following shall be done:

(a) The corrective action shall be in writing and served on the building official and the chief executive officers of all municipalities affected;

(b) The corrective action shall identify the facts and law relied upon for the required action; and

(c) A reasonable time shall be provided to the municipality for compliance.

(5) The director may revoke any authority of the municipality to administer any part of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.995 and 480.510 to 480.670 and this chapter or ORS chapter 447, 460 or 693 or any rule adopted thereunder if the director determines after a hearing conducted under ORS 183.413 to 183.497 that:

(a) All of the requirements of this section and ORS 455.775 and 455.895 were met; and

(b) The municipality did not comply with the corrective action required.

(6) Nothing in ORS 455.775 shall be construed to grant any authority over a municipality or inspector employed by a municipality. [1991 c.792 §§2,6; 1995 c.79 §230; 2001 c.411 §19]

455.775 Investigative authority of director; corrective action. In addition to any other authority and power granted to the Director of the Department of Consumer and Business Services under this chapter and ORS chapters 446, 447, 460, 479, 480 and 693:

(1) Except where inconsistent with other provisions of law, the director may enforce the provisions of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.950, 479.995 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693 against any person regardless of whether a permit, certificate, license or other indicia of authority has been issued. The director may:

(a) Make an investigation;

(b) Take sworn testimony;

(c) With the authorization of the Office of the Attorney General, subpoena persons and records;

(d) Order corrective action; and

(e) If an immediate hazard to health and safety is imminent, issue an order to stop all or any part of the work under the applicable specialty code.

(2) If the director has reason to believe that any person has been engaged, or is engaging, or is about to engage in any violation of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.950 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693 and any rule adopted thereunder, the director may issue an order, subject to ORS 183.413 to 183.497, directed to the person to cease and desist from the violation or threatened violation.

(3) If the director has reason to believe that any person has been engaged, or is engaging, or is about to engage in any violation of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.950 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693 and any rule

adopted thereunder, the director may, without bond, bring suit in the name and on behalf of the State of Oregon in the circuit court of any county of this state to enjoin the acts or practices and to enforce compliance with ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.950 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693 and any rule adopted thereunder. Upon a proper showing, a permanent or temporary injunction, restraining order or writ of mandamus shall be granted. [1991 c.792 §§3,5; 1999 c.597 §1; 2001 c.411 §20; 2003 c.14 §285]

MASTER BUILDER PROGRAMS

455.800 Definitions for ORS 455.800 to 455.820. As used in ORS 455.800 to 455.820:

(1) “Building official” means a person who is a building official as defined in ORS 455.715 or a Department of Consumer and Business Services employee charged with enforcement or administration of the state building code.

(2) “Building trade committee” means a group composed of experienced and knowledgeable local general contractors or other persons having substantial expertise in various aspects of one and two family dwelling construction under the Low-Rise Residential Dwelling Code.

(3) “General contractor” has the meaning given that term in ORS 701.005.

(4) “Master builder” means a person certified under ORS 455.810.

(5) “Qualified construction company” means a company that has been:

(a) Continuously licensed by the Construction Contractors Board during the preceding 60 months as a general contractor; or

(b) Continuously licensed by the Construction Contractors Board during at least the preceding 24 months as a general contractor and by one or more other states during the balance of the preceding 60 months in an occupation equivalent to that of a general contractor.

(6) “Regular employee” means a person who:

(a) Is continuously employed by, and on the regular payroll of, a qualified construction company;

(b) Has filed a withholding exemption certificate pursuant to ORS 316.182 for work performed for the qualified construction company; and

(c) Is available during working hours to supervise on-site dwelling construction, including but not limited to supervising the installation of:

(A) Drywall;

(B) Electrical systems;

- (C) Footings;
- (D) Foundations;
- (E) Framing;
- (F) Insulation;
- (G) Mechanical systems;
- (H) Plumbing systems; and
- (I) Stairs.

(7) “Whole dwelling remodel” means a project that includes the installation in an existing dwelling of all of the following:

- (a) Drywall;
- (b) Electrical systems;
- (c) Footings;
- (d) Foundations;
- (e) Framing;
- (f) Insulation;
- (g) Mechanical systems; and
- (h) Plumbing systems. [2001 c.406 §1; 2003 c.675 §38]

Note: 455.800 to 455.820 were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.805 Criteria for granting of master builder status. An individual may apply to the Department of Consumer and Business Services to be tested and certified as a master builder. The department shall establish uniform criteria for use in determining whether to grant an application. The criteria must, at a minimum, provide that:

- (1) The individual must be an owner or regular employee of a qualified construction company and be authorized by the company to provide assurance to the department that all state and local code requirements are

met.

(2) In each of the five preceding calendar years, the individual must either have performed or supervised a dwelling construction or whole dwelling remodel. In at least two of the years, the construction or remodel must have occurred in a geographic area that had a master builder program.

(3) The individual must have completed a program sponsored by a local building trade committee or other program approved by the department, providing training relating to the construction of one and two family dwellings under the Low-Rise Residential Dwelling Code. A program must include but need not be limited to instruction in:

- (a) Administration;
- (b) Chimneys and fireplaces;
- (c) Decay and termite protections;
- (d) Energy conservation;
- (e) Footings and foundations;
- (f) Roof-ceiling construction;
- (g) Roof coverings;
- (h) Site inspections;
- (i) Wall construction, assemblies and coverings; and
- (j) Wood and metal framing.

(4) The individual must have scored at least 75 percent on a written examination, approved and administered by the department, covering the appropriate aspects of the Low-Rise Residential Dwelling Code.

(5)(a) The individual must not be the subject of an adverse final order issued by the Construction Contractors Board or Department of Consumer and Business Services based upon acts committed within 36 months preceding the application date that:

- (A) Violated a specialty code, licensing or permit requirement; or
- (B) Resulted in a claim being filed with the board or department against the individual.

(b) For purposes of this subsection, if the individual is an owner of a qualified construction company, an adverse final order issued against the company is an adverse final order issued against that individual. [2001 c.406 §2; 2003 c.675 §39]

Note: See note under 455.800.

Note: Sections 6 and 9 (1), chapter 406, Oregon Laws 2001, provide:

Sec. 6. If an individual applies on or before January 1, 2006, to be certified as a master builder, and the individual has performed or supervised a dwelling construction or whole dwelling remodel in each of the five preceding calendar years, the Department of Consumer and Business Services may waive the geographical requirement of section 2 (2) of this 2001 Act [455.805 (2)]. [2001 c.406 §6]

Sec. 9. (1) Section 6 of this 2001 Act is repealed July 1, 2007. The repeal does not invalidate any certification granted prior to July 1, 2007. [2001 c.406 §9(1)]

455.810 Certificates; fees; discipline; rules. (1) An individual seeking certification as a master builder must apply to the Department of Consumer and Business Services on the form prescribed by the department. Upon determining that the applicant meets the criteria for certification set forth in ORS 455.805, the department shall issue the certificate.

(2) Certification as a master builder is valid for three years unless suspended or revoked. An individual may renew a certificate that is in good standing by:

(a) Providing evidence of continuing education as required by department rule; and

(b) Paying a renewal fee established by the department by rule.

(3) The department may deny, refuse to renew, suspend or revoke certification as a master builder if the individual fails or ceases to meet the criteria for certification set forth in ORS 455.805 or engages in actions resulting in a waiver revocation under ORS 455.820 (3). The department must afford an individual an opportunity for a hearing pursuant to ORS chapter 183 upon a denial or refusal to renew or prior to a suspension or revocation of certification.

(4) The department may adopt all rules necessary and proper for administering ORS 455.800 to 455.820, including but not limited to rules establishing application, examination, certification and renewal fees. [2001 c.406 §3]

Note: See note under 455.800.

455.815 Establishment of master builder programs; waiver of inspections; builder verification of performance. (1) Local government establishment of a master builder program is voluntary. A local government electing to establish or terminate a program shall notify the Department of Consumer and Business Services. If terminating a program, the local government must give the notice six months before the program terminates.

(2) The Department of Consumer and Business Services may implement a master builder program in one or more geographic areas for which the department provides plan review or inspection services. A department decision to include an area as a participant in the program affects only those areas, and those reviews or

inspections, for which the department provides services instead of a local government. The department shall notify a county prior to implementing a master builder program in areas of the county that are served by the department.

(3) A local government may not allow an individual to perform the duties of a master builder unless the local government has a master builder program. The department may allow an individual to perform the duties of a master builder in any geographic area administered by the department.

(4) A building official of a government having a master builder program may waive plan review elements by that government and may waive government performance of one or more of the required inspections identified by department rule, including but not limited to inspections described in subsection (6) of this section, if:

(a) An individual certified as a master builder submits construction plans for a one or two family dwelling regulated by the Low-Rise Residential Dwelling Code; and

(b) The building official determines that:

(A) The work is not of a highly technical nature; and

(B) There is no unreasonable potential risk to safety of the structure.

(5) A building official may not waive government performance of plan review or required inspections for:

(a) Special design applications that are complex and highly technical engineered systems; or

(b) Unique building sites, including but not limited to sites containing geologic hazards such as landslide hazard areas, floodplains and wetlands.

(6) Subject to subsections (3) to (5) of this section, a building official may allow a master builder to verify that the master builder has properly performed an installation on a project and, to the extent that inspection would duplicate the verification conducted by the master builder, may waive government performance of the following required inspections:

(a) Drywall;

(b) Footings and setbacks;

(c) Foundation walls, Ufer grounding rods and rebar;

(d) Insulation;

(e) Masonry fireplace pre-cover;

(f) Masonry rebar;

- (g) Gutters, downspouts and foundation drains;
- (h) Roof sheathing nailing;
- (i) Suspended ceilings;
- (j) Underfloor structural; and
- (k) Wall sheathing nailing. [2001 c.406 §4; 2003 c.675 §40]

Note: See note under 455.800.

455.820 Plan review and verification; documentation; duties of building official; effect of waiver revocation.

(1) A master builder must perform all plan review and required verifications for which government review or inspection has been waived by a building official. The master builder shall maintain copies of all documents and reports required by the government granting the waiver and provide those copies to the building official.

(2) When waiving government performance of plan review or required inspections, a building official shall require the master builder to sign a form that specifically identifies each waiver and states that the master builder accepts the duty of performing the review and verifications. A master builder who accepts the duty of performing a review or verification remains responsible for that duty unless released by written and signed permission of the building official. A building official may release a master builder from a review or verification duty by a written and signed assumption of the review or inspection duty by the building official or written and signed assumption of the review and verification duty by another master builder.

(3) A building official for a government that has a master builder program:

(a) Must conduct inspections of at least 10 percent of projects that are built under a master builder program;

(b) May revoke a waiver for a plan review or required inspection if the master builder fails to properly perform, or document performance of, review or verification duties; and

(c) Must notify the Department of Consumer and Business Services when the official revokes a waiver pursuant to paragraph (b) of this subsection.

(4) When revoking a waiver, a building official shall provide the master builder with a release under subsection (2) of this section from future performance of review or verification duties. A release does not relieve a master builder from liability for the failure to perform, or document performance of, review or verification duties prior to the revocation of the waiver.

(5) A government having a master builder program has no legal duty with regard to plan review or required inspections properly waived under ORS 455.815 and accepted by a master builder in a signed form described under subsection (2) of this section. This subsection does not release a government from a duty arising

ing due to a waiver revocation under subsection (3) of this section or an assumption under subsection (2) of this section.

(6) A local government may refuse to grant recognition to a certified master builder if a waiver granted to the master builder under that government's master builder program has been revoked pursuant to subsection (3)(b) of this section. If a waiver is revoked pursuant to subsection (3)(b) of this section, a local government or building official may send a recommendation to the department for action against the master builder who was granted the waiver. The local government or building official may also send the department any information supporting the recommendation. [2001 c.406 §5]

Note: See note under 455.800.

TRI-COUNTY BUILDING INDUSTRY SERVICE CENTER

455.840 [Formerly 705.700; repealed by 2003 c.675 §49]

455.842 Tri-County Building Industry Service Center; fees. (1) The Department of Consumer and Business Services shall establish and staff a Tri-County Building Industry Service Center to make available to licensed contractors and their employees, local governments and the public the resources and services described in ORS 455.844.

(2) The Director of the Department of Consumer and Business Services may adopt by rule a reasonable fee schedule for the purpose of recovering the costs incurred by the department and the service center in providing services under ORS 455.844. Fees adopted and imposed under this section shall be in addition to the total building permit fees otherwise imposed in Clackamas, Multnomah and Washington Counties. A municipality shall collect fees adopted and imposed under this section and remit the fees to the department. [Formerly 705.705; 2003 c.675 §41]

Note: 455.842 to 455.846 were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 455 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

455.844 Duties regarding Tri-County Building Industry Service Center. The Department of Consumer and Business Services shall:

(1) Develop and administer an installation label program for minor installations under the state building code, including but not limited to electrical installations under ORS 455.627, 479.540 and 479.570 and plumbing installations under ORS 447.076;

(2) Develop standard application forms and procedures for use by municipalities in Clackamas, Multnomah and Washington Counties when issuing structural, mechanical, electrical, plumbing and other permits when such permits do not require a review of building plans;

(3) Develop standard application forms and procedures for issuing building permits and recording inspections;

- (4) Develop standard forms and procedures for reviewing building plans;
- (5) Establish standardized criteria and methodology for determining fee amounts for permits that are required under the state building code established under ORS 455.030;
- (6) Maintain and make available to the public the names of persons certified to review building plans;
- (7) Maintain and make available to the public the names of persons certified to perform technical inspections;
- (8) Administer prepaid building permit cost accounts;
- (9) Establish sufficient resources to assist local building officials in interpreting the state building code;
- (10) Establish a process to facilitate consistent application of the state building code for the area served by the Tri-County Building Industry Service Center; and
- (11) Develop a process for resolving disputes between local building officials and contractors or developers regarding site-specific application of one or more provisions of the state building code. [Formerly 705.710; 2003 c.675 §42]

Note: See note under 455.842.

455.846 Rules. In accordance with the applicable provisions of ORS chapter 183, the Director of the Department of Consumer and Business Services may adopt rules necessary for the implementation of ORS 455.842 and 455.844. [Formerly 705.715; 2003 c.675 §43]

Note: See note under 455.842.

455.848 [Formerly 705.720; repealed by 2003 c.675 §49]

PENALTIES

455.895 Civil penalties. (1)(a) The State Plumbing Board may impose a civil penalty against a person as provided under ORS 447.992 and 693.992. Amounts recovered under this paragraph are subject to ORS 693.165.

(b) The Electrical and Elevator Board may impose a civil penalty against a person as provided under ORS 479.995. Amounts recovered under this paragraph are subject to ORS 479.850.

(c) The Board of Boiler Rules may impose a civil penalty against a person as provided under ORS 480.670. Amounts recovered under this paragraph shall be deposited to the General Fund.

(2) The Director of the Department of Consumer and Business Services, in consultation with the appropriate board, if any, may impose a civil penalty against any person who violates any provision of ORS 446.003 to

446.200, 446.225 to 446.285, 446.395 to 446.420, 479.510 to 479.945, 479.950 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693 or any rule adopted or order issued for the administration and enforcement of those provisions. Except as provided in subsections (3) and (8) of this section, a civil penalty imposed under this section must be in an amount determined by the appropriate board or the director of not more than \$5,000 for each offense or, in the case of a continuing offense, not more than \$1,000 for each day of the offense.

(3) Each violation of ORS 446.003 to 446.200 or 446.225 to 446.285, or any rule or order issued thereunder, constitutes a separate violation with respect to each manufactured structure or with respect to each failure or refusal to allow or perform an act required thereby, except that the maximum civil penalty may not exceed \$1 million for any related series of violations occurring within one year from the date of the first violation.

(4) The maximum penalty established by this section for a violation may be imposed only upon a finding that the person has engaged in a pattern of violations. The Department of Consumer and Business Services, by rule, shall define what constitutes a pattern of violations. Except as provided in subsection (1) of this section, moneys received from any civil penalty under this section are appropriated continuously for and shall be used by the director for enforcement and administration of provisions and rules described in subsection (2) of this section.

(5) Civil penalties under this section shall be imposed as provided in ORS 183.745.

(6) A civil penalty imposed under this section may be remitted or reduced upon such terms and conditions as the director or the appropriate board considers proper and consistent with the public health and safety. In any judicial review of a civil penalty imposed under this section, the court may, in its discretion, reduce the penalty.

(7) Any officer, director, shareholder or agent of a corporation, or member or agent of a partnership or association, who personally participates in or is an accessory to any violation by the partnership, association or corporation of a provision or rule described in subsection (2) of this section is subject to the penalties prescribed in this section.

(8) In addition to the civil penalty set forth in subsection (1) or (2) of this section, any person who violates a provision or rule described in subsection (2) of this section may be required by the director or the appropriate board to forfeit and pay to the General Fund of the State Treasury a civil penalty in an amount determined by the director or board that shall not exceed five times the amount by which such person profited in any transaction that violates a provision or rule described in subsection (2) of this section. [1991 c.792 §4; 1991 c.734 §111; 1999 c.1045 §19; 2001 c.411 §21; 2003 c.14 §286]

Note: The amendments to 455.895 by section 76, chapter 655, Oregon Laws 2003, become operative May 1, 2005. See section 147, chapter 655, Oregon Laws 2003. The text that is operative on and after May 1, 2005, is set forth for the user's convenience.

455.895. (1)(a) The State Plumbing Board may impose a civil penalty against a person as provided under ORS 447.992 and 693.992. Amounts recovered under this paragraph are subject to ORS 693.165.

(b) The Electrical and Elevator Board may impose a civil penalty against a person as provided under ORS 479.995. Amounts recovered under this paragraph are subject to ORS 479.850.

(c) The Board of Boiler Rules may impose a civil penalty against a person as provided under ORS 480.670. Amounts recovered under this paragraph shall be deposited to the General Fund.

(2) The Director of the Department of Consumer and Business Services, in consultation with the appropriate board, if any, may impose a civil penalty against any person who violates any provision of ORS 446.003 to 446.200, 446.225 to 446.285, 446.395 to 446.420, 446.566 to 446.646, 446.666 to 446.746, 479.510 to 479.945, 479.950 and 480.510 to 480.670 and this chapter and ORS chapters 447, 460 and 693, or any rule adopted or order issued for the administration and enforcement of those provisions. Except as provided in subsections (3) and (8) of this section or ORS 446.995, a civil penalty imposed under this section must be in an amount determined by the appropriate board or the director of not more than \$5,000 for each offense or, in the case of a continuing offense, not more than \$1,000 for each day of the offense.

(3) Each violation of ORS 446.003 to 446.200 or 446.225 to 446.285, or any rule or order issued thereunder, constitutes a separate violation with respect to each manufactured structure or with respect to each failure or refusal to allow or perform an act required thereby, except that the maximum civil penalty may not exceed \$1 million for any related series of violations occurring within one year from the date of the first violation.

(4) The maximum penalty established by this section for a violation may be imposed only upon a finding that the person has engaged in a pattern of violations. The Department of Consumer and Business Services, by rule, shall define what constitutes a pattern of violations. Except as provided in subsections (1) and (9) of this section, moneys received from any civil penalty under this section are appropriated continuously for and shall be used by the director for enforcement and administration of provisions and rules described in subsection (2) of this section.

(5) Civil penalties under this section shall be imposed as provided in ORS 183.745.

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(7) Any officer, director, shareholder or agent of a corporation, or member or agent of a partnership or association, who personally participates in or is an accessory to any violation by the partnership, association or corporation of a provision or rule described in subsection (2) of this section is subject to the penalties prescribed in this section.

(8) In addition to the civil penalty set forth in subsection (1) or (2) of this section, any person who violates a provision or rule described in subsection (2) of this section may be required by the director or the appropriate board to forfeit and pay to the General Fund of the State Treasury a civil penalty in an amount determined by the director or board that shall not exceed five times the amount by which such person profited in any transaction that violates a provision or rule described in subsection (2) of this section.

(9) If a civil penalty is imposed for a violation of a provision of ORS 446.566 to 446.646 and the violation relates to a filing or failure to file with a county assessor functioning as agent of the department, the department, after deducting an amount equal to the department's procedural, collection and other related costs and expenses, shall forward one-half of the remaining civil penalty amount to the county in which the manufactured structure is located at the time of the violation.

455.897 Criminal penalties. Violation of ORS 455.455 or 455.459 is a Class A misdemeanor. [1999 c.1045 §9]

455.990 [Formerly 456.885 (2); repealed by 1995 c.553 §16; 1995 c.675 §6]



Earthquake Hazard Mitigation

for Nonstructural Elements

Field Manual



FEMA

FEMA 74

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This field manual was prepared by Wiss, Janney, Elstner Associates, Inc. as a subcontractor to URS Corporation for FEMA under the Hazard Mitigation Technical Assistance Program, Contract EMW-2000-CO-0247.

Chapter 1 - Overview

The primary focus of this guide is to help the reader understand how to conduct a building survey to identify nonstructural items that are vulnerable in an earthquake and most likely to cause personal injury, costly property damage, or loss of function if they are damaged. In addition, this guide contains recommendations on how to implement cost-effective measures that can help to reduce the potential hazards.

Purpose

This guide was developed to fulfill several different objectives and address a wide audience with varying needs. The primary intent is to explain the sources of nonstructural earthquake damage in simple terms and to provide information on effective methods of reducing the potential risks. The recommendations contained in this guide are intended to reduce the potential hazards but cannot completely eliminate them.

Nonstructural Elements

Definitions

Two terms frequently used in the earthquake engineering field should be defined.

Structural

The structural portions of a building are those that resist gravity, earthquake, wind, and other types of loads. These are called structural components and include columns (posts, pillars); beams (girders, joists); braces; floor or roof sheathing, slabs, or decking; load-bearing walls (i.e., walls designed to support the building weight and/or provide lateral resistance); and foundations (mat, spread footings, piles). For buildings planned by design professionals, the structure is typically designed and analyzed in detail by a civil or structural engineer.

Nonstructural

The nonstructural portions of a building include every part of the building and all its contents with the exception of the structure--in other words, everything except the columns, floors, beams, etc. Common nonstructural components include ceilings; windows; office equipment; computers; inventory stored on shelves; file cabinets; heating, ventilating, and air conditioning (HVAC) equipment; electrical equipment; furnishings; lights; etc. Typically, nonstructural items are not analyzed by engineers and may be specified by architects, mechanical engineers (who design HVAC systems and plumbing for larger buildings), electrical engineers, or interior designers; or they may be purchased without the involvement of any design professional by owners or tenants after construction of a building. Figure 1 identifies the structural and nonstructural components of a typical building. Note that most of the structural components of a typical building are concealed from view by nonstructural materials.

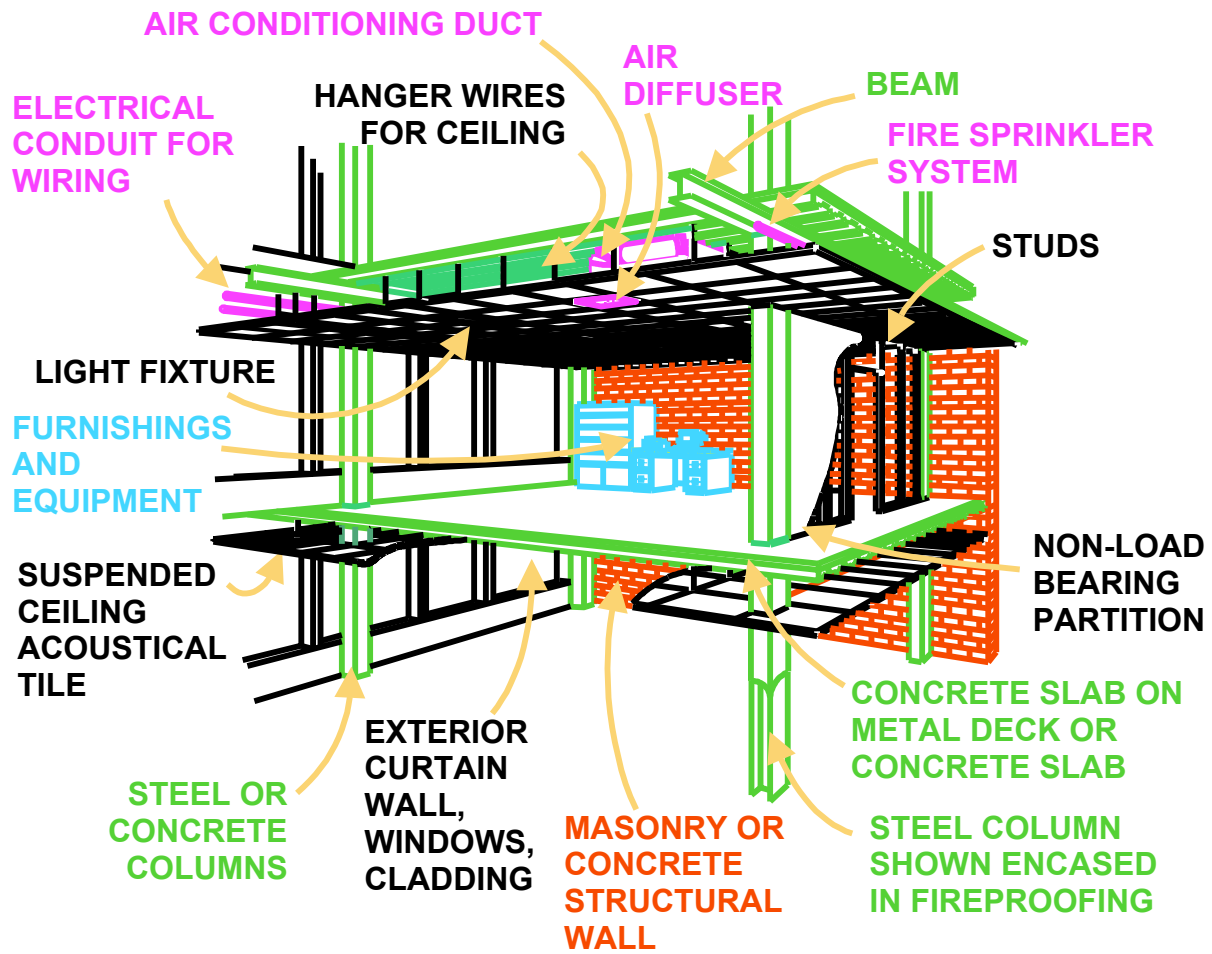


Figure 1

Chapter 2 - Behavior of Nonstructural Elements

Types of Nonstructural Elements

The nonstructural components listed in the tables and checklists provided in Chapters 4, 5 and 6 are elements that are most commonly found in commercial, multiple-unit residential, or public buildings such as schools and government buildings. A complex facility such as a hospital, research laboratory, or industrial plant will contain many additional types of specialized equipment that are not addressed in this guide. The common components can be divided into three general categories as follows.

Architectural Elements

These are typically built-in nonstructural components that form part of the building. Examples include partitions and ceilings, windows, doors, lighting, interior or exterior ornamentation, exterior panels, veneer, and parapets.

Building Utility Systems

These are typically built-in nonstructural components that form part of the building. Examples include mechanical and electrical equipment and distribution systems, water, gas, electric, and sewerage piping and conduit, fire suppression systems, elevators or escalators, HVAC systems, and roof-mounted solar panels.

Furniture and Contents

These are nonstructural components belonging to tenants or occupants. Examples include computer and communications equipment; cabinets and shelving for record and supply storage; library stacks; kitchen and laundry facilities; furniture; movable partitions; lockers; and vending machines. Not every conceivable item is included in these lists, so some judgment is needed to identify the critical items in a particular facility. In general, items that are taller, heavier, or important to operations, items that contain hazardous materials, and items that are more expensive should be included before items that are shorter, lighter, nonessential, inexpensive, and do not contain hazardous materials.

Factors Affecting Seismic Behavior

The seismic risk for a particular nonstructural component at a particular facility is governed by a variety of factors, including

- the regional seismicity
- the proximity to an active fault
- the local soil conditions
- the dynamic characteristics of the building structure
- the dynamic characteristics of the nonstructural element and its bracing to the structure
- the location of the nonstructural component within the building
- the function of the facility
- the importance of the particular component to the operation of the facility

Seismic Hazards

The seismic hazard in a given region or geographic location is related both to the severity of ground shaking expected in the area and to the likelihood, or probability, that a given level of shaking will occur. Seismologists review historical earthquake activity, locations and

characteristics of mapped faults, and regional geology to estimate the seismic hazard. This information is often depicted on a seismic hazard map.

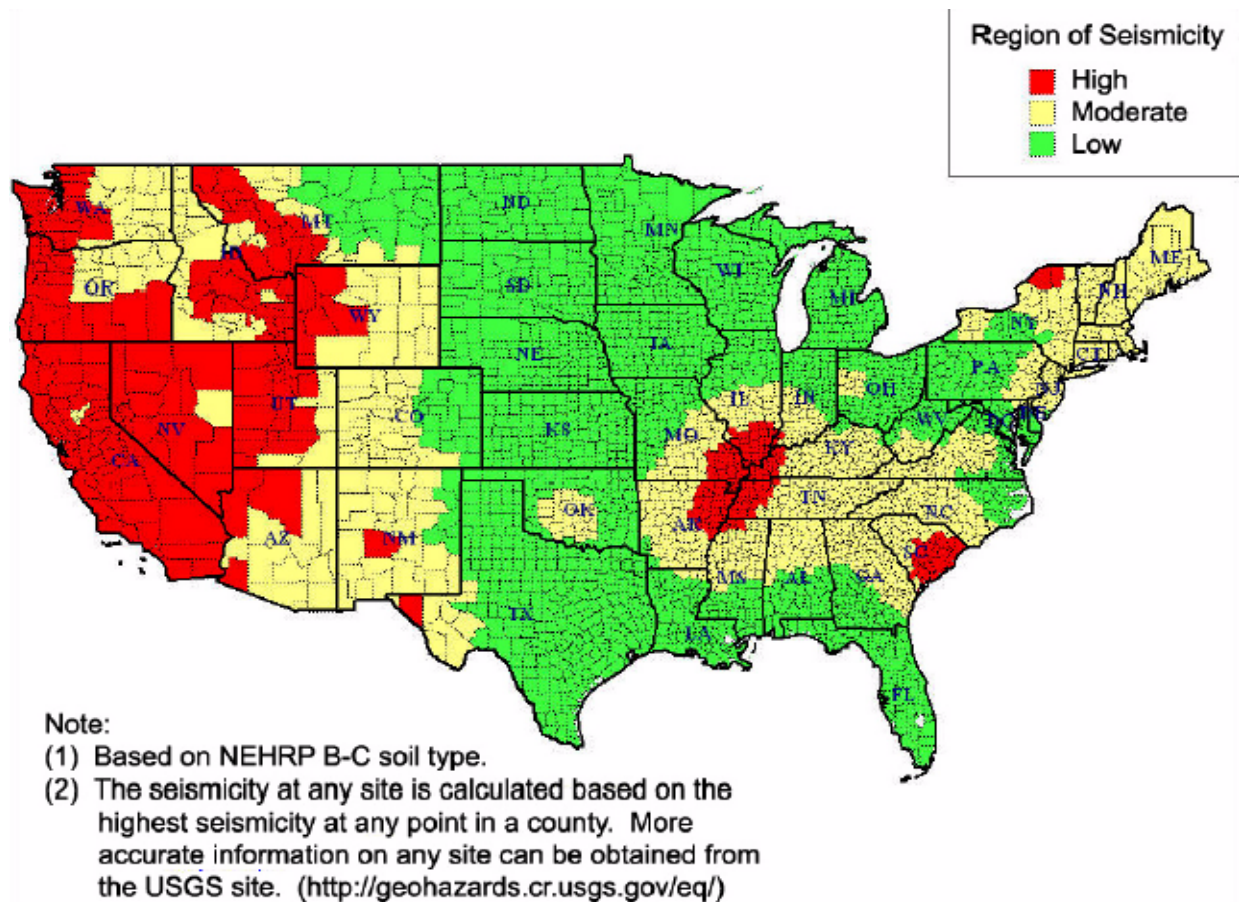


Figure 2

Seismic hazard is often characterized in terms of three levels of shaking intensity: namely light, moderate, and severe. The seismic hazard maps presented in Figure 2 show the geographic areas in the United States with low, moderate, and high probabilities of earthquake ground shaking in the future.

The seismic hazard throughout the country however, is more variable than simple seismic zones. The US Geological Survey (USGS) has published maps with contour lines showing detailed variations in seismicity depending on location. The USGS also maintains a web site that can be used to determine the seismicity of a location based on the zip code. It can be found at <http://eqint.cr.usgs.gov/eq/html/zipcode.shtml>.

Earthquake shaking can be represented either as a ground motion with an average return period or a probability of exceedence and the relative seismicity of a site may vary depending on the return period being considered. Building codes in use until about the year 2000 considered an earthquake with an average return period of 475 years, which is also described as having a 10 percent chance of exceedence in 50 years. Newer codes consider the seismicity based on an earthquake with an average return period of 2475 years, which is also described as having a 2

percent chance of exceedence in 50 years. The governing building code should be reviewed prior to a seismic evaluation and retrofit program to determine the appropriate seismicity to consider for each site.

The soil conditions at the site can also influence the seismic hazard. Buildings sited on softer soils may be subjected to greater earthquake shaking. The local soil conditions should be reviewed by a structural or geotechnical engineer to determine the effect of the soil conditions on the building's seismic hazard.

Causes of Nonstructural Damage

Earthquakes shake the ground in all directions. Because of this multi-directional shaking, the structural and nonstructural elements of a building must be specially designed to resist earthquake forces in a variety of directions. Structural and nonstructural elements of a building that are not secured to resist expected earthquake shaking pose a hazard to building occupants. Earthquake ground shaking has three primary effects on nonstructural elements in buildings. These are inertial or shaking effects, distortions imposed on nonstructural components when the building structure sways back and forth, and separation or pounding at the interface between adjacent structures.

Inertial Forces

When a building is shaken during an earthquake, the base of the building moves in unison with the ground, but the entire building and building contents above the base will experience inertial forces. These inertial forces can be explained by using the analogy of a passenger in a moving vehicle. As a passenger, you experience inertial forces whenever the vehicle is rapidly accelerating or braking. If the vehicle is accelerating, you may feel yourself pushed backward against the seat, since the inertial force on your body acts in the direction opposite that of the acceleration. If the vehicle is rapidly accelerating or braking, you may be thrown forward in your seat. The earthquake inertial forces are greater if the mass is greater (if the building or object within the building weighs more) and if the acceleration of the shaking is greater.

File cabinets, emergency power generating equipment, freestanding bookshelves, office equipment, and items stored on shelves or racks can all be damaged from the effect of inertial forces. When unrestrained items are shaken by an earthquake, inertial forces may cause them to slide, swing, strike other objects, or overturn. Items may slide off shelves and fall to the floor. One common misconception is that large, heavy objects are stable and not as vulnerable to earthquake damage as lighter objects, perhaps because we may have difficulty moving them. Because inertial forces during an earthquake are proportional to the mass or weight of an object, a heavily loaded file cabinet requires much stronger restraints to keep it from sliding or overturning than a light one with the same dimensions.

OVERTURNING OF SLENDER OBJECTS

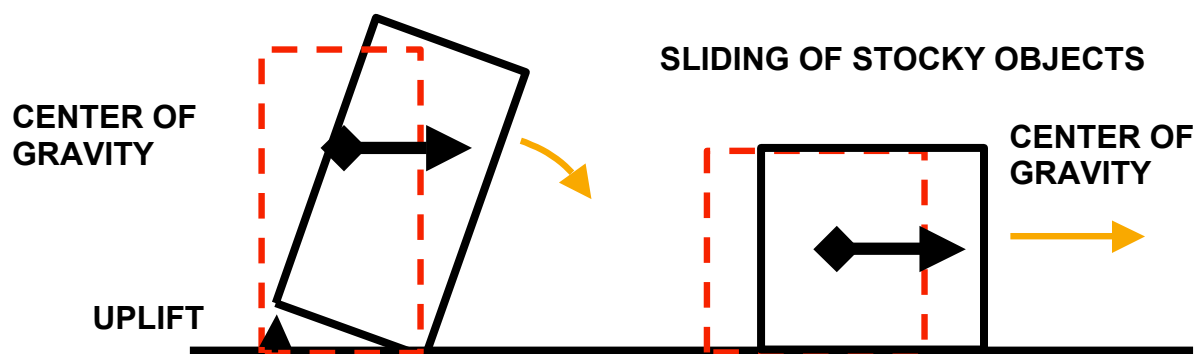


Figure 3

Building Distortion

During an earthquake, building structures distort, or bend, from side to side in response to the earthquake. For example, the top of a tall office tower may displace a few feet in each direction during an earthquake. The displacement over the height of each story, known as the story drift, might range from $\frac{1}{4}$ inch to several inches, depending on the size of the earthquake and the characteristics of the particular building structure. Windows, partitions, and other items that are tightly locked into the structure are forced to go along for the ride. As the columns or walls distort and become slightly out of square, any tightly confined windows or partitions must also distort the same amount. The more space there is around a pane of glass where it is mounted between stops or molding strips, the more distortion the glazing assembly can accommodate before the glass itself resists the distortion. Brittle materials like glass, plaster or drywall partitions, and masonry infill or veneer cannot tolerate any significant distortion and will crack when the perimeter gaps close and the building structure pushes directly on the brittle elements. Most architectural components, such as glass panes, partitions, and veneer, are damaged because of this type of building distortion, not because they themselves are shaken or damaged by inertial forces.

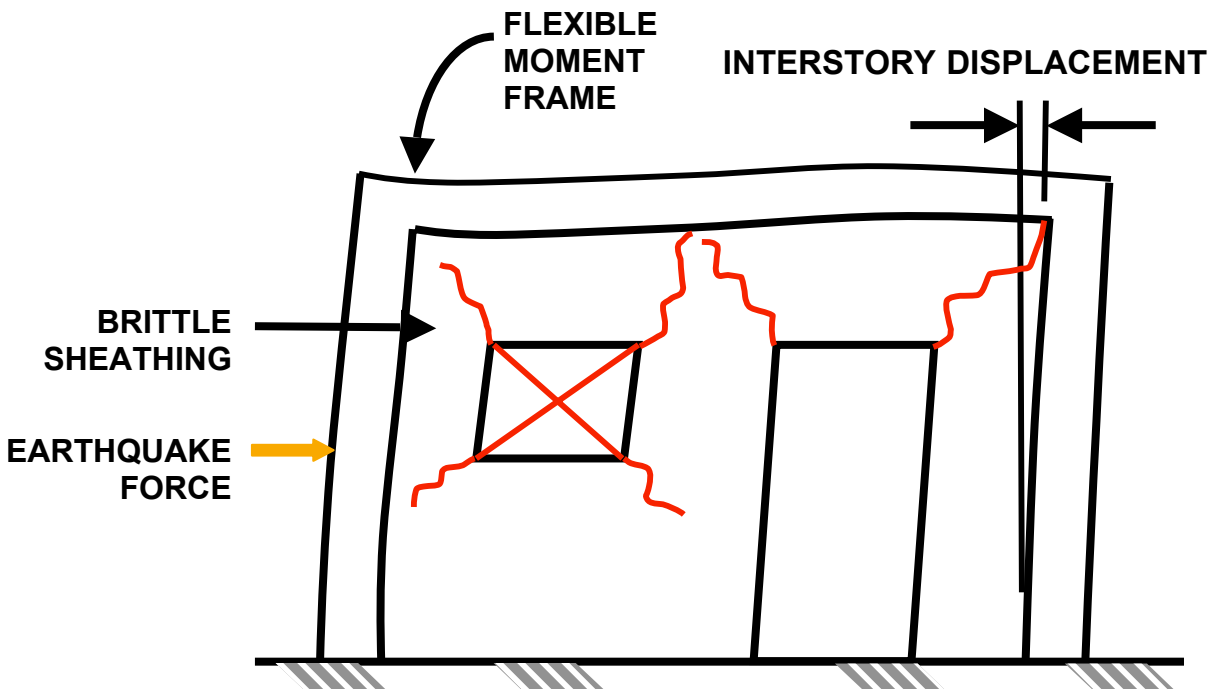


Figure 4

There have also been notable cases of structural-nonstructural interaction in past earthquakes, where rigid nonstructural components have been the cause of structural damage leading to collapse. These cases have generally involved rigid, strong architectural components, such as masonry infill or concrete spandrels that inhibit the movement or distortion of the structural framing and cause premature failure of column or beam elements. While this is a serious concern for structural designers, the focus of this guide is on earthquake damage to nonstructural components.

Building Separations

Another source of nonstructural damage involves pounding. A separation between two different buildings, often two wings of the same facility, which allows the buildings structures to move independently of one another. In order to provide functional continuity between separate wings, building utilities must often extend across these building separations, and architectural finishes must be detailed to terminate on either side. The separation may be only an inch or two in older construction or as much as a foot in some newer buildings, depending on the expected horizontal movement, or seismic drift. Flashing, piping, fire sprinkler lines, HVAC ducts, partitions, and flooring all have to be detailed to accommodate the movement expected at these locations when the two structures move closer together or further apart. Earthquake damage to items crossing these separations is common. If the size of the separation is insufficient, pounding between adjacent structures may result in damage to structural components but more often causes damage to nonstructural components, such as parapets, veneer, or cornices on the facades of older buildings.

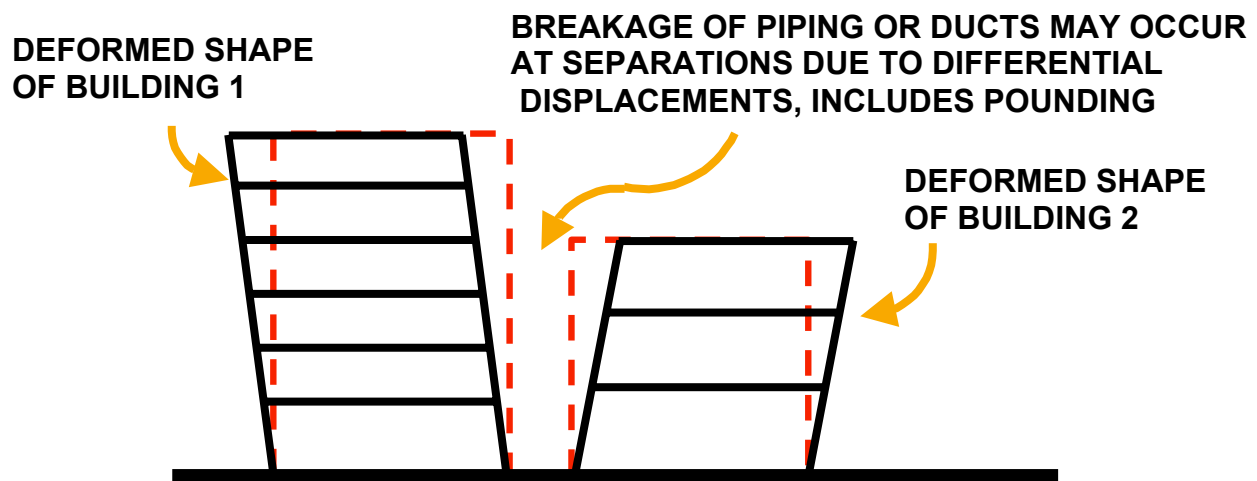


Figure 5

Earthquake Damage Effects

Nonstructural elements are more vulnerable to earthquake damage than is the structural framing of the building. There are several reasons for this, most notably the lack of earthquake design and construction of nonstructural elements. As a result, even light to moderate earthquake shaking can cause damage to nonstructural elements and this damage may result in life safety hazards, loss of function of the nonstructural elements, and monetary loss due to the damage. Cost of repair and disruption due to earthquake damage to nonstructural elements often exceeds the structural repair costs. Typical examples of nonstructural damage include:

- Brick chimneys and parapets falling away from the building
- Ceiling tiles and light fixtures falling
- Exterior glass windows cracking
- Spilling contents of shelves
- Breakage and leakage of pipes, including sprinkler pipes, gas pipes, water pipes and sewerage
- Building utility equipment sliding off of their supports or overturning

Chapter 3 - Nonstructural Inventory Process

Planning

A survey of a facility will identify nonstructural components that may be vulnerable to earthquake damage. As a first step in the inventory process, it may be useful to prepare a plan of action for conducting the survey is prepared. The following describes some of the steps in the process.

Identify areas to be surveyed

The nonstructural inventory program should have a clearly defined scope. The specific buildings and areas of buildings that will be surveyed should be identified prior to beginning the survey. Some buildings or areas of buildings may not be included in a survey if they are scheduled for replacement or remodeling or have been recently remodeled or built and the nonstructural hazards have been addressed. If the survey will be implemented in phases, it may be necessary to identify areas of high priority.

Establish evaluation criteria

The goal of a nonstructural inventory program is to identify the risks associated with existing nonstructural elements. In establishing criteria for evaluation, a number of factors should be considered:

- What is the earthquake hazard?
- What types of nonstructural seismic risks will be surveyed?
- What is the realistic expectation of seismic performance of nonstructural elements?
- How detailed should the survey be?
- How will a program for risk reduction be implemented?

In considering the realistic performance of nonstructural elements, it is important to define the desired levels of performance. There are six levels or ranges of nonstructural performance that have been described in seismic evaluation guidelines, as shown in the shaded box. These have been presented in order of increasing performance; Not Considered is the lowest performance and Operational is the best performance.

Nonstructural Performance Levels

- Not Considered
- Hazards Reduced
- Life Safety
- Damage Control
- Immediate Occupancy
- Operational

Life Safety performance is selected for most buildings. For Life Safety Performance, nonstructural elements are expected to remain in place and not fall resulting in serious injuries to occupants. Buildings whose functions are critical or important, such as hospitals and fire stations, need their nonstructural elements designed to achieve a higher level of performance. Many of these elements need to be functioning immediately after an earthquake, referred to as Immediate Occupancy Performance, or need to continue functioning even during an earthquake, Operational Performance. For higher performance levels, it is important to not only assure that the nonstructural elements remain in place, but that piping, ductwork, and cabling remain unbroken; equipment is rugged enough to sustain shaking; and utilities continue to function either with municipal services or backup services.

Identify and train personnel

Implementing a program for surveying nonstructural elements requires personnel that can commit the time required and who are familiar with building construction and seismic hazards. Often, this work is accomplished by maintenance personnel who are familiar with the buildings and systems. These people should receive training on the identification of nonstructural seismic hazards prior to implementing a program. A consultant specializing in nonstructural earthquake protection programs may be hired to help train your personnel and develop your survey program.

Prepare survey forms

Record keeping is an essential part of a successful program of nonstructural earthquake risk mitigation. The information obtained from the nonstructural survey should be recorded so that an accurate assessment of the seismic vulnerability can be made and the effort required to implement a mitigation plan is reduced. The essential data from the survey should be recorded in a uniform format.

Figure 6 shows an example of a survey format that can be used to record nonstructural data. Other forms can also be used, as-is or modified, or developed depending on your needs and building occupancy. The important information that should be included is:

- Identification of the building
- The inspector and date of the survey
- A description of the nonstructural element and the quantity
- The location of the nonstructural element in the building
- A description of the existing lateral bracing or anchorage

Assess the Attachment to the Structure

During the survey, the inspector should carefully examine each nonstructural element to assess how it is anchored or braced to the ground or structural framing to resist lateral forces. Friction due to the weight of an element should not be considered as a reliable means to resist lateral earthquake forces.

Record Information

The data on each nonstructural element should be recorded on the survey form. Care should be taken to fill out the form completely and accurately. Photographs or sketches of the nonstructural elements can be used to document the condition of the bracing and serve as a helpful reminder of the items surveyed.

Identify Patterns and Similarities

When conducting the survey, some types of elements or bracing details may occur repeatedly. The inspector should look for patterns and similarities in the bracing of these elements as well as changes or differences in the pattern. Differences may be due to incorrect installation, changes in structural framing used for bracing, or details of different vendors or age of installation.

Categorize Results

Following the walkthrough, the results of the nonstructural survey should be reviewed and categorized by importance, function, etc. prior to implementing a mitigation program.

Identify Performance Requirements

In the evaluation of the results of the survey, there needs to be an understanding of the performance requirements for various nonstructural components. Not all nonstructural elements need to have the same performance. The seismic performance goal for each nonstructural element should be identified based on its importance and seismic risk.

Determine Need for Engineering Design

Once the survey results have been compiled, the nonstructural elements can be grouped into several categories, such as type of nonstructural element, importance, and presence of existing restraint or anchorage. For those elements that do not appear to have adequate restraint or anchorage, retrofitting may be recommended. Some of the elements requiring restraint or anchorage can have the anchorage designed and installed without the need of an engineer, while other elements will need to have the mitigation designed by an engineer. This manual provides some recommendations for design responsibility for typical nonstructural elements. Those elements that are considered critical and elements in critical facilities may need to be evaluated by an engineer to verify that the existing bracing is adequate. Elements that are not described in this guide may also need to be evaluated by an engineer, particularly if the element is heavy or could cause injury if damaged due to earthquake shaking.

The nonstructural items in the survey can then be classified as either:

- Restraint appears to be adequate
- Restraint inadequate and can be retrofit without an engineer
- Restraint inadequate and mitigation should be designed by an engineer

Compare Benefit/Cost Ratio

For the nonstructural elements that are categorized as requiring bracing or anchorage, preliminary retrofit schemes can be prepared using the examples in this field manual and other available documents. Costs for the retrofits can be estimated. The cost for simple retrofit designs can be estimated based on knowledge of construction costs and an estimate of the time that may be required to install the retrofit. Nonstructural elements that require complex or specialized retrofit design or construction may need to be estimated by a contractor or engineer experienced with the elements.

For each nonstructural element being considered for mitigation, the benefit can be estimated in terms of repair cost or reduced disruption if damaged by an earthquake. The monetary benefit for bracing of some nonstructural elements may be easy to estimate based on expected cost to repair or replace. For other elements, the consequence of damage may be more difficult to quantify, because they may cause personal injury, result in fires or flooding, or damage financial or medical records or inventory.

The estimated cost of retrofit can then be compared to the estimated benefit of the retrofit. For some elements, the benefit of retrofitting may obviously outweigh the costs. However, for some elements, the cost of retrofitting may be large compared to the benefit. The benefit versus cost comparison can be used to assess whether retrofitting is reasonable and can be used for prioritizing retrofits. For those items that could pose a significant life safety risk in the event of an earthquake, mitigation should be implemented to reduce the life safety hazard, without regard to the benefit/cost ratio.

Prioritize

After deciding that retrofitting of some nonstructural elements are needed to achieve the desired earthquake performance for the building, it may be necessary to prioritize the retrofitting.

Prioritization could be done for a number of reasons:

- Budget constraints limit the amount of money that can be allocated
- Safety considerations suggest that those elements that pose the greatest risk to safety be retrofitted first
- Future construction presents opportunities for retrofitting in certain areas
- To achieve the best benefit: cost

Implement Retrofit Program

There are a number of different methods that can be used to implement the desired mitigation of nonstructural elements depending on the type of elements, the complexity of the required mitigation, and the availability of personnel. The implementation of the mitigation consists of design and execution.

Design Methods

The three methods that can be used for designing mitigation for nonstructural elements are described below. Next to each design method is a **graphic symbol** to indicate whether that type of design method can be implemented without an engineer.

Non-Engineered design relies on mitigation details that do not require engineering design to determine the requirements. Some examples of types of nonstructural mitigation that can be designed without an engineer are:



- Restraints for tenant-supplied equipment
- Restraints for cabinet doors and drawers
- Restraints for the contents of shelves

For these types of elements, typical methods of restraint are usually sufficient to provide adequate mitigation. The earthquake forces on these elements are generally small compared to the strength of the restraint methods that are usually recommended. However, there are limitations to the use of non-engineered mitigation:

- This method should only be used for elements that are relatively lightweight
- Non-engineered restraints should not be used for elements that are considered critical, such as emergency power systems, or for large inventories of hazardous materials
- Non-engineered restraints should not be used in critical facilities, such as hospitals

Prescriptive Design relies on standard methods that have been developed for use in mitigating specific types of nonstructural elements. For each of these types of elements, standard restraint details have been developed and can be implemented without the need for an engineer. Reference guidelines for nonstructural seismic restraints, such as FEMA 74, include details for these types of elements. Examples of elements that can be mitigated by prescriptive methods are:



- Water heaters, up to 100 gallons capacity
- Suspended acoustic ceilings, up to 4 pounds per square foot in weight

While the underlying design of the prescriptive methods has been reviewed by experienced engineers, use of these procedures relies on the ability of the person specifying and implementing these procedures to verify that the procedures are appropriate for the situation.

Engineering Design, as the name implies, requires design by an engineer. All other types of nonstructural elements, the mitigation should be designed by an engineer experienced in seismic design of nonstructural elements. The engineer will use building codes and guidelines to determine the requirements for supporting, considering the earthquake forces, the structural capacities of the restraint and structural framing. For critical facilities, it is important that mitigation details for all of the nonstructural elements be designed, or at least reviewed by an engineer to verify the appropriateness.



The engineer will need certain information to be able to design the mitigation:

- Access to the nonstructural elements to assess the condition and be able to determine the mitigation options
- Access to structural and architectural drawings for the building and vendor information for the elements to be able to accurately assess the weight, strength, and stiffness of the nonstructural elements and the structural elements to which they will be mitigated
- A description of the intended performance goals for each of the elements to be mitigated
- Notification of any constraints that may affect the design, such as locations that may affect operations of the facility

Implementation

The final step in the process is to implement the seismic retrofit of the nonstructural elements. The retrofit can be accomplished by either the maintenance staff of the building, a contractor, or by a combination of the two. Whoever implements the retrofit should be aware of the limitations and restrictions that may be imposed by the occupants.

The contractor or maintenance staff should also take care to follow the specified drawings and construction details. When conflicts arise due to existing conditions, the contractor or maintenance staff should request assistance or clarification from an engineer or other responsible party to verify that the intent of the retrofit is not compromised.

Other considerations in the implementation process are described below:

- **Prepare Timelines and Goals** if the project is being phased over time. This provides incentives and encouragement to complete the project in a reasonable period of time.
- **Look for Opportunities for Incremental Retrofits** where opportunities to retrofit certain areas or types of nonstructural elements. Future construction or remodeling may allow for retrofitting certain areas of a building. Replacement of building utilities may also provide an opportunity to retrofit the equipment and distribution systems associated with the building utilities.
- **Coordinate the Work with the Occupants** to avoid unnecessary disruption. The occupants of an area may also be able to provide information on retrofit opportunities.
- **The Interaction Between the Building and the Nonstructural Components** needs to be considered. The nonstructural components and their bracing should not interfere with the movement of the building during an earthquake.

Chapter 4 - Architectural Nonstructural Elements

Characteristics of Architectural Elements

Architectural elements are typically built-in elements that form part of the building. Most architectural elements are not intended to be load-bearing structural elements, but are usually attached to the structural framing. Typically architectural elements are visible to occupants. Often they are non-permanent (i.e. they can be moved or removed). Examples of nonpermanent architectural elements are partitions and ceilings, which are often moved or relocated to meet the needs of the tenants. Architectural elements can pose a safety hazard to occupants and the public if the element falls or becomes dislodged during an earthquake.

Architectural elements are often designed by architect. However, sometimes they can be designed by a specialty engineer, manufacturer, or structural engineer. For example, exterior façade panels are often designed by a manufacturer or an engineer that specializes in façade panel design.

Categories of Architectural Elements

The following are categories and types of architectural nonstructural elements that are present in most buildings.

- Partitions
- Ceilings and Soffits
 - Suspended Acoustic
 - Concealed Spline
 - Gypsum Board
 - Lath and Plaster
- Computer access floors
- Windows and Glazing
- Permanent Ornamentation and Appendages
- Cladding
 - Brick or Stone Veneer
 - Glazing
 - Precast Walls
 - Infill Walls

Architectural Element Restraint Checklist and Examples

The following eight pages describe some typical architectural elements of a building. For each of the elements, there are a series of questions regarding the seismic anchorage. These questions are not intended to definitively assess the adequacy of the anchorage of the elements. The intention is to identify key areas of vulnerability that should be checked during a seismic survey.

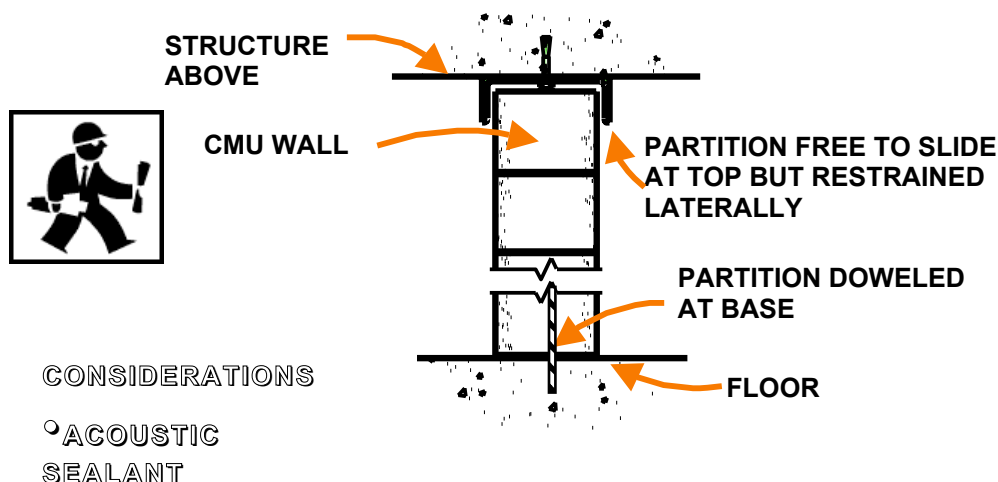
For several types of architectural elements, drawings have been provided to show typical retrofit measures that can be used to mitigate the seismic risk. These drawings are not intended to apply to all conditions, but are intended to provide an example of a type of retrofit that may be used. Next to each of the drawings is a graphic symbol to indicate whether the mitigation for this type of element should be designed by an engineer as described in the previous chapter. The mitigation methods shown depict generic details using standard hardware. Many manufacturers have developed products that can also be used in lieu of the generic details.

Partitions

These may include elements of many different materials and construction types:

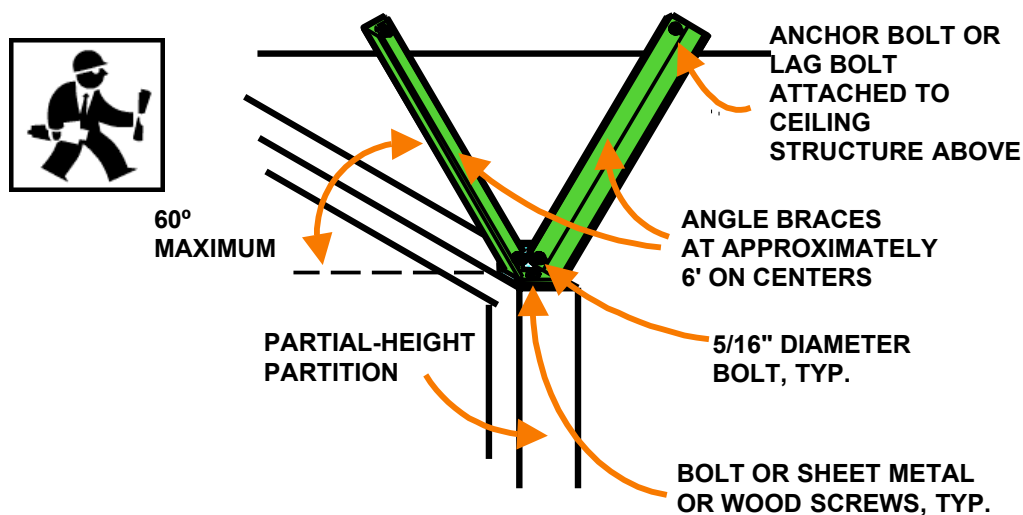
Permanent block wall partitions (concrete masonry unit, brick, hollow clay tile)

- ☐ Are block wall partitions reinforced? (Most brick or hollow clay tile walls in pre-1933 California buildings are unreinforced. In other geographic regions, unreinforced masonry elements may be found even in current construction.)
- ☐ Are the block wall partitions restrained at the top and bottom to resist out-of-plane forces?
- ☐ Are concrete masonry unit (CMU) partitions detailed to allow sliding at the top?



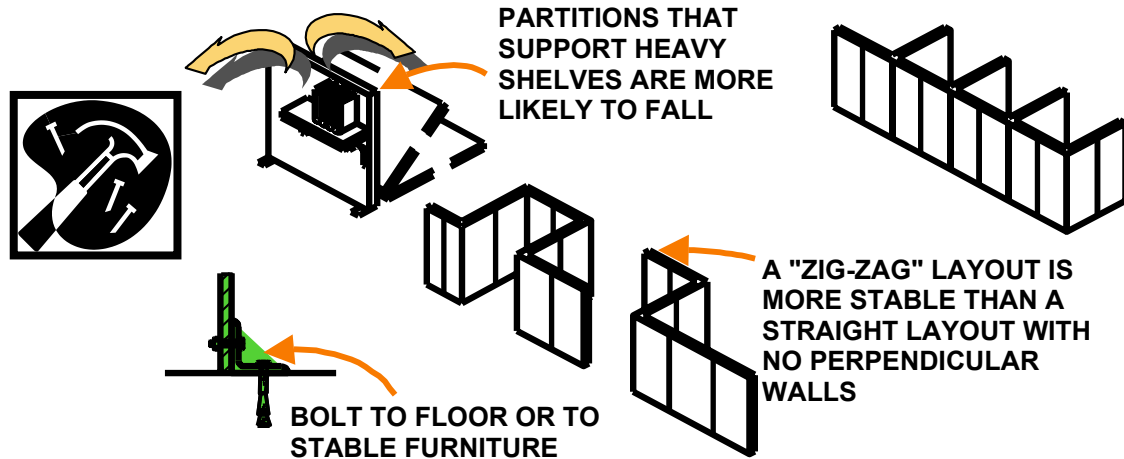
Partial-- and full--height stud wall partitions

- ☐ Are partial-height partitions attached to the structure above the ceiling line?
- ☐ If partitions function as lateral support for tall shelving or cabinets, are these partitions rigidly attached to the structure above the ceiling line?



Partial-height Prefabricated Partitions (Less than 6 feet tall)

- ☐ Are partial-height partitions attached to each other?
- ☐ Are partial-height partitions anchored to the floor?
- ☐ If tall shelving or cabinets are located next to the partitions, can these items be moved or independently anchored to the floor or structure?

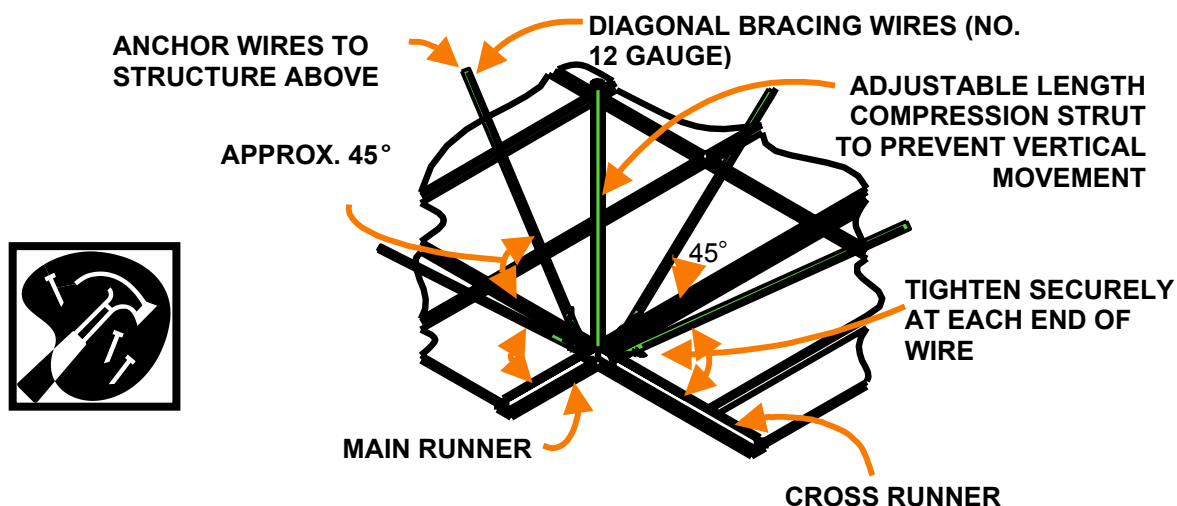


Ceilings and Soffits

These may include elements of many different materials and construction types:

Ceilings (acoustic tile, gypsumboard, plaster)

- ☐ Does the suspended ceiling have adequate diagonal bracing wires and compression struts?
- ☐ Are decorative ceiling panels and/or latticework securely attached?
- ☐ For plaster ceilings, is the wire mesh or wood lath securely attached to the structural framing above?
- ☐ Are partitions and lighting restrained independently and do not rely on the ceiling to provide lateral support?



PROVIDE 4-WAY DIAGONAL BRACING
AND COMPRESSION STRUT
APPROXIMATELY EVERY 4 FT EACH

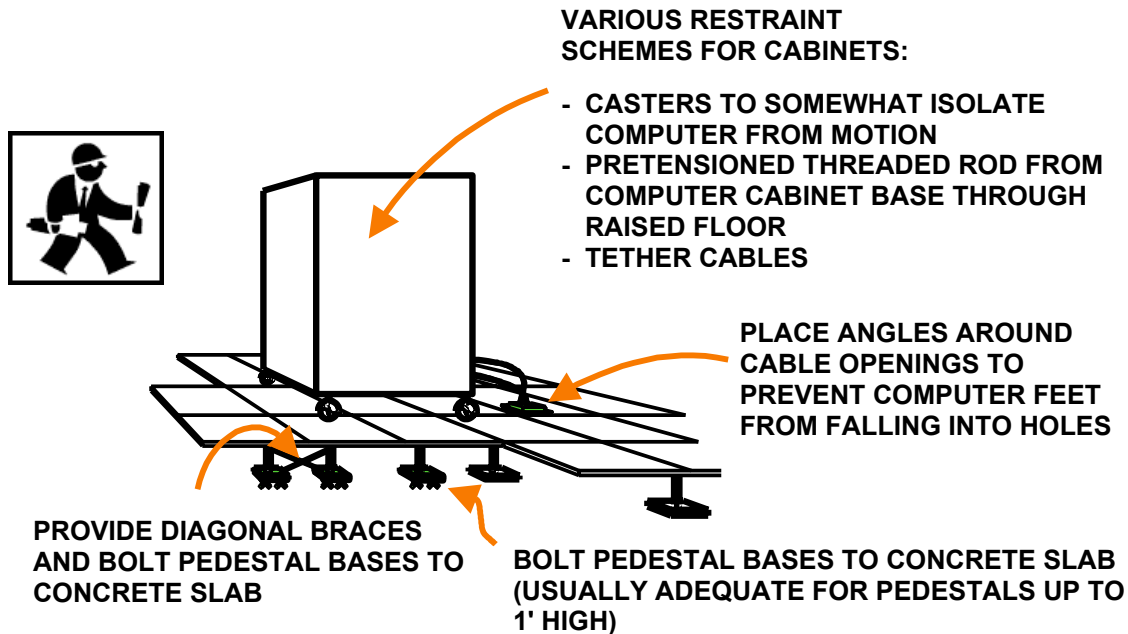
Soffits (stucco, gypsumboard, plaster)

- ☐ Are decorative finishes and/or latticework on beam soffits or beneath exterior eaves securely attached, particularly over exits?
- ☐ For stucco soffits, is the wire mesh or wood lath securely attached to the structural framing above?

Nonstructural Floors

Computer access floors

- ☐ Are computer access floors braced with diagonal steel members, or is it verified that the vertical pedestals are a seismically qualified model, installed in accordance with the manufacturer's recommendations?
- ☐ Do cable openings in the access floor have edge guards to prevent equipment legs from sliding into the openings?



Windows and Glazing

Glazing

- ☐ Is it known whether the glazing was designed by an architect/engineer to accommodate lateral movement?
- ☐ Do large windows, especially storefront windows, have safety glass?

Note: The term safety glass means tempered, laminated, or wired glass; glass covered with shatter-resistant film; or plastic panels.

Overhead glazing or skylights

- ☐ Are transoms (glass panes over doors) made of safety glass?
- ☐ Are skylights made of safety glass or covered with shatter-resistant film?
- ☐ Are large panes made of safety glass, or is it known whether the glazing assembly was designed by an architect/engineer to accommodate the expected seismic distortion of the surrounding structure?

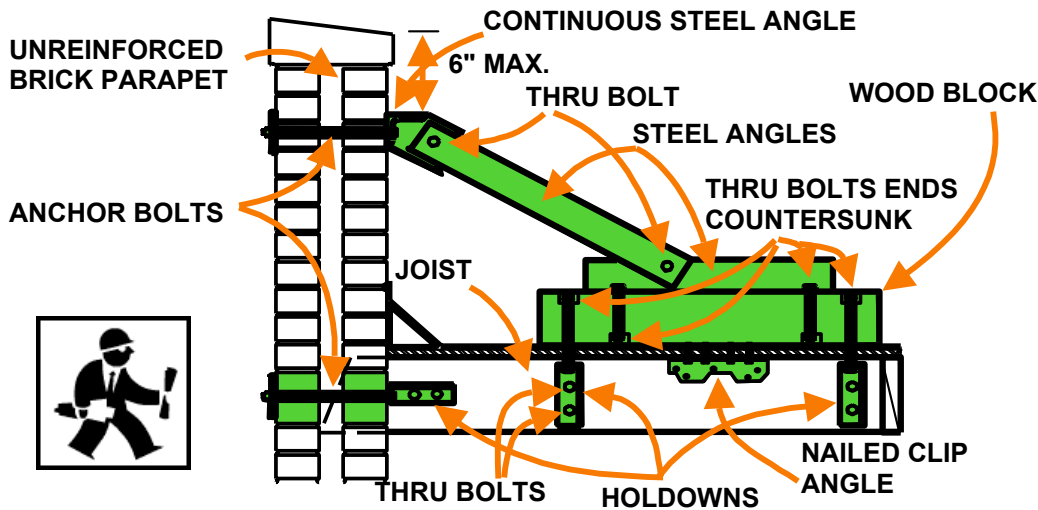
Interior glass or glass block partitions

- ☐ Are the glazed partitions laterally supported by the structure?

Permanent Ornamentation and Appendages: Exterior or Interior

Parapets, cornices, veneer or other decoration

- ☐ Are parapets or cornices reinforced and adequately supported laterally?
- ☐ Do other decorative elements have positive anchorage to the building?
- ☐ Does the veneer have positive anchorage to the building?



Exterior lighting

- ☐ Are exterior light fixtures properly supported or securely attached to the structure?

Tall sculptures (over about 5 feet)

- ☐ Are heavy or sharply pointed sculptures anchored to prevent overturning during an earthquake?
- ☐ Do hanging sculptures have a safety cable to prevent them from swinging excessively or falling?

Hanging appendages

- ☐ Are hanging appendages braced or secured with a safety cable?

Clay roof tiles

- ☐ Are clay roof tiles secured to the roof with one nail-and-wire connection per tile?

Freestanding walls or fences (concrete, CMU, brick, or stone)

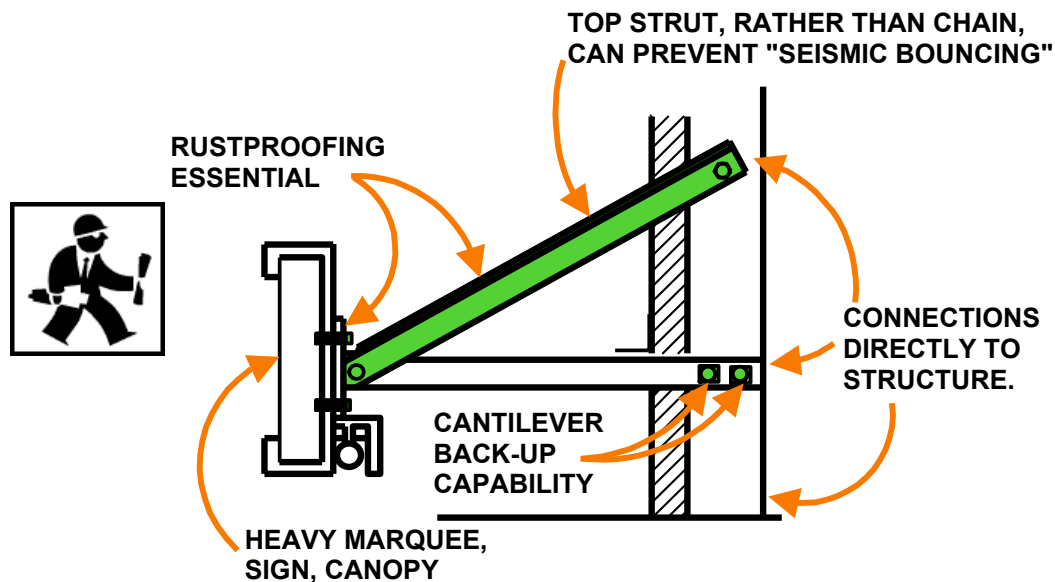
- ☐ Is it known whether freestanding walls or fences were designed by an architect/engineer to resist lateral forces?
- ☐ Are CMU walls adequately reinforced with vertical bars set in grout-filled cells and horizontal bars embedded in the mortar joints?
- ☐ Is it known whether CMU walls or fences were built with adequate foundations to prevent them from tipping over in an earthquake?

Flagpoles

- ☐ Are flagpoles securely attached to the structure?

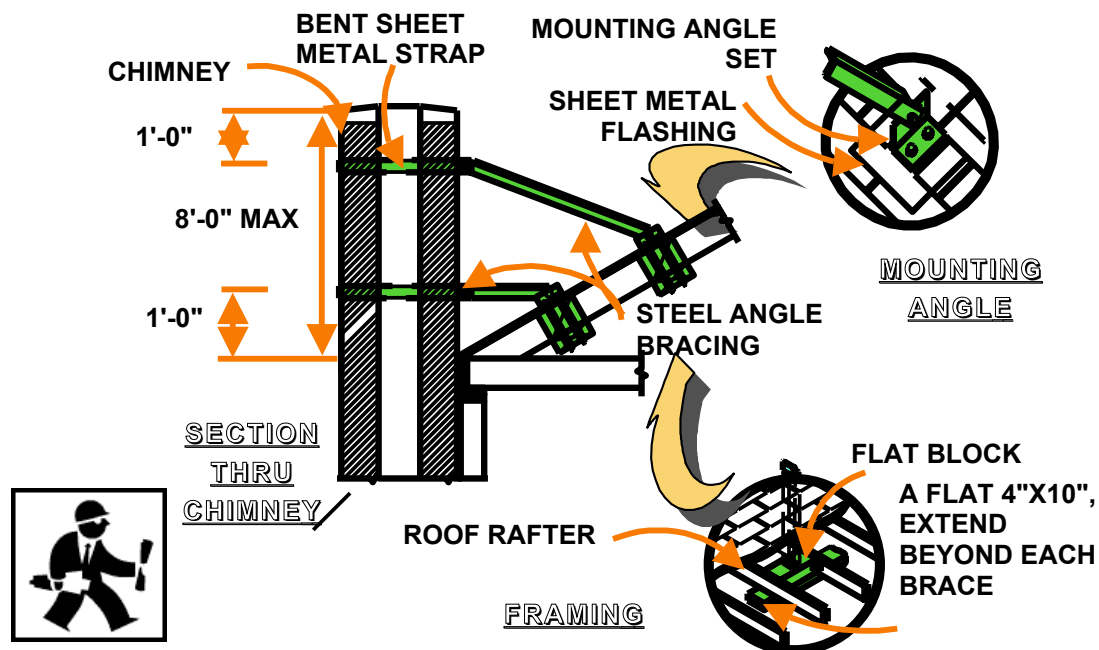
Heavy signs or exterior billboards

- ☐ Are exterior signs or billboards adequately supported laterally and anchored?
- ☐ Are interior signs securely attached with positive connections?



Small stacks or residential chimneys

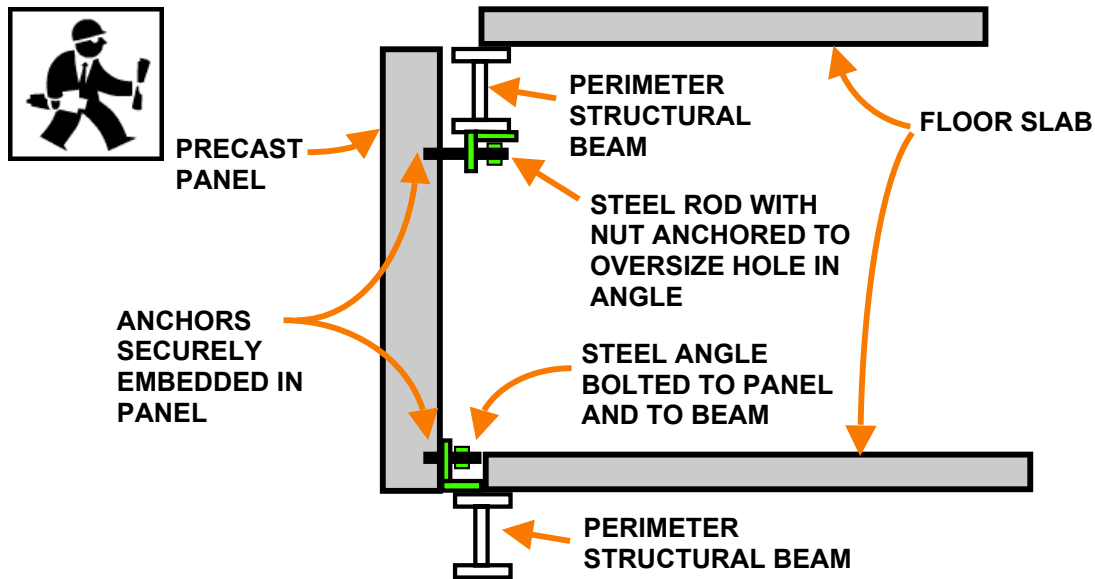
- ☐ Is the brick chimney restrained with braces to the roof near the top of the chimney?
- ☐ Is the brick chimney anchored near the roof line?
- ☐ Are stacks anchored to the supports or foundation by means of anchor bolts of adequate length and double nuts?



Cladding and Veneer

Prefabricated Cladding Panels

- ☐ Are prefabricated cladding panels detailed to allow relative movement between the panel and the structure?
- ☐ Are prefabricated panels supported for vertical loads with at least two connections per panel?
- ☐ Are prefabricated panels supported for out-of-plane loads with at least four connections per panel?



Masonry Veneer

- ☐ Is the masonry veneer supported by shelf angles or other elements at each floor?
- ☐ Is the masonry veneer connected to a structural back-up wall at adequate spacing?

Chapter 5 - Building Utility Nonstructural Elements

Characteristics of Building Utility Systems Elements

Building utility systems include a wide variety of elements including mechanical systems, electrical systems, plumbing, and communications. These elements can be either single elements, such as a tank or distributed systems, such as sprinkler piping. Usually these elements are attached to the structural framing and are often heavy elements. Typically the building utility systems are hidden from public view. As a result, they may not present an immediate hazard to the public due to falling, but failure of these systems in an earthquake will affect the functioning of the building.

The building utility systems element could have been designed by a mechanical or electrical engineer or mechanical or electrical contractor. Some elements, such as elevators, are designed by specialty engineers for the manufacturer.

Categories

The following are categories and types of building utility nonstructural elements that may be present in most buildings.

- Emergency power-generating equipment
- Electrical equipment and distribution
- Fire detection and suppression equipment
- Fuel tanks and distribution
- Heating, ventilation, air conditioning (HVAC) equipment and distribution systems
- Plumbing system (water, sewerage)
- Gas piping
- Mechanical appendages
- Lighting
- Communications equipment
- Elevators and escalators

Building Utility Elements Restraint Checklist and Examples

The following fifteen pages describe some typical building utility system elements of a building. For each of the elements, there are a series of questions regarding the seismic anchorage. These questions are not intended to definitively assess the adequacy of the anchorage of the elements. The intention is to identify key areas of vulnerability that should be checked during a seismic survey.

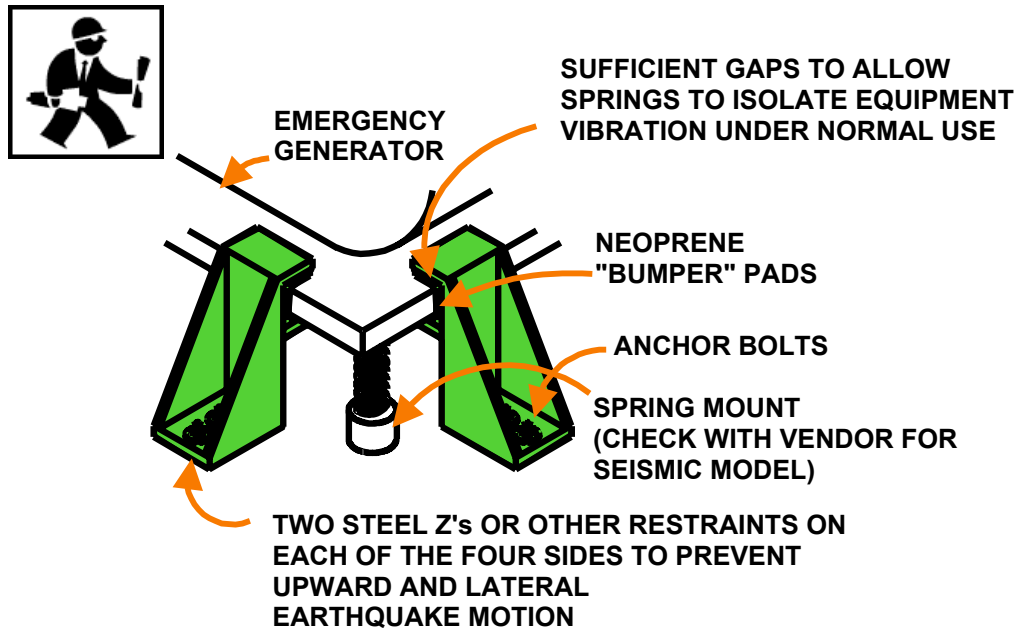
For several types of building utility system elements, drawings have been provided to show typical retrofit measures that can be used to mitigate the seismic risk. These drawings are not intended to apply to all conditions, but are intended to provide an example of a type of retrofit that may be used. Next to each of the drawings is a graphic symbol to indicate whether the mitigation for this type of element should be designed by an engineer as described in the previous chapter. The mitigation methods shown depict generic details using standard hardware. Many manufacturers produce earthquake retrofit products that can also be used in lieu of the generic details.

Emergency Power-Generating Equipment

Emergency power-generating equipment generally consists of the following components:

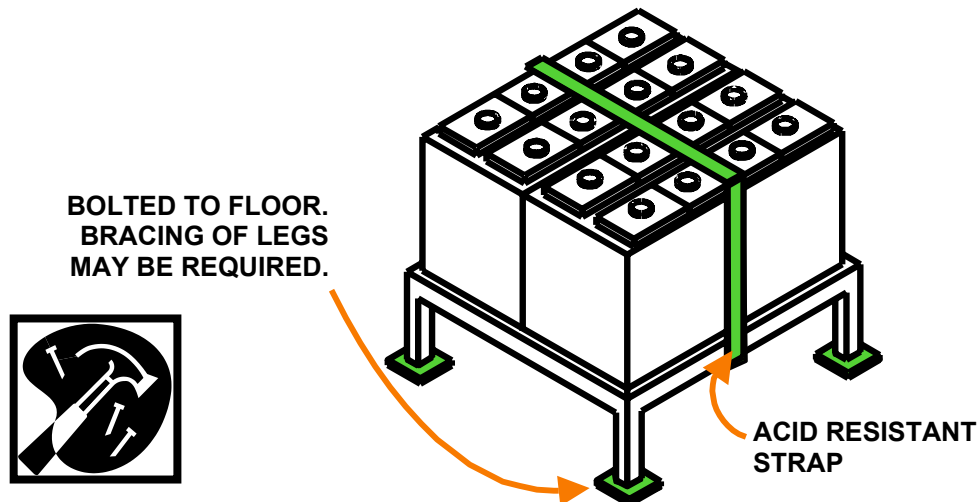
Generator

- ☐ Is the emergency generator adequately anchored, especially if mounted on motor vibration isolation springs?



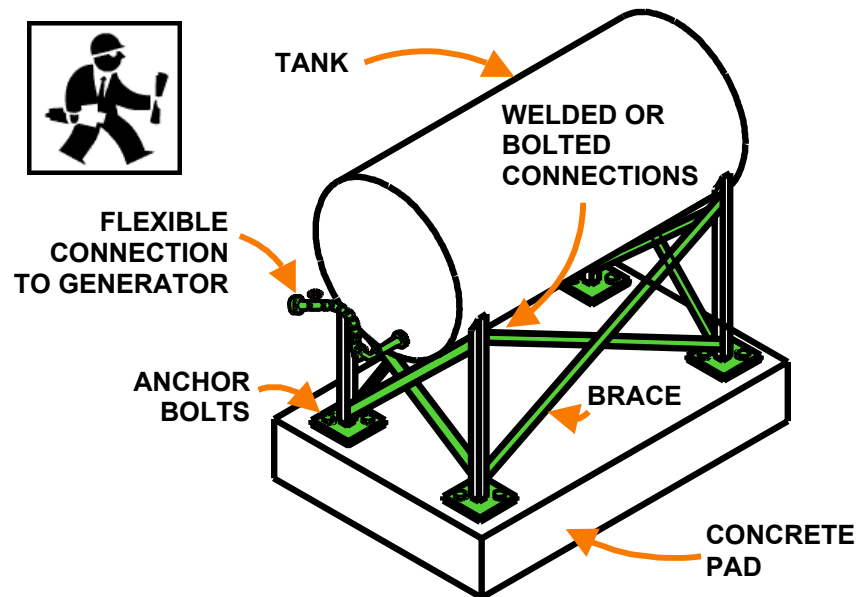
Batteries, battery rack

- ☐ Are the batteries securely attached to the battery rack?
- ☐ Is the battery rack cross-braced in both directions?
- ☐ Does the battery rack have anchor bolts secured to a concrete foundation pad?
- ☐ Is the foundation large enough to keep the rack from sliding or tipping?



Diesel fuel tank

- ☐ Is the tank securely attached to the supports?
- ☐ Are the tank supports laterally supported in both directions?
- ☐ Are the supports attached with anchor bolts to concrete walls or foundation pad?



- ☐ Is the foundation large enough to keep the tank from tipping over or sliding?
- ☐ Is the wall strong enough to support the tank?

Fuel line, cooling water lines, exhaust flues

- ☐ Are these lines attached with flexible connections that are able to accommodate relative movement at junctions to spring-mounted equipment, at building entry and exit points, and at expansion joints within the building?

Electrical Equipment and Distribution

The emergency power system includes both power-generating equipment and the electrical distribution system:

Transformers

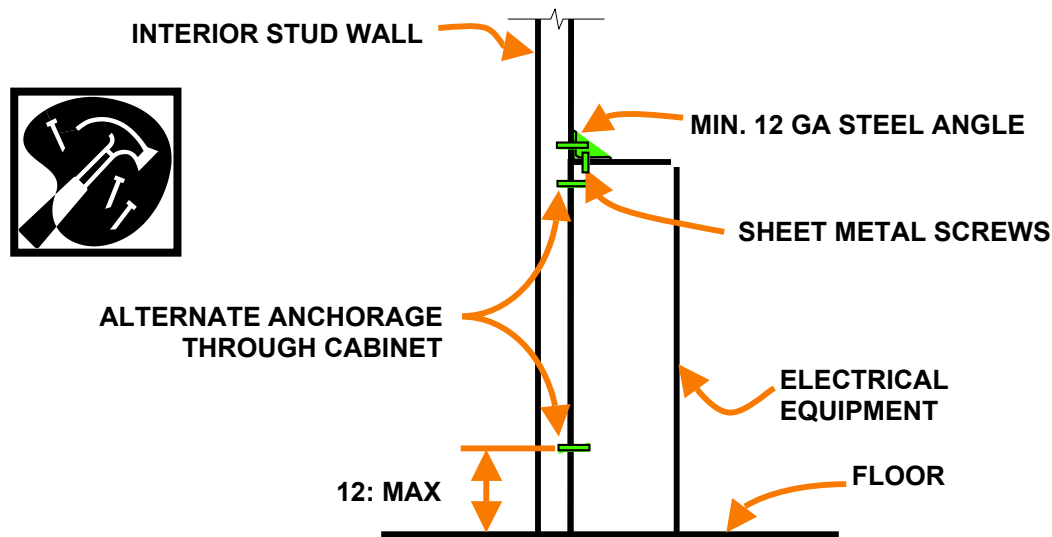
- ☐ Are transformers properly anchored to the floor or wall?

Motor Control Center (MCC)

- ☐ Are the motor control centers properly anchored to the floor or laterally supported by the wall?
- ☐ Does the wall have adequate strength to restrain the motor control center?

Electrical switchgear

- ☐ Is the switchgear properly anchored to the floor or supported by wall?
- ☐ Does the wall have adequate strength to restrain the switchgear?



Electrical bus ducts and primary cable system

- ☐ Are electrical cables or conduit able to distort at the connections with the equipment or where they cross seismic joints between buildings?
- ☐ Are the bus ducts or cable conduits laterally braced?

Caution: Only qualified personnel should open access panels on electrical equipment.

Fire Detection and Suppression System

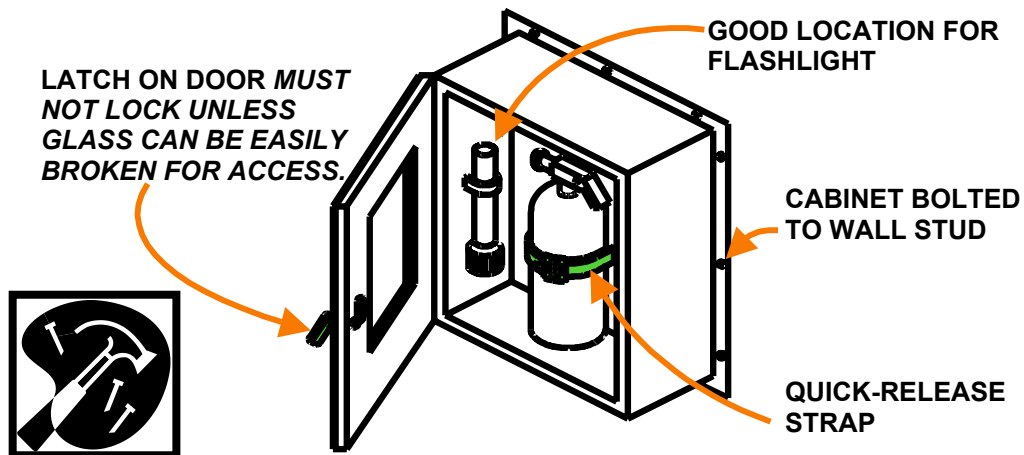
The fire detection and suppression system may include any or all of the following components:

Smoke detectors, fire alarm system, control system for automatic fire doors

- ☐ Are fire and smoke detectors properly mounted?
- ☐ Is the control equipment for the fire alarm system and automatic fire doors securely anchored?

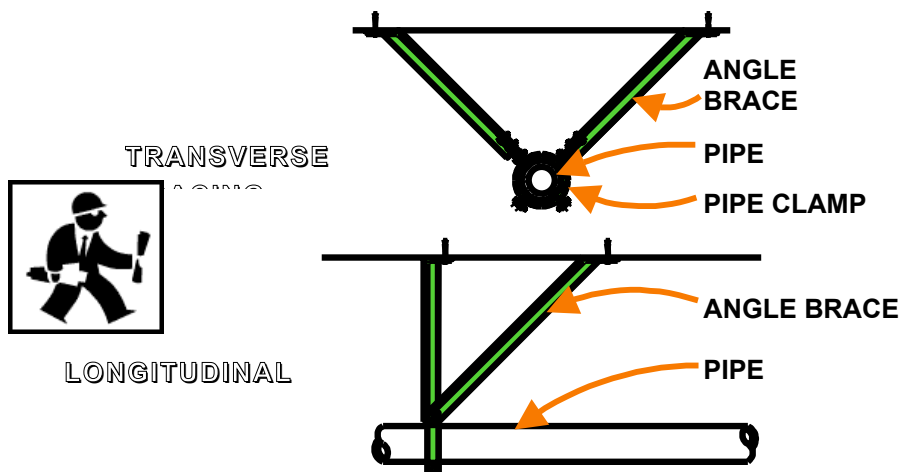
Fire extinguisher or fire hose cabinets

- ☐ Are the fire extinguisher cabinets and/or hose cabinets securely mounted?
- ☐ Are the fire extinguishers secured with quick-release straps?



Fire sprinklers and distribution lines

- ☐ Are the fire sprinkler piping components laterally restrained in each direction?
- ☐ Is the ceiling restrained so the ceilings won't break the sprinkler heads?
- ☐ Are the distribution lines able to accommodate movement where they cross between buildings?



Fire water pump

- ☐ Is the fire water pump anchored, or is it mounted on vibration isolation springs with additional seismic restraints?

Emergency water tank or reservoir

- ☐ Is the water tank or reservoir securely attached to its supports?
- ☐ Are the tank supports braced in both directions?
- ☐ Are the supports or braces properly anchored to the foundation?

Smoke control systems

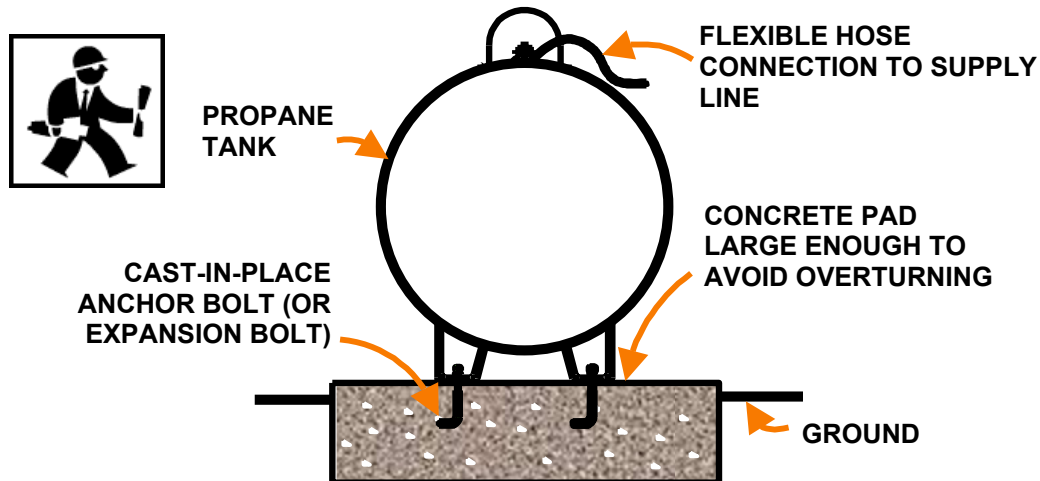
- ☐ Are the fans properly supported and/or anchored?
- ☐ Are fan control centers securely anchored?

Fuel Tanks and Distribution

Propane tanks may be used for backup power, heating, or cooking. These systems include:

Propane tank

- ☐ Is the tank securely anchored to the supports?
- ☐ Are the tanks laterally supported in both directions?
- ☐ Are the supports anchored to a concrete foundation pad?
- ☐ Is the foundation large enough to keep the tank from sliding or tipping over?

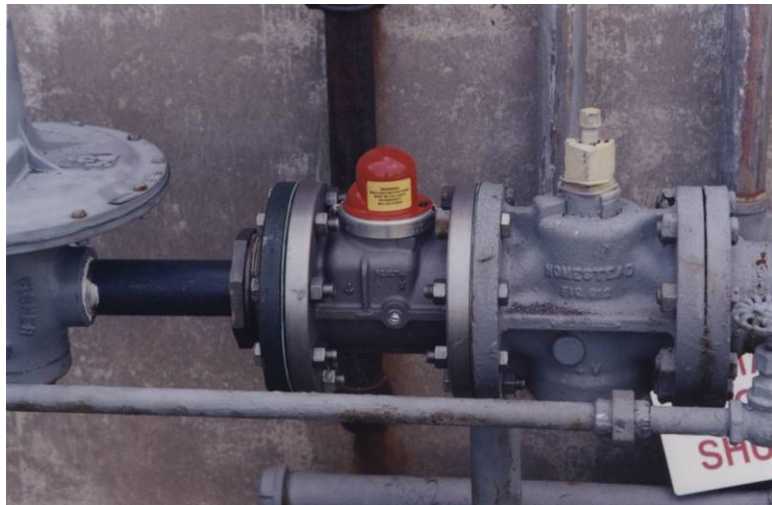


Shut-off valve

- ☐ Does the system have an automatic, earthquake-triggered shut-off valve?
- ☐ If the shut-off is manual, is a wrench stored within easy reach?

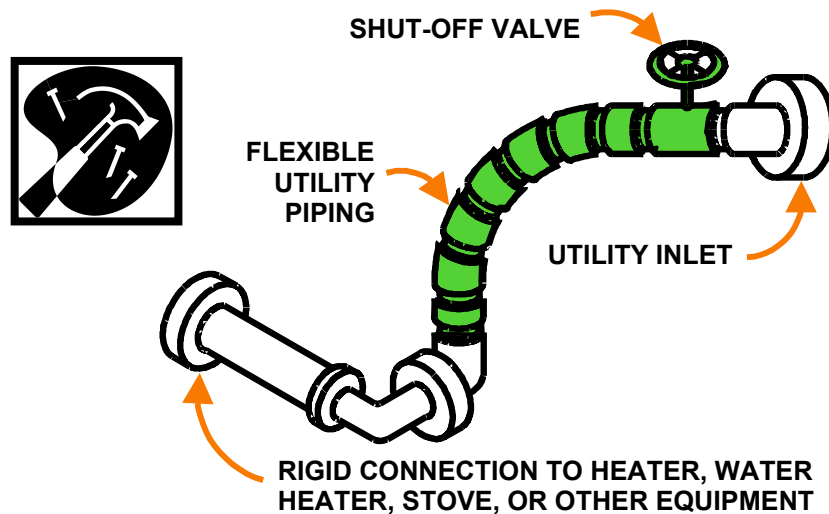


Caution: Only qualified personnel should make modifications to gas piping.



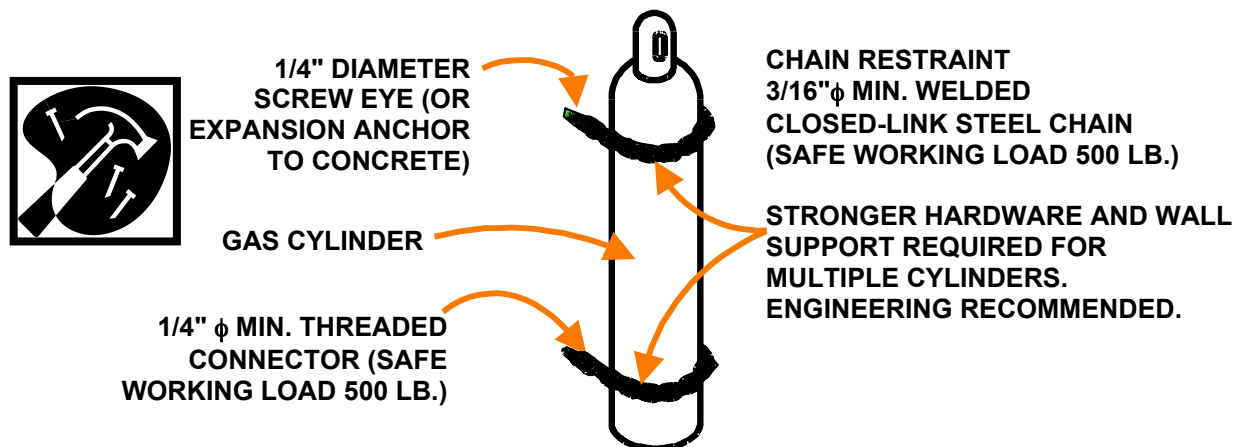
Gas or fuel supply pipe

- ☐ Are the supply pipes laterally restrained at reasonable intervals in each direction?
- ☐ Are the restraints securely attached to the structure?
- ☐ Do the pipes have flexible connections at the tank that are able to accommodate relative movement?



Compressed Gas Cylinders

- ☐ Are all gas cylinders tightly secured with a chain near the top and bottom or otherwise restrained from movement in each direction?
- ☐ Are the chains or restraints securely anchored to a wall or counter with screws or bolts rather than clamps?

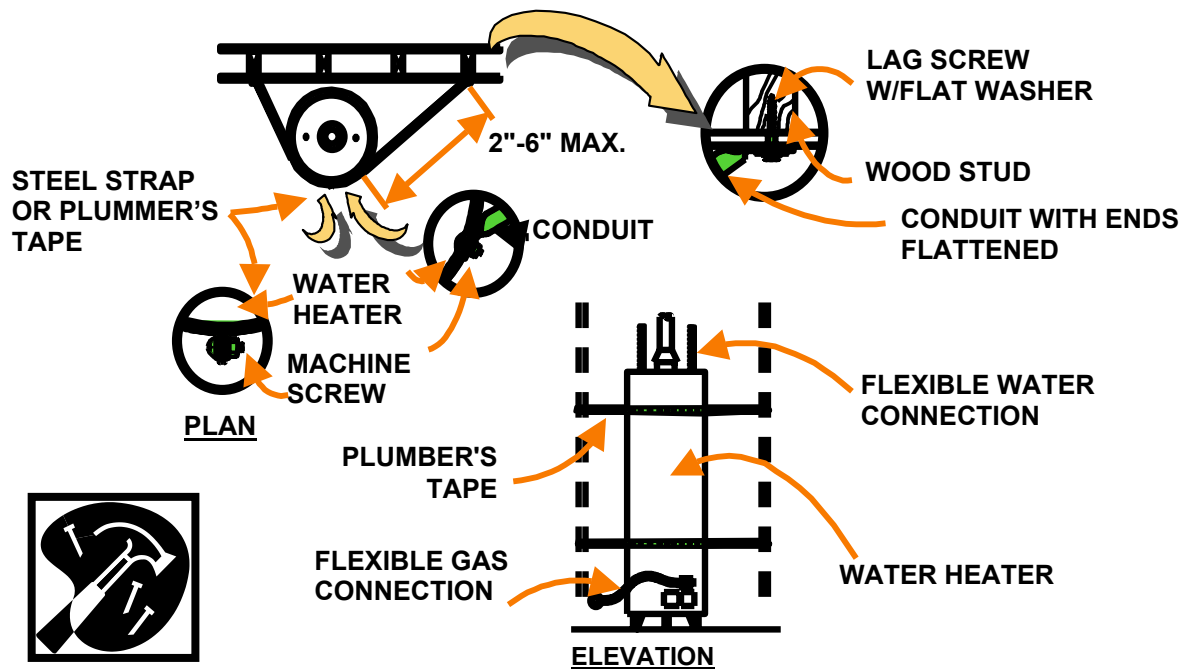


Plumbing System

The plumbing system may include:

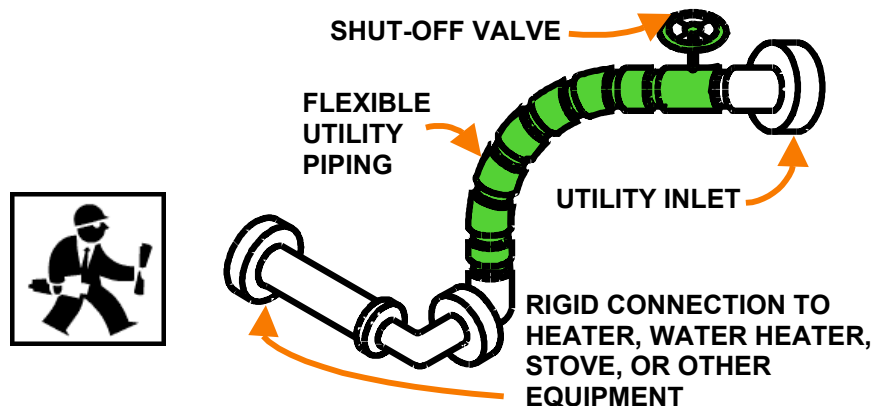
Residential water heater

- ☐ Are the water heaters securely anchored to the floor or wall?
- ☐ Does the gas line or electrical conduit have a flexible connection to the water heater that is able to accommodate movement?
- ☐ Does the water heater meet the limitations for use of prescriptive restraints:
 - Capacity < 100 gallons
 - Structural wall within 12 inches?
- ☐ Does the wall have adequate strength to restrain the water heater?



Commercial gas-fired water heater or boiler

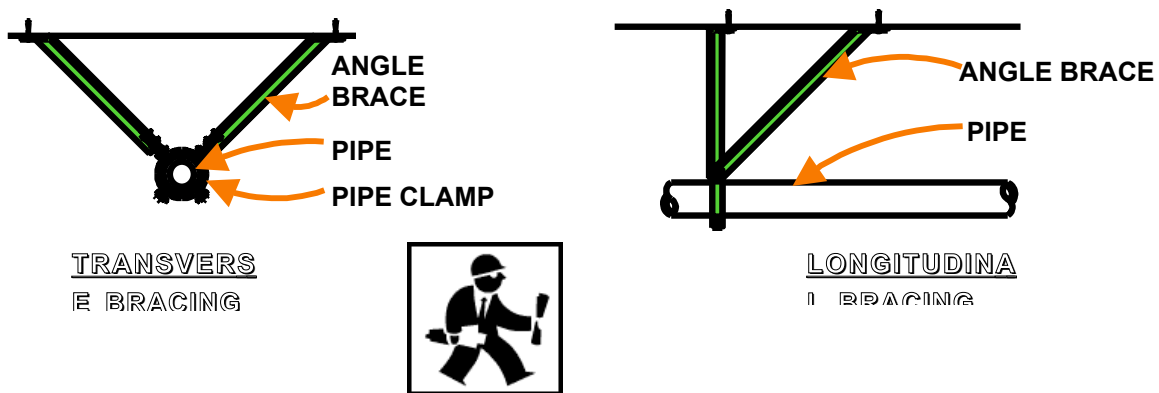
- ☐ Are the large commercial water heaters or boilers securely anchored to the floor or wall?
- ☐ Are housekeeping pads under boilers anchored to the floor slab?
- ☐ Does the gas line have a flexible connection to the water heater or boiler that is able to accommodate movement?



Hot and cold water pipes, hot water return, wastewater pipes

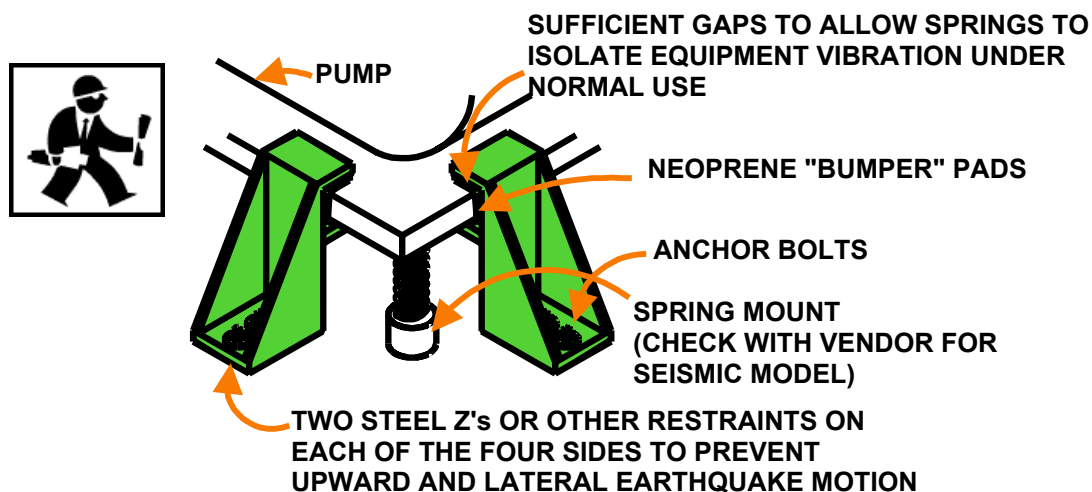
- ☐ Are the pipes laterally restrained at reasonable intervals in each direction?
- ☐ Are the restraints securely attached to the structure?
- ☐ Do the pipes have flexible connections to boilers or tanks that are able to accommodate movement?
- ☐ Are the distribution lines able to accommodate movement where they cross seismic joints between buildings?
- ☐ Are pipe penetrations through structural walls or framing members large enough to allow for some seismic movement?
- ☐ Are the pipes free of asbestos insulation that could be damaged by movement in an earthquake?
- ☐ Will asbestos abatement be required before any retrofit work?
- ☐ Are risers (vertical runs of piping) laterally restrained at each floor level?

ATTACH SECURELY TO STRUCTURE ABOVE



Distribution pumps

- ☐ Are the distribution pumps anchored, or are they mounted on vibration isolation springs with additional seismic lateral restraints?



Solar panels

- ☐ Are the solar panels securely anchored to the roof?

☐ Is the piping laterally restrained?

Heating, Ventilating, and Air Conditioning (HVAC) System

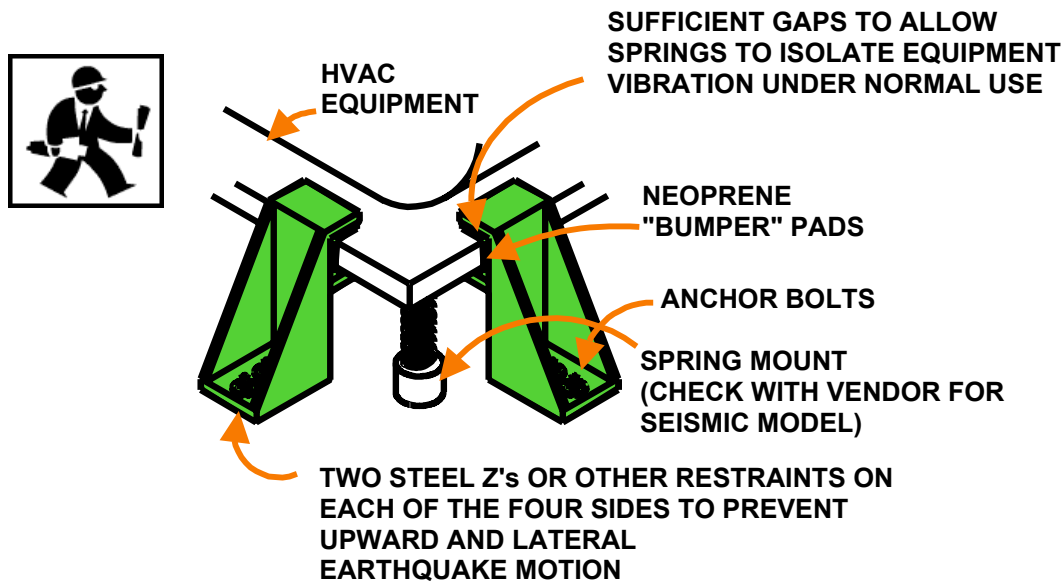
The HVAC system may include any or all of the following components, depending on the size of the facility:

Boilers and furnaces

- ☐ Are boilers and furnaces securely anchored with adequately sized bolts?
- ☐ Are furnaces, and furnace or boiler bases, constructed without using unreinforced masonry?

Chillers

- ☐ Are chillers securely anchored, or are they mounted on vibration isolation springs with added seismic restraints?



Heat pumps or heat exchangers

- ☐ Are pumps or heat exchangers anchored, or are they mounted on vibration isolation springs with added seismic restraints?

Fans, blowers, filters

- ☐ Are fans, blowers, and filters securely anchored, or are they mounted on vibration isolation springs with added seismic restraints?

Air compressors

- ☐ Are air compressors anchored, or are they mounted on vibration isolation springs with added seismic restraints?

Roof-mounted HVAC units

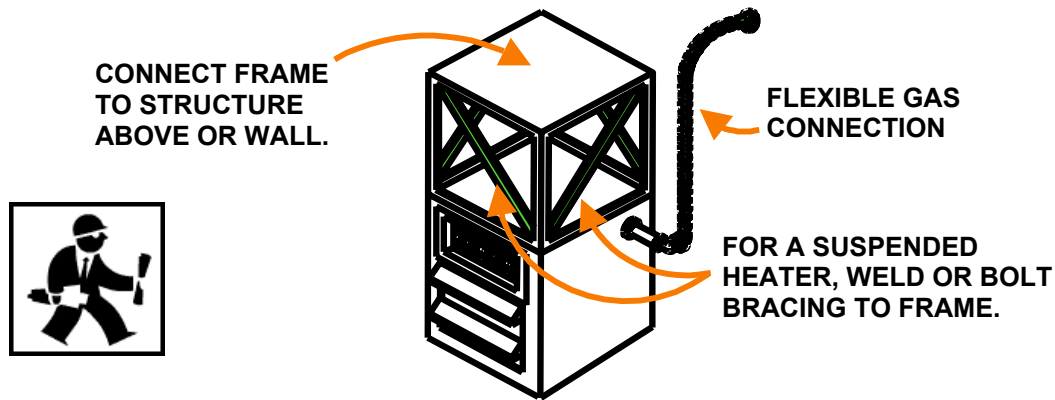
- ☐ Are the HVAC units securely anchored, or are they mounted on vibration-limiting springs with added seismic restraints?
- ☐ Are the curbs supporting the spring isolators securely attached to the structural roof framing?

Wall-mounted room air conditioning units

- ☐ Are the air conditioning units securely mounted to the wall or shelf?

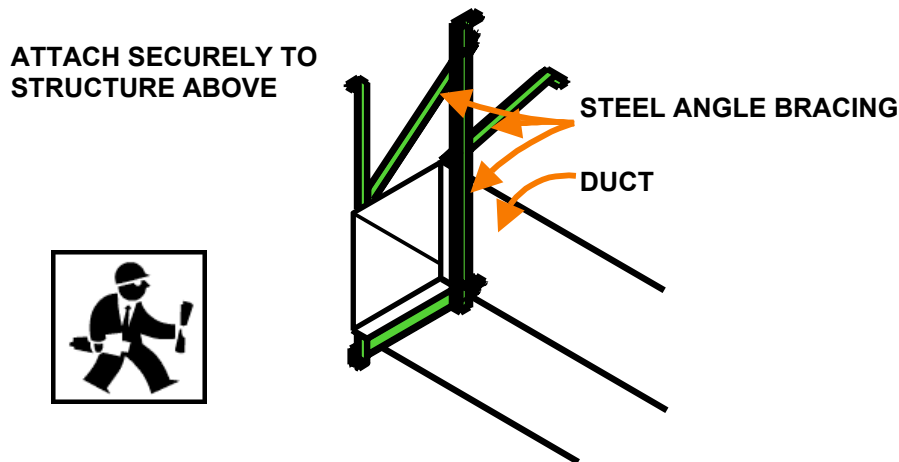
Suspended room heaters

- ☐ Are the suspended room heaters, especially gas-fired ones, laterally supported?
- ☐ Are gas-fired heaters fitted with flexible gas connections?



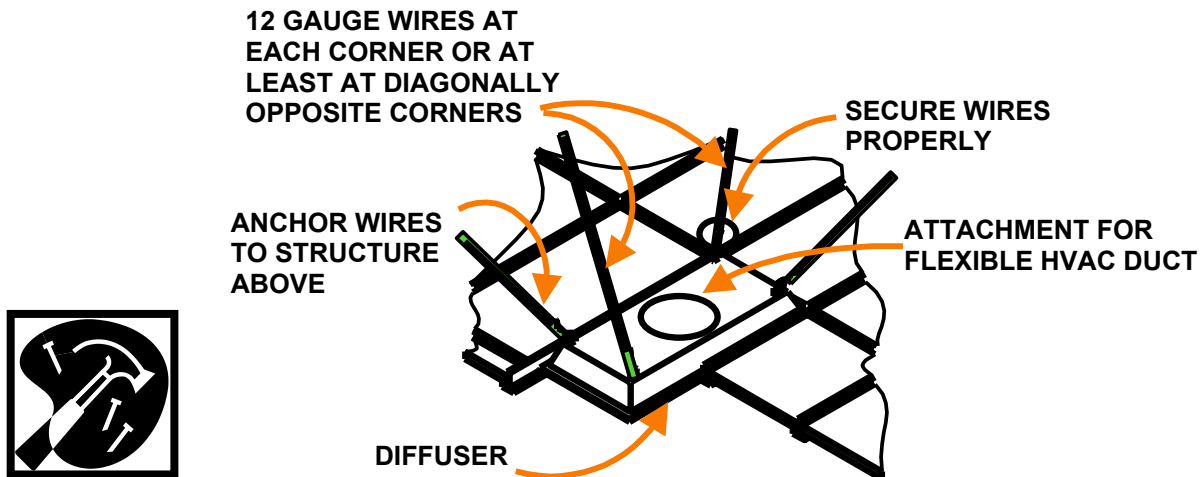
Distribution ducts

- ☐ Are the rectangular distribution ducts larger than 6 sq ft in cross sectional area laterally supported in each direction?
- ☐ Are circular ducts larger than 28 inches diameter laterally supported in each direction?
- ☐ Are the supports and hangers securely attached to the structure?
- ☐ Are the distribution ducts able to accommodate movement at locations where they cross separations between buildings?



Diffusers

- ☐ Are the air distribution grills or diffusers anchored to adequately supported sheet-metal ducts or to the ceiling grid or wall?
- ☐ Do the diffusers have positive restraint, independent of the ceiling grid, such as at least two hanger wires per diffuser?



Lighting

This category may include the following:

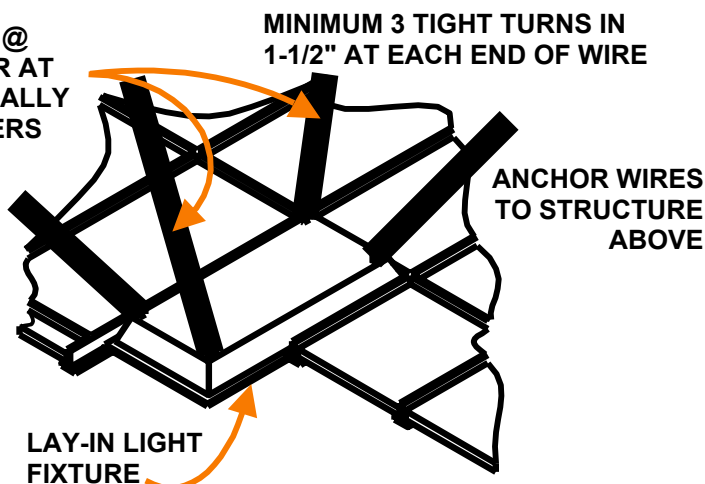
Suspended overhead lighting, fixed or track lighting

- ☐ Do the lay-in fluorescent light fixtures have positive support, independent of the ceiling grid, such as at least two diagonally opposite hanger wires per light fixture?
- ☐ Do chandeliers or other hanging fixtures have safety cables to prevent them from falling or impacting each other or a window?
- ☐ Are lens covers attached or supplied with safety devices?



12 GAUGE WIRES @
EACH CORNER OR AT
LEAST @ DIAGONALLY
OPPOSITE CORNERS

FOR EXPOSED FLORESCENT
LIGHT BULBS OR FIXTURE
LENSES SUBJECT TO FALLING,
SECURE IN PLACE WITH 2
WIRES THAT WRAP BENEATH
THE LENS OR BULBS AND
ATTACH SECURELY TO THE
FIXTURE

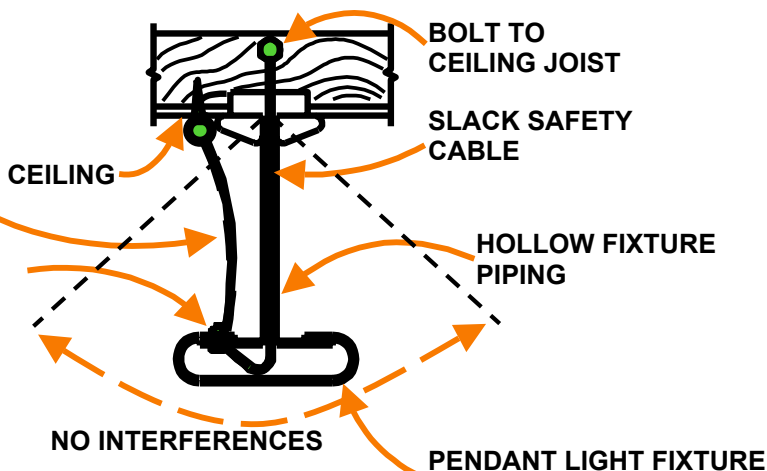


Fixed overhead, pendant, or track lighting

- ☐ Do pendant or stem light fixtures have safety cables so they will not fall if the fixture sways and breaks the stem connection, or are they braced to prevent swaying?
- ☐ Are spot lights or track lights securely attached to resist seismic shaking?

ALTERNATE:
RUN CABLE OUTSIDE
STEM AND ATTACH
TO CEILING JOIST
WITH A LAG SCREW

BOLT TO FIXTURE



Emergency lighting and exit lights

- ☐ Are emergency lights and exit lights mounted to protect them from falling off shelf supports?

Communications Equipment

Communications and emergency communications systems may include:

Radio and short short-wave radio equipment

- ☐ Is radio equipment restrained to keep it from sliding off shelving or tabletops?

Telephone, cellular phone, and fax equipment

- ☐ Is important equipment restrained to keep it from sliding off shelving or tabletops?
- ☐ Are telephones placed on desktops or counters far enough from the edge that they will not slide and fall off?

Public address system

- ☐ Is the public address system restrained to prevent the equipment from sliding and falling off the shelving?

Suspended speakers in conference room or auditorium

- ☐ Are sound system speakers in elevated locations anchored to the structure or hung with safety cables?

Microwave equipment (antennae, receiver, transmitter, etc.)

- ☐ Is the microwave communications equipment securely supported and/or anchored?

Computer networks, data storage

- ☐ Is computer information vital to operations backed up and stored off-site?
- ☐ Is critical computer equipment securely anchored to supports?
- ☐ Is sensitive computer or communications equipment located out of range of fire sprinkler heads or joints in the sprinkler pipes where they are less prone to water damage if the sprinkler lines break?

Overhead-mounted television sets or surveillance cameras

- ☐ Are overhead-mounted television sets or surveillance cameras securely anchored to support shelves or brackets that are in turn adequately connected to the wall or ceiling?

Elevators and Escalators

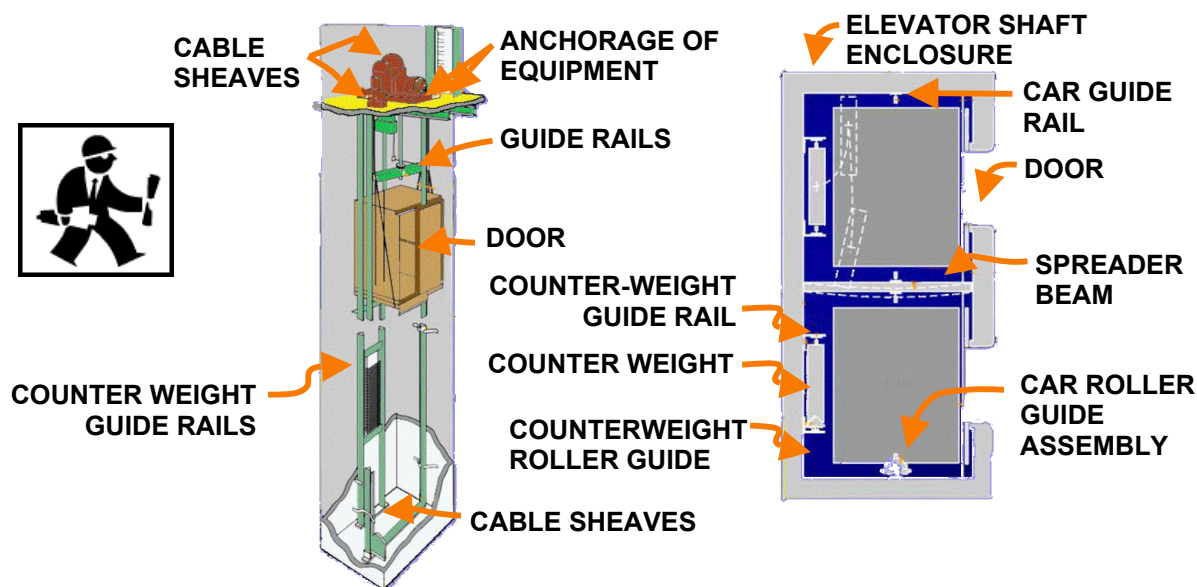
The transport equipment generally includes:

Elevator cab

- ☐ Is the elevator cab properly attached to the guide rails?
- ☐ Is the elevator equipped with a seismic switch?

Cables, counterweights, and guide rails (for cable--traction systems)

- ☐ Are the cables installed in such a way that they are protected against misalignment during an earthquake?
- ☐ Are the counterweights properly attached to the guide rails?
- ☐ Are the guide rails securely attached to the building?



Elevator motor and motor control cabinets

- ☐ Are the motor and motor control cabinets properly anchored?

Elevator cab and hydraulic elevator equipment (hydraulic systems)

- ☐ Are the components of the hydraulic system properly anchored?

Escalator

- ☐ Is the escalator control equipment securely anchored?

People mover

- ☐ Is the control equipment for the people mover properly anchored?

Caution: The moving parts or components of these systems need to be evaluated by qualified personnel. Inappropriate seismic restraints may compromise the safe operation of these systems.

Chapter 6 - Furniture and Contents

Characteristics of Furniture and Contents

Other nonstructural elements that are present in a building are furniture and contents. This classification can include any non-permanent elements in a building. Often furniture and contents are tenant-supplied elements that are not permanently attached to the structural framing. Furniture and contents can include a wide variety of elements within a building, from bookshelves and the books on the shelves to computer equipment.

Most furniture and contents elements are installed in a building with little or no consideration of seismic restraint.

Categories of Furniture and Contents

The following are typical categories and types of furniture and contents elements that are present in most typical buildings.

- Office and computer equipment
- Storage of records and supplies
- Kitchen and laundry equipment
- Hazardous materials (Hazmat)
- Furniture and interior decoration

Some buildings may contain additional elements that are specialized for the use and occupancy of the building, such as medical equipment in hospitals. These specialized elements may have characteristics similar to typical furniture, but some elements may require specialized considerations.

COMMON FAILURES CAUSING HAZ MAT RELEASES

- Building structural failures
- Dislodged asbestos
- Underground pipeline breaks
- Short connector pipe breaks
- Buckling of vertical cylindrical tanks
- Overturning of elevated tanks
- Sloshing from open-topped tanks
- Falling containers
- Equipment sliding or overturning

Furniture and Contents Examples

The following six pages described some typical furniture and contents of a building. For each of the elements, there are a series of questions regarding the seismic anchorage. These questions are not intended to definitively assess the adequacy of the anchorage of the elements. The intention is to identify key areas of vulnerability that should be checked during a seismic survey.

For several types of furniture and contents, drawings have been provided to show typical retrofit measures that can be used to mitigate the seismic hazard. These drawings are not intended to apply to all conditions, but are intended to provide an example of a type of retrofit that may be used. Next to each of the drawings is a graphic symbol to indicate whether the mitigation for this type of element should be designed by an engineer as described in the previous chapter. The mitigation methods shown depict generic details using standard hardware. Many manufacturers have developed products that can also be used in lieu of the generic details.

Office and Computer Equipment

This category may include a broad range of equipment, such as:

Large computer equipment, tape drives

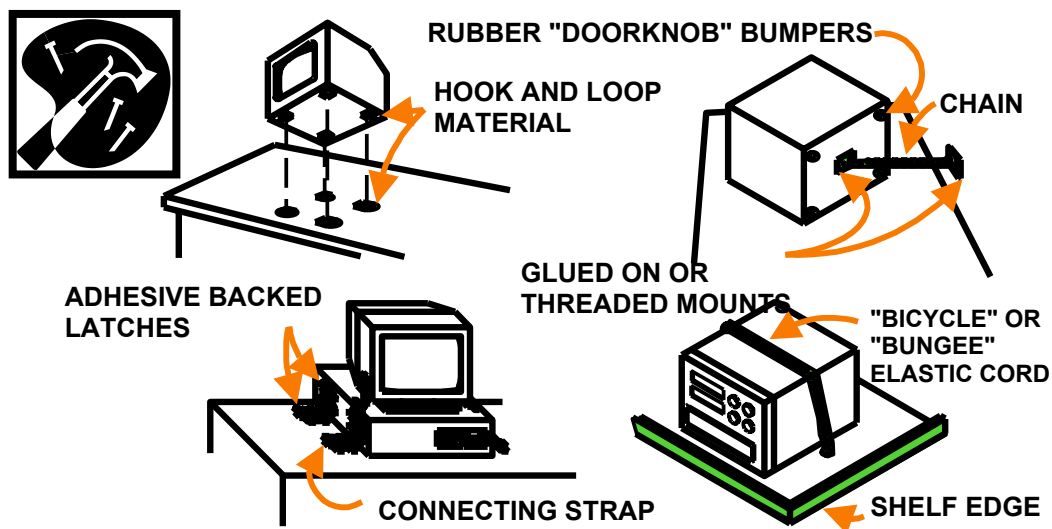
- ☐ Are computers, tape racks, and associated equipment that are about twice as tall as wide, anchored, tethered, and/or laterally supported?
- ☐ Is heavy computer equipment anchored to the structural floor slab and braced independently of the computer access floors?

Computer cabling

- ☐ Is computer cabling long enough to accommodate lateral movement within the building?

Desktop computer equipment or printers

- ☐ Are computer monitors anchored to desktops or computers?
- ☐ Are desktop computers and printers mounted with positive restraint, resting on high-friction rubber pads, or located far enough from the edges of desks and tables to prevent them from sliding and falling in an earthquake?

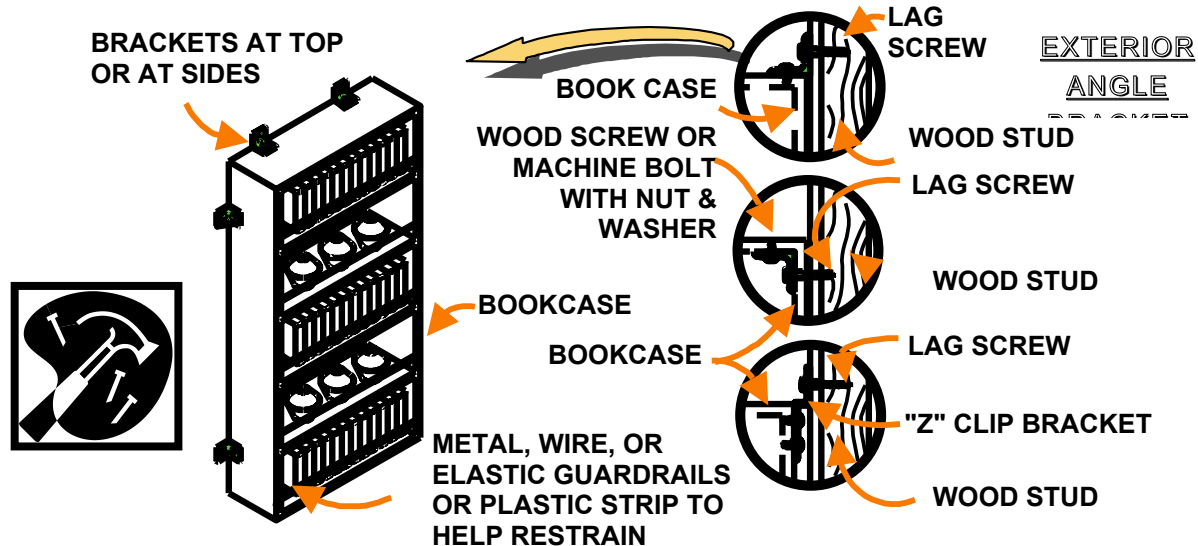


Storage of Records and Supplies

Storage for files, accounting records, and emergency supplies may include:

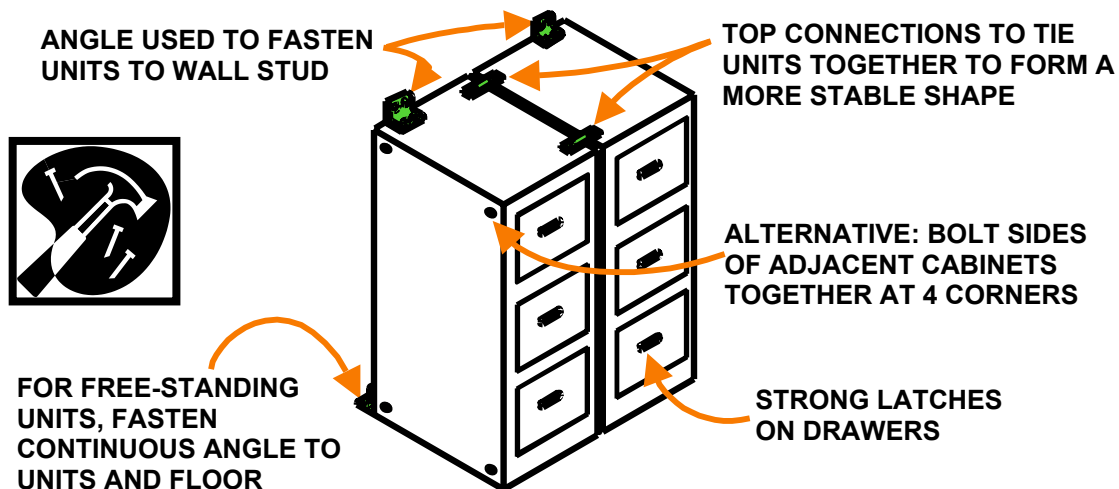
Bookshelves and library stacks 5 feet or taller

- ☐ Are bookshelves properly anchored with brackets to a solid wall or studs, or anchored to the floor?
- ☐ Are bookshelves fitted with edge restraints or elastic cords to keep books from falling?
- ☐ Are large and heavy books located on the lowest shelves?
- ☐ Are rare books given extra protection to prevent falling and water damage?



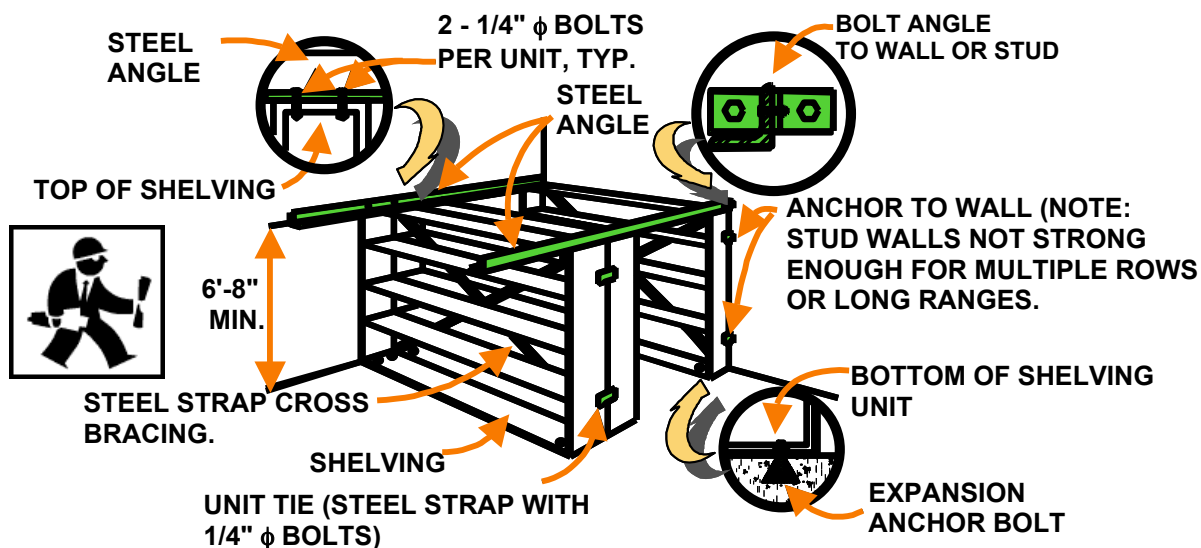
Tall vertical or lateral file cabinets

- ☐ Do the file cabinet drawers or doors latch securely?
- ☐ Are tall file cabinets anchored with wall brackets to a solid wall or studs, anchored to the floor, or bolted to one or more adjacent cabinets to form a more stable configuration, i.e., a larger "footprint"?
- ☐ Are unanchored cabinets located so that they will not fall or slide and block an exit?



Tall storage racks or shelving

- ☐ Are tall storage racks or shelves securely anchored to the floor or walls?
- ☐ If walls are used for lateral support, has the capacity of the walls been checked for adequacy to restrain the shelving?
- ☐ Are heavily loaded racks or shelves supported in both directions?
- ☐ For racks significantly taller than wide, are large anchor bolts used to anchor each leg to a concrete slab?
- ☐ Are breakable items secured to the shelves or racks, or are they stored in stable units (e.g., are they shelved in the original packing boxes, or are small items shrink-wrapped together)?

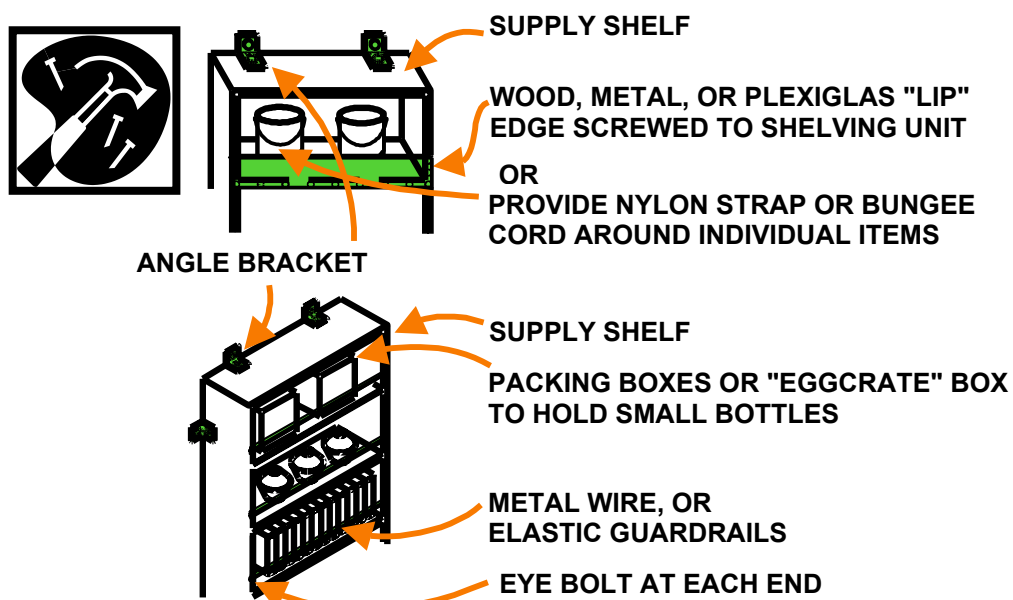


Emergency supply cabinet (water, medicine, food, etc.)

- ☐ Is the cabinet in an accessible location that is not likely to be heavily damaged?
- ☐ Is the cabinet properly supported and anchored, and are the cabinet doors securely latched?

Especially valuable and fragile merchandise

- ☐ Are valuable or fragile items protected against tipping or falling off shelving or pedestals?



Kitchen and Laundry Equipment

These facilities may include any or all of the following items: gas and/or electric stoves and ovens, built-in or countertop microwave ovens, garbage compactors, dishwashers, refrigerators and freezers, clothes washers and dryers, ironing and pressing equipment.

Large kitchen or laundry equipment

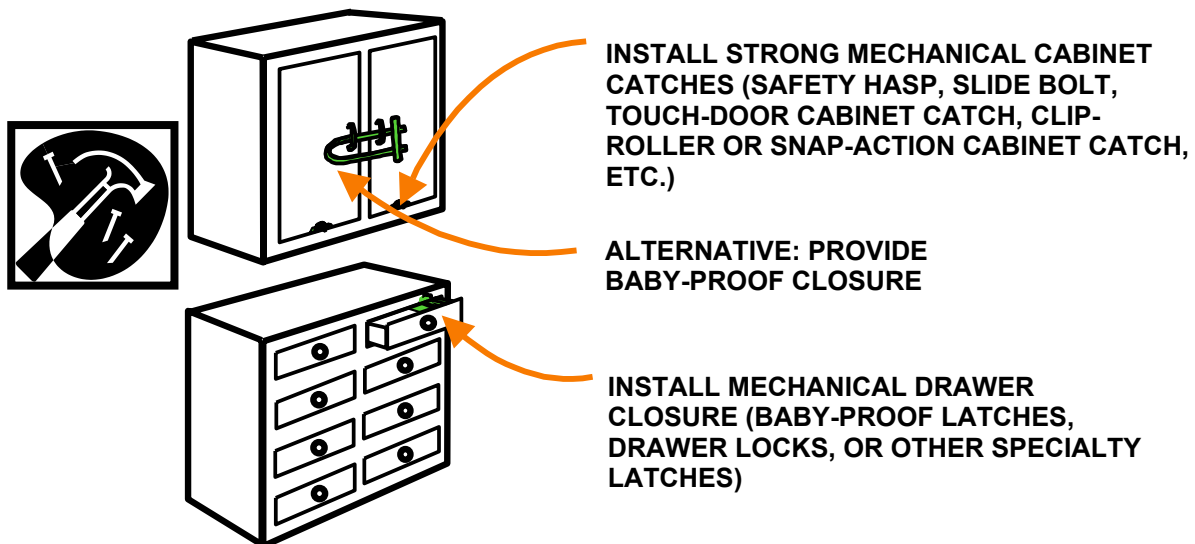
- ☐ Are all of the items securely anchored to the floor, wall, or countertop with adequate capacity?

Gas and/or electric hook hook-up

- ☐ Are the gas or electric hook-up lines able to accommodate movements at the equipment interface and where they cross between buildings?

Drawer and cabinet latches (kitchen, laboratory, office, etc.)

- ☐ Are the drawers and cabinet doors latched securely, e.g., with special latches or baby-proof hardware that will not fly open in an earthquake?



Hazardous Materials

Hazardous materials may include:

Chemical, laboratory, or medical supplies

- ☐ Are chemical supplies secured with shelf lips several inches high, or are they stored in "egg crate" containers in drawers, so that the containers will not overturn or fall and spill?
- ☐ Are chemicals stored in accordance with manufacturers' recommendations?
- ☐ Are incompatible chemicals stored at an appropriate distance from one another so that they will not mix if the containers are broken?
- ☐ Are the chemicals in each cabinet catalogued properly and marked clearly?
- ☐ Are Material Safety Data Sheets (MSDSs) stored in a location separate from the chemicals?

Cabinets for hazardous materials

- ☐ Are cabinets for hazardous materials securely attached to the floor or to a sturdy wall?

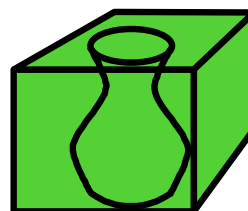
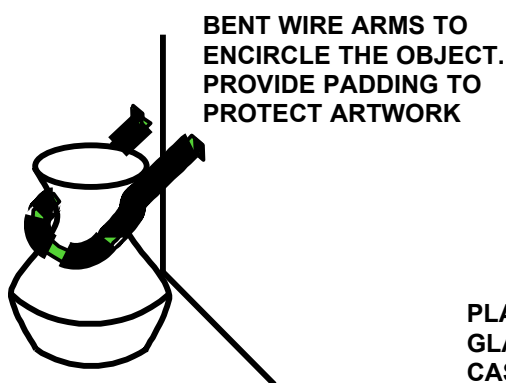
Asbestos

- ☐ Has asbestos insulation been removed, or has it been encapsulated to reduce the possibility of damage in an earthquake?
- ☐ Will asbestos abatement be required prior to installing retrofit details?

Furniture and Interior Decoration

Especially valuable and fragile artwork or decorative vases

- ☐ Are valuable or fragile items protected against tipping over and/or falling off shelves or pedestals?



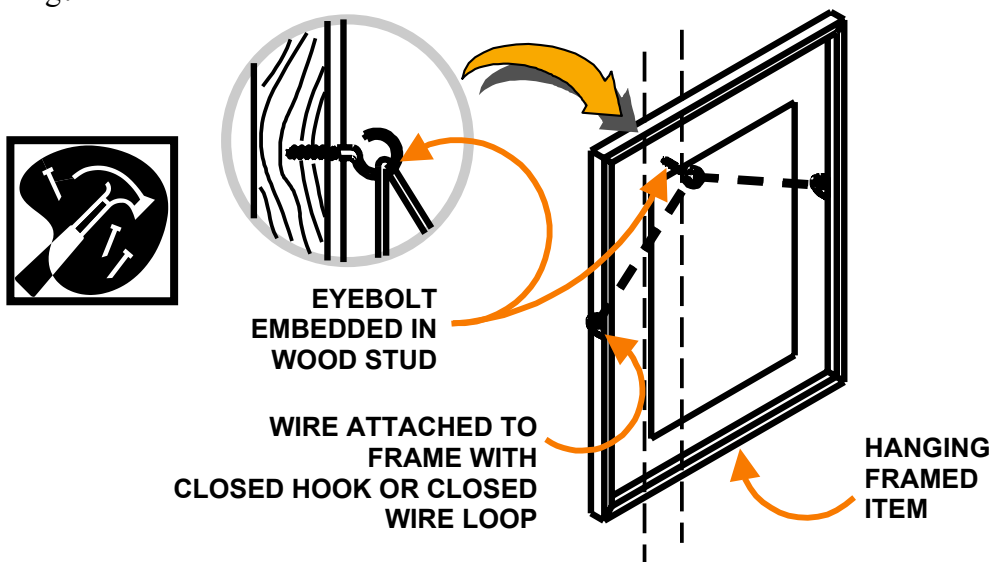
PLACE OBJECT IN CLOSE-FITTING
GLASS OR PLEXIGLASS DISPLAY
CASE
PEDESTAL MUST BE ANCHORED

Potted plants or indoor landscaping

- ☐ Are heavy potted plants on file cabinets or tall shelves restrained to prevent falling?
- ☐ Are heavy hanging plants secured to prevent falling or impact with windows?

Miscellaneous furnishings

- ☐ Are unanchored furnishings located where they cannot slide or overturn to block corridors or doors?
- ☐ Are heavy wall pictures and other wall hangings well anchored to the studs or structural framing?



Lockers, vending machines

- ☐ Are personal or storage lockers and vending machines anchored and laterally supported, or are they clear of exits?

Chapter 7 - Special Considerations

Disruption to Occupants and Operations

The mitigation project should consider the potential disruption to the building occupants. This applies to both the disruption caused by installing the restraints and the disruption of the mitigation components to ongoing operations after each is installed.

Permanence

The bracing for some nonstructural items can be permanently installed. However, other nonstructural items need to have mitigation designed so that the nonstructural items can be moved easily during normal operations. It can be more difficult to design a restraint system that allows for removing and reapplying the restraints. It is also very difficult to verify that nonstructural restraints that can be removed will be reinstalled. Occupants often forget to replace restraints or tethers or choose to leave them unattached to avoid delays and disruption. Periodic checks of removable restraints should be performed to verify that the restraints are still effective.

Redundancy

For some critical nonstructural items, it may not be sufficient to rely on a single type of mitigation. Providing additional supports or a back-up restraint may be necessary to assure a low probability of failure during an earthquake.

Building Interaction

The interaction between the building and the nonstructural component needs to be considered. The nonstructural elements and their bracing should not interfere with the movement of the building during an earthquake. Items, such as partitions and exterior walls, may unintentionally resist earthquake forces if they are not designed to allow building movement in each direction. Nonstructural elements that are attached to two or more structural elements, such as columns, walls, or ceilings, can potentially cause unintentional restraint of the structural framing. It may be advisable to consult with an engineer to determine the expected amount of structural movement so the nonstructural mitigation can be designed to accommodate this movement.

Building Performance

The expected performance of the building during an earthquake should be considered. Nonstructural components in buildings that may not be adequately designed to resist earthquake forces can be mitigated, but this mitigation may not be effective if the building is significantly damaged during an earthquake.

Anchorage to Structural Framing

When anchoring nonstructural elements, the structural framing must have sufficient strength to resist the forces due to the nonstructural elements. For nonstructural items that weigh more than 100 pounds, it is recommended that an engineer be consulted to determine whether the structural framing can support the forces of the nonstructural element. Building codes typically require engineering calculations for anchorage or support of items weighing more than 400 pounds.

There are various methods that can be used to anchor nonstructural elements to the structural framing. The general types of anchorage are discussed below.

Structural Framing Material	Types of Anchorage	Considerations	
Steel	Welding	Welding should be done by qualified welders in compliance with applicable codes and standards. For older structures it may be necessary to check the existing steel for weldability.	
	Bolts and screws	Bolts should be installed in drilled holes. Self-tapping screws should be installed according to manufacturers' recommendations.	
	Clamps	Clamps should only be used to restrain lightweight items.	
Concrete or Masonry	Cast-in-place anchors	Cast-in-place anchors can only be installed when new concrete elements are placed.	
	Epoxy anchors	Holes for epoxy anchors need to be thoroughly cleaned.	
	Expansion anchors	Expansion anchors need to be tightened to verify that the wedges are properly set. Expansion anchors should not be used for overhead applications or for vibrating equipment.	
Wood	Bolts	Bolts should be installed into drilled round holes.	
	Lag screws	Lag screws should be installed into holes that are predrilled in the wood to reduce the possibility of splitting the wood. Lag screws should not be forced into the wood using a hammer. Nails should not be used for anchorage.	

Limitations

The many nonstructural elements in a building and our imperfect understanding of both regional earthquake hazards and their impacts on buildings make the elimination of **all** damage to nonstructural building elements an unrealistic and expensive goal.

Some of the nonstructural elements described in this Field Manual require specialized expertise to identify the specific earthquake hazard and to develop appropriate nonstructural protection measures. This expertise may not be available among building facilities personnel. Many of these elements are included in the Field Manual as a means of increasing awareness of risks they present and the types of outside services that may be needed to reduce the risks.

Information in this Field Manual is based on current earthquake retrofit practice and standards for existing buildings. Practice and standards change as new information is available. Buildings and their elements cannot be made “earthquake proof” due to the many variables causing earthquake damage. The strengthening methods in this Field Manual can help make facilities more resistant to earthquake damage and improve the safety of building occupants.

Implementation of nonstructural protection measures must be completed before the ground begins to shake. These measures, which reduce the severity of loss through increasing the

resistance of nonstructural elements, are called mitigation measures. The earthquake is a test of the success of the implemented mitigation measures to resist damage.

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