

CHAPTER 4

SITE DEVELOPMENT AND LAND USE

SECTION 401 GENERAL

401.1 Scope and intent. This chapter provides requirements for the development of *building* and *building sites* that encourage energy efficiency and potable and nonpotable water conservation.

401.2 Other regulations. Where differences occur between the provisions of this code and the provisions of other referenced codes, the provisions of the most restrictive code or regulation shall apply. Locally adopted land use, zoning or site development regulations shall apply.

SECTION 402 PRESERVATION OF NATURAL RESOURCES

402.1 General. RESERVED.

402.2 Protection by Area. RESERVED.

402.2.1 Floodplains. RESERVED.

402.2.1.1 Development in flood hazard areas. RESERVED.

402.2.1.2 Floodplain preservation. RESERVED.

402.2.2 Surface water protection. RESERVED.

402.2.3 Conservation area. RESERVED.

402.2.4 Park land. RESERVED.

402.2.5 Agricultural land. RESERVED.

402.2.6 Greenfield sites. RESERVED.

402.3 Site design and development. RESERVED.

402.3.1 Predesign site inventory and assessment. RESERVED.

402.3.2 Stormwater management. RESERVED.

402.3.3 Irrigation systems. Irrigation systems for exterior landscaping shall comply with Sections 402.3.3.1 and 402.3.3.2.

402.3.3.1 Water for outdoor landscape irrigation systems. Water used in outdoor landscape irrigation systems shall comply with Sections 402.3.3.1.1 through 402.3.3.1.4.

402.3.3.1.1 Potable water. Developments shall reduce their use of *potable* water for landscape irrigation by 50 percent.

Exceptions: *Potable* water is permitted to be used in irrigation systems as follows:

1. During the establishment phase of newly planted landscaping. The establishment phase shall be not longer than the following:

- 1.1. Three years for trees.

- 1.2. Two years for shrubs.

- 1.3. One year for herbaceous cover plant.

2. To irrigate food production.

3. *Potable* water is permitted for landscape irrigation when *approved* by local ordinance or regulation.

402.3.3.1.2 Graywater systems. RESERVED.

402.3.3.1.3 Municipal reclaimed water. Shall comply with the Oregon Department of Environmental Quality regulations and the provisions of the *Oregon Plumbing Specialty Code*.

402.3.3.1.4 Collected rainwater. *Rainwater* collected on the surface of the *building site*, or from the roof surfaces of the *building*, and used for landscape irrigation purposes shall not be limited regarding the method of application. *Rainwater* collected from elevated *building* locations that is to be used in *building site* irrigation shall be in compliance with the provisions of Statewide Alternate Method 08-03.

402.3.3.2 Irrigation system design and installation.

Landscape irrigation systems shall be designed and installed to provide the minimum amount of irrigation required for maintenance of vegetation in the landscaping of the *building site*. The systems shall utilize drip irrigation, soaker hoses, subsurface and surface irrigation, where practicable. Landscape irrigation systems shall not direct spray onto *building* exterior surfaces or exterior paved surfaces.

402.3.4 Outdoor ornamental fountains and water features.

Outdoor ornamental fountains and other water features constructed or installed on a *building site* using 20 gallons (75.7 L) a day or more shall be supplied with either municipally reclaimed or collected *rainwater* complying with Section 402.3.3.1. Signage in accordance with the *Oregon Plumbing Specialty Code* shall be posted at each outdoor fountain and water feature where *nonpotable* water is used.

402.3.5 Management of vegetation, soils and erosion control. RESERVED.

402.3.5.1 Landscape, soil and water quality protection plan. RESERVED.

402.3.5.2 Vegetation and soil protection. RESERVED.

402.3.5.3 Topsoil protection. RESERVED.

402.3.5.4 Soil reuse and restoration. RESERVED.

402.3.5.5 Imported soils. RESERVED.

402.3.5.6 Invasive species. RESERVED.

402.3.5.7 Documentation. RESERVED.

402.3.6 Building site waste management plan. RESERVED
(See Appendix A).

**SECTION 403
TRANSPORTATION IMPACT**

403.1 Walkways and bicycle paths. RESERVED.

403.2 Changing and shower facilities. RESERVED.

403.3 Bicycle parking and storage. RESERVED.

403.3.1 Short-term bicycle parking. RESERVED.

403.3.2 Long-term bicycle parking. RESERVED.

403.4 Vehicle parking. RESERVED.

403.4.1 High-occupancy vehicle parking. RESERVED.

403.4.2 Low-emission, hybrid and electric vehicle parking. RESERVED.

**SECTION 404
HEAT ISLAND MITIGATION**

404.1 General. The heat island effect of *building* and *building site* development shall be mitigated in accordance with Sections 404.2 and 404.3.2.

404.2 Site hardscape. In Climate Zones 1 through 6, as established in the *Energy Code*, not less than 50 percent of the site *hardscape* shall be provided with one or any combination of options described in Sections 404.2.1 through 404.2.4. For the purposes of this section, site *hardscape* shall not include areas of the site covered by *solar photovoltaic* arrays or *solar thermal* collectors.

404.2.1 Site hardscape materials. *Hardscape* materials shall have a minimum initial *Solar Reflectance Index* of 29 when determined in accordance with ASTM E 1980 using a convection coefficient of 2.1 Btu/h-ft² (12 W/m² · k).

404.2.2 Shading structures. Where shading is provided by a structural device or element, such device or element shall comply with all of the following:

1. Where open trellis-type free-standing structures such as, but not limited to, covered walkways, and trellises or pergolas, are covered with native plantings, they shall be designed to achieve mature coverage within five years;
2. Parking shading *structures* shall comply with Section 404.3.2;
3. Shade provided onto the *hardscape* by an adjacent *building* or structure located on the same *lot* shall be calculated and credited toward compliance with this section based on the projected peak sun angle on the summer solstice.

404.2.3 Shade by trees. Where shading is provided by trees, such trees shall be selected and placed in accordance with all of the following:

1. *Construction documents* shall be submitted that show the planting location and anticipated five-year canopy

growth of all trees and that show the contributions of existing tree canopies; and

2. Shading calculations shall be shown on the *construction documents* demonstrating compliance with this section and shall include only those *hardscape* areas directly beneath the trees based on a five-year growth canopy. Duplicate shading credit shall not be granted for those areas where multiple trees shade the same *hardscape*.

404.2.4 Open-grid pavers and open-graded aggregate.

Open-grid pavers and open-graded aggregate shall be permitted where the use of these types of *hardscapes* does not interfere with fire and emergency apparatus or vehicle or personnel access and egress, utilities or telecommunications lines. Aggregate used shall be of uniform size.

404.3 Roof coverings. Where a building owner chooses roof coverings as a project elective, not less than 75 percent of the roof surfaces of a *building* shall comply with Section 404.3.2.

Exception: Portions of roof surfaces where *solar thermal* collectors and *solar photovoltaic* systems are provided shall be permitted to be deducted from the roof surface required to comply with this section.

404.3.1 Roof solar reflectance and thermal emittance. RESERVED.

404.3.1.1 Roof products testing. RESERVED.

404.3.1.2 Solar reflectance index. RESERVED.

404.3.2 Vegetative roofs. Roofs shall be covered with either an *extensive* or *intensive vegetative roof*. *Vegetative roofs* shall comply with Section 405.6.

**SECTION 405
DETAILED SITE DEVELOPMENT REQUIREMENTS**

405.1 General. The provisions of this section shall govern the design and installation of site development systems and use of materials.

405.2 Subsurface graywater irrigation systems. RESERVED. See Department of Environmental Quality rules, OAR 340-053.

405.2.1 Estimating graywater discharge. RESERVED.

405.2.2 Percolation tests. RESERVED.

405.2.2.1 Percolation tests and procedures. RESERVED.

405.2.2.1.1 Percolation test hole. RESERVED.

405.2.2.1.2 Test procedure, sandy soils. RESERVED.

405.2.2.1.3 Test procedure, other soils. RESERVED.

405.2.2.1.4 Mechanical test equipment. RESERVED.

405.2.3 Permeability evaluation. RESERVED.

405.2.4 Subsurface landscape irrigation site location. RESERVED.

405.2.5 Installation. RESERVED.

405.2.5.1 Absorption area. RESERVED.

405.2.5.2 Seepage trench excavations. RESERVED.

405.2.5.3 Seepage bed excavations. RESERVED.

405.2.5.4 Excavation and construction. RESERVED.

405.2.5.5 Aggregate and backfill. RESERVED.

405.2.6 Distribution piping. RESERVED.

405.3 Vegetation and soil protection. RESERVED.

405.4 Soil reuse and restoration. RESERVED.

405.4.1 Preparation. RESERVED.

405.4.2 Restoration. RESERVED.

405.4.2.1 Organic matter. RESERVED.

405.4.2.2 Additional soil restoration criteria. RESERVED.

405.4.3 Engineered growing media. RESERVED.

405.4.4 Documentation. RESERVED.

405.5 Landscape, soil and water quality protection plan. RESERVED.

405.6 Vegetative roofs. *Extensive and intensive vegetative roofs*, where provided in accordance with Section 404.3, shall comply with ASTM E 2396, ASTM E 2397, ASTM E 2398 and ASTM E 2400 or shall comply with the following:

1. All plantings shall be selected according to their United States Department of Agriculture hardiness zone classifications and shall be capable of withstanding the climate conditions of the *jurisdiction* and the microclimate conditions of the *building site* including, but not limited to, wind, precipitation and temperature. Planting density shall provide complete coverage within two years of the date of installation unless a different time period is established in the *approved* design. Plants shall be distributed to meet the coverage requirements. *Invasive plants* species shall not be planted. Selected plants shall not add to the potential for fire hazard in the event of severe drought. There shall be a diversity of types and species of plants.

2. The engineered soil medium shall be designed for the physical conditions and local climate to support the plants and shall consist of nonsynthetic materials. The planting design shall provide a wind erosion blanket that protects the engineered soil medium until the plants are established. The engineered soil medium shall be not less than 3 inches (76 mm) in depth in all areas.
3. All roof penetrations, changes in elevation and parapet walls shall be provided with a nonvegetated buffer not less than 12 inches (305 mm) wide. Where access to the *building* facades is provided from locations on the perimeter of the roof, nonvegetated buffers adequate to support associated equipment and to protect the roof shall be provided.
4. Plantings shall be managed to maintain the function of the vegetative roof.

**SECTION 406
PROJECT ELECTIVES
RESERVED**

