Evergreen Sustainable Development Standard

Department of Commerce

Housing Trust Fund

ESDS Version 2.1

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Introduction

Overview

The Evergreen Sustainable Development Standard (ESDS) is a building performance standard required of all affordable housing projects or programs receiving capital funds from the Housing Trust Fund after July 1, 2008. The Evergreen Sustainable Development Standard aligns Washington State's affordable housing investment strategies with environmentally responsible building practices. Green building improves the economics of managing affordable housing and promotes environmental quality while enhancing quality of life for residents.

The Evergreen Sustainable Development Standard (ESDS) was developed in compliance with RCW 39.35D.080 and contains 79 criteria that safeguard health and safety, increase durability, promote sustainable living, preserve the environment, and increase energy efficiency. In addition to complying with all mandatory provisions, new construction projects must achieve 50 points from the optional criteria, while rehabilitation projects must achieve 40 points from the optional criteria.

In the creation of the ESDS, technical experts in the field of sustainable development were chosen to meet and recommend the best existing green building standard; they chose Green Communities™ Criteria developed by Enterprise Community Partners. Modifications were needed in order to accommodate the diversity of projects funded by the Housing Trust Fund and to focus the criteria on building practices, codes, climate and communities in Washington State. The ESDS has been reviewed by Housing Trust Fund stakeholders with widespread agreement that this standard is the best first step for affordable sustainable development in Washington State.

Revisions to the Green Communities™ Criteria (2011), changes to the Washington State Energy Code (2009), and stakeholder recommendations for improvement necessitated significant revisions to the ESDS. ESDS 2.0 was published in June 2011and is required of all projects receiving Housing Trust Fund awards after July 1, 2011.

Important Definitions

Applicants must determine the construction type (new construction, substantial rehab, moderate rehab) of the project and if the site is located in a rural or urban area. See the Glossary at the end of this document for definitions.

ESDS Policies & Procedures

The ESDS policies and procedures, which also include the step-by-step process of ESDS, can be found in Chapter 2 of the Housing Trust Fund Handbook, section 207.

Quick Reference Guide

This guide provides a quick overview of the technical requirements of the ESDS Criteria.
Applicants must refer to the ESDS criteria for a complete understanding of the requirements.

Integrative Design	
M	**1.1 Green Development Plan** Conduct one or more integrative design meeting(s) as appropriate for your project and submit a written Green Development Plan outlining the integrative design approach that demonstrates involvement of the entire development team. Use the guidelines in Appendix C for the Green Development plan.
3 max	**1.2 Universal Design** Incorporate Universal Design by choosing one of three options.
Location & Neighborhood Fabric	
M	**2.1 Sensitive Site protection** Verify that the project site: (1) Can comply with local critical area ordinances which include protection of: wetlands, fish and wildlife habitat, geologically hazardous areas, aquifer recharge areas and frequently flooded areas. AND (2) Is not located on land designated by the county as agricultural or forest land of long-term commercial significance under the GMA. (RCW 36.70A.060)
M and 2	**2.2 Connections to existing development & Infrastructure** *Mandatory for Urban New Construction. Optional 2 points for Rural New Construction* Provide site map demonstrating that the development is located on a site: With access to existing roads, water, sewers and other infrastructure within or contiguous (having at least 25 percent of the perimeter bordering) to existing development; and within the Urban Growth Area designated by an adopted Comprehensive Plan. Do not build on tracts of land that require installing a septic tank or a sanitary sewer line extension of 1,000 feet or greater from the property line of the tract being developed.
M	**2.3 Compact development** Design and build the project to the density required for the location type: *Urban:* minimum net density of at least 7 dwelling units per acre & consistent with local zoning. *Rural and/or Tribal:* minimum net density of 5 dwelling units per acre, & consistent with local zoning. Do not build in areas designated as "Rural lands" under the Growth Management Act.
5	**2.4 Maximizing Density** Design and build the project to the maximum density allowed per local zoning.
M and 5	**2.5 Access to services & Public Transportation** *Mandatory & option to achieve additional 5pts* Locate the project within walking distance of services or public transportation. Projects are required to provide at least one option from the options listed (see criterion for options). Projects that achieve both options will receive 5 points.
3	**2.6 Preservation of & Access to Open Space** Set aside common, outdoor open space for use by residents.
M	**2.7a Walkable neighborhoods- Sidewalks & pathways** *Mandatory for urban projects* Provide a site map indicating that sidewalks or all-weather pathways will be created or preserved within a multifamily property or single-family subdivision to link the residential development to public spaces, open spaces and adjacent development.
3, 5	**2.7b Walkable neighborhoods- connections to surrounding neighborhood** *Optional 3 or 5 points for Rural & Tribal projects only* Connect the project to public and open spaces and adjacent development by providing at least three separate connections (excluding entrances/exits from a single building) from the project to sidewalks or pathways in surrounding neighborhoods and natural areas. Types of connections can include roadways, bike trails, sidewalks, footpaths, and the like.
7	**2.8 Smart Site Location: Passive Design** Demonstrate a project with a passive solar design, orientation, and shading that meets the guidelines for building orientation, glazing, glazing type and shading.

10	**2.9 Brownfield or Adaptive reuse site** Locate the project on a grayfield, brownfield, or adaptive reuse site.
3	**2.10 Access to Fresh, Local Foods** Provide access to fresh local foods by choosing one of three options: Neighborhood Farms and Gardens, Proximity to Farmers Market, or Community-Supported Agriculture.
Site Improvements	
M	**3.1 Environmental Remediation** Conduct and provide a Phase I Environmental Site Assessment according to the *American Society for Testing and Materials (ASTM) E1527-05* standard and any additional assessments required to determine whether any hazardous materials are present on site.
M	**3.2 Erosion & Sedimentation Control** Implement EPA's Best Management Practices (BMP) for erosion and sedimentation control during construction, referring to the EPA document, *Storm Water Management for Construction Activities (EPA 832-R-92-005).* Or comply with local erosion and sedimentation control standards if the local standards are more stringent than EPA. See criterion for erosion control measures that must be included.
M	**3.3a Landscaping** Provide a landscape plan (including trees, shrubs, and groundcover) showing that 50% of the newly landscaped area includes a selection of trees and plants that is native and/or adaptive species.
5	**3.3b Landscaping** Meet the requirements of 3.3a for 100% of the newly landscaped area.
5 max	**3.3c Landscaping- Significant Trees** Provide a landscape plan demonstrating the preservation of existing significant trees within the buildable area of the site.
M	**3.4 Efficient Irrigation** If irrigation is utilized, install an efficient irrigation system as defined in the criterion.
6 max	**3.5 Surface Water Management** Implement a comprehensive stormwater management plan for the project that retains the rainfall volumes on-site listed in the criterion. Appropriate management strategies include infiltration, evapo-transpiration, and/or harvesting and reuse.
M	**3.6 Storm Drain Labels** Label all storm drains or storm inlets to clearly indicate where the drain or inlet leads.
Water Conservation	
M	**4.1 Water-Conserving Fixtures** Install WaterSense water-conserving fixtures with the following specifications: Toilets: 1.28 GPF or less, WaterSense certified with MaP test performance at minimum 500g Showerheads: 2.0 GPM or less, WaterSense labeled Bathroom faucets: 1.5 GPM or less, WaterSense labeled Kitchen faucets: 2.0 GPM or less
6 max	**4.2 Advanced Water-Conserving Fixtures** Install WaterSense water-conserving fixtures with the following specifications: Toilets: 1.1 GPF (gallons per flush) or less WaterSense certified and with a MaP test performance at minimum 500g. For a dual flush toilet, calculate average flush volume use the following formula: (2 x part-flush volume + 1 x full flush volume)/3 ≤ 1.1 gallons. Showerheads: 1.75 GPM (gallons per minute) or less, WaterSense labeled Bathroom faucets: 0.5 GPM or less, WaterSense labeled Kitchen Faucets: 1.5 GPM or less
8 max	**4.3 Water Reuse** Install supply plumbing for non-potable end uses so that "salvaged water" may be supplied to these fixtures in the future without significant disturbance of building structure or harvest, treat, and reuse rainwater and/or greywater to meet a portion of the project's water needs.

Energy Efficiency	
M	**5.1a Building Performance Standard** *Mandatory for all new construction projects* Meet the minimum requirements of the 2009 WSEC and these additional requirements: • *For Single Family Homes* there are two options (including duplexes or townhomes within the scope of Section R101.2 of the International Residential Code): (1) Obtain two extra credits from WSEC 2009 Table 9-1. When using the systems analysis approach, demonstrate a 7% reduction in energy use for each credit. OR (2)Use the 2011 EnergyStar Northwest Builder Option Packages • *For Multifamily Units*: Use the prescriptive, component performance or systems analysis methods from the modified 2009 WSEC tables in Appendix A.
M	**5.1b Building Performance Standard** *Mandatory for Moderate and Substantial Rehab only* Provide insulation and air sealing improvements as prescribed in Appendix by employing one of three methods: a prescriptive list of measures, a method for calculating a simple 10-year payback, or a more complex savings-to-investment ratio (SIR) calculation.
5	**5.2a Additional Reduction in Energy Use** New construction only Reduce the project's overall energy usage by an additional 7%.
5	**5.2b Additional Reduction in Energy Use** *Optional for moderate & substantial Rehab only* Use the method in Appendix B for the simple 10-year payback except extend the payback period to at least 14 years
M	**5.3 Sizing of Heating & Cooling equipment** Size heating and cooling equipment as required by the most recent edition of the energy code. Size heating and cooling ducts as required by the most recent edition of the mechanical code, as applicable.
M	**5.4 Energy Star Appliances** If providing appliances, install ENERGY STAR-labeled clothes washers, dishwashers, and refrigerators.
3	**5.5 Central Laundry** Provide centralized laundry facilities. Do not install in-unit washers or dryers. If residential scale washers are provided in the centralized laundry facilities, they must be ENERGY STAR-labeled.
M	**5.6 Efficient Lighting- Interior Units** 80% of lighting shall be fitted with Energy Star, high efficiency luminaires or lamps.
M	**5.7a Electricity Meter** *Mandatory for New Construction only* Install an individual or a sub-metered electric meter for each individual unit.
2	**5.7b Electricity Meter** *Moderate and Substantial Rehab only* Install an individual or a sub-metered electric meter for each individual unit.
5 max	**5.8a Renewable Energy** Install photovoltaic (PV) panels, wind turbines, or other electric-generating renewable energy source to provide a specified amount of energy generation.
1	**5.8b Photovoltaic/Solar Hot Water Ready** Site, design, engineer, and/or plumb the development to accommodate installation of photovoltaic (PV) or solar hot water system in the future.
10 max	**5.8c Solar Water Heating** Provide domestic water heating using solar collectors.
M	**5.9 Domestic Water Heating** Provide residential or commercial water heaters with the minimum energy performance expectations outlined in the criterion.
2,3, 5	**5.10 Domestic Water Heating** Select a Residential Energy Star Water Heater, or upgrade commercial water heating combustion efficiency to a condensing boiler or water heater. See criterion for point structure.
3,7	**5.11 Performance Tested Building Air Sealing** *Moderate and Substantial Rehab only* In addition to the prescriptive air sealing measures (see Appendix B), conduct a blower door air sealing protocol that achieves the outlined performance objectives.
10	**5.12 Performance Tested Duct Sealing** *Moderate and Substantial Rehab only* Conduct performance tested duct sealing.

2,5,7	**5.13 Space heating & Cooling Equipment Replacement** *Moderate and Substantial Rehab only* Install Space Heating and Cooling Equipment Replacement to the specified standards.
17	**5.14 Document Space Condition Savings of 50% or more** *New Construction only* In addition to meeting the mandatory requirements for energy efficient new construction as specified in ESDS 5.1a, demonstrate that space conditioning energy use is reduced by 50 percent when compared to the 2009 International Energy Conservation Code Supplement.
Materials Beneficial to the Environment	
M	**6.1 Low/No VOC Paints & Primers** All interior paints, varnishes and primers will be less than or equal to the specified VOC levels.
M	**6.2 Low/No VOC Adhesives & sealants** All interior adhesives must comply with the most recent version of Rule 1168 of the South Coast Air Quality Management District. All interior caulks and sealants must comply with Regulation 8 Rule 51 of the Bay Area Air Quality Management District (BAAQMD).
5 max	**6.3 Construction Waste Management** Reduce the amount of construction waste and demolition debris sent to the landfill. Choose one of the following methods. (1)Measured by percentage, (2)Material Specific ,or (3)Minimizing Construction Waste *(last option is for New Construction only)*
10 max	**6.4 Environmentally Preferable Materials** Use environmentally preferable materials and/or materials that are produced (extracted, harvested, manufactured and processed) within 500 miles of the construction site.
5 max	**6.5 Water-Permeable Walkways** Use water-permeable materials in walkways.
5 max	**6.6 Water-Permeable Parking Areas** If providing parking, use water-permeable materials in the parking and driveway area.
5	**6.7a Reduced Heat-Island Effect: Roofing** Choose one of the following options: (1) Choose, specify, and use Energy Star-compliant roofing. (2) Install a “green” (vegetated) roof for at least 50 percent of the roof area. (3)Combinations of high-albedo and vegetated roof can be used, providing they collectively cover 75 percent of the roof area.
5	**6.7b Reduced Heat-Island Effect: Paving** Use light-colored/high-albedo materials and/or an open-grid pavement, with a minimum Solar Reflective Index of 29 over at least 50 percent of the site’s hardscaped area.
3 max	**6.8 Socially Sustainable Products** Choose building products from manufactures that support a broader socially sustainable mission, outside of their environmental mission.
Healthy Living Environments	
M	**7.1 Composite Wood Products that Contain No Added Urea Formaldehyde** Only use composite wood products exposed to the interior (inside the weather resistive barrier) with no added urea formaldehyde.
M	**7.2a Healthy Flooring Materials Mandatory if providing floor coverings** Do not install carpets within three feet of entryways, or in laundry rooms, bathrooms, kitchens / kitchenettes, and utility rooms. Do not install carpet on slab on grade. Any carpet products used in a permitted location must meet the Carpet and Rug Institute’s Green Label or Green Label Plus certification for carpet, pad, and carpet adhesives.
4	**7.2b Healthy Flooring Materials** In all rooms, do not install carpet or flooring containing PVC or chlorine.
M	**7.3a Exhaust Fans- Bathroom** *New Construction & Substantial Rehab only* Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are equipped with a timer, humidistat sensor, or that operate continuously.

5	7.3b Exhaust Fans- Bathroom *Moderate Rehab only* Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are equipped with a timer, humidistat sensor, or that operate continuously.
M	**7.4a Exhaust Fans- Kitchen** *New Construction only* Install Energy Star labeled power vented fans or range hoods that exhaust to the exterior.
3	**7.4b Exhaust Fans- Kitchen** *Moderate/Substantial Rehab only* Install Energy Star labeled power vented fans or range hoods that exhaust to the exterior.
M	**7.5 Ventilation** Install a ventilation system for the dwelling unit that provides a minimum of 15 cfm (cubic feet per minute) of fresh air per occupant. Use the 2009 International Residential Code, or as an alternative, use 2010 ASHRAE standard 62.2.
M	**7.6 Clothes Dryer Exhaust** Clothes dryers must be exhausted directly to the outdoors using metal duct work.
M	**7.7 Combustion Equipment** If using fossil fuel fired water heaters, specify direct power vented or combustion sealed appliances when the heater is located in a conditioned space.
M	**7.8 Cold Water & Hot Water Pipe Insulation** Insulate all hot water pipes from the hot water heater to point of use. Insulate all cold water pipes in locations where freezing is a possibility including exterior walls and unheated attics or crawl spaces.
M	**7.9a Mold Prevention: Water Heaters, Condensing Boilers, Furnaces, & AC** *Mandatory for New Construction only* If storage water heaters are installed in interior spaces, provide an auxiliary drain or catch pan that drains to the exterior of the building. For HVAC equipment, provide auxiliary drain pans when required by code. Insure that any catch pans or drip pans minimize standing water.
M	**7.9b Mold Prevention: Surfaces** In wet areas, use materials that have smooth, durable, cleanable surfaces.
M	**7.9c Mold Prevention: Tub & Shower Enclosures** Use one-piece fiberglass or similar enclosure or, if using any form of grouted material, use backing materials such as cement board, fiber cement board, fiberglass-reinforced board or cement plaster.
M	**7.10 Vapor Barrier Strategies** *Mandatory for New Construction & Moderate/Substantial Rehab projects with foundation work only* Install vapor barriers that meet the specified criteria appropriate for the foundation type
M	**7.11 Radon Mitigation** For New Construction in high risk radon counties, provide radon mitigation as required by code. For Rehab projects in those counties, conduct radon testing using the protocols described.
M	**7.12 Water Drainage** Provide drainage of water away from windows, walls, and foundations by implementing list of techniques.
8 max	**7.13 Enhanced Building Envelope Design** Utilize any of the four listed measures to enhance the building envelope design for durability.
M	**7.14 Garage Isolation** Follow the list of criteria for projects with garages.
M	**7.15 Integrated Pest Management** Utilize the sealing methods outlined in the criterion. Develop an integrated pest management (IPM) policy with resident guidance related to pesticide use, housekeeping, and prompt reporting of pest problems to be included in the Maintenance and Resident Manuals.
M	**7.16 Lead-Safe Work Practices** For properties built before 1978, use lead-safe work practices during renovation, remodeling, painting and demolition.
7	**7.17 Smoke-Free Building** Implement and enforce a smoke-free policy in all common and individual living areas, including decks and patios, in unit leases and within 25 feet of building entries or ventilation intakes.

Operations and Maintenance	
M	**8.1 Building Maintenance Manual** A building maintenance manual explaining the project's ESDS features will be provided by the project sponsor.
M	**8.2 Resident Manual** A guide for homeowners and renters that explains the intent, benefits, use and maintenance of green building features will be provided by the project sponsor.
M	**8.3 Resident & Property Manager Orientation** Provide a comprehensive walk-through and orientation for the residents and property manager(s) using the appropriate manual (see Criteria 8.1 and 8.2) to review the project's green features, operations, and maintenance, and, for the resident orientation, the neighborhood amenities.
7	**8.4 Project Data Collection** Collect and monitor project performance data on energy, water, and, if possible, healthy living environments for a minimum of five years. Allow Commerce access to that data.
2	**8.5 Educational Signage** Post current, durable and permanent educational signage throughout the building and/or provide educational material to communicate the green efforts of the project to the community, residents and building operators.

Integrative Design

An Integrative design process facilitates the design and development team's achievement of green objectives throughout the project life cycle

1.1 Green Development Plan

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Conduct one or more integrative design meeting(s) as appropriate for your project and submit a written Green Development Plan on outlining the integrative design approach that demonstrates involvement of the entire development team. Use the guidelines in **Appendix C** for the Green Development plan.

➡ **Required documentation for Evergreen Project Plan:**
Attach to the EPP the completed Green Development Plan that provides the Process, Goals, Milestones and Measure Champions as outlined in **Appendix C**.

Rationale

An integrative design process facilitates the design and development team's achievement of green objectives throughout the project life cycle. The outcomes of an integrative design process can include substantially lower development costs, lower utility costs and greater health, economic, and environmental benefits for residents, property owners, and communities.

Recommendations

- Include the full development team and other stakeholders in the green design charrette. Perhaps more than one meeting is necessary to achieve clarity of design goals and agreement with the full development team. Consider inviting participants from the following disciplines or interests:
  - Prospective or current residents
  - Architecture or residential building design
  - Mechanical or energy engineering
  - Building science or performance testing
  - Green building or sustainable design
  - Civil engineering, landscape architecture, habitat restoration, or land-use planning
  - Building management & maintenance
  - Environmental science
  - Public health, Local Officials, code officials

- Review the life cycle and maintenance of similar purpose materials and products and consider choosing the more durable less polluting ones. This will promote the increased service life of the building while lowering maintenance and replacement costs.

Resources

- Enterprise Green Communities offers a variety of resources to support the integrative design process: http://www.greencommunitiesonline.org/tools/funding/grants/charrette.asp
- Whole Building Design Guide describes the core elements of whole building design and helps users identify design objectives and organize their processes to meet those objectives: http://www.wbdg.org/wbdg_approach.php
- The Department of Ecology may offer eco-charrette facilitation for your project.

1.2 Universal Design

Optional up to 3 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Option #1: (1 point) will be awarded for including the following features:

- All unit entries on an accessible route of travel.
- All door hardware (including closet doors) accessible lever or loop style handles. Bi-pass or sliding doors are exempt.
- All doors to provide 32 inches clear or 36 inches rough opening. This includes all doors designed to allow passage through the unit; this includes entry doors, doors to habitable rooms or hallways, doors in walk in closets, patio doors and doors in utility/storage rooms larger than 48”x48” in size.”
- All closets to have adjustable shelves and rods (or combination shelf / clothes rod) able to be located between 42 and 60 inches above the finished floor.

Option #2: (2 points) will be awarded for including the previous features, plus:

- Accessible appliances including front or side control ranges, side-by-side front-load washers and dryers (if provided) and side-by-side or accessible top-freezer refrigerators.
- Accessible controls, which includes rocker light switches and digital thermostats. All controls between 36 and 44 inches above the finished floor.
- All faucets in kitchens and bathrooms to have single lever anti-scald accessible controls, with a clear knee space under the sink. The clear knee space shall be 30” wide, 11” deep and 27” high. All pipes in the knee space shall be insulated. The clear knee space can be accommodated with removable doors and deck in the base cabinet.

Option #3: (3 points) will be awarded for including the previous features, plus:

- Locate toilet so centerline of toilet is 15 to 18 inches from parallel wall on the side of the toilet, and so that 24 inches of clear floor space is located to the other side of the toilet.
- All hallways or routes of travel to be a minimum of 48” clear.
- Kitchen to include a minimum 30” wide accessible work surface 30 to 34 inches above the finished floor with a clear knee space below. The clear knee space shall be 30” wide, 11” deep and 27” high.
- At least half of the base cabinets in kitchens (excluding sink bases) to have full extension pull out drawers. Counter top to be 34 inches above the finished floor, and the bottom of upper cabinets to be a maximum of 48 inches above the finished floor.

Required documentation for Evergreen Project Plan:
On the EPP Form, specify which option will be incorporated and list the features.

Rationale

Universal design features result in a building that is sensitive to a wide range of resident needs, including those who have temporary or permanent disabilities. The creation of comfortable environments for a diverse population increases the likelihood of dynamic, diverse communities.

Recommendations

Universal design features should be considered during the integrative design process, based on the sustainability goals of the project.

Resources

- ICC/ANSI A117.1 Standard: http://webstore.ansi.org/RecordDetail.aspx?sku=ICC%2FANSI+A117.1-2003 and http://www.iccsafe.org/store/Pages/Product.aspx?id=9033X03#longdesc

Location & Neighborhood Fabric

Locating a project within an existing neighborhood and in close proximity to infrastructure encourages more resource-efficient development of land, reduces development costs, conserves energy and adds to the vitality of the overall community

2.1 Site protection

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Verify that the project site:

1. Can comply with local critical area ordinances which include protection of: wetlands, fish and wildlife habitat, geologically hazardous areas, aquifer recharge areas and frequently flooded areas.
2. Is not located on land designated by the county as agricultural or forest land of long-term commercial significance under the GMA. (RCW 36.70A.060)

Required documentation for the Evergreen Project Plan:
Attach documentation from the local jurisdiction stating the zoning for the property, identification of any known critical areas within 300 feet and any resulting development restrictions.

Rationale

Proper site selection avoids development of inappropriate sites and damage to or loss of fragile and scarce environmental resources.

2.2 Connections to existing development & Infrastructure

Mandatory for Urban New Construction. Optional 2 points for Rural New Construction

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide site map demonstrating that the development is located on a site:

- With access to existing roads, water, sewers and other infrastructure within or contiguous (having at least 25 percent of the perimeter bordering) to existing development; and
- Within the Urban Growth Area designated by an adopted Comprehensive Plan.

Do not build on tracts of land that require installing a septic tank or a sanitary sewer line extension of 1,000 feet or greater from the property line of the tract being developed.

Required documentation for the Evergreen Project Plan:
Attach a clear and detailed Site & Vicinity Map with explanations. Clearly label and indicate on the map the areas specific to this criterion.

Rationale

Locating a project within an existing neighborhood and in close proximity to infrastructure encourages more resource-efficient development of land, reduces development costs, conserves energy, and adds to the vitality of the overall community.

2.3 Compact Development

Mandatory (see exemptions)

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Design and build the project to the density required for the location type:

> *Urban:* A minimum net density of at least 7 dwelling units per acre, or consistent with local zoning.
>
> *Rural and/or Tribal:* A minimum net density of 5 dwelling units per acre, or consistent with local zoning.

Do not build in areas designated as "Rural lands" under the Growth Management Act. Rural lands are those lands in a county that have not been designated as natural resource lands of long-term commercial significance and have not been designated for urban growth. Rural lands do not include incorporated rural towns or cities, but can include existing rural communities that have not been incorporated. County planning for development in rural areas needs to include goals and policies to provide for a variety of rural densities and to protect rural character.

Exemption: Seasonal Farmworker and Tribal projects are exempt from this criterion.

➡ **Required Documentation for the Evergreen Project Plan:**
Attach the architect's density calculation and statement of correctness.

Rationale

Compact development encourages more resource-efficient development of land, reduces development costs and can reduce automobile dependence. It also can contribute to creating more walkable communities, while helping restore, invigorate and sustain livable development patterns.

Resources

- Smart Growth Network: this website outlines smart growth principles, provides a guide through smart growth terms and technical concepts, and hosts a searchable catalogue of reports, websites, tools, and case studies: http://www.smartgrowth.org/

2.4 Maximizing Density

Optional 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Design and build the project to the maximum density allowed per local zoning.

➡ **Required Documentation for the Evergreen Project Plan:**
Attach the architect's density calculation and statement of correctness.

Rationale

Compact development encourages more resource-efficient development of land and supports demand for other infrastructure such as public transportation and commercial development.

2.5 Access to services & Public Transportation

Mandatory plus an option to achieve an additional 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Locate the project within walking distance of services or public transportation. Projects are required to provide at least one option from the options below. Projects that achieve both options will receive 5 points. NOTE:

- Facilities used to meet this criterion must be built at the time of application.
- Each establishment must be a separate and distinct business and may only count as one facility. Separate and distinct businesses under one roof will each count as a facility. For example, a Safeway that also houses a Wells Fargo Bank and a Starbucks will count as 3 facilities.

Option #1: Proximity to Services. Locate the project within:

-*Urban:* a 0.25-mile distance of at least two or a 0.5-mile distance of at least four facilities
-*Rural / Tribal:* 2 miles of at least two facilities.

CIVIC & COMMUNITY FACILITIES		SERVICES	RETAIL
Medical clinic or office	Police or fire station	Bank	Supermarket
Licensed Adult or senior care	Public Library	Restaurant, café, diner Laundry, dry cleaner	Other food store with produce
Licensed Childcare	Public park	Gym, health club, exercise studio	Farmers market
Community or recreation center	Post office		Hardware store
Entertainment venue (theater, sports)	Place of worship		Pharmacy
Educational facility (including k-12 school, university, adult education, vocational school, community college)	Government office that serves public on-site		Clothing retail
Cultural arts facility (museum, performing arts)	Social services center		Other retail

List taken from LEED 2009 Neighborhood Development Rating System

Option #2: Access to Public Transportation. Locate project within:

Urban: a 0.5-mile distance of combined transit services (bus, rail, & ferry).

Rural / Tribal: a 5-mile distance of the following transit options: 1) vehicle share program; 2) dial-a-ride program; 3) employer vanpool; and 4) public–private regional transportation

Required Documentation for the Evergreen Project Plan:
On the EPP form, state which option(s) the project will provide. If both options are provided, award 5 points. Attach the following documents for the applicable option(s):

For Option #1: Attach a context map demonstrating that the center of the site is within the required walk distances of the required number of services. Google Maps offers a function to demonstrate walk distance. On Google Maps, go to "Directions" and select "Walk Directions" to obtain this information.

For Option #2: Attach a context map to demonstrate that the center of the site is within the required distance of transit options. Google Maps offers a function to demonstrate walk distance. On Google Maps, go to "Directions" and select "Walk Directions" to obtain this information.

Rationale

Projects located near transit and/or services reduce residents' need to own a car, thereby eliminating or lowering the costs of auto ownership, a significant assistance to low-income populations. Additionally, it strengthens those communities and residents' ties to society and creates walkable communities that promote human health while reducing transit related emissions of air pollutants and carbon dioxide.

Resources

Safe Routes to School National Partnership: http://www.saferoutespartnership.org/home
This network of more than 300 nonprofit organizations, government agencies, schools, and professionals works to advance the Safe Routes to School (SRTS) movement in the United States. SRTS can provide a variety of important benefits to children and their communities, including increasing physical activity, reducing traffic congestion, improving air quality, and enhancing neighborhood safety.

Reconnecting America: http://www.reconnectingamerica.org/
This national nonprofit organization provides both the public and the private sectors with a fact-based perspective on development-oriented transit and transit-oriented development.

2.6 Preservation of & Access to Open Space

Optional 3 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Set aside common, outdoor open space for use by residents. Open space does not include streets, roadways, tenant private outdoor areas, or areas inaccessible to residents. Provide one of the following options:

Option #1: (1 point) Set aside 10% common, outdoor open space for use by residents.

Option #2: (2 points) Set aside 20% common, outdoor open space for use by residents.

Option #3: (3 points) Set aside 30% common, outdoor open space for use by residents.

Option #4: (1 point) Locate project within a 0.25-mile distance of dedicated public open space that is a minimum of 0.75 acres. The open space requirement may be met by either one large open space or two smaller spaces totaling 0.75 acre.

Required Documentation for the Evergreen Project Plan:
On the EPP, state the option chosen and how the design will meet the requirement. Also, attach a clear and detailed Site & Vicinity Map and indicate on the map the areas designated as open space for residents. Open space should not include streets, roadways, or tenant private outdoor areas, or areas inaccessible to residents.

Rationale

Access to open space and natural resources improves quality of life by providing physical and psychological health benefits, by promoting social interactions, and by supplying the opportunity to better understand the importance of the natural environment.

Recommendations

- Plan for the security, maintenance, and operations of the open space.
- Good design for open space should include at least one pedestrian trail or walkway, and should be improved to the extent necessary for safety.

Resources

- U.S. Environmental Protection Agency, Smart Growth and Open Space Conservation: www.epa.gov/smartgrowth/openspace.htm
- Embrace Open Space, Citizens Resources: www.embraceopenspace.nonprofitoffice.com/index.asp?Type=B_LIST&SEC=%7B6F5B2EF3-C9B6-49B2-989B-DE2FBA9F4F13%7D

2.7a

2.7a Walkable neighborhoods- Sidewalks & pathways

Mandatory for urban projects

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide a site map indicating that sidewalks or all-weather pathways will be created or preserved within a multifamily property or single-family subdivision to link the residential development to public spaces, open spaces and adjacent development.

Required Documentation for the Evergreen Project Plan:
Attach a site map clearly illustrating the sidewalks and all-weather pathways and where they lead to.

Rationale

Making the streetscape safer and more inviting for walkers and bicyclists encourages alternative transportation choices to the automobile. This promotes physical activity and public health, while creating opportunities for social interaction and increased safety by bringing more eyes on public spaces.

Recommendations

Consider porous pavement for sidewalks and other paved surfaces to reduce storm-water runoff and the distribution of pollutants to streams, rivers and water bodies. Design sidewalks to distribute storm water to open space for recharge and to prevent flooding.

2.7b

2.7b Walkable neighborhoods- connections to surrounding neighborhood

Optional 3 or 5 points for Rural & Tribal projects only

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Connect the project to public and open spaces and adjacent development by providing at least three separate connections (excluding entrances/exits from a single building) from the project to sidewalks or pathways in surrounding neighborhoods and natural areas. Types of connections can include roadways, bike trails, sidewalks, footpaths, and the like.

(3 points) for providing two separate connections.
(5 points) for providing three separate connections.

Required Documentation for the Evergreen Project Plan:
On the EPP form, state how many separate connections the project will provide. Attach a site map demonstrating at least three separate connections to sidewalks or all-weather pathways in surrounding neighborhoods.

Rationale

Providing choices for pedestrians to connect to adjacent development and public and open spaces promote walking, biking, and other healthy lifestyles.

Recommendations

- Pedestrian activity and improved safety can be encouraged by placing parking underground or locating the garage in the rear or on the side of a home.
- Consider using porous pavement for sidewalks and other paved surfaces to reduce stormwater runoff and the distribution of pollutants to streams, rivers, and water bodies. Design sidewalks to distribute stormwater to open space for recharge and to prevent flooding.
- Where possible, wait until project is occupied before laying out paved pathways/sidewalks from the project to the surrounding neighborhood. Build the pathways/sidewalks where there is visible evidence of pedestrian and bicycle use.

2.8 Smart Site Location: Passive Design

Optional 7 points for all projects

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Demonstrate a project with a passive solar design, orientation, and shading that meets the guidelines below.

Project Type	Potential Points & Guideline Requirements
Stand-alone building	(7 points) Meet all guidelines
Projects w/ multiple buildings	(2 points) 25% of the homes meets all guidelines (4 points) 50% of the homes meet all guidelines (6 points) 75% of the homes meet all guidelines (7 points) 100% of the homes meet all guidelines
Moderate or Substantial rehab	(2 points) All new windows must comply with the windows guidelines by climate zone (2 points) All South Facing elevations must comply with shading guidelines

Guidelines:

1. *Building orientation:*

Elongate the building on an east–west axis with a minimum ratio of width to depth of 2:1 and orient the east–west axis of the building to be within 20 degrees of true east–west.

2. *Glazing:* The glazing area on the south-facing façade should be 30% greater than the sum of the glazing areas on the east-, west-, and north-facing façades.

3. *Glazing type:*

- WSEC Climate zone 1: Provide south-facing windows with maximum U-Factor of 0.30 and a minimum solar heat gain coefficients (SHGC) of 0.4.
- WSEC Climate zone 2: Provide south-facing windows with U-Factor of 0.28 and a minimum solar heat gain coefficients (SHGC) of 0.4.

NOTE: When choosing glazing type, consider the climate, orientation, and external shading. Windows with a high SHGC rating are more effective at collecting solar heat gain during the winter. Windows with a low SHGC rating are more effective at reducing cooling loads during the summer by blocking heat gained from the sun. Typically, specify low SHGC for East and West facing windows, and high SHGC for south-facing windows as long as they are fully shaded from summer sun. SHGC is unimportant for north-facing windows, which receive little or no direct solar gain; use whatever is most cost effective. Stock windows with low U-factor will

often have low SHGC as well, so you may need to ask for Low-U factor/High SHGC glazing options. Better quality vendors may offer both.

4. *Shading:* For south-facing windows, 100% of each window should be shaded at noon on June 21st.

Required Documentation for the Evergreen Project Plan:
On the EPP form, specify the project type and attach plan drawing(s) with True North arrow (not magnetic) and section drawings including sun angles, shading depth, window heights and glazing types.

Rationale

The utilization of passive design minimizes reliance on mechanical heating, lowers the cooling load, and provides more residents with access to daylight.

Recommendations

- Design interior spaces that maximize lighting, heating, and cooling. For interior spaces where cooling may be required, utilizing daylighting from the north is often more effective and also reduces glare.
- A narrow floor plate (less than 40 feet), single-loaded corridors, and an open floor plan optimize daylight and natural ventilation
- Thermal Massing
  - Thermal mass should be incorporated in the interior, southern portion of the house where sunlight hits during the heating season. This mass will buffer the rate at which the sun heats the space during the day by storing solar energy for release in the evening and at night. Consult the resources below for guidance on appropriate locations and sizing.
  - Materials with thermal mass include brick, concrete, stone, water, and any other material of a similar high density and specific heat capacity.
  - The thermal mass location must be shown in the schematic building sections that address the relevant areas of the building.
- Additional Potential Passive Cooling Strategies
  - Plant deciduous trees that will shade the south and west façades in the summer. If view corridors are valued, even shading the walls between windows will help reduce cooling loads. Trees also reduce ambient air temperatures adjacent to buildings.
  - If there is a clear path between windows, with no intervening walls, maximize cross ventilation by installing operable windows at the leeward and windward sides of the building.

Resources

- U.S. Department of Energy, National renewable Energy Laboratory
  "Passive Solar Design for the Home," Report #DOE/GO-102001-1105, February 2001:
  www.nrel.gov/docs/fy01osti/27954.pdf
- U.S. Dept. of Energy, Passive Solar Design:
  http://www.energysavers.gov/your_home/designing_remodeling/index.cfm/mytopic=10250

2.9 Brownfield or Adaptive reuse site

Optional 10 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Locate the project on a grayfield, brownfield, or adaptive reuse site.

For brownfields, locate the project on a site, part or all of which is documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment or a local Voluntary Cleanup Program), or on a site defined as a brownfield by a local, state, or federal government agency; and remediate site contamination such that the controlling public authority approves the protective measures and/or cleanup as effective, safe, and appropriate for the future use of the site.

Required Documentation for the Evergreen Project Plan:
On the EPP form, provide description and explanation that confirms the type of site.

Rationale

Use of brownfields or adaptive reuse sites reduces pressure on undeveloped land. Reuse of existing structures reduces the need for new materials.

Resources

- U.S. Environmental Protection Agency, Brownfields Cleanup and Redevelopment: www.epa.gov/brownfields/index.html
- Municipal Research and Services Center of Washington, Infill Development Strategies for Shaping Livable Neighborhoods: http://www.mrsc.org/Publications/textfill.aspx
  This site contains an overview of strategies for encouraging and implementing infill development patterns.
- National Vacant Properties Campaign: http://www.communityprogress.net/
  This website provides information, resources, tools, and assistance to support vacant property revitalization efforts.

2.10 2.10 Access to Fresh, Local Foods

Optional 3 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Choose one of the following options for a maximum of 3 points:

Option #1: Neighborhood Farms and Gardens (3 points for choosing 1a or 1b)

1a) Dedicate permanent and viable growing space and/or related facilities (such as greenhouses) within the project equal or greater in size to 25 square feet per dwelling unit of the project. Provide solar access, fencing, watering systems, garden bed enhancements (such as raised beds), secure storage space for tools, and pedestrian access for these spaces. Ensure that the spaces are owned and managed by an entity that includes occupants of the project in its decision making, such as a community group, homeowners' association, or public body. Established community gardens outside the project boundary but within a 0.5-mile walk distance of the project's geographic center can satisfy this option if the garden otherwise meets all of the option requirements.

1b) Dedicate permanent and viable growing space and/or related facilities (such as greenhouses) within the project equal or greater in size to 25 square feet per dwelling unit of the project, and establish an agreement with a local farming operation to farm the land. Ensure in the agreement that at least 50% of the produce is made available for purchase by the project's residents. Provide solar access, fencing, watering systems, garden bed enhancements (such as raised beds), and secure storage space for tools.

Option #2: Community-Supported Agriculture (3 points)

Offer a specified location within the project boundaries for delivery of community-supported agriculture (CSA) program shares for residents, project staff, and surrounding community members, as appropriate. The farm(s) supplying the CSA shares must be within 150 miles of the project site. Shares must be delivered to the specified delivery point on a regular schedule at least twice a month for at least four months of the year.

Option #3: Proximity to Farmers Market (3 points)

Locate the project's geographic center within a 0.5-mile walk distance of an existing or planned farmers market that is open or will operate at least once a week for at least five months of the year. Farmers market vendors may sell only items grown within 150 miles of the project site OR market vendors consisting of only Washington state farmers, fishers, ranchers, foragers and small food businesses who sell directly to the public what they grow or produce. A planned farmers market must have firm commitments from farmers and vendors that the market will meet all of the above requirements and be in full operation by the time there is 50% occupancy of the project's dwelling units.

Required Documentation for the Evergreen Project Plan:

On the EPP form, specify which option the project will provide. Attach a detailed plan of how the requirements will be met.

Rationale

Access to fresh produce offers healthy food options for residents. This measure also supports local economic development that increases the economic value and production of farmlands and community gardens.

Recommendations

- For projects pursuing Option 1a, consider bringing in an individual or group (e.g., master gardener(s) or a garden club) to work with the residents to establish the garden and maintain productivity.
- For projects pursuing Option 2 or 3, encourage the farms supplying the produce to accept food stamps.

Resources

- Local Harvest: This website offers a search function to find farmers markets, family farms, and other sources of local, sustainably grown food in a given area: www.localharvest.org/
- U.S. Department of Agriculture, National Agricultural Library, Food and Nutrition Information Center, Community Food Systems: http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=2&tax_subject=276&topic_id=1344&placement_default=0

Site Improvements

Low impact design and development principles minimize the site's environmental footprint.

3.1 Environmental Remediation

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Conduct and provide a Phase I Environmental Site Assessment according to the *American Society for Testing and Materials (ASTM) E1527-05* standard and any additional assessments required to determine whether any hazardous materials are present on site.

- If hazardous substances are considered to be present, conduct and provide a Phase II Environmental Site Assessment.
- For all existing buildings, limited surveys for asbestos, lead-based paint and mold are required to be submitted with the application.
- For all vacant land, a limited wetland survey is required.

Required documentation for Evergreen Project Plan:

On the EPP form, state the conclusion of the ESA Phase 1 and that it was submitted with your application for funding. Only if you did not submit your ESA with your funding application, then please attach it to the EPP.

3.2 Erosion & Sedimentation Control

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Implement EPA's Best Management Practices (BMP) for erosion and sedimentation control during construction, referring to the EPA document, *Storm Water Management for Construction Activities (EPA 832-R-92-005).* Or comply with local erosion and sedimentation control standards if the local standards are more stringent than EPA.

Erosion control measures must include all of the following:

a) Stockpile and protect disturbed topsoil from erosion (for reuse).
b) Control the path and velocity of runoff with silt fencing or comparable measures.
c) Protect onsite storm sewer inlets, streams and lakes with straw bales, silt fencing, silt sacks, rock filters or comparable measures.
d) Provide swales to divert surface water from hillsides.
e) If soil in a sloped area (i.e., 25 percent, or 4:1 slope) is disturbed during construction, use tiers, erosion blankets, compost blankets, filter socks and berms, or some comparable approach to keep soil stabilized.

Required documentation for Evergreen Project Plan:
On the EPP form, state which BMP or local controls will be incorporated into the construction and site development plans and contracts. Also, state the actual erosion measures that will specifically be used on the site.

Rationale

Erosion and sedimentation control during site development keeps valuable top soils on site and reduces pollution, storm-water runoff and sediment runoff associated with construction activities into local waterways. Erosion and sedimentation control helps to avoid storm-water-related problems that can delay construction, cause environmental degradation (to creeks, streams and coastal waters) and damage public and private properties downstream. The goal of this criterion is no visible off-site discharge.

Recommendations

The EPA's document, *Storm Water Management for Construction Activities*, may be purchased as item PB 922 359 51 from the National Technical Information Service at www.ntis.gov.

3.3a

3.3a Landscaping

Mandatory if providing landscaping

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide a landscape plan (including trees, shrubs, and groundcover) showing that 50% of the newly landscaped area includes a selection of trees and plants that is native and/or adaptive species. Where possible, locate newly planted trees to provide shade in the summer and allow for solar access in the winter.

All new plants within the property boundaries should meet the following criteria:

- Must be appropriate to the site's soils and microclimate
- If providing irrigation, meet the irrigation requirements outlined in **ESDS 3.4**
- Have an anticipated size at maturity that will not interfere with building areas, or require topping or heavy pruning to control height and growth
- None should be noxious weeds or weeds of concern

Areas specifically dedicated to food production are exempt from this requirement and not included as landscaped area.

Required documentation for Evergreen Project Plan:
Attach a landscape plan showing native plantings including trees, shrubs and ground cover and their relation to the building(s). The map should clearly show 50% or more of the landscaped area as native and/or adaptive species.

Rationale

Native and adaptive plants are well suited to the climate and provide excellent erosion, sediment, dust, and pollution control. Native and adaptive plants are more resistant to naturally occurring disease, insects, and low levels of nutrients, thereby reducing or eliminating the need for fertilizers, pesticides, or herbicides.

Recommendations

- Consult a local arborist and involve a landscape architect in the architectural design process to identify appropriate areas for landscaping including energy and water savings, and to ensure that landscaping includes appropriately sized trees or shrubs.
- Combine landscape plan with storm-water management to provide surface water filtration and aesthetic benefits.
- Non-native turf needs about 35 inches of water per year to thrive, whereas native turf needs much less water per year.
- In areas where water shortages are common, xeriscape (a landscaping method that uses drought-resistant plants to conserve resources, especially water) should be considered.
- If a project has exhausted all other options where the installation of grass is needed, select turf grass seed mixes that contain two or more species that have good drought tolerance. Drought tolerance should be confirmed by a qualified landscape professional or State authority, if possible. Species performance may be compared under the National Turfgrass Evaluation Program reports for various grass types: http://www.ntep.org/previous.htm

Resources

- For projects in Climate Zone 1, these resources may be helpful:
  - Seattle Green Factor Tools- Tree List and Plant List: www.seattle.gov/dpd/permits/greenfactor/greenfactortools
  - King County Weed Lists and Laws: Noxious Weed List, Non-Regulated Noxious Weed List, and Weeds of Concern List, www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds/laws
- Washington Native Plant list by county: http://www.wnps.org/plant_lists/exploring_native_plants.html

3.3b

3.3b Landscaping

Optional 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide a landscape plan (including trees, shrubs, and groundcover) showing that 100% of the newly landscaped area includes a selection of trees and plants that is native and/or adaptive species. Where possible, locate newly planted trees to provide shade in the summer and allow for solar access in the winter.

All new plants within the property boundaries should meet the following criteria:

- Must be appropriate to the site's soils and microclimate
- Meet the irrigation requirements outlined in **ESDS 3.4**
- Have an anticipated size at maturity that will not interfere with building areas, or require topping or heavy pruning to control height and growth
- None should be none should be noxious weeds or weeds of concern

Areas specifically dedicated to food production are not included as landscaped area.

Required documentation for Evergreen Project Plan:
Attach a landscape plan showing native plantings including trees, shrubs and ground cover and their relation to the building(s).

3.3c

3.3c Landscaping- Significant Trees

Optional up to 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide a landscape plan demonstrating the preservation of existing significant trees within the buildable area of the site. A significant tree (or stand of trees) provides a signature for the site and has diameter at breast height (DBH) of nine inches or more. Any combination of points below can be used from the options below, up to 5 points.

(1 point) For each tree with a diameter at breast height (DBH) of nine inches or more
(2 points) For each tree with a DBH of twelve inches or more
(3 points) For each tree with a DBH of eighteen inches or more
(4 points) For each tree with a DBH of twenty-four inches

Required documentation for Evergreen Project Plan:
Attach a landscape plan showing existing significant trees, which trees are being preserved, and their relation to the building(s). Preserved trees must meet criteria under **ESDS 3.3a** for size and location.

Rationale

Trees are valuable resources that provide economic, environmental and social benefits. Trees reduce the impact of stormwater runoff, improve air quality, moderate the effects of wind and temperatures, enhance the visual appearance of the community and help protect property values. Although trees can be removed and replaced with new plantings, it takes many years or decades for young trees to reach maturity and match the benefits of existing trees.

Recommendations

Consult a local arborist or landscape architect in the site design process to identify significant trees suitable for preservation which must have an anticipated size at maturity that will not interfere with building areas or require topping or heavy pruning to control height and growth. Ascertain the health and safety of the trees targeted for preservation, particularly if they are part of a tree stand where others are removed.

Resources

- The National Tree Benefit Calculator estimates the benefits of significant trees on your site: http://www.treebenefits.com/calculator/
- OSU's Best Management Practices for Tree Protection on Construction & Development Sites: http://www.dnr.wa.gov/Publications/rp_urban_treeprtctnguidbk.pdf

3.4 3.4 Efficient Irrigation

Mandatory if irrigation is utilized

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

If irrigation is utilized, install an efficient irrigation system. These irrigation requirements are mandatory only for permanent landscaping that requires regular irrigation.

An efficient irrigation system must include the following at a minimum:

- For all landscape planting beds and trees, drip and/or bubbler irrigation system must be used.
- For turf, separately zone turf based on watering needs. If using conventional rotors, multi-stream rotors, or high efficiency spray heads, the nozzles must have documented average distribution uniformity (DU) of at least 0.70.
- A zone manifold and/or timer/controller that can be programmed to control the frequency, time of day and duration of irrigation for each watering zone to minimize evaporative losses while maintaining healthy plants and obeying local regulations and water-use guidance.
- A moisture sensor controller or rain delay controller or weather-based irrigation controller designed to eliminate irrigation overwatering when plant needs are met by natural precipitation.

In climate zone 1: watering tubes for trees are allowed for a period of two years.
In climate zone 2: watering tubes for trees are allowed for a period of four years.

Required documentation for Evergreen Project Plan:
On the EPP form, specify that drip and/or bubbler irrigation system will be used for all landscape planting beds and trees. Specify that turf and each type of bedding area will be separately zoned based on watering needs with a programmed zone manifold and/or timer/controller. Specify that a controller designed to eliminate irrigation overwatering will be installed.

Rationale

Accurate delivery of water reduces evaporation and eliminates overspray. Proper scheduling eliminates fluctuations between wet and dry states that stress plants.

Recommendations

Use high-efficiency irrigation nozzles with average distribution uniformity (DU) of at least 0.70. This may include conventional rotors, multi-stream rotors, or high-efficiency spray heads, but the DU must be verified by manufacturer documentation or third-party tests.

Resources

- U.S. Environmental Protection Agency, WaterSense: Efficiency Made Easy: http://www.epa.gov/watersense/index.html and *Water-Efficient Landscaping: Preventing Pollution and Using Resources Wisely*: www.epa.gov/WaterSense/docs/water-efficient_landscaping_508.pdf

3.5 Surface Water Management

Optional – Up to 6 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Implement a comprehensive stormwater management plan for the project that retains the rainfall volumes on-site listed in Table 1. Appropriate management strategies include infiltration, evapo-transpiration, and/or harvesting and reuse.

Calculation Requirements:

Rainfall volume is calculated by multiplying the total generating surface area of the project by the appropriate percentile rainfall event.

The total generating surface area of the project is the combined area (in square feet) of:

1) The project's development footprint,
2) Any other areas that have been graded so as to be effectively impervious, and
3) Any pollution-generating pervious surfaces, such as landscaping, that will receive treatments of fertilizers or pesticides.

The percentile rainfall event (Table 1) is the total rainfall on a given day in the record that is greater than or equal to X percent of all rainfall events over a 20- to 40+-year period. For example, a 95th percentile event in a particular region might be 1.5 inches, which would then be the volume to retain.

To determine the appropriate rainfall event size for their location, projects may:

A) Use NOAA's published national rainfall data – See Table 2 which provides 24 hour storm event data percentiles for nine selected locations. Use the location nearest your project. If none of these locations are appropriate, instructions are available in **Appendix D** for how

to access data from NCDC/NOAA and to process the data to calculate percentiles. One hundred percent of the water volume from rainfall events up to the X percentile event must not be discharged to surface waters unless the runoff water is harvested and reused, and is then authorized for discharge or allowed to be discharged into sanitary treatment systems.

Table 1. Points for retaining stormwater on-site

Percentile rainfall event (total volume to be retained)	Points
80%	1
85%	2
90%	4
95%	6

Table 2. Precipitation Data by location (based on most recent 20 year, 24 hour storm event data from NCDC/NOAA

Location	80th Percentile (inches)	85th Percentile (inches)	90th Percentile (inches)	95th Percentile (inches)
Aberdeen	0.22	0.26	0.34	0.47
Ellensburg	0.18	0.22	0.26	0.40
Longview	0.41	0.49	0.61	0.80
Omak	0.35	0.40	0.50	0.69
Pullman	0.29	0.34	0.42	0.56
Richland	0.15	0.19	0.24	0.32
Seattle	0.38	0.47	0.61	0.82
Spokane	0.24	0.29	0.37	0.50
Whidbey Island	0.22	0.26	0.34	0.47

Best Management Practices:
The BMPs for the comprehensive stormwater management plan must include season-specific maintenance that ensures continuous performance of the system and must be selected from:

- The Washington State Department of Ecology's Stormwater Management Manual for Western Washington, Volume V, Runoff Treatment (2005 edition),
- The Washington State Department of Ecology's Stormwater Management Manual for Eastern Washington, (2004 edition) with additional reference to new and emerging BMPs referenced in the Western Washington Manual

  -OR-
- Locally approved equivalent, whichever is more stringent, and must comply with all federal, state, and local regulations.

For stormwater reuse systems not on a combined stormwater and sewer system, the total water reused for indoor use must not exceed 90% of the average annual rainfall.

Stormwater BMPs (except cisterns) must be designed to drain down within 72 hours.

Required documentation for Evergreen Project Plan:
Attach the precipitation data location used, the percentile event (80th, 85th, etc.), the appropriate rainfall event size, the total generating surface area for the project and describe design features that will be implemented to meet the requirements.

Rationale

Reducing storm-water runoff through design and management techniques increases on-site filtration, prevents pollutants from entering waterways and reduces soil erosion. Water storage and nutrient collection processes reduce the need for irrigation and contribute to forming a healthier ecological community within the landscape.

Recommendations

- If a rainwater harvesting and storage strategy is considered in addition to infiltration, check with state and local governments to verify that capture and/or reuse of rainwater is permitted. If not, consider appealing local rules.
- Attempt to make use of innovative, low-impact techniques such as disconnected downspouts, permeable paving, swales, retention basins, rain gardens, sidewalk planters, xeriscaping, and nature-scaping, ecoroofs, rain barrels, and cisterns to convey, capture, infiltrate, and /or reuse stormwater.
- Strive to minimize impervious areas (surfaces that do not allow stormwater infiltration), including roofs, driveways, sidewalks, and streets, or use porous materials for such areas. Water-permeable materials include pervious interlocking concrete paving blocks, concrete grid pavers, perforated brick pavers, and compacted gravel.

Resources

- National Oceanographic & Atmospheric Administration's National Climatic Data Center: http://www.ncdc.noaa.gov/oa/mpp/digitalfiles.html
- Department of Ecology, Stormwater Management & Design Manuals http://www.ecy.wa.gov/programs/wq/stormwater/municipal/StrmwtrMan.html
- U.S. Environmental Protection Agency, Storm Drain Marking: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=15
- U.S. Environmental Protection Agency, *Low-Impact Development Design Strategies: An Integrated Design Approach:* www.epa.gov/owow/NPS/lidnatl.pdf

3.6 Storm Drain Labels

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Label all storm drains or storm inlets to clearly indicate where the drain or inlet leads.

Required documentation for Evergreen Project Plan:
On the EPP form, state your commitment to label all storm drains and inlets.

Rationale

Provide a visual reminder that storm sewer inlets connect to area waterways and groundwater storages, and should not be used to dump garbage of any kind.

Recommendations

To provide a visual reminder that storm sewer inlets connect to area waterways and ground-water storages, use a plaque, tile, painted, or pre-cast message such as “No Dumping. Drains to [name of water source].”

Water Conservation

Water conservation translates into direct utility savings for residents and building owners and lowers infrastructure costs associated with stormwater management and water treatment facilities

4.1 Water-Conserving Fixtures

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

In new construction and when fixtures are replaced in rehabilitation, install WaterSense labeled toilets, showerheads and bathroom faucets, and water-conserving kitchen faucets with the following specifications:

- Toilets – 1.28 GPF (gallons per flush) or less, WaterSense labeled with MaP test performance at minimum 500g
- Showerheads – 2.0 GPM (gallons per minute) or less, WaterSense labeled
- Bathroom faucets – 1.5 GPM or less, WaterSense labeled
- Kitchen faucets – 2.0 GPM or less

Note: At the time of this publication, WaterSense does not certify kitchen faucets.

Required documentation for Evergreen Project Plan:
On the EPP form, specify flow rates, WaterSense, and MaP performance for applicable fixtures that will be installed. Do not send in product literature or spec sheets with the EPP.

Rationale

Showers and faucets account for approximately 25 percent of indoor water use. Toilets account for approximately 30 percent of indoor water use. Saving water translates into utility savings, both by conserving water and reducing the energy required for water heating. A typical 3 person household using WaterSense faucets, showerheads and toilets, with electric hot water heating, will save about 5,100 gallons per and 400 KWh of electricity every year. That's roughly equivalent to water used in 130 loads of laundry and to leaving a light bulb burning continuously for 10 months. (Sources: *Code of Federal Regulations, March 18, 1998, Page 13307* & EPA WaterSense)

Recommendations

- Certain existing fixtures, such as bathroom faucets, can be retrofitted with an aerator to reduce water flow to the requisite level.
- For senior projects, consider using single-flush toilets that meet the criterion flow rates, rather than dual-flush toilets. Feedback from past projects suggests that senior populations may be unsure of the dual-flush technology, which may lead to their having difficulty in operating the toilets in an effective and appropriate way.

Resources

- To search for toilets that meet the required MaP test performance: http://www.map-testing.com/about/maximum-performance/map-search.html

- Like Energy Star, the WaterSense label makes it easy for consumers to recognize products and programs that save water without sacrificing performance quality. Independent, third-party licensed certifying bodies certify that products meet EPA criteria for water efficiency and performance by following testing and certification protocols specific to each product category. Products that are certified to meet EPA specifications are allowed to bear the WaterSense label. http://www.epa.gov/watersense/about_us/watersense_label.html

4.2 Advanced Water-Conserving Fixtures

Optional up to 6 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install WaterSense labeled toilets, showerheads and bathroom faucets and water-conserving kitchen faucets with the following specifications:

- Toilets (2 points) – 1.1 GPF (maximum gallons per flush) or less, or a toilet with dual flush, one of the options being less than 1 GPF, WaterSense labeled
- Showerheads (2 points) – 1.75 GPM (gallons per minute) or less, WaterSense labeled
- Bathroom faucets (1 points) – 0.5 GPM or less, WaterSense labeled
- Kitchen Faucets (1 points) -1.5 GPM or less

Required documentation for Evergreen Project Plan:
On the EPP form, specify flow rates WaterSense and MaP performance for applicable fixtures that will be installed. Do not send in product literature or spec sheets with the EPP.

Rationale

Water conservation translates into direct utility savings for residents and building owners and lowers infrastructure costs associated with stormwater management and water treatment facilities.

Recommendations

- High Efficiency Toilets (HETs) are toilets that use 1.3 GPF or less. These include dual flush toilets that are rated based on the average flush volume of the two settings. Both single and dual flush toilets are now available with flush volumes as low as 1 GPF. The WaterSense label will be on HETs that are certified by independent laboratory testing to meet rigorous criteria for both performance and efficiency.
- Certain existing fixtures, such as bathroom faucets, can be retrofitted with an aerator to reduce water flow to the requisite level.
- For senior projects, consider using single-flush toilets that meet the criterion flow rates, rather than dual-flush toilets. Feedback from past projects suggests that senior populations may be unsure of the dual-flush technology, which may lead to their having difficulty in operating the toilets in an effective and appropriate way.

4.3 Water Reuse

Optional up to 8 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Option #1: (4 points)
Infrastructure Pre-plumbing: Install supply plumbing for non-potable end uses (toilets and/or laundry facilities) so that "salvaged water" may be supplied to these fixtures in the future without significant disturbance of building structure. Design wastewater plumbing to keep greywater from showers and laundry facilities separate from all other waste water until immediately before it exits the building or meets the main sanitary sewer line leaving the property.

Option #2: (up to 8 points)
Harvest, treat, and reuse rainwater and/or greywater to meet a portion of the project's water needs. To achieve optional points, provide the defined percentage of the project's total water needs through rainwater and /or greywater (using either one or a combination of both strategies). Total water needs include all exterior and interior water use. Use the table below to determine the appropriate number of optional points:

Total water needs supplied by rainwater and/or greywater	Optional points awarded
20%	6 points
40%	8 points

Required documentation for Evergreen Project Plan:

For Option #1: On the EPP form, state how the design will meet the requirement; how these details will be communicated to the plumbing contractor; and how they will be recorded in the "As Built" documents

For Option #2: On the EPP form, in addition to the relevant details from Option 1, state the percentage of the project's water needs that will be supplied by rainwater and/or greywater. Also, attach an explanation of how the project's total water need was determined and describe the design features (including cistern sizing calculation) that will be implemented to achieve the stated percentage.

Rationale

Rainwater and greywater reuse strategies reduce the need for municipal water supplies and sewage treatment. Water distribution in buildings tends to be embedded in structure; difficult or impossible to retrofit in a building designed to last 50 years or more. Installing the infrastructure for reusing water in the future is a solid investment in building longevity.

Recommendations

- An effective way to design for future use of salvaged water is to place non-potable end uses (such as toilets and clothes washers) on a separate plumbing trunk from potable uses (showers, all indoor faucets, etc.). Using purple pipe for this distribution will denote that this water is salvaged/non-potable – avoiding possible confusion between potable and non-potable lines, both current and future. This supply should pass through an area of the building where supply from a rainwater or greywater cistern can be installed and city water supply is also available for makeup. Accommodations will also be required for city water supply isolation and back-flow prevention, which will be required when the salvaged water source is installed.
- Rainwater can be harvested from impervious surfaces such as roofs and carried via gutters and downspouts to a storage tank or cistern where it can be treated or filtered for potable uses. Untreated rainwater may be used for non-potable uses.
- Greywater may be stored and treated for non-potable uses such as toilet flushing and irrigation.
- Rainwater and greywater systems are subject to state and local regulations and special requirements. In some jurisdictions, rainwater or greywater systems may not be allowed. Check with your local building code officials for requirements. If not, consider appealing local rules.
- Consider striving for rainwater and greywater utilization beyond 20%. In some cases, employing rainwater and greywater harvesting, treatment, and reuse can provide for all of a project's water needs.

Resources

- International Living Building Institute, Achieving Water Independence in Buildings: https://ilbi.org/education/reports/oregon. This downloadable publication explains water reuse systems and regulatory barriers, and provides information for those wishing to explore the possibilities of water reuse in buildings and to reform limiting regulation.

Energy Efficiency

Improvements in building energy performance result in utility cost savings from more efficient heating, cooling, hot water, lights and appliances, which improves residents' comfort and lowers costs.

5.1a 5.1 A Building Performance Standard

Mandatory for all new construction projects

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Meet the minimum requirements of the most recent edition of the Washington State Energy Code and incorporate the following additional requirements.

For Single Family Homes there are two options (including duplexes or townhomes within the scope of Section R101.2 of the International Residential Code):

1. Obtain two extra credits from WSEC 2009 Table 9-1. When using the systems analysis approach, demonstrate a 7% reduction in energy use for each credit.

   -OR-

2. Use the 2011 EnergyStar Northwest Builder Option Packages

For Multifamily Units: Use the prescriptive, component performance or systems analysis methods from the 2009 WSEC, with modifications to the building envelope tables 13-1 and 13-2 attached in **Appendix A**. (This applies to spaces not covered within the scope of Section R101.2 of the International Residential Code)

Required Documentation for the Evergreen Project Plan:

Single Family: On the EPP form, specify which option you are choosing.

1. If choosing to obtain two extra credits from WSEC 2009, specify which credits will be implemented from WSEC 2009 Table 9-1.
2. If using the NW Energy Star Homes option, provide documentation on the building option package to be used and identify the Energy Star compliance verifier.

Multifamily:

On the EPP form, provide the energy code compliance documentation, with the specified modifications to tables 13-1 or 13-2. Provide a plan for assuring the beyond code measures will be installed and inspected in the project.

Rationale

This requirement will result in savings that contribute to improved home quality and homeowner comfort, and to lower energy demand and reduced greenhouse gas emissions.

Recommendations

Single Family:

- If choosing incremental improvements compared to code:
  The 2009 WSEC requires applicants to choose additional energy efficiency improvements

based on the requirements of Chapter 9. To meet code, the proposed design must either demonstrate a 7% improvement in energy efficiency through a chapter 4 systems analysis approach, or select a combination of measures that provide one credit from Table 9-1. The requirements listed in section 105 are incremental improvements over the base code requirements.

- If choosing Energy Star for New Homes:
  Specific prescriptive options for Energy Star compliance have been developed for the Pacific Northwest climate. These have been accepted as equivalent to the national Energy Star standard. The Northwest options are based on this region's State energy codes, with additional upgrades specified to meet the Energy Star goals. Prescriptive builder option packages are detailed on the web site listed below. The builder will also want to identify a Participating Verifier who will provide required third party certification.
  Basic Steps:
  - Use Energy Star Northwest Specifications: http://www.northwestenergystar.com/partners/home-builders?tid=18
  - Use or sign up as an Energy Star Builder.
  - Identify and use an Energy Star Homes Northwest Performance Contractor.
  - Describe the Energy Star Qualification Method.
  - Complete construction, testing, verification, and certification.

New Multi-Family Construction: Use **Appendix A**. Basic Steps:

- Review **Appendix A** and identify the selected compliance option.
- Develop and provide associated documentation.
- Facilitate verification of insulation, windows, and air sealing during construction.

Resources

- For more information regarding ENERGY STAR standards: http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.pt_bldr
- For more information regarding Pacific Northwest ENERGY STAR for New Homes, visit:www.northwestenergystar.com/partners
- To identify a Home Energy Rater in your area visit: http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.locator or call the
- ENERGY STAR toll-free hotline: 888.STAR.YES

5.1b 5.1b Building Performance Standard

Mandatory for all rehab projects

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide insulation and air sealing improvements as prescribed in **Appendix B**.
Three methods for addressing a successful energy efficiency strategy for rehabilitation are detailed in **Appendix B**. This includes a prescriptive list of measures, a method for calculating a simple 10-year payback, and a more complex savings-to-investment ratio (SIR) calculation. It is worth noting that all three methods tend to result in a similar if not identical list of energy efficiency measures. Unless there are special conditions in the existing building, it is likely that conducting a simple payback or SIR calculation will not be needed.

A typical set of improvements will include:

- Air sealing
- Wall, floor, and ceiling insulation
- Duct sealing

Required Documentation for the Evergreen Project Plan:
On the EPP form, state the method chosen. For prescriptive, attach all finished insulation levels and U values of windows and list ventilation, air sealing, and duct sealing. For Simple Payback, attach the energy analysis on each of the mandatory prescriptive measures. For Savings-To-Investment, attach the TREAT analysis and a list of the WX measures.

5.2a 5.2A Additional Reduction in Energy Use

Optional 5 points for new construction

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Reduce the project's overall energy usage by an additional 7%.

For Single Family: Obtain three credits from WSEC 2009 Table 9-1.

For Multifamily: Reduce the building heat loss (UA) by 15% compared to the requirements in **Appendix A**, or use the systems analysis methodology from WSEC 2009, Appendix RS-29 to demonstrate an additional reduction in energy use of 7 percent compared to the minimum code requirements.

Required Documentation for the Evergreen Project Plan:
Attach supporting documentation. You can include items in this analysis if you have received points elsewhere. All additional efficiency measures shall be incorporated in this methodology. NOTE: If this option is chosen, option **ESDS 5.14** cannot also be claimed.

Rationale

For new construction, adding incremental improvements will improve energy efficiency while reducing utility and operating costs for residents and building owners. Energy conservation lessens smog, acid rain and greenhouse gas emissions.

5.2b 5.2B Additional Reduction in Energy Use

Optional 5 points for moderate and substantial rehab

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Use the method in **Appendix B** for the simple 10-year payback except extend the payback period to at least 14 years.

- Include the energy improvement report done by the qualified engineer identifying energy efficiency improvements meeting the 14-year simple payback and that provide greater energy efficiency than the prescriptive measures listed in **Appendix B**.
- Specify those measures in the design and install those improvements.
- Facilitate verification during the construction process.

Note: All mandatory measures included in **5.1b** must be implemented. If new construction

standards can be achieved, use the same calculation and documentation methods noted for new construction in **5.2a**.

Required Documentation for the Evergreen Project Plan:
Attach the energy analysis identifying specific efficiency improvements meeting the 14-year simple payback that provide greater energy efficiency than the mandatory prescriptive measures. Note: If you choose this criterion, you cannot use **ESDS 5.11, 5.12, 5.13.**

5.3 5.3 Sizing of Heating & Cooling equipment

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Size heating and cooling equipment as required by the most recent edition of the energy code. Size heating and cooling ducts as required by the most recent edition of the mechanical code, as applicable.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state that the heating and cooling equipment will be sized as required by the most recent edition of the energy code and list the selected equipment. Also state that the heating and cooling ducts will be sized as required by the most recent edition of the mechanical code, as applicable.

Rationale

Appropriately sized equipment and ducts will improve the heating, cooling, and dehumidification performance.

Recommendations

- Manual J and D calculations are required by code. This simply adds this documentation to the program requirements.
- The HVAC contractor generates a Manual J load calculation to ensure proper sizing of the cooling system. This calculation accounts for factors such as the home's orientation with respect to the sun, window design and insulation rating. The contractor can utilize one of the HVAC-industry adopted software programs, based upon Manual J, which assists with these designs.
- Manual D provides duct sizing instruction that assures that the system does not restrict air flow across the equipment heat exchanger. Manual D design also assures all rooms are provided with the design air flow needed to heat or cool the space.
- Consult www.acca.org for a list of software programs to perform Manual J and D calculations.

5.4 5.4 Energy Star Appliances

Mandatory for all projects providing appliances

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

If providing appliances, install ENERGY STAR-labeled clothes washers, dishwashers, and refrigerators.

Required Documentation for the Evergreen Project Plan:
Specify that all clothes washers, dishwashers & refrigerators will be Energy Star. Do not send in product literature or spec sheets with the EPP.

Rationale

In 1992, EPA introduced Energy Star, a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Energy Star products must meet strict energy efficiency criteria set by EPA. These products reduce utility costs and greenhouse gas emissions.

5.5 5.5 Central Laundry

Optional 3 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide centralized laundry facilities. Do not install in-unit washers or dryers. If residential scale washers are provided in the centralized laundry facilities, they must be ENERGY STAR-labeled.

Exemption: Live-in resident manager units are exempt from this optional criterion.

Required Documentation for the Evergreen Project Plan:
Specify that the project will provide centralized laundry facilities and will not install in-unit washers or dryers. Facilitate on-site verification by the third party verifier.

Rationale

In-unit laundry washers use 3.3 times more water compared to centralized laundry. Energy usage of in-unit applications is close to 5 times higher compared to common area laundry rooms. (Source: 2002 Study: A National Study of Water and Energy Consumption in Multifamily Housing).

5.6 Efficient Lighting- Interior Units

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

80% of lighting shall be fitted with Energy Star, high efficiency luminaires or lamps.

The WSEC defines high efficiency lighting as follows:

High Efficacy Lamps: Compact fluorescent lamps, T-8 or smaller diameter linear fluorescent lamps, or lamps with a minimum efficacy of:
a. 60 lumens per watt for lamps over 40 watts;
b. 50 lumens per watt for lamps over 15 watts to 40 watts;
c. 40 lumens per watt for lamps 15 watts or less.

High Efficacy Luminaire: A lighting fixture that does not contain a medium screw base socket (E24/E26) and whose lamps or other light source have a minimum efficiency of:
a. 60 lumens per watt for lamps over 40 watts;
b. 50 lumens per watt for lamps over 15 watts to 40 watts;
c. 40 lumens per watt for lamps 15 watts or less.

Note: The 2009 WSEC current requires 50% of all luminaire installed in housing to be high efficiency.

Note: Emergency lighting should be LED's or of similar efficiency.

Required Documentation for the Evergreen Project Plan:
On the EPP form, include required lighting specifications for the project. Do not send in product literature or spec sheets with the EPP.

Rationale

Lighting accounts for between 5-10% of a home's energy use. Energy Star-qualified lighting uses 2/3 less energy and lasts six to ten times longer than traditional lighting. Reduced energy use lowers utility costs and greenhouse gas emissions.

Resources

For more information on lighting, go to:

- Products section of the Energy Star homepage, www.energystar.gov
- Check with the local utility for possible rebates on lamps or luminaires

5.7a 5.7A Electricity Meter

Mandatory for New Construction

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install an individual or a sub-metered electric meter for each individual unit.

Exceptions: Shelters, Single Room Occupancy & Designated Supportive Housing Dwelling units, Seasonal Farmworker.

Required Documentation for the Evergreen Project Plan:
On EPP form, specify commitment to install individual or a sub-metered electric meter for each individual unit.

Rationale

Providing information to residents on the cost and usage associated with the electricity consumption in their unit may reduce energy use.

Recommendations

Individual metering and/or sub-metering should be specified in the Integrative Design stage.

5.7b 5.7B Electricity Meter

Optional 2 points for moderate and substantial rehab projects

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install an individual or a sub-metered electric meter for each individual unit.

Required Documentation for the Evergreen Project Plan:
On EPP form, specify commitment to install individual or a sub-metered electric meter for each individual unit.

Rationale & Recommendations

See **ESDS 5.7a.**

5.8a Renewable Energy

Optional up to 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install photovoltaic (PV) panels, wind turbines, or other electric-generating renewable energy source to provide a specified amount of energy generation.

Single Family: For each 1200 kWh of electrical generation per housing unit provided annually by on-site wind or solar equipment, 0.5 points shall be awarded, up to 5 points. If solar power is used to document compliance with WSEC Chapter 9, the optional credits shall be based on an incremental improvement code, section 105, and 5.2a.

Multifamily: For each 600 kWh of electrical generation per housing unit provided annually by on-site wind or solar equipment, 0.5 point shall be allowed, up to 5 points. If solar power is used to document compliance with WSEC Chapter 9, the optional credits shall be based on an incremental improvement code, section 105, and 5.2a.

Required Documentation for the Evergreen Project Plan:

On the EPP form, specify the renewable energy source.

- For solar electric systems, attach the design demonstrating this requirement using the National Renewable Energy Laboratory calculator PVWATTs. Documentation noting solar access shall be included on the plans.
- For wind generation projects, attach designs documenting annual power generation based on the following factors: The wind turbine power curve; average annual wind speed at the site; frequency distribution of the wind speed at the site and height of the tower.

Rationale

Use of renewable energy reduces environmental impacts associated with utility energy production and use. These impacts include natural resource destruction, air pollution, greenhouse gas emissions and water pollution. Use of onsite renewable energy technologies, such as PV panels, can also result in energy cost savings.

Resources

- National Renewable Energy Laboratory, P.V. WATTS http://www.nrel.gov/rredc/pvwatts/grid.html
- National Renewable Energy Laboratory, Small Wind for Homeowners, Ranchers, and Small Businesses http://www.windpoweringamerica.gov/small_wind.asp
- Solar Electric System Design, Operation and Installation, An Overview for Builders in the Pacific Northwest http://www.energy.wsu.edu/Documents/SolarPVforBuildersOct2009.pdf

5.8b 5.8b Photovoltaic/Solar Hot Water Ready

Optional 1 point

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Site, design, engineer, and/or plumb the development to accommodate installation of photovoltaic (PV) or solar hot water system in the future.

Required Documentation for the Evergreen Project Plan:

Attach the design and engineering analysis that establishes the parameters of the installation and submit photos that demonstrate the following:

- Orient buildings to permit access to sunlight.
- Design and include south facing architectural elements on the roof for PV
- Reserve unobstructed roof areas where panels can be placed
- Run conduit from the prospective PV location to a central panel, as part of the general electrical work.
- Do not install wire inside the conduit until the photovoltaic panels are installed. On the EPP form, explain the plan including orientation, unobstructed exposure, conduit route and location of terminations.

Rationale

Generating and using renewable energy in a development is a hedge against rising costs for purchased energy. Further, it avoids the environmental impacts associated with conventional power generation: natural resource destruction, air and water pollution, and greenhouse gas production.

Recommendations

Building “PV Readiness” into a project reserves the opportunity to install a system later when resources become available.

5.8c

5.8c Solar Water Heating

Optional- up to 10 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide domestic water heating using solar collectors. The system must meet the following requirements:

- The system must be certified by the Solar Rating and Certification Corporation (SRCC). http://www.solar-rating.org/
- Determine annual performance using the SRCC document OG 300 Rated Systems in Seattle Washington.
  -For locations in western Washington, use the Seattle sizing data.
  -For eastern Washington north of I-90, multiply Seattle rated energy savings by 1.18.
  -For eastern Washington south of I-90, multiply Seattle rated energy savings by 1.25.
  -Mount the system facing within 25 degrees of south at a 15-45 degree angle.
- If the system cannot be mounted as prescribed, provide engineering documentation that the loads will be met through alternative methods.
- 50% is equivalent to about 2600 kWh of electricity or 125 therms of gas.

Points: Projects will be awarded 1 point for every 5% of annual domestic hot water usage provided by solar collectors, up to 10 points:

1 point for 5%	**6 points for 30%**
2 points for 10%	7 points for 35%
3 points for 15%	8 points for 40%
4 points for 20%	9 points for 45%
5 points for 25%	10 points for 50%

NOTE: If solar water heating is used to meet energy code requirements, this measure is for incremental improvement above code.

Required Documentation for the Evergreen Project Plan:
Attach the plan for the size and type of solar water heating system including the mounted orientation, the annual performance, how it supplies the annual percentage of domestic hot water, how it was calculated and SRCC product information.

Rationale

Solar Hot Water systems can be a cost effective way to use the sun's energy to help meet domestic water needs.

Resources

Database of State Incentives for Renewable Energy:
http://dsireusa.org/incentives/index.cfm?re=1&ee=1&spv=0&st=0&srp=1&state=WA

5.9 Domestic Water Heating

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Residential Water Heaters must meet the following minimum energy factors.

Type		Tank Size/ Gallons	Energy Factor
Gas or Propane	75,000 Btu/h or less	≤60	.61
		>60	.60
Electric	12 kW (40,956 Btu/h) or less	≤70	.93
Electric	12 kW (40,956 Btu/h) or less	>70	.92

Commercial Water Heaters: Commercial water heating equipment must meet the following criteria. This includes heating efficiency and storage tank heat loss.

- Commercial water heaters or boilers must have demand efficiency of 80% AFUE or 80Et.
- Commercial hot water storage tanks must have standby losses that do not exceed the following (Btu/hr):

Gallons	70-74	75-79	80-84	85-89	90-94	95-99	100+
Max Standby Loss	930	960	980	1010	1030	1060	1080

Improving the efficiency of the water heating equipment either by improving the combustion efficiency or by reducing standby losses will result in significant energy savings. The equipment selected here is mandatory to comply with the Northwest Energy Star program.

Required Documentation for the Evergreen Project Plan:
On the EPP form, specify the type of fuel, tank size, energy factor, and standby loss as applicable. Do not send in product literature or spec sheets with the EPP.

5.10 5.10 Domestic Water Heating

Optional 2-5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Select a Residential Energy Star Water Heater. Go to the Energy Star Web site for complete product criteria: http://www.energystar.gov/index.cfm?c=water_heat.pr_crit_water_heaters, or upgrade commercial water heating combustion efficiency to a condensing boiler or water heater.

In-unit System	Efficiency	Points
Gas Storage	EF >= 0.67	2
Whole-Home Gas Tankless	EF >= 0.82	3
Gas Condensing	EF >= 0.8	5
Heat Pump Water Heaters	EF >= 2.0	5

Central System	Efficiency	Points
Gas Boiler or Water Heater	90% AFUE or .90Et	5

Equipment that provides superior performance above the mandatory requirements is readily available.

- For individual housing units with gas/propane/oil, the on-demand water heaters are recommended.
- Large central water heating systems should choose condensing boiler equipment.
- For homes with only electric energy, heat pump water heaters are available.
  - Caution: heat pump water heaters should not be installed in the conditioned living space or in a confined space.

Required Documentation for the Evergreen Project Plan:

On the EPP form, specify the type of fuel, type of equipment, and energy rating. Do not send in product literature or spec sheets with the EPP.

5.11 5.11 Performance Tested Building Air Sealing

Optional 3 or 7 points for Rehabilitation projects

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

In addition to the prescriptive air sealing measures (see **Appendix B**), conduct a blower door air sealing protocol that achieves the following performance objectives.

- For single family homes, the test will be conducted on the entire building.
- For multi-family buildings, the test will be conducted on individual dwelling units. At a minimum a sample of units shall be selected to represent both corner and central dwelling units on each floor. All tested units need to meet the minimum standard.

Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding the specified air changes per hour. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). A written report of the results of the test shall be signed by the party conducting the test and be included in project documentation. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures;

2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;

3. Interior doors, if installed at the time of the test, shall be open, access hatches to conditioned crawl spaces and conditioned attics shall be open;

4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;

5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and

6. Supply and return registers, if installed at the time of the test, shall be fully open.

(3 points) Through performance testing, document that the unit air tightness level is less than 7 ACH 50.
(7 points) Through performance testing, document that the unit air tightness level is less than 5 ACH 50.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify the category of points chosen and provide performance testing documentation, calculations, and explanation as soon as available. State the estimated date the information will be submitted.

Rationale

This section provides credit for the verification of intent. The required prescriptive air sealing and duct sealing should have resulted in an air leakage rate of 7 ACH50 or less.
5 ACH50 is an air leakage rate similar to new construction. Additional points are granted for achieving this level of savings in a rehabilitation project.

Recommendations

For guidance on air leakage control and possible testing equipment, see the following links:

- A Do-it Yourself Guide to Energy Star® Home Sealing: http://www.energystar.gov/ia/partners/manuf_res/salestraining_res/HS_diy_guide.pdf
- Infiltec Test Equipment: http://www.infiltec.com/inf-catb.htm
- The Energy Conservatory Test Equipment: http://www.energyconservatory.com/

5.12 5.12 Performance Tested Duct Sealing

Optional 10 points for Rehabilitation

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Performance Tested Duct Sealing

- Test is to be conducted by an Energy Star, Climate Crafters, or equivalent independent third party organization Certified Technician or Inspector.
- Duct leakage shall not to exceed 0.10 CFM50 x floor area (in square feet) served by the system,
  -OR-
  It shall be reduced by 50% by comparing leakage to the outside before and after sealing.
- Based on the protocol for "Combustion Appliance Zone Pressure Testing" forced air system operation shall not depressurize a combustion appliance zone by more than 3 Pascals.
- When combustion appliances are located within a conditioned space, a UL listed carbon monoxide alarm must be installed unless the appliance has a type IV venting system.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify the commitment to test and provide the performance testing documentation, calculations, and explanation as soon as available. State the estimated date the information will be submitted.

Rationale

This section sets performance goals listed for duct sealing beyond the prescriptive requirements.

Recommendations

For guidance on duct sealing and possible testing equipment, see the following links:

- Thermal Energy Distribution: http://ducts.lbl.gov/
- Infiltec Test Equipment: http://www.infiltec.com/inf-catb.htm
- The Energy Conservatory Test Equipment: http://www.energyconservatory.com/

5.13 5.13 Space heating & Cooling Equipment Replacement

Optional 2, 5 or 7 points for Rehabilitation

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install Space Heating and Cooling Equipment Replacement to the following standards.
Note: In order to claim these points, all ducts must be mechanically fastened, sealed with mastic, and insulated.

Electric Resistance Heating in a Forced Air Furnace (7 points): Upgrade electric resistance forced air furnace to Energy Star compliant furnace or heat pump.

Other Central Heating Equipment (5 points): During equipment replacement, choose Energy Star central heating equipment, including boilers, furnace or heat pumps.

Heat Pump Performance Testing (2 points):

- The air distribution system design and installation shall be such that air flow across the indoor coil is as specified in the heat pump manufacturer's literature, or is between 350 and 425 cubic feet per minute (CFM) per 12000 BTU/hr output at ARI rating conditions.
- Using a qualified contractor, test and verify the system meets the Performance Tested Comfort Systems (PCTS) requirements. See this web site for a list of qualified contractors: http://www.ptcsnw.com/FindContractor.aspx"

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify the option chosen, how ducts will be fastened and sealed, and what insulation level will be installed. Specify that only Energy Star equipment will be used or provide the Heat Pump Performance Testing as soon as available. Do not send in product literature or spec sheets with the EPP.

Rationale

Improving equipment efficiency at time of equipment replacement is very cost effective for all but a few applications. This section provides points for increasing the energy efficiency in existing housing using equipment upgrades.

Recommendations

- Always size the equipment as to meet the design heating and cooling loads as noted in the **ESDS 5-3** criterion.
- For combustion appliances, examine combustion venting needs before selecting equipment.
- For heat pumps, make sure the existing duct work has enough cross sectional area for the equipment.

5.14 Document Space Condition Savings of 50% or more compared to national standards

Optional 17 points for New Construction

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

In addition to meeting the mandatory requirements for energy efficient new construction as specified in **ESDS 5.1a**, demonstrate that space conditioning energy use is reduced by 50 percent when compared to the 2009 International Energy Conservation Code Supplement. Documentation is provided by Home Energy Raters certified in the region to provide the Northwest Energy Star support or by a qualified architect or engineer.

Required Documentation for the Evergreen Project Plan:
Attach commitment to meet mandatory requirements of 5-1 including all measures and parameters that apply to this project and provide additional analysis showing what measures will reduce energy use by 50% compared to the 2009 IECC.
NOTE: If this option is chosen, option **ESDS 5.2a** cannot also be claimed.

Rationale

The Federal Government has implemented an efficiency program that provides a $2000 per unit tax credit for the construction of energy efficient homes. This criterion encourages developers and builders to participate in this program and achieve the target energy savings.

Recommendations

As of the writing of this Criterion, qualification is typically provided using energy simulation software designed to provide the required documentation. Prescriptive options are being developed and will be provided when they are finished.

In addition to meeting the Energy Star Northwest requirements, or the requirements for multi-family construction outlined in **ESDS 5.1a** and **Appendix A**, the following measures will likely be included:

- Glazing area limited to 13-15 percent of floor area
- U-0.30 glazing standard
- All of the heating and cooling system components are installed inside the heated space
- Air leakage of the building is limited to 3.7 ACH 50
- Furnace Efficiency of 94 percent AFUE

Contact WSU Extension Energy Program for more information at 360-956-2042.

Materials Beneficial to the Environment

Using green construction materials, diverting construction debris, recycling and reusing materials whenever possible reduces waste and disposal costs.

6.1 6.1 Low/No VOC Paints & Primers

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

All interior paints, varnishes and primers will be less than or equal to the following VOC levels, in grams per liter.

Paint Type	Maximum VOC Limit
Flats	50 g/L
Non-Flats	50 g/L
Primer or Undercoat	100 g/L
Floor	100 g/L
Anti-corrosive	250 g/L

If colorant is added at point of Sale, the VOC content shall not exceed the following:

Paint Type	Maximum VOC Limit
Flats w/ colorant added at point of sale	100 g/L
Non-Flats w/ colorant added at point of sale	100 g/L
Primer or Undercoat w/ colorant added at point of sale	100 g/L
Floor w/ colorant added at point of sale	100 g/L
Anti-corrosive w/ colorant added at point of sale	250 g/L

These levels are based on a combination of the MPI and Green Seal Standards (GS-11).
NOTE: These requirements do not apply to finishes that are factory applied or applied off site.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that all interior paints and primers will meet the standard. Do not send in product literature or spec sheets with the EPP.

Rationale

Interior paints and primers may release VOCs, particularly when wet. Exposure to individual VOCs and mixtures of VOCs can cause or aggravate health conditions, including allergies, asthma, and irritation of the eyes, nose, and airways; however, no health-based standards for indoor non-occupational exposure have been set.

Recommendations

Avoid epoxy-based paints, even those that comply with VOC standards, as these contain the chemical Bisphenol A. Bisphenol A was identified by the EPA on March 29, 2010, as a "chemical of concern." See http://www.epa.gov/oppt/existingchemicals/pubs/ecactionpln.html

6.2 6.2 Low/No VOC Adhesives & sealants

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

All interior adhesives must comply with the most recent version of Rule 1168 of the South Coast Air Quality Management District.

All interior caulks and sealants must comply with Regulation 8 Rule 51 of the Bay Area Air Quality Management District (BAAQMD).

Adhesives, caulks and sealants that are used outside of the weather resistive barrier or to seal the weather resistive barrier to itself or to building openings are exempt from this mandatory requirement. The weather resistive barrier includes the roof membrane.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that all interior adhesives will comply with the most recent version of Rule 1168 of the South Coast Air Quality Management District. Specify that all interior caulks and sealants will comply with Regulation 8 Rule 51 of the Bay Area Air Quality Management District. Do not send in product literature or spec sheets with the EPP.

Rationale

VOCs may pose health hazards to residents and workers. Use of low-VOC adhesives and sealants will reduce the concentration of such airborne chemicals.

Resources

- Rule 1168 of the South Coast Air Quality Management District: http://www.aqmd.gov/rules/reg/reg11/r1168.pdf
- Regulation 8 Rule 51 of the Bay Area Air Quality Management District: http://www.baaqmd.gov/dst/regulations/rg0851.pdf

6.3 Construction Waste Management

Up to 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Reduce the amount of construction waste and demolition debris sent to the landfill.
Choose one of the following methods.

Method #1- Measured by percentage

- Provide a waste plan that diverts 50% of the construction waste from the landfill. (2 Points)
- Provide a waste plan that diverts 75% of the construction waste from the landfill. (5 Points)

Method #2 – Material Specific (up to 5 Points)

- Recycle all cardboard (1 Point)
- Recycle all wood (1 Point)
- Recycle all drywall (1 Point)
- Recycle all metals (1 Point)
- Recycle all concrete, brick, and asphalt (1 Point)
- Develop & implement a comprehensive efficient framing plan that minimizes all waste by design (5 Points)

*Method #3- Minimizing Construction Waste (*New Construction only)

- Total Construction Waste to Landfill or Incinerator < 2.5 lbs / SF of building (2 Points)
- Total Construction Waste to Landfill or Incinerator < 1.5 lbs / SF of building (5 Points)

Required Documentation for the Evergreen Project Plan:
On the EPP form, specify the method chosen. State that the approved contractor submittal of the construction waste plan will be available on the job site, specifying how reusable/recyclable materials are redirected from the landfill and where each material goes. Also state that waste receipts will be available on the job site.

Rationale

The amount of job-site waste resulting from construction of the average U.S. home is 4 pounds per square foot of conditioned space, totaling about 8,000 pounds and taking up 50 cubic yards of landfill space. To the extent possible, waste should be avoided because 1) landfill space is rapidly diminishing, 2) incineration produces pollutants, and 3) waste of materials is in itself a negative environmental impact. Source: National Association of Home Builders Research Center, 2001, http://www.toolbase.org/ToolbaseResources/level3.aspx?BucketID=5&CategoryID=26

Resources

See the following for more information on advanced framing:
http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/26449.pdf

6.4 Environmentally Preferable Materials

Up to 10 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Use environmentally preferable materials and/or materials that are produced (extracted, harvested, manufactured and processed) within 500 miles of the construction site. Use the table below to determine the required specifications. Products that meet the EPP specification receive 0.5 point and/or 0.5 point if produced locally. Projects can receive a maximum of 10 points.

Assembly	Component (0.5 point per component)	Environmentally Preferable Materials (EPM) Specifications	Local production (0.5 point component)
Exterior wall	Framing/wall structure	Concrete wall structure: Use 20% fly ash or slag. Wood structure: FSC-certified or reclaimed or finger joint studs	Eligible
	Siding or masonry	Recycled content, reclaimed, or FSC-certified	Eligible
	Aggregate	Recycled content	Not Eligible
Flooring	Flooring-50% (0.5 point awarded for meeting the EPM specification for 50% of the floor area).	Linoleum, cork, bamboo, FSC-certified or reclaimed wood, sealed concrete, recycled-content flooring, or combination.	Eligible – projects will be awarded 0.5 point total if 50% or more of the floor area is produced locally.
	Flooring- 75% (1 point awarded for meeting the EPM specification for 75% of the floor area).		
	Flooring -100% (1.5 point awarded for meeting the EPM specification for 100% of the floor area).		
	Framing	FSC-certified or reclaimed	Eligible
Foundation	Aggregate	Recycled aggregate	Eligible
	Cement	Use 20% fly ash or slag	Eligible
Interior walls AND ceilings	Framing	FSC-certified or reclaimed	Eligible
	Gypsum board	N/A	Eligible
	Paints and coatings	Recycled pain that meets Green Seal standard GS-43	Not Eligible
Landscape	Decking or patio material	Recycled content, FSC-certified, or reclaimed	Eligible

Interior Finishes	Cabinets	Recycled content, FSC-certified, or reclaimed and composite materials must contain no added urea-formaldehyde resins	Eligible
	Counters (kitchens and bathrooms)	Recycled content, FSC-certified, or reclaimed AND composite materials must contain no added urea-formaldehyde resins	Eligible
	Doors(not including garage or insulated doors)	Recycled content FSC-certified or reclaimed	Eligible
	Trim	Recycled content, FSC-certified, or reclaimed AND composite materials must contain no added urea-formaldehyde resins	Eligible
Exterior Wall	Window framing	Recycled content, FSC-certified. Or reclaimed	Eligible
Roof	Framing	FSC-certified	Eligible
	Roofing	Recycled content	Eligible
Envelope	Insulation	Recycled content of 20% or more	Eligible
	Sheathing	Recycled content FSC-certified. Or reclaimed	Eligible

Required Documentation for the Evergreen Project Plan:
Attach the list of environmentally preferable materials that will be used and note the specification requirement and/or the local production requirement. Do not send in product literature or spec sheets with the EPP.

Rationale

Use of building materials with recycled content reduces the negative environmental impact resulting from extraction and processing of virgin materials. Building materials that are extracted, harvested, processed, and manufactured locally to the project site minimize the energy embedded in their transportation and contribute to the local economy.

Resources

- GreenSpec Directory, Building Green: http://www.buildinggreen.com/
  The online GreenSpec® Directory lists product descriptions for more than 2,000 environmentally preferable products.

6.5 Water-Permeable Walkways

Optional up to 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Use water-permeable materials in walkways. Include a site map showing all walkways to be constructed and identifying the area that will be water-permeable.

Percentage of water-permeable materials	Points
20% of walkways use water-permeable materials	1
40% of walkways use water-permeable materials	2
60% of walkways use water-permeable materials	3
80% of walkways use water-permeable materials	4
100% of walkways use water-permeable materials	5

Required Documentation for the Evergreen Project Plan:
On the EPP form, state what percentage of water-permeable materials will be used in the walkways. Also attach a Site Map showing all walkways and which ones are water-permeable and the type of material. Clearly label and indicate on the map the areas specific to this criterion.

Rationale

Water-permeable materials reduce storm-water runoff by allowing water to soak into the ground. Storm-water runoff pollutes receiving waterways by carrying sediment and other pollutants and by raising water temperature. Storm-water runoff also causes downstream flooding and erosion, and hampers aquifer recharge and transmission of moisture for vegetation.

Recommendations

Use water-permeable materials such as pervious interlocking concrete paving blocks, concrete grid pavers, perforated brick pavers, porous concrete or compacted gravel.

6.6 Water-Permeable Parking Areas

Optional up to 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

If providing parking, use water-permeable materials in the parking and driveway area.

Percentage of water-permeable materials	Points
20% of walkways use water-permeable materials	1
40% of walkways use water-permeable materials	2
60% of walkways use water-permeable materials	3
80% of walkways use water-permeable materials	4
100% of walkways use water-permeable materials	5

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state what percentage of water-permeable materials will be used in the parking and driveway areas. Also attach a Site Map showing all parking and driveways and which ones are water-permeable and the type of material. Clearly label and indicate on the map the areas specific to this criterion.

Rationale

Water-permeable materials reduce storm-water runoff by allowing water to soak into the ground. Storm-water runoff pollutes receiving waterways by carrying sediment and other pollutants and by raising water temperature. Storm-water runoff also causes downstream flooding and erosion and hampers aquifer recharge and transmission of moisture for vegetation.

Recommendations

Water-permeable materials include pervious interlocking concrete paving blocks, concrete grid pavers, perforated brick pavers, porous concrete or compacted gravel.

6.7a

6.7a Reduced Heat-Island Effect: Roofing

Optional 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Choose one of the following options:

Option #1 (5 points) - Choose, specify, and use Energy Star-compliant roofing. 100% of the roofing must meet the requirements in the table below to achieve optional points. Emissivity should be greater than or equal to 0.8 when tested in accordance with ASTM 408.

	Roof Slope	Initial Solar Reflectance	Maintained Solar Reflectance	Emissivity
Low Slope	≤ 2 : 12	≥ 0.65	≥ 0.50	0.8
Steep Slope	> 2 : 12	≥ 0.25	≥ 0.15	0.8

Option #2 (5 points) - Or, install a "green" (vegetated) roof for at least 50 percent of the roof area.

Option #3 *(5 points)* - Combinations of high-albedo and vegetated roof can be used, providing they collectively cover 75 percent of the roof area.

➡ **Required Documentation for the Evergreen Project Plan:**
On the EPP Form, specify which option is chosen. Also attach roof map showing all roofing areas with the type of roof specified. Clearly label and indicate on the map the areas specific to this criterion

Rationale

Urban heat islands disturb the atmosphere and cause energy waste by increasing loads on cooling systems. Heat islands create thermal gradient differences between developed and undeveloped areas. Using roof surfaces that do not retain heat reduces the heat island.

Energy Star Reflective Roofing may reduce energy use in the warmer regions of Washington State. Green Vegetated Roofing may also reduce energy use and provide desirable storm water retention. Resources and information on green roofs can be found at:

- Greenroofs 101
- Scandinavian Green Roof Institute

Recommendations

Energy Star Reflective Roofing may or may not provide energy saving benefits in Washington. A reflective roof will reduce cooling cost, but may slightly increase heating cost in ceilings or attics with lower levels of insulation. To demonstrate that the application of an Energy Star roof

provides energy savings and financial benefit, use the Roof Savings Calculator: http://www.roofcalc.com/

Resources

- Energy Star Roof Products: http://www.energystar.gov/index.cfm?c=roof_prods.pr_roof_products
- Design green vegetated roofing in accordance with the following ASTM standards:
  E2396-05 *Standard Test Method for Saturated Water Permeability of Granular Drainage Media [Falling-Head Method] for Green Roof Systems*
  E2397-05 *Standard Practice for Determination of Dead Loads and Live Loads associated with Green Roof Systems*
  E2398-05 *Standard Test Method for Water Capture and Media Retention of Geocomposite Drain Layers for Green Roof Systems*
  E2399-05 *Standard Test Method for Maximum Media Density for Dead Load Analysis of Green Roof Systems*
  E2400-06 *Standard Guide for Selection, Installation, and Maintenance of Plants for Green Roof Systems*

6.7b

6.7b Reduced Heat-Island Effect: Paving

Optional 5 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Use light-colored/high-albedo materials and/or an open-grid pavement, with a minimum Solar Reflective Index of 29 over at least 50 percent of the site's hardscaped area.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify the category of points chosen and provide performance testing documentation, calculations, and explanations as soon as available. State the estimated date the information will be submitted. Attach a map of all paved areas showing the portion that will reduce the heat-island effect and the type of material.

Rationale

Urban heat islands have increased local air temperatures due to the absorption of solar energy by the built environment. They increase energy consumption by increasing loads on cooling systems. Heat islands create thermal gradient differences between developed and undeveloped areas. Use paving surfaces that do not retain heat and that reduce the heat island effect.

6.8 Socially Sustainable Products

Optional up to 3 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Choose building products from manufactures that support a broader socially sustainable mission, outside of their environmental mission. An example would be a product manufacturer who hires laborers with developmental disabilities. One point is given for each manufacturer of a product type and 90% (by cost) of that product is used in the project, up to 3 points.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify the socially sustainable products that will be used. Attach an explanation of each manufacturer, the product used in the project, and how they support a broader socially sustainable mission. Provide a website supporting your information or written documentation from the manufacturer with their contact information. Documentation will be provided to Commerce after construction bid.

Rationale

Social sustainability is about creating and maintaining quality of life for all people. Like public affordable housing, the marketplace also plays a vital role in supporting socially sustainable communities. Human development and the achievement of human potential require a form of economic activity that is environmentally and socially sustainable in this and future generations.
(Source: CPHA, 1992 Canadian Public Health Association)

Healthy Living Environments

Optimal ventilation improves indoor air quality and the flow of fresh air throughout the home, contributing to a healthier living environment

7.1 Composite Wood Products that Contain No Added Urea Formaldehyde

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Only use composite wood products exposed to the interior (inside the weather resistive barrier) with no added urea formaldehyde. This includes particleboard, plywood, OSB, medium density fiberboard, cabinetry and any other applicable wood products.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that all particleboard, plywood, OSB, medium density fiberboard, cabinetry and any other applicable wood products will contain no added urea-formaldehyde. Do not send in product literature or spec sheets with the EPP.

Rationale

Particleboard, interior grade plywood, MDF, and other composite wood products typically contain formaldehyde based glues. Formaldehyde is a volatile organic compound. Symptoms of exposure vary widely and can include watery eyes, nausea, coughing, chest tightness, wheezing, skin rashes, allergic reactions and burning sensations in the eyes, nose and throat. In a recent report, the World Health Organization (WHO) International Agency for Research on Cancer upgraded its evaluation of formaldehyde from a probable carcinogen to a known human carcinogen based on new evidence that formaldehyde causes nasopharyngeal cancer in humans. Avoiding products with added urea formaldehyde will reduce the quantity of harmful indoor air contaminants.

Recommendations

- ANSI standards A208.1 and A208.2 apply to formaldehyde emission limits of particleboard and medium density fiberboard. They do not regulate the content of urea formaldehyde resins, and therefore cannot be used as an indicator for this criterion.
- Structural panel products bearing the trademark of the APA use phenol formaldehyde resins. These glues are highly durable, waterproof, and do not release significant amounts of formaldehyde. These products meet the specs of this criterion.

7.2a Healthy Flooring Materials

Mandatory if providing floor coverings

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Prohibited Locations

Do not install carpets within three feet of entryways, or in laundry rooms, bathrooms, kitchens / kitchenettes, and utility rooms. Do not install carpet on slab on grade. Any carpet products used in a permitted location must meet the Carpet and Rug Institute's Green Label or Green Label Plus certification for carpet, pad, and carpet adhesives.

Products

- Any hard surface flooring products used must be ceramic/porcelain tile, hardwood floors, linoleum, cork or other materials that meet the Scientific Certification System's FloorScore program criteria (including pre-finished hardwood flooring).
- The use of reclaimed flooring is encouraged, and such flooring need not meet the FloorScore certification. Reclaimed wood flooring must be free of lead-based paint, and tiles should be free of asbestos.

Exemption for New Construction Only: Where occupancy or other factors make it preferable to hard surface flooring, carpet tile may be installed on slab-on-grade floors with proper vapor barrier strategies installed (see 7.10 Vapor Barrier Strategies). Carpet tile products must meet the certification requirements above. Tile should not be permanently glued to the slab so that individual tiles can be easily removed for spot cleaning or replacement. The carpet tile should be installed using either a releasable adhesive that meets the certification requirements above; or a releasable system for joining tiles together to create a single, floating sheet. Property Management unit turnover plans should also include appropriate directions for removing, cleaning, and replacing carpet tiles.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify what floor coverings will be used and where and that they will meet the requirements of this criteria. Do not send in product literature or spec sheets with the EPP.

Rationale

New carpets, padding, and adhesives release VOCs that may pose health hazards to residents and workers. Carpets also attract allergens such as dirt, pollen, mold spores, dust mites and other microbes that may pose health hazards to individuals allergic to these substances. The Carpet and Rug Institute's program certifies that labeled carpets are low VOC.

Recommendations

- Resilient flooring that has passed the California Section 01350 program (FloorScore, CHPS) or NSF/ANSI 332 is compliant with this standard.
- More information on the Carpet and Rug Institute's Green Label program can be found on their website at www.carpet-rug.org.
- The EPA Energy Star with Indoor Air Package Specifications requires Green Label Plus carpet. The plus label is more stringent. The California Rug Institute maintains a list of manufacturers and products meeting the Green Label Plus standard. To view the lists go to: http://www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label-plus-carpet-list.cfm
- .Make Green Label Plus part of the specifications for sub-contractor submittals when using carpet.
- In wet areas, use smooth and resilient flooring that can tolerate moisture (e.g., ceramic tile, linoleum, etc.).

7.2b 7.2b Healthy Flooring Materials

Optional 4 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

In all rooms, do not install carpet or flooring containing PVC or chlorine.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that no carpet flooring or flooring containing PVC or chlorine, will be used.

Rationale

While certain health hazards are linked with the production of vinyl products, some alternative flooring materials that are natural and renewable have demonstrated low-VOC emissions and an environmentally friendly production. Avoid the use of carpet, which can serve as a sink for dust, allergens and other substances that may pose health hazards to susceptible residents.

Recommendations

- Use alternative flooring materials such as linoleum, laminate, ceramic tile, bamboo, cork, wood (especially salvaged wood) or rubber.
- For concrete floors and basements, leave the slab exposed and stained with low-VOC material rather than providing any floor treatments.

7.3a

7.3a Exhaust Fans- Bathroom

Mandatory for New Construction & Substantial Rehab

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are equipped with a timer, humidistat sensor, or that operate continuously.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify Energy Star bathroom fans including how they will be controlled. Do not send in product literature or spec sheets with the EPP.

Rationale

Properly sized and controlled exhaust fans in bathrooms reduce moisture condensation, lowering the potential for indoor mold growth that may yield odors and pose health hazards to residents. Energy Star-qualified fans use 65 percent less energy on average than standard models and move more air per unit of energy used with less noise. Timers and humidistat sensors help ensure that fans regularly remove moisture and provide increased ventilation.

Recommendations

- For more information on bathroom fans, go to the Products section of the Energy Star homepage: www.energystar.gov.

7.3b

7.3b Exhaust Fans- Bathroom

Optional 5 points for Moderate Rehab only

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are equipped with a timer, humidistat sensor, or that operate continuously.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify Energy Star bathroom fans including how they will be controlled. Do not send in product literature or spec sheets with the EPP.

7.4a

7.4a Exhaust Fans- Kitchen

Mandatory for New Construction

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install Energy Star labeled power vented fans or range hoods that exhaust to the exterior.

Exemption: Microwaves with integrated range hoods do not need to be Energy Star certified. However, they exhaust fan must still vent to the exterior.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify Energy Star kitchen fans that are vented to the outside. Do not send in product literature or spec sheets with the EPP.

Rationale

Besides helping to reduce moisture, kitchen fans also help remove carbon dioxide and carbon monoxide over fuel-burning appliances and other air contaminants that may be byproducts of cooking. Energy Star-qualified fans use 65 percent less energy on average than standard models and move more air per unit of energy used with less noise.

Recommendations

- Energy Star products: http://www.energystar.gov/index.cfm?c=products.pr_find_es_products
- If installing a microwave with integrated range hood, ask your vendor for the efficacy and sound level they are proposing. Matching Energy Star levels will help minimize energy consumption and complaints about hood noise. Energy Star range hoods meet the following: Max flow=500 cfm, Fan Efficacy ≥ 2.8cfm/Watt, Sound level ≤ 2.0 sones.

7.4b

7.4b Exhaust Fans- Kitchen

Optional 3 points for Rehab

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install Energy Star labeled power vented fans or range hoods that exhaust to the exterior.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify Energy Star kitchen fans that are vented to the outside. Do not send in product literature or spec sheets with the EPP.

7.5 Ventilation

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Install a ventilation system for the dwelling unit that provides a minimum of 15 cfm (cubic feet per minute) of fresh air per occupant. Use the 2009 International Residential Code, or as an alternative, use 2010 ASHRAE standard 62.2.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify whole-house ventilation according to the 2009 International Residential Code or 2010 ASHRAE 62.2 including size of fan, how the size was determined, the location, and how it is controlled. Do not send in product literature or spec sheets with the EPP.

Rationale

Optimal ventilation improves indoor air quality by providing fresh air to the living space on a regular basis. Since air sealing is part of the energy efficiency measures, adequate ventilation becomes essential to the health of the occupants.

Recommendations

In smaller units, a bathroom exhaust fan can double as the whole house fan if the fan is set to properly cycle on and off.

7.6 Clothes Dryer Exhaust

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Clothes dryers must be exhausted directly to the outdoors using metal duct work.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that clothes dryers will be exhausted to the exterior.

Rationale

Outdoor venting of clothes dryers substantially reduces air moisture that can lead to mold growth.

Recommendations

It is important to minimize the duct run to avoid build up of moisture and particles that can inhibit the flow of air through the duct. Rigid duct materials are preferred to help ensure clean ducts and to reduce the buildup of particles and moisture.

International Residential Code:
SECTION M1502- CLOTHES DRYER EXHAUST
M1502.1 General. Dryer exhaust systems shall be independent of all other systems, and shall convey the moisture to the outdoors.
Exception: This section shall not apply to listed and labeled condensing (ductless) clothes dryers.
Refer to subsections for details on duct termination, duct type, duct diameter, duct length limits.

7.7 Combustion Equipment

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

If using fossil fuel fired water heaters, specify direct power vented or combustion sealed appliances when the heater is located in a conditioned space.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that there will be direct power vented or combustion sealed fossil fuel fired water heaters when in the conditioned space. Do not send in product literature or spec sheets with the EPP.

Rationale

- Direct vent systems draw all the air needed directly from the outside so there is no risk of spilling combustion contaminants into the residence. Power vented equipment uses a fan or blower to create the pressure difference that causes air to flow from inside the house, through the combustion device out an approved chimney or vent system to the outdoors.
- For all new construction in Washington since 1990, homes have been constructed to the air sealing level defined by the International Residential Code as unusually tight construction. In addition, projects complying with the energy efficiency requirements of this standard will achieve unusually tight construction.

International Residential Code:

UNUSUALLY TIGHT CONSTRUCTION: Construction in which:

1. *Walls and ceilings comprising the building thermal envelope have a continuous water vapor retarder with a rating of 1 perm (5.7·10-11 kg/Pa · s · m2) or less with openings therein gasketed or sealed.*
2. *Storm windows or weatherstripping is applied around the threshold and jambs of opaque doors and openable windows.*
3. *Caulking or sealants are applied to areas such as joints around window and door frames between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings.*

Chapter 17 Combustion Air:

M1701.1.1 Buildings of unusually tight construction. In buildings of unusually tight construction, combustion air shall be obtained from outside the sealed thermal envelope. In buildings of ordinary tightness, insofar as infiltration is concerned, all or a portion of the combustion air for fuel-burning appliances may be obtained from infiltration when the room or space has a volume of 50 cubic feet per 1,000 Btu/h (4.83 L/W) input.

7.8 7.8 Cold Water & Hot Water Pipe Insulation

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Insulate all hot water pipes from the hot water heater to point of use. Insulate all cold water pipes in locations where freezing is a possibility including exterior walls and unheated attics or crawl spaces.

At a minimum, the following building codes apply:
Insulate Cold Water Pipes in accordance with the *2009 Uniform Plumbing Code*, as amended by Washington State, *(Chapters 51-56 and 51-77 WAC), Section 313.6.*

- All hot and cold water pipes installed outside the conditioned space shall be insulated to a minimum R-4 (K-3).

Insulate Hot Water Pipes in accordance with the *Washington State Energy Code (2009) Section 503.11 and Table 5-12* based on pipe size and operating temperature.

- R-3.6 for < 2 inch pipe, R-5.4 for > 2 inches. Refer to Table 5-12 for all other applications

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that there will be insulation on hot and cold water pipes as applicable.

Rationale

- Insulation of hot water pipes minimizes heat loss and may allow the lowering of water heater temperature.
- Insulation of cold water pipes prevents condensation that can lead to mold growth. Wherever there is a high differential between indoor air temperatures and the temperature of water supplies – especially in locations with moderate to high humidity – condensation on uninsulated cold water pipes is likely to occur.
- Plumbing in exterior walls and in unconditioned attics or crawl spaces may be exposed to substantial variations in temperature making it more vulnerable to damage and leakage.

7.9a

7.9a Mold Prevention: Water Heaters, Condensing Boilers, Furnaces, & Air Conditioning

Mandatory for New Construction

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Water Heaters: If storage water heaters are installed in interior spaces provide an auxiliary drain or catch pan that drains to the exterior of the building. Water heaters should be located in rooms with non–water sensitive floor coverings. Drain pans should be sloped and corrosion resistant (e.g., stainless or plastic) with drains at the low point. Condensate lines should be drained to a drainage system, and not just deposited under slab.

HVAC equipment: Provide auxiliary drain pans when required by code. Insure that any catch pans or drip pans minimize standing water.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that there will be auxiliary drain pans that drain to the exterior.

Rationale

The use of heaters with drains and catch pans prevents moisture problems caused by leakage or overflow. Capturing water overflow from hot water heaters and allowing for proper drainage will prevent water from sitting idle, creating excess moisture and allowing mold to propagate. Cooling coils, as part of the HVAC equipment for air conditioning, can generate significant amounts of water through condensation on the surface of the coils. If this water is not constantly drained from the "drip pan" under the coil, mold and other organisms can grow in the standing water. HVAC-system air blowing across this area can distribute this mold and other material throughout the home.

Recommendations

- ASHRAE. User's Manual of Standard 62.1-2004, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 2004. (Fig 4.9a and 4.9b). See www.ashrae.org.
- International Residential Code IRC SECTION M1411 notes when requirements for auxiliary condensate drain pans are required for air conditioners and condensing equipment. See International Code Council website for background: http://www.iccsafe.org/Pages/default.aspx.

7.9b

7.9b Mold Prevention: Surfaces

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

In wet areas, use materials that have smooth, durable, cleanable surfaces. Do not use mold-propagating materials such as vinyl wallpaper and unsealed grout.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that there will be smooth, durable, cleanable, water-proof surfaces in wet areas including the type and production and location. Do not send in product literature or spec sheets with the EPP.

Rationale

The use of moisture-resistant materials in wet areas reduces moisture buildup, diminishing the potential for indoor mold growth that may yield odors and pose health hazards to residents.

7.9c

7.9c Mold Prevention: Tub & Shower Enclosures

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Use one-piece fiberglass or similar enclosure or, if using any form of grouted material, use backing materials such as cement board, fiber cement board, fiberglass-reinforced board or cement plaster.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify which materials for tub and shower enclosures will be used. Do not send in product literature or spec sheets with the EPP.

Rationale

Projects pursuing Evergreen certification are expected to have a 40 to 50 year service life with minimal maintenance and replacement requirements. Wet rooms, particularly bathrooms, pose a significant challenge to this expectation. It is prudent to assume that any finish in a bathroom will eventually let water through to what's behind it. Using materials that do not degrade with time or the presence of moisture, and do not support mold growth, ensures that the underlying structure of these rooms remains intact when surface treatments degrade.

7.10 Vapor Barrier Strategies

Mandatory for New Construction & Moderate/Substantial Rehab with foundation work

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Beneath Concrete Slabs, Including Basements

- Provide vapor barriers under all slabs at conditioned spaces.
- Install a capillary break as follows:
  - Install a 4-inch layer of ½-inch diameter or greater clean aggregate, covered with 6 mil (or thicker) polyethylene sheeting, overlapped 6 to 12 inches at the seams, and in direct contact with the concrete slab above.

    -OR-

    Install a 4-inch uniform layer of sand, overlain with a layer or strips of geotextile drainage matting installed according to the manufacturer's instructions and covered with polyethylene sheeting overlapped 6 to 12 inches at the seams.

    NOTE: In dry climates, in addition to one of the two methods above the following are suggested to reduce slab curl and improve slab strength and hardness:

    -Maintain slab surface moisture during the curing process- called wet or moist curing- by regular wetting with a spray and/or application of wet burlap. For more information: http://www.cement.org/tech/cct_curing.asp

    -Install a 2-inch deep sand bed over the vapor barrier before placing the concrete. However, this option does increase the risk of moisture collecting in the sand above the vapor barrier, to be released later as vapor through the slab.
- On interior below-grade walls, avoid using separate vapor barrier or a below-grade vertical insulation (such as polyethylene sheeting, vinyl wallpaper, or foil faced), which can trap moisture inside wall systems. Semi–vapor-permeable rigid insulation is not considered a vapor barrier.

Beneath Crawl Spaces

- Install 8-mil minimum thickness cross-laminated polyethylene on the crawl floor, extended at least 12 inches up on piers and foundation walls, and with joints overlapping at least 12 inches. (The 8-mil polyethylene and the cross-lamination ensure longevity of the poly.)
- Line the likely "high-traffic" areas of the crawl space with foam board, so the polyethylene beneath will not be disturbed.

Exemption: Exceptions will be granted if recommended by the project's Geotechnical Specialist.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, specify that there will be a minimum 6 mil vapor barrier under interior concrete slabs over 4 inches of clean aggregate or sand. If there are crawl spaces, specify 8-mil minimum thickness cross-laminated polyethylene on the crawl floor, extended at least 12 inches up on piers and foundation walls, and with joints overlapping at least 12 inches.

Rationale

Water can migrate through concrete and most other masonry materials. Proper foundation drainage prevents water from saturated soils from being pushed by hydrostatic pressure through small cracks. Vapor barriers and waterproofing materials can greatly reduce the migration of moisture that can occur even in non-saturated soils.

Recommendations

Ensure that trades' work does not puncture the vapor barrier.

7.11 7.11 Radon Mitigation

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

New Construction

- In high risk radon counties, provide radon mitigation as required by code. Radon Mitigation Systems are required for new construction in EPA Zone 1 counties. High risk EPA Zone 1 counties in Washington State are: Clark, Ferry, Okanogan, Pend Oreille, Skamania, Spokane, and Stevens Counties.
- Washington State has adopted the International Residential Code *APPENDIX F RADON CONTROL METHODS* for single family and duplex construction.

Rehabilitation

- In EPA Radon Zone 1 counties, conduct radon testing using the protocols described in the EPA publication: "*Protocols for Radon and Radon Decay Product Measurements in Homes.*" See http://www.epa.gov/radon/pdfs/homes_protocols.pdf.
- When testing concludes that indoor radon levels in the home are 4 picocuries per liter (pCi/L) or higher, provide radon mitigation measures.

Required Documentation for the Evergreen Project Plan:

On the EPP form, specify whether the project is in a high risk radon county. If so, continue with the following:

- *For New Construction*, on the EPP form specify the list of radon mitigation measures that will be installed. Facilitate post testing and ensure documentation verification is reviewed by the third party verifier.
- *For Rehabilitation*, on the EPP form specify that radon testing using the EPA protocols will be done and state type and duration of test. If radon testing shows 4 pCi/L or higher, specify here the radon mitigation measures that will be installed. Facilitate post testing and ensure documentation verification is reviewed by the third party verifier.

Rationale

Installation of radon-resistant features will reduce concentrations of radon, a cancer-causing soil gas that can leak into homes from the crawl space, cracks in the slab, or basement walls. EPA estimates that 20,000 individuals die of cancer every year due to excessive exposure to radon.

Recommendations

- Consult http://www.epa.gov/radon/index.html for information on the health effects, testing and mitigation strategies.
- The most commonly used test methods are: Activated Charcoal Adsorption for short-term monitoring (2-5 days) and Alpha Track Detection for long-term monitoring (3-12 months). Long term monitoring provides the most reliable results.
- Tests are best conducted during the winter months under closed house conditions. This is when the building is most likely to have higher radon levels.
- Radon mitigation strategies are provided in the EPA publication Radon Reduction Techniques for Existing Detached Houses: Technical Guidance (Third Edition) for Active Soil Depressurization Systems.

7.12 Water Drainage

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

- Provide drainage of water away from windows, walls, and the entire perimeter of foundations.
- In new construction, foundation walls should be carefully waterproofed on the exterior to avoid moisture migration and should not leach chemicals into the soil.
- If poured concrete walls are used, release agents used to free forms from concrete walls should not be comprised of used motor oil, diesel fuel or some other toxic material.
- Divert water drainage away from the building by directing gutters and downspouts to flow onto splash blocks or a proper drainage system. If possible, water should be diverted at least 12 feet from any building foundation and then allowed to infiltrate on site.
- Slope new and rebuilt walkways, stairs, patios and thresholds away from the buildings.
- Properly flash all roof penetrations.
- Where feasible, extend eaves 18 inches to 2 feet to keep water off walls and windows.
- Install pan flashing on windows and exterior doors. Apply window pan flashing over building paper at sill and corner patches.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that drainage of water away from buildings and proper waterproofing and flashing will be installed and list every applicable instance as stated in the criterion. For all new windows and doors, specify that they will be installed with pan flashing.

Rationale

Diverting water from the building prevents bulk water entry through foundations and into basements, which can contribute to moisture-related problems such as mold and the deterioration of wood and other building materials. Flashing helps direct water away from wall cavities to the drainage plane. Careful architectural detailing of the drainage system and diligent construction supervision ensure proper water drainage.

Recommendations

Best practices include a grade of 0.5 inch per foot, or approximately a 4 percent pitch. EPA recommends a 2 percent pitch (0.25 inch per foot) for hard surfaces such as patio slabs, walks and driveways.

Code References:
Storm Drainage: Provide storm drainage in compliance with the Uniform Plumbing Code Chapter 11, the International Residential Code Chapter 4, and local storm water regulations. This includes but is not limited to:

- *All roofs, paved areas, yards, courts and courtyards shall be drained to a separate storm system, or to other place of disposal satisfactory to the Authority Having Jurisdiction.*
- *Subsoil drains shall be provided around the perimeter of buildings having basements, cellars, crawl spaces or floors below grade.*
- *Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm).*

Foundations: Provide foundation water proofing in compliance with IRC SECTION R406. Select environmentally friendly release agents & coating materials. This includes but is not limited to:

- *Foundation walls that retain earth and enclose interior spaces and floors below grade shall be damp proofed from the top of the footing to the finished grade.*
- *If poured concrete walls are used, release agents used to free forms from concrete walls should not be comprised of used motor oil or some other toxic material.*

Water Resistive Barriers and Flashing: Provide Water Resistive Barriers and Flashing in compliance with the International Residential Code, Chapter 7 for wall covering and Chapter 9 for roof covering.

7.13 7.13 Enhanced Building Envelope Design

Up to 8 points for New Construction and Substantial Rehabilitation

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Utilize any of the following measures to enhance the building envelope design for durability.

Option #1 (2 points): Prepare a water and moisture inspection plan that provides, at a minimum, for documented independent periodic review of the building enclosure during the course of construction to ascertain whether construction has been performed in substantial compliance with the building enclosure design documents.

Option#2 (2 points): Provide full-size mock ups of essential building envelope systems including all envelope penetrations, reviewed by the architect or independent building envelope consultant, and made available for reference on the construction site throughout the construction period.

Optional #3(2 points): Provide a building envelope design that makes it possible to remove and replace windows without compromising the performance of the building envelope. This must be achieved without compromising the requirements of *7.12 Water Drainage.*

Option #4 (2 points): Provide water penetration resistance testing of a representative sample of windows and window installations, conducted according to industry standards. The construction review and testing protocols shall be carried out by an independent testing laboratory or qualified building envelope consultant.

Required documentation for Evergreen Project Plan:
On the EPP form, specify the option(s) chosen and how the objective will be achived. State that inspection reports and photos of any mockups will be available on job site.

Rationale

The building envelope should be designed in such a way that the physical and chemical properties of water and water vapor do not create structural or health issues during the useful life of the building.

Recommendations

The design should be appropriate for its location and climate, and consider the physical and financial operating conditions anticipated for the building. Consult architects and engineers who specialize in building envelope or include an independent building envelope inspector in the project team.

Resources

- Lstiburek, Joseph. *Builder's Guide to Mixed-Humid Climate.* Bloomington MN: Energy and Environmental Building Association, 2005.
- Lstiburek, Joseph. *Water Management Guide*. Westford MA: Building Science Press, 2006. http://www.buildingsciencepress.com/Water-Management-Guide-P9.aspx

7.14 Garage Isolation

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

- Provide a continuous air barrier between the conditioned (living) space and any garage space to prevent the migration of any contaminants into the living space.
- Do not install ductwork or air handling equipment in a garage.
- All connecting doors between living space and garage must include an automatic closer / spring hinges, and be fixed with gaskets or otherwise made substantially airtight with weather stripping.
- Install Carbon Monoxide Alarms as per the requirements of the Washington State Carbon Monoxide Alarm Laws.
- Common walls and ceilings between attached garages and living spaces must be visually inspected to ensure that they are air-sealed before insulation is installed (requirement taken from EPA's Indoor airPLUS program 5.5).

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that there will be a continuous air tight barrier between the living space and an attached garage, how it will be achieved, and the number of placements of CO monitors.

Rationale

Carbon monoxide inhalation can be dangerous to human health. The air barrier and air sealing will help prevent carbon monoxide migration from the garage to the living space, and the CO alarm will help ensure that residents are alerted in the case of accidental accumulation of the gas.

Recommendations

ASHRAE 62.2 requires that the building envelope between the garage and occupied spaces be sealed to prevent air leakage. Refer to ASHRAE 62.2 for more information and to specify garage contaminant isolation measures. Homes meeting the Energy Star Northwest certification will meet the duct leakage test standard.

7.15 Integrated Pest Management

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate non-toxic sealing methods to prevent pest entry. Provide rodent- and corrosion-proof screens (e.g., copper or stainless steel mesh or rigid metal cloth) for openings greater than ¼ inch.

Develop an integrated pest management (IPM) policy and, as part of that, develop resident guidance related to pesticide use, housekeeping, and prompt reporting of pest problems to be included in the Maintenance and Resident Manuals for cockroaches, rodents, and bedbugs.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify that sealing of all penetrations will be done and include what materials will be used to prevent pest and rodent entry.

Rationale

Sealing of cracks and penetrations will minimize entry points for pests such as rodents and cockroaches. Avoiding unnecessary pesticides, improving resident housekeeping, and promptly responding to pest problems will reduce the chemicals needed to treat pests and will keep homes pest-free longer than a routine chemical treatment program.

Recommendations

- For guidance on low-VOC caulk, see **ESDS 6.2**.
- Integrated pest management work should be completed in conjunction with air sealing. Project teams should work with an air sealing contractor to ensure that IPM strategies are part of scope.

Resources

- "How to Control Pests Safely: Getting Rid of Cockroaches and Mice," New York City Department of Health and Mental Hygiene, under the header "Guide to Safe Pest Control in the Home": http://www.nyc.gov/html/doh/downloads/pdf/pest/pest-bro-healthy-home.pdf
- The National Center for Healthy Housing, Integrated Pest Management in Affordable Housing: http://www.healthyhomestraining.org/IPM/
  This webpage has resources dedicated to IPM in affordable housing, including model RFPs and contract language for greener pest control, case studies, and training.

7.16 7.16 Lead-Safe Work Practices

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

For properties built before 1978, use lead-safe work practices during renovation, remodeling, painting and demolition.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state the year when the buildings were constructed. For structures built before 1978, specify that lead-safe work practices will be followed.

Rationale

Any activity that disturbs painted surfaces or building components in pre-1978 dwellings that contain lead-based paint may generate and spread lead dust and debris, increasing the risk of lead poisoning for exposed children and families.

Recommendations

Get a lead-based paint inspection or risk assessment if it is likely that the surfaces to be disturbed contain lead-based paint. Information about lead-safe work practices can be found at www.epa.gov/lead/pubs/traincert.htm and www.hud.gov/offices/lead/training/index.cfm.

7.17 7.17 Smoke-Free Building

Optional 7 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Implement and enforce a smoke-free policy in all common and individual living areas, including decks and patios, in unit leases and within 25 feet of building entries or ventilation intakes (including operable windows). The lease language must prohibit smoking in these locations and specify that it is a violation of the lease to smoke. The no-smoking restriction applies to all owners, tenants, guests, and servicepersons.

Required Documentation for the Evergreen Project Plan:
On the EPP form, specify that a smoke-free policy in all common and individual living areas, including decks and patios, in unit leases and within 25 feet of building entries or ventilation intakes (including operable windows) will be implemented and enforced. Also specify that the lease language will prohibit smoking in these locations and that it is a violation of the lease to smoke. Provide a copy of the lease in the on-site binder for the Third Party Verifier to review on-site.

Rationale

Housing currently presents the biggest exposure to indoor secondhand smoke in Washington, and exposure is disproportionately experienced by vulnerable populations. Smoke-free housing policies effectively remove smoke from housing and are a major step to address the social inequities of tobacco use and secondhand smoke exposure. There is no safe level of exposure to secondhand smoke and air filtration and ventilation systems do not prevent smoke from moving between areas in a building. In addition to the negative health effects, smoking in housing significantly increases fire hazard and increases cleaning and maintenance costs. The leading cause of preventable fires is smoking-related fires.

Recommendations

- Service enriched housing should endeavor to offer tobacco cessation services as a part of their program.
- Properties should seek an insurance discount for projects with no-smoking policies.
- Project owners and property managers should inform residents that they are prohibited from smoking in the project.
- If necessary to implement policy, owners and managers may offer a designated outdoor smoking area. This area should include suitable receptacles for the disposal of cigarettes. Ensure that the receptacles are inside the project line and do not encroach into public space.

Resources

- National Center for Healthy Housing, "Reasons to Explore Smoke-Free Housing Fact Sheet": http://www.nchh.org/Portals/0/Contents/NCHH_Green_Factsheet_Smokefree.pdf
- American Lung Association, Air Quality in the Home: www.lungusa.org
  This site includes an entire section devoted to indoor air quality in the home. Choose "Air Quality" at the bottom of the screen and then click "Indoor Air Quality" and "Air Quality in the Home" to find numerous articles and educational pieces about maintaining a healthy indoor environment.
- Smokefreewashington.com (http://www.smokefreewashington.com/apartments/) Includes steps to developing and implementing a smoke-free policy.
- U.S. Environmental Protection Agency, Indoor Air Quality Division: www.epa.gov/iaq
  This site has numerous resources related to indoor air quality in homes, including reports and web links.

Operations & Maintenance

An orientation to the project helps educate residents and property managers on the green features that were designed to deliver health, economic, and environmental benefits, as well as their role in realizing those benefits in their own lives and the lives of future residents.

8.1 Building Maintenance Manual

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

The project sponsor will provide a manual that includes the following:

- operations and maintenance guidance for all appliances
- HVAC operation and maintenance schedule
- location of water-system turnoffs
- lighting equipment
- paving materials and landscaping
- green cleaning products and schedule(s)
- pest control
- any other systems within the project, including renewable energy systems if applicable
- an occupancy turnover plan that describes the turnover process, including all materials that are frequently replaced at turnover and the process of educating the residents about proper use and maintenance of all project systems

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state that the project sponsor will create, or help create, the Building Maintenance Manual and submit it to Commerce before the project is completed; include an estimated date of submittal.

Rationale

Regular building maintenance using green methods helps minimize utility consumption and provides a healthy and durable living environment for residents.

Recommendations

- During the design process, keep a running list of how maintenance and landscaping teams and residents may need to be involved with the building in order to ensure that its lifespan is maximized and that it will perform as intended. Once the project team has completed the integrative design process (see Criterion 1.1), amend templates of the Operations and Maintenance documents with project-specific information for maintenance and residents. By working in this manner, Operations and Maintenance documents will be informed by the development process and completed at the same time the project is ready for occupancy.
- Consider developing an integrated pest management (IPM) policy and, as part of that, develop guidance related to pesticide use, housekeeping, and prompt reporting of pest problems to be included in maintenance manuals.
- If the project is utilizing greywater, design and institute a policy that requires biodegradable soaps, cleaners, and other products that are flushed down the drains.
    - Provide maintenance staff with local information for handling hazardous waste, including fluorescent and compact fluorescent lighting (CFLs).
- NCHH. “Healthy Homes Maintenance Checklist.” National Center for Healthy Housing,

2005. See http://www.nchh.org/Portals/0/Contents/Maintenance_Checklist2009.pdf

- Ventilation instruction manuals have been developed for the most common systems. They can be downloaded from the WSU Extension Energy Program: http://www.energy.wsu.edu/code/

Resources

Green Communities has created a free resource, the "Template for Green Operations and Maintenance Manual" that can be used to achieve the goals of this criterion: http://www.greencommunitiesonline.org/tools/resources/

8.2 8.2 Resident Manual

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

The project sponsor will provide a guide for homeowners and renters that explains the intent, benefits, use and maintenance of green building features. The Guide should include the following:

- a routine maintenance plan
- location of transit stops and other neighborhood amenities
- operations and maintenance guidance for all appliances and special plumbing fixtures
- HVAC operation
- cautions or appropriate maintenance on renewable energy systems
- location of water-system turnoffs
- lighting equipment
- interior finish materials, including paints, caulks, and flooring
- paving materials and landscaping
- pest control and Non-toxic measures in pest control
- special health considerations if greywater is used indoors (e.g., do not drink from the toilet in emergency situations)
- encouraging additional green activities such as recycling, gardening, use of healthy cleaning products, purchase of green power, energy savings potential in plug loads
- any other systems that are part of the home

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state that the project sponsor will create, or help create, the Resident Manual and submit it to Commerce before the project is completed; include an estimated date of submittal.

Rationale

Education on the operations and maintenance of the home will allow residents to fully realize the environmental, health, and economic benefits that green housing offers. This resource will familiarize residents with the green features and methods used in their new home and additional activities they could initiate to realize the home's benefits.

Recommendations

- During the design process, keep a running list of how maintenance and landscaping teams and residents may need to be involved with the building in order to ensure that its lifespan is maximized and that it will perform as intended. Once the project team has completed the integrative design process (see Criterion 1.1), amend templates of the Operations and Maintenance documents with project-specific information for maintenance and residents. By working in this manner, Operations and Maintenance documents will be informed by the development process and completed at the same time the project is ready for occupancy.
- Provide residents with local information for handling household hazardous waste, including CFLs.
- Consider including ENERGY STAR "Best Practices" information in the Resident Manual. See the following websites:
    - For washers and dryers: http://www.energystar.gov/index.cfm?c=clotheswash.clothes_washers_performance_tips
    - For refrigerators: http://www.energystar.gov/index.cfm?c=refrig.pr_best_practices_refrigerators
    - For dishwashers: http://www.energystar.gov/index.cfm?c=dishwash.pr_best_practices
- For additional best practices on ENERGY STAR products: http://www.energystar.gov/index.cfm?c=products.pr_find_es_products
  Select a product type, click on "Buying Guidance," and scroll down to the bottom of the page to select "Best Practices" products.
- Provide homeowners / tenants with two radon test kits designed for 48-hour exposure, and include instructions for use and follow-up action, per EPA's Indoor Air Package.
- Provide residents with

Resources

There are two templates that can be used to help create your Resident Manual:

1. On Green Communities Website: "Template for Healthy Home Guide for Residents" http://www.greencommunitiesonline.org/tools/resources/
2. On Commerce's website: "Example Resident's Manual"

8.3 Resident & Property Manager Orientation

Mandatory

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

Requirements

Provide a comprehensive walk-through and orientation for the residents and property manager(s) using the appropriate manual (see **ESDS 8.1 and 8.2**) to review the project's green features, operations, and maintenance, and, for the resident orientation, the neighborhood amenities that may facilitate a healthy lifestyle.

NOTE: In addition to verifying this requirement at the end of development, these records should be updated when there is turnover; HTF staff will monitor these records during site visits.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, specify how the orientations will be completed with new tenants and the plan for orientation at turnover. State that a record of the orientation will be submitted to Commerce after project development is completed and at least 90% occupied. The record should include the date of the orientation, who in each household received the orientation, and who on the management team gave the orientation; include an estimated date of submittal.

Rationale

An orientation to the project helps educate residents and property manager(s) on the green features that were designed to deliver health, economic, and environmental benefits, as well as their role in realizing those benefits in their own lives and the lives of future residents.

8.4 Project Data Collection

Optional 7 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

REQUIREMENTS

Collect and monitor project performance data on energy, water, and, if possible, healthy living environments for a minimum of five years. Allow Commerce access to that data.

For sub-metered projects, property owner /developer must agree to collect utility release forms from the required number of residents to track actual utility data of a sample of homes. The following table identifies the number of residents for which the property owner /developer must collect and track utility data, as based on the project size in total number of units.

Project Size	Number of Units to report
0-24 units	8
25-49 units	10
50-74	12
75+	15

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state that the property management staff will collect and monitor project performance data on energy, water, and, if possible, healthy living environments for a minimum of five years and provide that information to Commerce.

RATIONALE

A data collection and monitoring system helps project owners, on-site staff, and residents to understand project performance issues. Once an issue is identified, appropriate actions can be taken to maximize cost savings and health benefits associated with green building features.

RECOMMENDATIONS

- Provide Commerce with access to the performance data annually for a five-year period through the Utility Release Form and /or the EPA's Portfolio Manager account information to help populate its database intended to collect national information on green affordable housing.
- Ensure that the training for residents and building maintenance staff includes information on how to effectively use the data collection, monitoring, and reporting system.
- Multifamily building data can be tracked and analyzed using EPA's Portfolio Manager tool.
- Property owners have indicated that the best time to collect tenant release forms is during tenant lease-up.

RESOURCES

- Environmental Protection Agency, Portfolio Manager Overview:
  www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager
  The Portfolio Manager Overview is an interactive energy management tool that allows the project team to track and assess energy and water consumption across its entire portfolio of buildings in a secure online environment.

8.5 8.5 Educational Signage

Optional 2 points

U-NC	U-Mod	U-Sub		R-NC	R-Mod	R-Sub

REQUIREMENTS

Post current, durable and permanent educational signage throughout the building and/or provide educational material to communicate the green efforts of the project to the community, residents and building operators.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state that educational signage and/or educational material will be provided onsite.

RATIONALE

Educating residents, building operators and the community about the benefits of green buildings can help motivate others to make change. People take care of beautiful buildings; understanding how a building operates instills pride and ownership which maximizes the building maintenance and performance.

Appendices

Appendix A: Energy Efficiency for New Multi-family Construction

Climate Zone 1: 2009 WSEC Table 13-1 as modified for the Evergreen Standard Building Envelope Requirements

	Nonresidential		Residential, Other than Single-Family	
Opaque Elements	**Assembly Max.**	**Insulation Min. R-Value**	**Assembly Max.**	**Insulation Min. R-**
Roofs				
Insulation Entirely above Deck	U-0.034	R-30 c.i.	U-0.031	R-38 c.i.
Metal Building	U-0.031	R-25 + R-11 Ls	U-0.031	R-25 + R-11 Ls
Single-Rafter	U-0.027	R-38	U-0.027	R-38
Attic and Other	U-0.027	R-38 adv or R-49	U-0.027	R-38 adv or R-49
Walls, Above-grade				
Mass	U-0.150	R-5.7 c.i.	**U-0.057**	**R-16 c.i.**
Metal Building	U-0.064	R-13 + R-7.5 c.i.	U-0.057	R-19 + R-8.5 c.i.
Steel Framed	U-0.064	R-13 + R-7.5c.i.	U-0.057	R-1-9 + R-8.5 c.i.
Wood Framed and Other	U-0.057	R-21	U-0.057	R-13 + R- 6 c.i.
Wall, Below Grade				
Below Grade Wall		Same as above grade		Same as above grade
Floors				
Mass	U-0.029	R-30 c.i.	U-0.029	R-30 c.i.
Steel Joist	U-0.029	R-38 + R-4 c.i.	U-0.029	R-38 + R-4 c.i.
Wood Framed and Other	U-0.029	R-30	U-0.029	R-30
Slab-On-Grade Floors				
Unheated	F-0.540	R-10 for 24 in. (with thermal break)	F-0.540	R-10 for 24 in. (with thermal break)
Heated	F-0.360	R-10 c.i.(with thermal break)	F-0.360	R-10 c.i. (with thermal break)
Opaque Doors				
Swinging	U-0.600		**U-0.200**	
Non-Swinging	U-0.600		**U-0.200**	
Fenestration *0-25% of Wall*	**Assembly Max. U**	**Assembly Max. SHGC**	**Assembly Max. U**	**Assembly Max. SHGC**
Vertical Fenestration				
Nonmetal framing: all Metal framing: fixed /operable Entrance doors	U-0.32 U-0.40 U-0.60	SHGC-0.40 all, OR SHGC-0.45 all PLUS permanent PF > 0.50 on west, south, and east	**U-0.30** **U-0.30** U-0.60	
Skylights				
Without curb (i.e. sloped glazing)	U-0.50	SHGC-0.35 all	U-0.50	SHGC-0.35 all
With curb (i.e. individual unit skylights)	U-0.60		U-0.60	

The following definitions apply: c.i. = continuous insulation, Ls = liner system (see definitions

Climate Zone 2: 2009 WSEC Table 13-2 as modified for the Evergreen Standard Building Envelope Requirement

	Nonresidential		Residential, Other than Single-Family	
Opaque Elements	**Assembly Max.**	**Insulation Min. R-Value**	**Assembly Max.**	**Insulation Min. R-Value**
Roofs				
Insulation Entirely above Deck	U-0.034	R-30 c.i.	U-0.031	R-38 c.i.
Metal Building	U-0.031	R-25 + R-11 Ls	U-0.031	R-25 + R-11 Ls
Single-Rafter	U-0.027	R-38	U-0.027	R-38
Attic and Other	U-0.027	R-38 adv or R-49	U-0.027	R-38 adv or R-49
Walls, Above-grade				
Mass	U-0.123	R-7.6 c.i.	**U-0.044**	**R-22 c.i.**
Metal Building	U-0.064	R-13 + R-7.5 c.i.	U-0.044	R-19 + R-16 c.i.
Steel Framed	U-0.064	R-13 + R-7.5 c.i.	U-0.044	R-19 + R-14 c.i.
Wood Framed and Other	U-0.051	R-13 + R-7.5 c.i., or	U-0.044	R-21 + R-5 c.i.
Wall, Below Grade				
Below Grade Wall		Same as above grade		Same as above grade
Floors				
Mass	U-0.029	R-30 c.i.	U-0.029	R-30 c.i.
Steel Joist	U-0.029	R-38 + R-4 c.i.	U-0.029	R-38.0 + R-4 c.i.
Wood Framed and Other	U-0.029	R-30	U-0.029	R-30
Slab-On-Grade Floors				
Unheated	F-0.540	R-10 for 24 in. (with thermal break).	F-0.540	R-10 for 24 in. (with thermal break)
Heated	F-0.360	R-10 c.i. (with thermal break)	F-0.360	R-10 c.i. (with thermal break)
Opaque Doors				
Swinging	U-0.600		**U-0.200**	
Non-Swinging	U-0.600		**U-0.200**	
Fenestration *0-25% of Wall*	**Assembly Max. U**	**Assembly Max. SHGC**	**Assembly Max. U**	**Assembly Max. SHGC**
Vertical Fenestration				
Nonmetal framing: all Metal framing: fixed/operable Metal framing, entrance door	U-0.32 U-0.40 U-0.60	SHGC-0.40 all, OR SHGC-0.45 all PLUS permanent PF > 0.50 on west, south, and east	**U-0.30** **U-0.30** U-0.60	
Skylights				
Without curb (i.e. sloped	U-0.50	SHGC-0.35 all	U-0.50	SHGC-0.35 all
With curb (i.e. individual unit skylights)	U-0.60		U-0.60	

The following definitions apply: c.i. = continuous insulation, Ls = liner system (see definitions)

Appendix B:
Energy Efficiency for Rehabilitation of Existing Housing

A list of prescriptive weatherization methods has been adopted as the primary method for meeting the Evergreen Sustainable Development Criteria for energy efficiency during building rehabilitation. Two analysis methods are also available as an alternative to the prescriptive method. This includes a simple 10 year payback calculation, or a savings to investment ratio. The prescriptive options have been adopted principally from the Regional Technical Forum, Site Built Housing Weatherization Specifications, October 1, 2003. This is the list of measures developed by the Northwest Power Planning Council and Bonneville Power Administration. The list of measures has been developed over 20 years with input from weatherization agencies and sponsor utilities. The list of measures has remained fairly consistent over time. In most cases, when the opportunity presents itself, it is cost effective to provide air sealing and insulation measures to housing in the Pacific NW Region.

There are special conditions in some buildings that make it more difficult than usual to install the prescriptive options detailed here. For these cases, the applicant may wish to propose an alternative to the prescriptive requirements. To propose an alternative list of measures, the applicant may provide either a simple payback analysis or a savings to investment ratio, as detailed below.

In all cases minimum code requirements must be met. Specific to energy efficiency, the requirements of Washington State Energy Code Section 101.3 apply to existing buildings.

1. Prescriptive Option - Mandatory Measures

For each project, complete the following mandatory weatherization measures.

Existing Building Air Sealing and Ventilation:

- Mechanical Ventilation (Mandatory): Provide a whole house mechanical ventilation system in compliance with the Washington State Ventilation and Indoor Air Quality Code or ASHRAE Standard 62.2 - 2004.

- Prescriptive Air Sealing (Mandatory): All accessible exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors and roofs; and all other openings in the building envelope for all occupancies and all other openings in between units in R-1 and R-2 occupancies shall be sealed, caulked, gasketed or weatherstripped to prevent air leakage. All exterior doors or doors serving as access to an enclosed unheated area shall be weatherstripped to prevent leakage around their perimeter when in a closed position.

Attic Spaces: (Mandatory)

- All penetrations in the ceiling shall be sealed to prevent air leakage from the interior space to the attic space.
- Attic ceilings with less than R-20 existing insulation shall be insulated to a minimum of R-38 or the highest R-value approaching R-38 which is practical.
- Uninsulated knee walls shall be insulated to R-21, or the highest R-value approaching R-21 which is practical.
- Attic access doors which are adjacent to Conditioned Spaces shall be insulated to at least R-30 for horizontal openings and to at least R-13 for vertical openings and weatherstripped.
- If water pipes are located in the attic space, water pipe insulation shall be included with ceiling insulation.
-

Single Rafter Vaults: (Mandatory)

- When vaulted roof cavities are exposed during renovation, the cavity shall be insulated to R-38 or highest R-value approaching R-38 which is practical. Code required roof cavity ventilation shall be taken into account when determining the maximum depth of insulation installed in the rafter space.

Floors over vented crawl space, or other unconditioned spaces. (Mandatory)

- All penetrations in the floor system shall be sealed to prevent air leakage from the crawl space to the interior space.
- Underfloors shall be insulated to a minimum of R-30, or to the maximum level needed to fill the joist cavities.
- Any crawlspace access door adjacent to a Conditioned Space shall be insulated to at least R-30 for horizontal openings and to at least R-13 for vertical openings and shall be weatherstripped with appropriate materials.
- Uninsulated walls separating the crawlspace from Conditioned Space shall be insulated to a minimum of R-21 or the highest R-value which fills the cavity.
- If water pipes are located in the crawlspace, water pipe insulation shall be included with underfloor insulation.

Above and Below Grade Walls (Mandatory)

- Insulation shall be installed in wall cavities that have less than 1” of existing insulation.
    - Walls shall be insulated to minimum R-13 in 2x4 walls and R-21 in 2x6 walls or the highest R-value practical for the wall cavity space.
- When exterior wall cladding is replaced or installed over existing siding and windows are replaced, R-5 minimum exterior foam sheathing shall be installed.

Window Replacement: (Mandatory)

- When windows are replaced, all replacement windows must meet a minimum thermal heat transmission of U-0.30. An area weighted U-factor calculation may be used to demonstrate compliance.
- For homes with exhaust only ventilation systems, outdoor air inlets meeting the requirements of the Washington Ventilation and Indoor Air Quality Code shall be installed in new window frames.

Skylight Replacement: (Mandatory)

- When skylights are replaced, all skylights must meet a minimum thermal heat transmission of U-0.40.

Ductwork located in unconditioned and semi-conditioned spaces, including crawl spaces, attics and garage.

- All existing ductwork shall be inspected. Damaged ducts are to be repaired or replaced with new ductwork. All joints are to be inspected to assure they are mechanically fastened as required by the mechanical code. All duct joints and seams shall be sealed with mastic. All existing ducts shall be insulated to R-8 (2 ½ “) if the existing insulation is less than R-4 (1/1/2”) insulation.

2. Simple Payback Method Option – (Mandatory)

As an alternative to the prescriptive building envelope measures, implement all building envelope measures that are demonstrated to provide a 10 year simple payback or less.

- Identify an engineer or energy auditor to conduct an energy analysis of the existing building condition and identify cost-effective energy improvements by preparing an energy improvement report.
- The report analyzes the current and projected energy performance of the building using energy simulation software.
- Analyze all of the mandatory prescriptive measures listed above.
- First costs are determined using actual bids for the project, or information from a similar project. First costs include only the contractor bid price. First costs do not include financing, overhead or profit.
- Cost of energy is calculated using local utility rates. If the local utility uses a block rate structure, the lowest block rate should not be used to calculate space conditioning energy cost. Use the second and third block rates.
- Simple payback is calculated as: first cost of the measure / first year energy cost savings.

3. Savings to Investment Ratio Option – (Mandatory)

Using TREAT Weatherization Evaluation Software, or an equivalent software, analyze all of the mandatory prescriptive measures listed above. Implement all measures that are demonstrated to provide a savings to investment ratio greater than 1.

For 5.2b: Simple Payback Method – Additional Points (5points)

Specify and install measures that provide greater energy efficiency than the prescriptive measures listed above as demonstrated by a 14-year simple payback calculation described above.

Notes: This Appendix was developed by Chuck Murray, Energy Policy Specialist, Department of Commerce, 360.725.3113, Chuck.Murray@commerce.wa.gov.

The prescriptive standards included here were adopted from the 5th Northwest Power Plan, with some modification. Since the 1980's, the Northwest Power Planning Council has developed a set of weatherization measures for regional adoption. They are analyzed for three regional climate zones. Zones 1 and 2 are in Washington State. The standards were developed using a detailed cost effectiveness calculation. They evaluate the life cycle cost to the building occupant, as well as impacts of savings on the regional rate payers.

Prior to making this recommendation, several additional sources were checked to confirm that measures, measure savings and cost figures were reasonable.

To confirm that the list of measures was not out of the ordinary:

- The weatherization specifications developed by Oak Ridge National Laboratory was consulted. This document was in agreement with the list of the applications. The R-values varied to some degree. ORNL staff contacted noted they are currently updating the R-values to reflect recent changes in fuel cost.
- The weatherization specifications developed by the Commerce weatherization program was consulted. Table 5.1 Draft Matrix of Weatherization Measures. This document also includes a similar set of measures, with somewhat different R-values. Commerce staff noted this table has not been updated to reflect the recent changes in fuel price.

To confirm that the cost in the Power Plan were not out of the ordinary, 2006 RS Means was consulted. There is some variation in the cost. Some cost are higher, some lower. But there were no cases where the cost differences were substantial.

For insulation, the changes have been small. The level of insulation recommended for rehabilitation work has remained fairly constant since the early 1990's. The opportunities to

make changes in existing structures have not changed over time. The physical limitations on access and space in attic crawl or wall systems have not changed. This document has included two variations from the Power Plan.

- All references to R-11 insulation have been changed to R-13.
- All references to R-19 for walls have been changed to R-21.
- In response to changes in fuel cost, he insulation measures are the same for all equipment and fuel types.

There are several mandatory measures that are only required as part of other work. This is because they are only cost effective when incorporated with the work noted. This includes:

- Window Replacement – U-factor: Window replacement is very expensive. It is not cost effective to replace windows simply for energy savings. But when windows are replaced, it is cost effective to purchase the most energy efficiency products available. The state energy code would require a U-35 window. The mandatory requirement for window replacement for this document is U-.30.
- Window Replacement – ventilation ports: The Washington State Ventilation and Indoor Air Quality Code requires outdoor air inlets as part of code compliance. For exhaust only ventilation systems, this is typically accomplished by providing small ports in the frame. This is a reasonable requirement for projects using this ventilation strategy when the windows are replaced.
- Foam Sheathing- Adding foam sheathing is cost effective when exterior cladding is being replaced or installed over existing siding. In addition, it is important to integrate the foam sheathing with the flashing details, especially with the windows. As a result, foam sheathing is only required when both the windows are being replaced and the cladding is replaced or new cladding is installed over existing siding.

Prescriptive air sealing measures have been included. This is simply a “find the hole, seal the hole” approach. For additional points, performance testing has been included.

In all cases, when air sealing work is conducted, a minimum standard for whole house ventilation needs to be included. Because there are very few people that can accurately assess the need for mechanical ventilation, it is mandatory in all cases. Also, it is likely that it will cost less to simply implement a ventilation strategy, than to analyze it.

Duct sealing and improved duct insulation was introduced during the early 1990’s. The Power Plan would require the performance testing as noted in the optional measures. The prescriptive section was written to simply bring the existing ducts up to current energy code requirements. Use the Performance Tested Comfort Systems methodology, or an equivalent to take additional credit for air sealing. This method is required on all new Energy Star homes with duct systems.

Additional credit is assigned to performance testing for heat pump systems. Heat pumps need to have adequate air flow across the heating/cooling coil to achieve the rated performance.

Performance Tested Comfort Systems methodology has been developed to meet this challenge. It is required on all new Energy Star homes with heat pumps.

Equipment upgrades during time of replacement are only included in the optional criteria. For most rehabilitation projects providing the most efficient replacement equipment would be cost effective. It is highly recommended. There are conditions where the cost of replacing existing venting systems or ductwork to accommodate contemporary systems is too costly to provide reasonable recovery.

Measure Name	Savings (kwh/yr)	Phys Life (yrs)	Capital Cost ($2000)	Deemed
Single Family R0 to R19 Attic Insulation - Heating Zone 1	1.83	45.00	0.86	X
Single Family R0 to R19 Attic Insulation - Heating Zone 2 1	2.41	45.00	0.86	X
Single Family R19 to R38 Attic Insulation - Heating Zone 1	0.66	45.00	0.33	X
Single Family R19 to R38 Attic Insulation - Heating Zone 2	0.87	45.00	0.33	X
Single Family R0 to R19 Floor Insulation - Heating Zone 1	2.04	45.00	0.80	X
Single Family R0 to R19 Floor Insulation - Heating Zone 2	2.68	45.00	0.80	X
Single Family R19 to R30 Floor Insulation - Heating Zone 1	0.38	45.00	0.15	X
Single Family R19 to R30 Floor Insulation - Heating Zone 2	0.50	45.00	0.15	X
Single Family R0 to R11 Wall Insulation - Heating Zone 1	1.90	45.00	0.81	X
Single Family R0 to R11 Wall Insulation - Heating Zone 2	2.49	45.00	0.81	X
Single Family Infiltration Control - Heating Zone 1	0.24	20.00	0.16	X
Single Family Infiltration Control - Heating Zone 2	0.32	20.00	0.16	X
Single Family Energy Star Prime Window Replacement - Heating Zone 1	10.04	45.00	16.01	
Single Family Energy Star Prime Window Replacement - Heating Zone 2	13.17	45.00	16.01	
	2.49		1.19	

Measure Name	Savings (kwh/yr)	Phys Life (yrs)	Capital Cost ($2000)	Deemed
Multifamily - R0 - R19 Attic insulation - Heating Zone 1	2.23	45.00	0.86	X
Multifamily - R0 - R19 Attic insulation - Heating Zone 2	3.26	45.00	0.86	X
Multifamily - R19 - R38 Attic insulation - Heating Zone 1	0.46	45.00	0.33	X
Multifamily - R19 - R38 Attic insulation - Heating Zone 2	0.66	45.00	0.33	X
Multifamily - Wall Insulation - Heating Zone 1	1.31	45.00	0.81	X
Multifamily - Wall Insulation - Heating Zone 2	1.91	45.00	0.81	X
Multifamily - R0 - R19 Floor insulation - Heating Zone 1	1.41	45.00	0.80	X
Multifamily - R0 - R19 Floor insulation - Heating Zone 2	2.05	45.00	0.80	X
Multifamily - R19 - R30 Floor insulation - Heating Zone 1	0.26	45.00	0.15	X
Multifamily - R19 - R30 Floor insulation - Heating Zone 2	0.38	45.00	0.15	X
Multifamily - Energy Star Prime Window Replacement - Heating Zone 1	9.58	45.00	16.01	
Multifamily - Energy Star Prime Window Replacement - Heating Zone 2	13.97	45.00	16.01	

Appendix C: Green Development Plan (ESDS 1.1)

Instructions: Below are all the elements required in the Green Development Plan to complete ESDS 1.1.

Description of Process: A description of the integrative design process that was used to select the green building strategies, systems and materials that will be incorporated into the project. Include a summary of meeting minutes or notes with dates or another type of documentation that captures the integrative design process.

Goals: A statement of the overall green development goals of the project and the expected intended outcomes from addressing those goals.

Milestones: An explanation regarding how all of the parties involved in the project are informed about the sustainable goals and features and how you will assure that the goals and features are fully implemented by all workers.

Measure Champions: Identify which members of the design and development team are responsible for implementing each ESDS criterion and phases of sustainable development. Below is an example of how the information can be captured:

Criteria	**Name of the Champion for that measure**	**Description of Measure Champion's Role**	**Follow-up (description of follow-up measures needed throughout completion of design, permitting, construction and operation**

Appendix D: Accessing location specific rainfall data

If table 2 of ESDS 3.5 does not contain a location near your project, below are the text instructions on how to access the rainfall data for a specific location and how to process it. Daily rainfall data can be downloaded from the National Climatic Data Center (NCDC) website:

- Go to the NCDC website (www.ncdc.noaa.gov/oa/mpp/digitalfiles.html).
- Select the DSI 3200-3210 /CDO dataset.
- Select "Continue with SIMPLIFIED Options."
- Select "Specific Station," select the State, and select "Continue."
- Scroll down to click on a list of all weather stations and select the one nearest the project site; select "Continue."
- Specify the date range (at least the most recent 20 years) and select "Continue."
- Review the information, select "Add to Shopping Cart," and complete the checkout process.
- Download and save the ASCII file and then import it into Excel.
- Remove all non-storm events (all days with no numerical recorded rainfall) from the data set.
- Use the Excel Percentile function to determine the percentiles of rainfall events.

(Instructions taken from the USGBC LEED ND Reference Guide. URL & instructions accurate as of June 2011)

Glossary

Adaptive plant species: A non-native plant species that performs similarly to a native species in a particular region, state, ecosystem, and habitat, and that 1) can survive temperature / weather extremes in the microclimate; 2) requires little irrigation or fertilization, once established; 3) is resistant to local pests and diseases; and 4) does not displace other plants, as invasives do.

Adaptive reuse site: A site that was previously developed for non-residential purposes in which at least 25% of the proposed development will reuse existing non-residential structures.

Anti-Corrosive Coating: A coating formulated and recommended for use in preventing the corrosion of metal substrates.

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Standard 62.2-2010: Establishes minimum requirements for ventilation and acceptable indoor air quality in low-rise residential building. http://www.ashrae.org/technology/page/548

ASHRAE Standard 90.1-2007: Establishes minimum requirements for the energy-efficient design of buildings, except single-family houses, multifamily structures of three stories or fewer above grade, and manufactured houses (mobile and modular). This standard is also the basis of Chapter 7 of the International Code Council's International Energy Conservation Codes. State energy codes that may be more stringent than ASHRAE 90.1 are identified on the U.S. Department of Energy's Building Energy Codes website, http://www.energycodes.gov/

Berm: A sloped wall or embankment, typically constructed of earth, hay bales, or timber framing, used to prevent inflow or outflow of material into or out of an area.
http://www.epa.gov/OUST/pubs/tum_appx.pdf

Building Performance Institute (BPI): A national standards development and credentialing organization for residential energy-efficiency retrofit work that provides training through a network of affiliate organizations, individual certifications, company accreditations, & quality assurance programs.

Brownfields: real property where the expansion, redevelopment, or reuse may be complicated by the presence of a hazardous substance, pollutant, or contaminant including petroleum. These sites require a Phase II Environmental Site Assessment and a remediation plan.

CFM (cubic feet per minute): A standard unit of measurement for airflow that indicates how many cubic feet of air are passing through a fixed point per minute.

Charrette: A focused and collaborative brainstorming session held at the beginning of a project to bring people from different disciplines and backgrounds together to explore design options for a particular area or site. All stakeholders are encouraged to exchange ideas and information beyond their areas of expertise so as to allow truly integrative design solutions to take form.

Common area: An area available for use by more than one person, including rental or sales offices, entrances, hallways, shared leisure rooms, resident services areas, and laundry rooms.

CSA (Community-Supported Agriculture): A community of individuals who pledge support to a farm operation so that the farmland becomes the community's farm, with the growers and consumers providing mutual support and sharing the risks and benefits of food production. Typically, members of

the farm or garden pledge in advance to cover the anticipated costs of the farm operation and the farmer's salary. In return, they receive shares in the farm's bounty throughout the growing season. Members also share in the risks of farming, including poor harvests due to unfavorable weather or pests. http://www.nal.usda.gov/afsic/pubs/csa/csadef.shtml

Compost blanket: A layer of loosely applied compost or composted material that is placed on the soil in disturbed areas to control erosion and retain sediment resulting from sheet-flow runoff. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=118&minmeasure=4

CO (carbon monoxide): A colorless, odorless, and tasteless gas that greatly affects indoor air quality. Because it is impossible to see, taste, or smell the toxic fumes, CO can kill you before you are aware it is in your home. At lower levels of exposure, CO causes mild effects that are often mistaken for the flu. These symptoms include headaches, dizziness, disorientation, nausea, and fatigue.

Critical habitat: is an area that the U.S. Fish and Wildlife Service or a state or tribal authority designates as occupied by a threatened or endangered species, or essential to the conservation of a threatened or endangered species. See, for example, Endangered Species Act, 16 U.S.C. 1523(5).

Critical slope area: is an area within a tract of land that has a greater than 15 percent change in elevation or an erodability factor of greater than 0.4 as determined by the Natural Resources Conservation Service of the USDA.

Dial-a-ride program: A privately or publicly operated program that provides an on-demand ride service, requiring passengers to call ahead to reserve a ride. These programs usually provide connections between different transportation systems and/or employment centers, and must operate at least Monday through Friday to qualify.

Distribution Uniformity: A measure of the evenness of irrigation water coverage over a given area.

DU (distribution uniformity): A standard unit of measurement that looks at how uniformly water is applied to a defined area.

ECM (electronically commutated motor): A DC electric motor that uses electricity efficiently, particularly at lower speeds. Also known as a "brushless DC motor."

Emissivity: A unitless measure, describing the relative ability of a surface to emit heat through radiation, ranging from 0.00 (minimum radiation of heat) to 1.00 (maximum radiation of heat). Generally, more reflective materials have a lower emissivity.

Employer vanpool: A program in which 5 to 15 people (over the age of 16) ride together to and from work. The vanpool may be public or private, but must carry all passengers more than half the distance to work to qualify. Vanpools may be employer-operated, sponsored by transit agencies, or administered by third-party operators.

ENERGY STAR: A voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Introduced by the EPA in 1992, ENERGY STAR is an accepted, national standard for single-family and low-rise residential New Construction projects. ENERGY STAR New Homes Version 3 will be expanded to include mid-rise multifamily buildings with their own heating, cooling, and hot water systems.

Engineered wood products: Wood building materials manufactured by gluing particles, fibers, or veneers to increase strength.

Entryway: Threshold separating the indoor space from the outdoor space.

Environmental site assessment: An investigation of the site's conditions often performed before acquisition of a property to satisfy the due-diligence requirements of a property transaction.

EPP: Abbreviation for Evergreen Project Plan

Erosion blankets: Porous fabrics used for a variety of purposes, including separators, reinforcement, filtration and drainage, and erosion control. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=45&minmeasure=4

Evergreen Application Checklist: When applicants apply for funding from the Housing Trust Fund, they are required to submit the Evergreen Checklist. This form lists all of the mandatory criteria required of the project and the optional criteria chosen for the project.

Evergreen Coordinator: The individual chosen by the project sponsor who is responsible for the implementation of the Evergreen Sustainable Development Standard. In previous versions of ESDS, this individual's title was Sustainable Development Project Manager (SDPM). See Chapter 2, Section 207.4 of the Housing Trust Fund Handbook for specific requirements of the Evergreen Project Plan.

Evergreen Project Plan: The document submitted to the Housing Trust Fund outlining how a project specifically intends to meet the ESDS. It includes the Evergreen Project Plan form, and any necessary attachments, completed by the Evergreen Coordinator. See Chapter 2, Section 207.3 of the Housing Trust Fund Handbook for specific requirements of the Evergreen Project Plan.

ESDS: Abbreviation for Evergreen Sustainable Development Standard.

Filter sock: A mesh tube filled with composted material that is placed perpendicular to sheet-flow runoff to control erosion and retain sediment in disturbed areas. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=120&minmeasure=4

Formaldehyde: A chemical used widely by industry to manufacture building materials and numerous household products. Formaldehyde is also a by-product of combustion and certain other natural processes, and thus may be present in substantial concentrations both indoors and outdoors. Health effects include eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; and severe allergic reactions. May cause cancer.

Greenfield: A previously undeveloped parcel of land.

Grayfields: previously developed vacant or underutilized sites, such as parking lots and shopping centers.

Green roof: A planted roof that reduces stormwater runoff. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=114&minmeasure=5

Greywater: Wastewater produced from baths and showers, clothes washers, and lavatories. Greywater gets its name from its cloudy appearance and from its status as being neither fresh (as in potable water) nor heavily contaminated (as in black-water from toilet waste).
http://greywater.sustainablesources.com/

HERS Index (Home Energy Rating System Index): A scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERS Index of 0. The lower a home's HERS Index, the more energy-efficient it is in comparison to the HERS Reference Home. Each 1-point decrease in the HERS Index corresponds to a 1% reduction in energy consumption compared to the HERS Reference Home; thus a home with a HERS Index of 85 is 15% more energy-efficient than the HERS Reference Home, and a home with a HERS Index of 80 is 20% more energy-efficient.

Home Energy Rating: An analysis of a home's construction plans and onsite inspections. Based on the home's plans, the Home Energy Rater uses an energy-efficiency software package to perform an energy analysis of the home's design. This analysis yields a projected, pre-construction HERS Index. Upon completion of the plan review, the rater will work with the builder to identify the energy-efficiency improvements needed to ensure that the house will meet ENERGY STAR performance guidelines. The rater then conducts on-site inspections, typically including a blower door test (to test the leakiness of the house) and a duct test (to test the leakiness of the ducts). Results of these tests, along with inputs derived from the plan review, are used to generate the HERS Index score for the home.

HTF: abbreviation for Housing Trust Fund

IECC (International Energy Conservation Code): A model building energy code created by the International Code Council to set a minimum standard for energy efficiency.
http://www.iccsafe.org/Pages/default.aspx

Infill: a site with utilities adjacent that is surrounded by developed parcels and bordering streets.

Integrative design: A design approach that brings together at an early stage in project planning all the members of the building stakeholder community, and the technical planning, design, and construction team (including green building consultants such as the green rater, mechanical engineer /energy expert, and others) to look at the project objectives, building materials, systems, and assemblies from many different perspectives. This approach is a deviation from the typical planning and design process of relying on the expertise of specialists who work in their respective specialties somewhat isolated from each other.

Intermittent rate: Ventilation that stops and starts at regular intervals (i.e., the opposite of continuous ventilation).

Local production: materials that are produced within 500 miles of the project site.

LED (light-emitting diode): Energy-efficient lights that produce less initial heat per lumen, consume less energy, and last longer than conventional incandescent and fluorescent lights.

Low-impact development: A strategy of site design where the goal is to restore the natural, pre-developed ability of an urban site to absorb stormwater.

Maintained solar reflectance: A measure of a material's ability to maintain its initially rated solar reflectance. Products are tested over a period of three years.

Manual D: Manual prepared by the Air Conditioning Contractors of America (ACCA) on residential duct sizing.

Manual J: Manual prepared by ACCA on residential load calculations. http://www.acca.org/store/product.php?pid=172

Manual S: Manual prepared by ACCA on residential equipment selection. http://www.acca.org/store/product.php?pid=154

Moderate rehabilitation: a project that does not fully gut and expose the structure and air barrier of the building envelope or replace / improve all major systems of the building.

Native plant species: A plant species that occurs naturally in a particular region without direct or indirect human actions. http://web4.audubon.org/bird/at_home/PlantNativeSpecies.html

Naturescaping: A method of landscaping that reduces water use, energy consumption, and chemical needs by using climate-appropriate plants and maintenance techniques.

Non-buildable land: Land that is not economically feasible to be developed, such as easements, utility fall zones, unsuitable soil, steep grades, water features, wetlands, or natural preserves.

Noxious weeds: non-native plants that, once established, are highly destructive, competitive and difficult to control. They have economic and ecological impacts and are very difficult to manage once they get established. Some are toxic or a public health threat to humans and animals; others destroy native and beneficial plant communities.

Open space: Undeveloped land that is permanently set aside for public use. Open space may be used as community open space or preserved as green space, and includes parcels in conservation easement or land trust, park or recreation areas, and community gardens.

Phase I Site Assessment: is an investigation and a report regarding a specific site to satisfy the due-diligence requirements of an acquisition. The site assessment identifies existing or potential environmental contamination liabilities addressing both the underlying land and any physical improvements.

Phase II Environmental Site Assessment: is an investigation that collects original samples of soil, groundwater, or building materials to analyze for quantitative values of various contaminants and includes a report of the results.

Phase III Environmental Site Assessment: an investigation regarding the remediation of a contaminated site including a report that documents the steps in the cleanup and the monitoring of residual hazardous substances.

Permeable paving: A porous cover system that encourages groundwater recharge and infiltration. http://www.epa.gov/oaintrnt/stormwater/pavers.htm and http://www.epa.gov/greeningepa/stormwater/best_practices.htm

Phenol-formaldehyde: A resin used in the manufacture of composite wood products primarily for

outdoor use, including softwood plywood and flake or oriented strand board. Composite wood products that contain phenol-formaldehyde generally emit formaldehyde at lower rates than those containing urea formaldehyde resin. http://www.epa.gov/iaq/formalde.html

Photocell: A light-sensitive device that detects ambient light and controls exterior fixtures accordingly.

Photovoltaics: Composite materials that convert sunlight directly into electrical power.

Post-consumer waste: Materials or finished products that have served their intended use and so have been diverted or recovered from waste destined for disposal.

Post-industrial waste (also called pre-consumer waste): Materials generated in manufacturing and converting processes such as manufacturing scrap and trimmings and cuttings.

Prime farmland: is defined by the U.S. Department of Agriculture (USDA) in the *U.S. Code of Federal Regulations, Title 7, Volume 6, Parts 400-699, Section 657.5*. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is available for these uses. This restriction covers cropland, pastureland, rangeland, forestland and other land, and excludes urban built-up land.

Project Sponsor: The sponsoring organization who submits the HTF application and who will contract with Commerce to complete the project. Also called the "Applicant."

Public–private regional transportation: Private company offering public transit services through a public funding stream, based on a regular schedule and permanent stops.

Radon: A colorless, odorless, and tasteless gas that greatly affects indoor air quality. According to the EPA, radon exposure is the second leading cause of lung cancer in the United States.

Resilient flooring: Flooring products in which the wearing surface is non-textile, including but not limited to rubber, polymeric, and linoleum.
http://webstore.ansi.org/RecordDetail.aspx?sku=NSF%2FANSI+332-2010

RESNET (Residential Energy Services Network): A national, nonprofit corporation that certifies raters to evaluate building energy performance using HERS.

Retention basin: A shallow impoundment designed to infiltrate stormwater into the soil.
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=69

Road section: The cross-section through a street, with particular attention paid to the width of the street and its hydrology. Carefully planned road sections can decrease the amount of impervious surfaces and can improve the overall stormwater management for the project site. More information can be found in the document *Low-Impact Development Design Strategies: An Integrated Design Approach*, found at http://www.epa.gov/owow/NPS/lidnatl.pdf

Rock filter: A permanent or temporary stone structure installed to serve as a sediment-filtering device in drainage ways. Allows a pool to form in an excavated or natural depression, where sediment can settle. The pool is then dewatered through the gravel rock dam.

Rural:
For the purposes of ESDS, a rural area or community is defined as follows:

a) Counties with a population of less than 85,000, subject to the following:
   - Cities within these counties with a population greater than 20,000 will be deemed "Urban". For example, Franklin County except the City of Pasco.
   - Cities within these counties with a population greater than 20,000 but less than 25,000 *and with a prevailing "rural" character*; will be deemed "Rural". For example, the City of Moses Lake.

b) Counties with a population greater than 85,000 but less than 385,000 when more than an aggregated 25% of that county's population resides in one substantially contiguous metropolitan area. In this case, the county except such metropolitan area would be considered rural; for Example, Yakima County except the City of Yakima.

Silt fencing: A temporary fabric barrier surrounding a site to control stormwater runoff.

Silt sacks: Tube-shaped erosion-control devices.

Smart grid: A modern electrical grid that integrates a digital communication overlay on the electro-mechanical grid from the power plant to the end-use appliance.

Smart meter: A system that collects energy usage data (both energy consumption and production, if renewable systems are present) from a home or building.

Solar hot water system: Captures, converts, and transfers heat from direct and indirect sunlight to heat an auxiliary water tank and provide hot water for a building's occupants.

Solar reflectance (or albedo): A measure of a material's ability to reflect sunlight (including the visible, infrared, and ultraviolet wavelengths) on a scale of 0 to 1. A solar reflectance value of 0.0 indicates that the surface absorbs all solar radiation, and a 1.0 solar reflectance value represents total reflectivity.

Solar south: A measurement of the sun's true position based on its path across the sky. It is different from magnetic south, which is taken from a compass reading. Methods for calculating solar south include the solar noon method or a compass using a magnetic declination chart to correct for magnetic declination.

Straw bale: A bound block of straw and organic material used to control stormwater runoff. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=122&minmeasure=4

Substantial Rehab: (or Gut Rehab) a project that includes the replacement and/or improvement of all the major systems of the building, including its envelope. The building envelope is defined as the air barrier and thermal barrier separating exterior from interior space. For Substantial Rehab projects, this could include either removing materials down to the studs or structural masonry on one side of the exterior walls and subsequently improving the building envelope to meet the whole-building energy performance levels for the project type, or creating a new thermal and air barrier around the building

Supportive housing dwelling units: Permanent housing with attached intensive services targeted to populations that have special needs, including people who are currently or formerly homeless; those with serious, chronic mental health issues; people in various stages of recovery from substance abuse; people with HIV/AIDS, or physical or developmental disabilities; the formerly incarcerated, the frail elderly, homeless or emancipated youth, and victims of domestic violence; and other groups that would not be able to live independently and maintain housing without intensive support.

Swales: Shallow grass-covered hydraulic conveyance channels that help to slow runoff and facilitate infiltration. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=75&minmeasure=5

T8 fixture: A fixture made up of a tubular fluorescent bulb and an electronic ballast, both operating with a higher efficacy than traditional tubular fluorescent design technology, such as the T12 bulb and magnetic ballast.

Third Party Verifier: The individual(s) hired by the Department of Commerce who are responsible for conducting on-site inspections to verify compliance with the Evergreen Sustainable Development Standard. See Chapter 2, Section 207.5 of the Housing Trust Fund Handbook for specific requirements of the Third Party Verifier.

Tiers: Earthen embankments that reduce erosion by slowing, collecting, and redistributing surface runoff to stable outlets that increase the distance of overland runoff flow.

Transit ride: A scheduled stop along a defined route of one form of public transportation (bus, rail, or ferry).

Universal design: The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The principles of universal design are as follows: 1) equitable use, 2) flexibility in use, 3) simple and intuitive use, 4) perceptible information, 5) tolerance for error, 6) low physical effort, and 7) size and space for approach and use. http://www.ncsu.edu/www/ncsu/design/sod5/cud/

Urea-formaldehyde: A toxic resin created from formaldehyde that causes similar side effects. Composite wood products made for indoor use, such as particleboard, hardwood plywood paneling, and medium-density fiberboard, often contain this resin.

Urban: For the purposes of ESDS, an urban area or community is defined as any municipality with a population greater than 20,000 and does not fall into the definitions of rural. Projects located within a municipality with a population <20,000, but which is adjacent to a city deemed "Urban" may be deemed functionally related to that city and therefore also deemed Urban; for example, Bier, population 6,361 (2003), which is functionally related to the City of Lynwood.

Vehicle share program: A private system in which a company or a group of individuals share vehicles on a reservation basis and pay for the use on the basis of time or mileage. Programs that qualify under Criterion 2.15 must have an established formal agreement among participants.

Ventilation: The process of supplying outdoor air to, or removing indoor air from, a dwelling by natural or mechanical means. Such air may or may not have been conditioned.

VOCs (Volatile Organic Compounds): A large group of carbon-based chemicals that easily evaporate at room temperature.

Waiver Request: Recognizing a need for some flexibility given the variation in projects, The Housing Trust Fund's ESDS Program Manager may consider waivers for specific ESDS Criteria. The project sponsor must demonstrate that the criterion creates an excessive hardship or is inadvisable for a specific project, AND that an alternative path is identified and will be implemented that meets the intent of the criteria. Housing Trust Fund Handbook Chapter 2 section 207.8

Walk distance: The distance a pedestrian must travel between origins and destinations without obstruction, in a safe and comfortable environment on a continuous network of sidewalks, all-weather-surface footpaths, crosswalks, or equivalent pedestrian facilities. Any crossing of a street with speeds at or greater than 30 miles per hour requires controlled crossing (e.g., a stop sign or stop light).

Watershed: The area of land where all of the water that is under it or drains off of it goes into the same place. http://water.epa.gov/type/watersheds/whatis.cfm

Xeriscaping: A method of landscaping aimed at reducing or eliminating excess water from irrigation by using drought-tolerant plants.

3PV: Abbreviation for Third Party Verifier

Websites listed were last accessed May 8, 2013