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	**1.1a Integrative Process & Green Development Plan** Plan, carry out, and document the development of your housing project, to the greatest extent feasible, using an Integrative Process (IP) to achieve the highest possible performance goals over the long term.
10 max	**1.1b Integrative Process- Advanced Tools** Utilize any of the following measures to enhance and increase the accountability of the Integrated Process for your project: Energy and water modeling, Life Cycle Cost Analysis, or a Capital Needs Assessment
3 max	**1.2 Universal Design** Incorporate Universal Design by choosing one of three options.
M	**1.3a Performance Verification** The Evergreen Coordinator, or independent consultant, will verify that specific building systems were installed correctly, operate as intended and perform in accordance with the Evergreen Requirements
10 max	**1.3b Commissioning** Hire a qualified independent consultant, to commission specific building systems operate as intended and according to the applicable Evergreen Requirements
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) (3) Do not build in areas designated as "Rural lands" under the Growth Management Act.
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:* Comply with local zoning.
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.
M	**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.
2	**2.8 Improving Connectivity to Community** Improve access to community amenities by enhancing access to transit or shared autos, and/or incentivizing biking mobility.
5	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) E1527-13* 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 on-site the rainfall volumes listed.
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	**4.1a 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 Urinals: 0.5 gpf or less, WaterSense labeled 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	**4.1b 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: 1 GPM or less, WaterSense labeled Kitchen Faucets: 1.75 GPM or less New constructions projects must comply with optional 4.5
4 max	**4.2 Water Metering** Meter or submeter each dwelling unit with a technology capable of tracking water use.
12 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.
7	**4.4 Efficient Plumbing Layout and Design** Save water and energy by efficiently designing hot water delivery systems to reduce the amount of time it takes hot water to reach a fixture.
Energy Efficiency	
M	**5.1a Building Performance Standard** *Mandatory for all new construction projects* Meet the minimum requirements of the WSEC and these additional requirements: • For Single Family Homes, duplexes, townhomes or multi-family buildings three stories or less: Obtain one additional credits from 2015 WSEC Table 406.2, Energy Credits. Or, use the 2015 WSEC section R405.3 Performance-based compliance to demonstrate an additional 7% reduction in energy use compared to code. • For Multifamily buildings greater than three stories: Use either Building Envelop, Ventilation Optimization strategies, high efficiency water heating or the performance-based compliance detailed within the criterion.
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 more than required in 5.1a.
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
5	**5.3 Shading for South Facing Windows** Providing solar access to south facing windows to reduce the space heating loads of the building.
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** 90% of lighting shall be fitted with LED lamps or luminaires.
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.
Materials Beneficial to the Environment	
	6.1 Low/No VOC Paints & Primers All interior paints, varnishes and primers will be less than or equal to the specified.
M	**6.2 Low/No VOC Adhesives & sealants** All adhesives & sealants (including caulks) must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by the South Coast Air Quality Management District Rule 1168.
5 max	**6.3 Construction Waste Management** Reduce the amount of waste and 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	**6.5a 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	**6.5b 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	**6.6 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 Emit Low/No Formaldehyde** All composite wood products exposed to the interior (inside the weather resistive barrier), including particle board, plywood, OSB, MDF, cabinetry, and any other applicable wood product, must be certified as compliant with California 93120 Phase 2.
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.
6	**7.2b Healthy Flooring Materials** Use non-vinyl, non-carpet floor coverings throughout each building in the project. In addition, do not install 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 an automatic timer, motion sensor, 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 an automatic timer, motion sensor, 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 each dwelling unit that that meets the Washington State Amendments to the International Mechanical Code Section 403. Ventilation system energy use shall meet the fan power limits in the Washington State Energy Code, Section R403 or C403.
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: Surfaces** Use materials that have durable, cleanable surfaces throughout bathrooms, kitchens and laundry rooms. Materials installed in these rooms should not be prone to deterioration due to moisture intrusion or encourage the growth of mold.
M	**7.9b Mold Prevention: Tub & Shower Enclosures** Use moisture-resistant backing materials such as cement board, fiberglass faced gypsum board or equivalent behind tiled/grouted or multi-piece shower and tub enclosures. Projects using one piece fiberglass/plastic shower/tub enclosures may use paper-faced gypsum backer board that meets mold-resistant requirements per ASTM #D3273 with a score of at least 10, on all walls and ceiling facing the shower.
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.
M	**7.13a Enhanced Building Envelope Design** Provide a building envelope design that makes it possible to remove and replace windows without compromising the performance of the building envelope.
8 Max	**7.13b Enhanced Building Envelope Design** Utilize any of the three 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.
M	**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 Guidance** Develop Building Operations and Maintenance instructions that will be permanently affixed to the building. The instructions for each system should be located where maintenance staff will be handling the relevant equipment.
M	**8.2 Emergency Management Plan** Provide a Plan on emergency operations targeted toward operations and maintenance staff and other building-level personnel.
M	**8.3 Resident Manual and 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.
8 Max	**8.4 Project Data Collection** Collect and monitor project performance data on energy, water, and, if possible, healthy living environments for a one year, post occupancy. Provide a post occupancy report to Commerce.
M	**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

1.1a

1.1A INTEGRATIVE PROCESS & GREEN DEVELOPMENT PLAN

Mandatory

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

REQUIREMENTS

Plan, carry out, and document the development of your housing project, to the greatest extent feasible, using an Integrative Process (IP) to achieve the highest possible performance goals over the long term. A brief definition of the Integrative Process is a multi-disciplinary approach that enables developers to optimize the performance of buildings by focusing throughout the development process on clearly defined functional, environmental, and financial goals. The result of the Integrated Process will be buildings that optimize the value of the public investment in affordable housing by achieving very high standards of sustainability, measured primarily in terms of long-term durability, low maintenance, healthy indoor and outdoor environment, and extreme efficiency in energy and water use.

A fully integrated process as applied to affordable housing will typically include the following elements:

- Identifying development team members who can deliver a high-performing product
- Defining performance goals for the project early in the process
- Modeling various aspects of performance for design alternatives
- Using life cycle cost analysis (Insert link) to make decisions about major design elements
- Developing a well-defined metric for total cost of ownership per unit
- Holding a series of meetings with essential team members throughout design and construction to make sure the process is on target and document the process and results

It is not expected that all organizations pursuing public financing for housing projects will have the expertise and resources to adopt all elements of a fully integrated process immediately. Rather, this ESDS criterion is established as a goal toward which all developers of affordable housing will be expected to work over a period of one or more years. Certain steps can be implemented without delay, however, and proposed projects will be expected to show good faith efforts toward addressing and incorporating additional Integrative Process elements.

At a minimum, you will consider and plan your project with an IP perspective and document the following elements in your Green Development Plan, Appendix C:

1. Identify members of the integrative process team, with an explanation of the role of each person and their contribution to the overall sustainability of the project.
2. A statement of the green development goals of the project and the expected outcomes from addressing those goals through the design, construction, and operation phases.

3. A summary of the integrative process used to select the green building strategies, systems, and materials that will be incorporated into the project.
4. A description of how progress and success towards these goals will be measured throughout the completion of design, construction and operation to ensure that the green features are included and correctly installed.

➡ **Required documentation for Evergreen Project Plan:**
Attach to the EPP the completed Green Development Plan as outlined in **Appendix D**.

RATIONALE

The over-arching purpose of the Evergreen Sustainable Development Standard (ESDS) is to improve the life outcomes of people with low incomes by enhancing the quality of affordable housing in Washington State. We do this by pushing developers to create healthier and more cost-effective residences that help residents take advantage of life opportunities. The ESDS supports excellence in sustainable development practices from design through building operations by challenging developers, owners, and managers to achieve four core Green Development Goals: high levels of energy and water efficiency, healthy living environments, long-term durability and low maintenance, requirements.

Seventy percent of design decisions are made in the first ten percent of a typical project. The integrated process establishes and maintains a focus on green objectives throughout the project life cycle. The outcomes of an integrative process can include lower development and operating costs, fewer change orders, lower utility and other operating costs, and greater health, economic, and environmental benefits for residents, property owners, and communities.

Integrative Process

IP is a highly collaborative process in which the project team thinks and consults about the entire building and all of its systems together from design through occupancy. Conventional project management processes often fail to recognize that buildings are part of larger, complex systems. As a result, solving for one goal, or problem, may create problems elsewhere in the system. An integrated design process creates a team of professionals who may have traditionally worked as separate entities. An IP team might include the sponsor (Development manager AND Property/Asset manager), Evergreen Coordinator, a building performance analysis consultant, the architect, the mechanical engineer, and the contractor. This team will analyze and develop integrated solutions to complex design challenges and maintain close collaboration throughout the entire development process to ensure that the green development goals are met.

Community Meetings

Community meetings can be powerful opportunities to educate and align stakeholders with the goals and objectives of a project. This is also an opportunity for the integrative process team to tap into collective wisdom of the group- the future resident community, the surrounding neighborhood and other critical details. This is also an opportunity to ensure that lessons learned through maintenance of other projects are woven into design decisions of current projects. Examples of group meeting participants may include:

- Prospective or current residents, including potential community and/or neighborhood stakeholders
- Architecture or residential building design
- Mechanical or energy engineering
- Building science or performance testing
- Civil engineering, landscape architecture, habitat restoration or land-use planning
- General contractor
- Building management and maintenance staff
- Asset managers
- Planning and building officials with jurisdiction over the project, or city green building reps
- Funders and key donors
- Resident services staff
- Environmental science experts
- Local public health officials

For best results, these meetings should be coordinated by a skilled facilitator who is familiar with ESDS requirements and strategies to achieve them.

Recommendations

- ***Benchmarking:*** Use data on actual operations from projects in your portfolio as baselines to inform the performance goals for your current project. Examples: portfolio energy and water consumption per bedroom, maintenance costs per unit per year, small repair costs, health needs assessment data and financial data, other pro forma assumptions broken down more finely regarding operating expense categories.
- ***Life cycle cost analysis:*** Use life cycle cost analysis tools to model the initial cost and maintenance/replacement costs of similar purpose materials and products to identify what will promote the increased service life of the building, be healthier for the residents and lower maintenance, operations and replacement costs.
- ***Performance modeling:*** Engage consultants with expertise in energy and water consumption modeling to assess design alternatives and inform decisions about the most cost-effective options for major building elements over the long term.
- ***Energy efficiency and water use:*** Identify specific consumption thresholds or goals for your project that will be evaluated after project completion and occupancy. Create a Measurement and Verification plan that identifies what information you will need to track performance, and how you will gather and manage in the data.
- ***Performance specification:*** Add building envelope and mechanical installation details to your plans and specifications for the most critical project components, paying particular attention to: air handler closet air sealing, floor system and band air sealing, party wall air sealing, proper insulation installation, ventilation system installation, and duct sealing with "bucket" mastic. Wherever possible, use tangible targets and specific metrics (such as building envelope leakage, duct leakage and exhaust fan flow rate) and require that it be field

verified.
Also provide the construction team with installation guides for the measures above.

- ***Operating manual for property managers and residents:*** Develop a simple and highly useful manual that will enable property managers and residents to operate your high-performance building to its optimum standard. Consider making essential operating information available in the location it is needed – on the equipment, rather than just in a manual, for example.
- ***Incentives for teffective integration:*** Consider creating incentives for your design and construction team that reward superior performance at completion of construction and in occupancy.

RESOURCES

- Enterprise Green Communities offers a variety of resources to support the integrative process, particularly the Pre-Development Design Toolkit, Green Charrette Toolkit, Green Development Plan and Project Management Guide. *www.enterprisecommunity.org/resources*
- Whole Building Design Guide: This website describes the core elements of "whole building design," which includes the combination of an integrative approach and an integrative team process. This site helps users identify design objectives and organize their processes to meet those objectives. *www.wbdg.org/wbdg_approach.php*
- *The Integrative Design Guide to Green Building: Redefining the Practice of Sustainability*. 7group and Bill Reed (2009). This book provides guidance to building professionals on incorporating integrative process into every phase of a project.
- Green Building 101: What is an integrated process? http://www.usgbc.org/articles/green-building-101-what-integrated-process

1.1b 1.1 B INTEGRATIVE PROCESS – ADVANCED TOOLS

Optional, up to 10 points

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

REQUIREMENTS

Utilize any of the following measures to enhance and increase the accountability of the Integrated Process for your project.

Option 1 ***(4 points)****:* Include a building performance consultant on your project team who will provide building energy and water modeling. The services should include research into technologies for efficiency, and strategies for post-occupancy monitoring and quantification of performance in relation to the owner's project goals. Provide documentation of how these services have informed your decisions about design, construction, and post-occupancy monitoring.

Option 2 ***(4 points)****:* Early in the design process, incorporate the use of the ESDS Life Cycle Cost Tool (insert link) to refine design decisions. Include the total cost of ownership on a per-unit basis for your project, encompassing all development costs, maintenance costs and utility

costs over a 25-year period. Provide a narrative detailing how the design team incorporated the use of the tool into their process, how, or if, design decisions were influenced by the process of using the tool, and suggestions for enhancements to the tool.

Option 3 ***(2 points for new construction only)****:* Identify IP team members who are able to develop a 25-year capital needs assessment (CNA) during the design phase of the project and provide a copy of the CNA with your funding application.

➥ **Required documentation for Evergreen Project Plan:**
On the EPP form, state the option chosen. Provide the following for each option:

Option #1- Attach energy and water modeling documentation and a narrative explaining how these services informed decisions about design, construction and post-occupancy.

Option #2- Attach the life cycle cost analysis. Use the LCCA tool provided here (insert link). In addition, attach a narrative detailing how the design team incorporated the use of the tool into their process, how, or if, design decisions were influenced by the process of using the tool, and suggestions for enhancements to the tool.

Option #3- State that a 25-year CNA was provided with your funding application. If not, provide the report.

RATIONALE

Using data and analysis during design helps compare the effect of choices over the lifetime of a building to support responsible resource management while also comparing costs.

RECOMMENDATIONS

- Use the ESDS Life Cycle Cost Tool: insert link
- Whole Building Design Guide description of Life-Cycle Cost Analysis: http://www.wbdg.org/resources/lcca.php

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, state 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 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

1.3a

1.3A PERFORMANCE VERIFICATION

Mandatory

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

REQUIREMENTS

The Evergreen Coordinator, or independent consultant, will verify the following building systems were installed correctly, operate as intended and perform in accordance with the Evergreen Requirements:

4.1 & 4.2	Water Conserving Fixtures
4.4	Water Metering
7.5	Ventilation

Required documentation for Evergreen Project Plan:

On the EPP form, state which applicable systems will be included in the commissioning plan and compliance with the following requirements:

- Performance verification requirements will be incorporated into the construction documents.
- During installation, verify the installation and performance of selected systems and provide written verification of each selected systems to be available on the jobsite.
- Post installation, perform systems functional performance testing
- Once all required systems are complete, provide a summary verification report to be reviewed on the job site.

1.3b 1.3B COMMISSIONING

Optional up to 10 points

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

REQUIREMENTS

Hire a qualified independent consultant, as a commissioning agent to verify that the following building systems as operating as intended and according to the applicable ESDS Requirements:

ESDS #	Building System	Points given
5.2a or 5.10	Domestic Water Heating	2 points
5.5	Lighting Controls	2 points
5.8a	Renewable Energy systems	2 points
5.8b	Solar Water Heating	2 points
	HVAC	2 points
	Any other automated building systems controls	2 points

Required documentation for Evergreen Project Plan:

On the EPP form, state that a final commission report to Commerce upon completion. In addition state which applicable systems will be included in the commissioning plan and compliance with the following requirements:

- The architect and MEP consultants will develop a Basis of Design (BOD) that will meet the Owner's Project Requirements (at a minimum, the performance requirements established in 1.1);
- Commissioning requirements will be incorporated into the construction documents.
- During installation, the commission agent will verify the installation and performance of commissioned systems against the Basis of Design and provide written verification of each commissioned system to be available on the jobsite.
- Post installation, the commissioning agent will perform systems functional performance testing
- Once all required systems are complete, the commission agent will provide a commissioning report to be reviewed on the job site.

RATIONALE

Commissioning yields significant improvements in energy and water efficiency and ensures that facilities personnel understand how to operate key building systems. Commissioning also identifies mistakes such as missing or incorrectly installed equipment, avoiding occupant complaints and callbacks, indoor air quality and thermal comfort problems, premature equipment failure, and litigation.

RECOMMENDATIONS

RESOURCES

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

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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)
3. Not built 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 documentation from the local jurisdiction stating the zoning for the property, identification of any known critical areas or resource lands 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.

➡ **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 2.3 COMPACT DEVELOPMENT

Mandatory

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: Comply with 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, 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.

In areas where local zoning does not specify maximum density exceed the residential density (dwelling units /acre) of the census block group in which your project is located by a multiple of 2. Find the density of your census block group by typing your project address into the Center for Neighborhood Technology "Residential Density of a Location" calculator found at *http://apps.cnt.org/residential-density/*. Then multiple the net density by 2.

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 EPP approval.
- 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:* 1 mile of at least two facilities, 2 miles for at least four 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	Other food store with produce
Licensed Childcare	Public park		
Community or recreation center	Post office	Laundry, dry cleaner	Farmers market

Entertainment venue (theater, sports) **Educational facility (including k-12 school, university, adult education, vocational school, community college)** **Cultural arts facility (museum, performing arts)**	Place of worship Government office that serves public on-site Social services center	Gym, health club, exercise studio Hair care	Hardware store Pharmacy Clothing retail 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 transit services (bus stop, rail stop, orferry terminal),

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

Required Documentation for the Evergreen Project Plan:

On the EPP form, state which option(s) the project will be able to access. 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

Mandatory

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: Set aside 10% common, outdoor open space for use by residents. Open spaces should be safe and designed to enhance physical activity and or/social interaction.

OR

Option #2: Locate project within a 0. 5-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.

Land that is set aside for future development cannot be included as open space in these calculations.

➡ **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

- For single family, front lawn space can be used to meet this criterion.
- Create a site plan with total acres and the number of acres of the proposed open space, and a narrative plan for security and maintenance for the preservation of the open space.
- When calculating open space, be sure to deduct buildings, private outdoor areas, streets and roadways from your total site area.
- To determine if your project qualifies as Rural / Tribal / Small Town, reference the Instructions at the beginning of Category 2: Location + Neighborhood Fabric. Design building massing's to enhance nearby parks, plazas and open spaces.

- Open spaces should be safe and designed to promote active use by residents. Features such as active bike and walking trails/paths, lighting, seating options, native plantings and recreation facilities to make open space a community amenity. Open spaces should compliment the cultural preferences of the local population and accommodate people of all ages.

Resources

- U.S. Environmental Protection Agency, Smart Growth and Open Space Conservation: www.epa.gov/smartgrowth/openspace.htm
- The Trust for Public Land: Creates parks and protects land for people, ensuring healthy, livable communities for generations to come. www.tpl.org/
- The Trust for Public Land, ParkScore Index: A rating system developed to measure how well U.S. cities are creating parks. http://parkscore.tpl.org/

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 existing and proposed 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, all-weather 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 in single family residences by locating the garage in the rear or on the side of the 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.

2.8 IMPROVING CONNECTIVITY TO COMMUNITY

Optional 2 points for all projects

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

REQUIREMENTS

Improve access to community amenities by selecting at least two of the measures below:

Improving Access

Transit

- Provide residents with discounted transportation passes for a period of at least 12-months.
- Provide residents with free transportation passes for a period of at least 12-months.

Auto

- Include car-share services (parking) on property.
- Provide all eligible residents with discounted car-share memberships for a period of at least 12-months.
- Provide a minimum of 50% of eligible residents with free car-share memberships for a period of at least 12-months.

Incentivize Biking Mobility

- Provide outdoor bicycle racks that are accessible for visitors and residents.
- Provide secure, lockable, sheltered and accessible bicycle storage. Provide one bicycle parking space for every two residential units. Post signage directing residents to bicycle parking areas and programs.
- Provide bicycles and equipment (e.g., helmets, locks, tire pumps, maintenance equipment) for resident use.
- Promote use of, and access to, one or more bicycle-share programs within 0.25-mile of the building. Bicycles need to be accessible to occupants at all hours. Maps to the nearest bike station should be posted in a visible location within a common area in the building and included in the Resident Manual (Criterion 8.3).
- Provide residents with discounted or free bicycle-share memberships for a period of at least 12-months

➡ **Required Documentation for the Evergreen Project Plan:**

On the EPP form, state which two measures will be used and the implementation plan. Attach a site map identifying space if choosing car-sharing services parking, or bicycle racks/storage

RATIONALE

Connections to adjacent development and public, open spaces promote recreational walking, biking and other healthy lifestyle choices, as well as promoting alternative means of commuting.

RECOMMENDATIONS

- Pedestrian activity and improved safety should be encouraged when considering opportunities for biking, walking, driving and parking.
- Provide orientation materials and maps to the nearest bus, transit stations and car-share facilities (general orientation materials are acceptable for floating car-share services such as Car2go). Information about these amenities should be posted in a visible location in a common area in the building and included in the Resident Manual (Criteria 8.3).
- Consider including a small amount of credit ($10) for residents to try their local car-share service. Contact the car-share services to see if they would like to offer discount or credit to encourage use.
- Promote designs that encourage slow-speed, low-volume roadways, thereby enhancing walkers' and bikers' safety.
- For ease of use, bicycle storage is ideally incorporated on the ground floor with direct roll-in access that is separate and distinct from automobile access. Push-button doors make roll-in access even more convenient for riders, especially during inclement conditions.
- Provide bicycle storage for staff as well as residents.
- Consider designing the building exterior and massing to encourage physical activity by
- maximizing variety, detail and continuity on the lower one-to-two floors of the building exterior; by providing multiple entries and maximum transparency; and by incorporating canopies and awnings into building façade.
- 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.
- Make bicycle and pedestrian routes to parks and public spaces safe and visible.
- Conduct an assessment to determine most likely routes of pedestrian and bicycle use when 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.
- To encourage pedestrian activity, minimize addition of mid-block vehicular curb cuts on streets with heavy foot traffic; construct curb extensions along sections of the sidewalk that tend to attract greater pedestrian congestion and that are close to pedestrian crossings.
- Dedicated pedestrian and bicycle paths are important even on dead-end streets.
- Design vehicular driveways and ramps to improve pedestrian safety and encourage walkability.
- Incorporate street furniture such as benches, trash receptacles and bicycle racks to create an active streetscape.
- Install street features that have been shown to effectively calm traffic, including curb extensions, medians, roundabouts and raised speed reducers.

Resources

- NYC Departments of City Planning, Health and Mental Hygiene, and Design and Construction.

- Active Design Supplement: Shaping the Sidewalk Experience, 2013. *www.nyc.gov/html/dcp/pdf/sidewalk_experience/active_design.pdf*
- Robert Wood Johnson Foundation, Active Living Research. *http://activelivingresearch.org/active-design-supplement-affordable-designs-affordable-housing*
- Task Force on Community Preventive Services, The Community Guide — What Works to Promote Health. *http://www.thecommunityguide.org/pa/environmental-policy/communitypolicies.html*
- Task Force on Community Preventive Services, The Community Guide — Street-Scale Urban Design Land Use Policies. *http://www.thecommunityguide.org/pa/environmental-policy/streetscale.html*

2.9 BROWNFIELD OR ADAPTIVE REUSE SITE

Optional 5~~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.

1. **Adaptive reuse site**: Rehabilitate an existing structure that was not previously used as housing.
    - An Adaptive reuse site is defined as 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.

2. **Brownfields:** locate the project on a site for which part or all 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. 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.
    - A Brownfield is defined as 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.

3. **Grayfields:** locate the project on previously developed vacant or underutilized sites, such as parking lots and shopping centers.

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 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, state 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) E1527-13* 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.

3.3 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.

Adaptive plant species Definition: 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.

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 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.

Adaptive plant species Definition: 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.

➡ **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 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. In addition:

- Obtain an arborist report that states that evaluates each significant tree's life expectancy, health, future maintenance needs and safety. Significant trees should be adaptive, easy to

maintain, healthy with a life expectancy of at least 10 years and safe for residents, surrounding buildings and infrastructure.
- Do not build within the drip line or the branch overhang of the significant trees.
- Trees 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

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:

On the EPP form, identify the number of trees and DBH of each. State that the project will not build within the drip line of the significant trees Attach the arborist report and a brief explanation regarding the property maintenance plan for the significant trees, given the arborist report conclusions. Attach a landscape plan showing existing significant trees, which trees are being preserved, and their relation to the building(s).

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 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.

Efficient 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.

Watering Trees

- Western Washington: watering tubes for trees are allowed for a period of two years.
- Eastern Washington: watering tubes for trees are allowed for a period of four years.
    - Supplement watering may be allowed beyond the grace period if doing so will prevent the death of the affected tree(s).

➥ **Required documentation for Evergreen Project Plan:**

On the EPP form, state that drip and/or bubbler irrigation system will be used for all landscape planting beds and trees. State 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. State 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 on-site the rainfall volumes listed in Table 1. Example: To gain six ESDS points, a project located closest to Aberdeen would need to retain 290 gallons of rainwater per 1,000 sqft.

Appropriate management strategies include Low Impact Development (LID) Best Management Practices (BMPs) including bioretention, permeable paving, soil amendment, evapo-transpiration, and/or rainwater harvesting and reuse*, as described in the Stormwater Management Manuals for Eastern and Western Washington and the Technical Guidance Manual for LID in Puget Sound.

Calculation Requirements:
Rainfall volume to be retained is calculated by multiplying the total generating surface area of the project by the appropriate rainfall event defined in Table 1. Use the location nearest your project.

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, but not fully amended, so as to be effectively impervious, and
3) Any pollution-generating pervious surfaces, such as landscaping, that will receive treatments of fertilizers or pesticides.

Table 1. Size Surface Water Management BMPs to retain on-site the following volumes in a 24 hour storm event

Achievement Level	85th Percentile 2 Points		90th Percentile 4 Points		95th Percentile 6 Points	
Location	Inches	Gals/1,000 sqft	Inches	Gals/1,000 sqft	Inches	Gals/1,000sqft
Aberdeen	0.26	160	0.34	210	0.47	290
Ellensburg	0.22	140	0.26	160	0.40	250

Longview	0.49	310	0.61	380	0.80	500
Omak	0.40	250	0.50	310	0.69	430
Pullman	0.34	210	0.42	260	0.56	350
Richland	0.19	120	0.24	150	0.32	200
Seattle	0.47	290	0.61	380	0.82	510
Spokane	0.29	180	0.37	230	0.50	310
Whidbey Island	0.26	160	0.34	210	0.47	290

Best Management Practices:
The BMPs for the comprehensive stormwater management plan must be selected from:

- The Washington State Department of Ecology's Stormwater Management Manual for Western Washington, Volume V, Runoff Treatment (2012 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
- 2012 Low Impact Development Technical Guidance Manual for Puget Sound

-OR-

- Locally approved equivalent, whichever is more stringent.

And must include a season-specific maintenance plan that ensures continuous performance of the system, including clear indication of responsibility for implementing the maintenance plan.

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.
*Make sure to check that the jurisdiction allows this

➡ **Required documentation for Evergreen Project Plan:**
Attach the precipitation data location used, 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, with an affidavit affirming that the design is sized to accommodate the target rainfall event - from the qualified design professional responsible for the design calculations.

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

- Precipitation Data by location (based on most recent 20 year, 24 hour storm event data) from NCDC/NOAA. Columns represent the 85th, 90th, and 95th percentile respectively.
- National Oceanographic & Atmospheric Administration's National Climatic Data Center: http://www.ncdc.noaa.gov/oa/mpp/digitalfiles.html
- Puget Sound Partnership 2012 LID Technical Guidance Manual for Puget Sound: http://www.psp.wa.gov/LID_manual.php
- Department of Ecology, Stormwater Management & Design Manuals for Eastern and Western Washington
- Department of Ecology's Low Impact Development Training Program: http://www.ecy.wa.gov/programs/wq/stormwater/municipal/LID/TRAINING/index.html
- 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]."

Resources

- Pollution Prevention Resource Center: http://pprc.org/wp-content/uploads/2014/09/Stormwater-P2-Manual_BMP-Topic-3_Storm-Drains-and-Catch-Basins.pdf

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

4.1a 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 in all units and all common space facilities with the following specifications:

- Toilets – 1.28 GPF (gallons per flush) or less. WaterSense labeled with MaP test performance at minimum 500g
- Urinals- 0.5 gpf or less, WaterSense labeled
- 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

In addition, comply with the following:

- Aerators may be used to meet faucet flow requirement, but they must be tamper-proof and "Pressure Compensating" to ensure consistent flow delivery across a wide range of supply pressures.
- Supply pressure (Single Family and Lowrise MF only, Mid/highrise exempt): Supply pressure may not exceed 60 PSI and should be controlled by pressure regulator if necessary.
- NOTE: Compliance with ESDS 4.5 is recommended but not required.

Required documentation for Evergreen Project Plan:
On the EPP form, state that the 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.

- Dual-flush toilets have an average flow rate calculated and provided by the manufacturer. However, if you are not able to locate this information on the packaging, use a 2:1 ratio for low-volume flush to high-volume flush to determine the average flow rate.

  For example, with a dual-flush toilet that has a 0.8 low-volume flush and a 1.6 high-volume flush, the calculation to determine the average would be:

  $$\frac{(0.8 \text{ gpf} \times 2) + (1.6 \text{ gpf} \times 1)}{3} = 1.067 \text{ gpf}$$

- For all single-family homes and all dwelling units in buildings three stories or fewer:

  The static service pressure must not exceed 60 pounds per square inch (psi) (414 kilopascal [kPa]). For units in multifamily buildings, the service pressure within each unit must not exceed 60 psi. Compliance for homes supplied by groundwater wells shall be achieved by use of a pressure tank. Compliance for single-family homes with publicly supplied water may be achieved by one of the following methods:

  • Use of a pressure-regulating valve (PRV) downstream of the point of connection. All fixture connections shall be downstream of the PRV.
  • Determination that the service pressure at the home is 60 psi or less at the time of inspection and documentation from the public water supplier that service pressure is unlikely to regularly exceed 60 psi at the home on a daily or seasonal basis.

- Piping for fire sprinkler systems is excluded from this requirement and should comply with state and local codes and regulations.

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

4.1b

4.1B ADVANCED WATER-CONSERVING FIXTURES

Optional up to 6 points, new construction must also achieve 4.2

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 in all units and all common space facilities 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, 500gWaterSense labeled
- Showerheads (2 points) – 1.75 GPM (gallons per minute) or less, WaterSense labeled
- Bathroom faucets (1 points) – 1 GPM or less, WaterSense labeled.
- Kitchen Faucets (1 points) -1.75 GPM or less

For New constructions projects, you must comply with optional 4.5 to gain these optional points.

Required documentation for Evergreen Project Plan:
On the EPP form, state that the 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.

4.2 Water Metering

Optional new construction 2 points, Rehab 4 points

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

Requirements

Meter or sub-meter each dwelling unit with a technology capable of tracking water use. Also separately meter outdoor water consumption (deduct meter). For rehab only, if each dwelling unit is not feasible, provide an optimal measuring proposal.

Single-Family buildings
Install a whole-house water meter. Attached single-family homes that are pursuing Evergreen Certification may share a whole-building water meter if their irrigation is also commonly metered. Homes that use only well water and are not connected to a municipal water system are exempt from this measure.

Multifamily buildings:

- Install a water meter or sub-meter for each of the project's dwelling units; OR
- For multifamily projects with riser-fed systems, install a water meter or sub-meter for each of the project's risers rather than for each of the project's dwelling units.

Required documentation for Evergreen Project Plan:

- Attach a description of how sub-meter data will be tracked, who will be responsible for monitoring it, and how the data will be used (direct billing or back-charging residents for water/sewer costs, providing consumption feedback for conservation assistance, leak detection and isolation, etc.)
- For rehab only, if metering each dwelling unit is not feasible, attach an optimal measuring proposal.

Rationale

Individual metering or sub-metering of each unit allows building managers and residents to understand and better manage their water use. Monitoring individual units also enables property managers to more easily identify and manage potential issues such as leaks that might be occurring within a specific unit.

Recommendations

- As a first step, when designing the plumbing system for a multifamily building, consider supplying each unit with a single pipe source for the water to facilitate individual unit sub-metering. This will

reduce costs associated with having to install multiple meters for several points of use attached to a single riser pipe.

- Second, choose equipment that is best suited for accurately measuring water use in each unit. Because water use within individual units will fluctuate between low and peak flows, depending on the unit's occupancy and the time of day, positive displacement meters are often the best option. Also, work with the meter manufacturer to select an appropriately sized sub-meter. It is critical to understand both the building's and the individual units' size, function, fixture types, usage occupancy and peak population in order to select an appropriately sized meter. These statistics determine the minimum and maximum flow rates and will assist in the selection of a properly sized water meter for each unit.
- Follow manufacturers' instructions closely so that proper installation can occur. Improper installation can lead to metering inaccuracies. In general, meters (including sub-meters for individual units) should be installed in an accessible location to allow for reading and repair. In addition, the meter location should be protected from potential damage. To ensure uniform flow entering and exiting the meter, the meter should be located where there is sufficient length of straight pipe above and below the meter. Also, install a strainer to prevent debris and sediment from entering the meter and causing reading inaccuracies.
- Several options exist for monitoring water use on a per-unit basis. Meters are typically owned by the water purveyor and represent separate accounts. In order to be separately metered, each unit must typically represent a wholly separate plumbing system attached to the main line. Sub-metering typically involves using smaller meters to monitor the different uses of water under a single account. Several alternative technologies are emerging that give property managers the ability to track water use on a per-unit basis without installing physical meters or sub-meters for each unit.

Resources

- American Water Works Association Offers information and articles on sub-metering: *http://www.awwa.org/*
- California Apartment Association has articles on sub-metering: *www.caanet.org*
- California Urban Water Conservation Council has articles on submetering: *http://www.cuwcc.org/*
- WaterSense-labeled New Homes: http://www.epa.gov/watersense/new_homes/
- Alliance for Water Efficiency, 2010, "Submetering Introduction." *http://www.allianceforwaterefficiency.org/submetering.aspx*
- "Water-Meter Selection and Sizing," Smith, Timothy A. April 22, 2008. http://www.park-usa.com/skins/park/homepage.aspx?elid=71&arl=108

4.3 Water Reuse

Optional up to 12 points

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

Requirements

Projects can earn credit for Option 1 only, or for Option 1 and 2 combined, for a possible total of 12 points.

Option #1: Infrastructure Pre-plumbing (4 points)

a. *Supply (2 points)*: Install purple (reclaimed water) supply plumbing for cold water to laundry facilities, and design plumbing layout so these lines can be hooked up to the potable supply initially, but may be transferred to a non-potable supply in the future so that harvested rainwater or treated greywater may be supplied to these fixtures in the future without significant disturbance of building structure. For projects with common, rather than in-unit laundry, the purple pipe should serve all laundry rooms. For project with in-unit laundry, the purple pipe must serve at least 30% of the units.

b. *Wastewater (2 points)*:
Design wastewater plumbing to keep grey water from all central laundry facilities separate from all other wastewater. Grey water collector should pass through a location where it may be tapped in future for treatment and reuse (for irrigation or indoor non-potable supply). Grey and black water should only be combined immediately before exiting the building to the sanitary sewer.

OR

Design wastewater plumbing to keep at least 30% of in-unit laundry facilities separate from all other wastewater. Grey water collector should pass through a location where it may be tapped in future for treatment and reuse (for irrigation or indoor non-potable supply). Grey and black water should only be combined immediately before exiting the building to the sanitary sewer.

Option #2: Harvest, treat, and reuse rainwater and/or greywater (up to 8 points)

Harvest, treat, and reuse rainwater and/or greywater to meet a portion of the project's water needs. Determine the total water needs including all exterior and interior water use. Provide the defined percentage of the project's total water needs supplied by rainwater and/or greywater. Use the table below to determine the appropriate number of optional points:

Total water needs supplied by rainwater and/or greywater	Optional points awarded
5%	1 points
10%	2 points
20%	4 points
30%	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 verified as compliant at construction.

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.

4.4 Efficient Plumbing Layout & Design

Optional up to 7 points

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

Requirements

To minimize water loss from delivering hot water, the hot water delivery system shall store no more than 0.5 gallons of water in any piping/manifold between the hot water source (tank or recirculation trunk) and any hot water fixture.

- Hot water tanks must have heat traps installed on hot and cold lines (in-line or pipe bends) and 1" insulation on the first 5' or first penetration (whichever is shorter) for hot and cold lines.

- Recirculation system must have both temperature and demand controls, such that the return temperature of the recirculation loop does not drop below 100 degrees F, and a demand flow of more than 0.5 gallons per minute initiates the recirc pump until the return water temp reaches the design supply temp minus 5 degrees F.

- Recirc loop must be fully insulated with foam insulation of at least equal thickness to the nominal diameter of the pipe, but no more than 2" (or equivalent R-value if pipe is embedded in cavity insulation).

0.5 gallons of water represents the following maximum pipe runs from the hot water source (tank or recirculation loop) for different pipe materials and nominal sizes.

Type of Pipe	3/8"	½"	¾"	1"
	Max Run (ft)	Max Run (ft)	Max Run (ft)	Max Run (ft)
K copper	75	45	22	12
L copper	60	40	20	12
M copper	60	40	18	11
CPVC	NA	50	24	15
PEX	95	50	26	16

Plumber's scope must include language requiring compliance with the maximum pipe run requirements, based on actual run of pipe, which will be visually verified in the field.

Required documentation for Evergreen Project Plan:
On the EPP form, state how the design will meet the requirement; how the details will be communicated to the plumbing contractor; and how proper installation will be confirmed.

Rationale

Efficiently designed hot water delivery systems reduce the amount of time it takes hot water to reach a fixture, saving both water and energy. Approximately 10–15% of the energy use associated with the hot water delivery system is wasted in distribution losses, and studies have shown that the average home wastes more than 3,650 gallons of water per year waiting for hot water to arrive at the point of use.

Recommendations

• Effective and efficient distribution of hot water requires a whole-system approach and can be challenging to many builders. Considering the hot water delivery system early in the design phase and carefully following a plumbing design can deliver superior homes and reduced installation costs.

• A hot water distribution system with less stored water in its piping will waste less water and energy. The length of piping between the water heater and each fixture, the pipe diameter and piping material can have a great cumulative impact on the efficiency of hot water delivery.
• Insulation of hot water pipes can improve the efficiency of a hot water distribution system. Insulation of hot water pipes reduces the rate of heat loss and can deliver water that is 2°F to 4°F hotter than uninsulated pipes can. Pipe sleeves made with polyethylene or neoprene foam with thicknesses of either ½ or ¾ inch are the most commonly used insulation. The pipe sleeve inside diameter should match the diameter of the pipe for a close fit. Securing insulation every one or two feet using tape, wire or cable tie will also help to fit insulation close to the pipe. Insulation should be used along the entire length of hot water pipes, including elbows and joints, but should be kept 6 inches away from the flue of gas water heaters. Insulation performs better with an R-value of R-3.0 or greater.
• Consider central core plumbing, and/or multiple stacked central core plumbing layout, locating the water heater very close to hot water fixtures.

Resources

- EPA Hot Water Volume Tool: This editable tool allows project teams to design their plumbing system with a variety of materials to minimize waste in delivery. *http://epa.gov/watersense/excel/hw_volume_tool_v1.xlsm*
- EPA WaterSense-labeled New Homes — Hot Water Delivery Systems. *www.epa.gov/watersense/docs/newhome_builder_resource_manual508.pdf*
- EPA's Guide for Efficient Hot Water Delivery Systems. *www.epa.gov/watersense/docs/hw distribution_guide.pdf*
- "Hot-Water Distribution Systems Part 1," *Plumbing Systems & Design*, Gary Klein, Mar/Apr 2004.

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.

5.1 5.1A 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, duplexes, townhomes or multi-family buildings three stories or less: Obtain one additional credits from 2015 WSEC Table 406.2, Energy Credits. Or, use the 2015 WSEC section R405.3 Performance-based compliance to demonstrate an additional 7% reduction in energy use compared to code.

For Multifamily buildings greater than three stories: Use either Building Envelop, Ventilation Optimization strategies, high efficiency water heating or the performance-based compliance detailed below.

Building Envelop:

Multifamily buildings greater than three stories: Use the 2015 WSEC, C402.1.3 Component performance building envelope option. Include the target UA modifications in ESDS Appendix A, Table C402.1.2 and C402. 3.

Ventilation Optimization:

1. Meet the code air leakage control rates for unit and common areas.
    a. *Buildings greater than three stories shall not exceed 0.40 cfm/ft2 at a pressure differential of 0.3 inches water gauge - 2015 Washington State Energy Code C402.5.1.2.3 Building test.
    b. *Common areas in all buildings shall not exceed 0.40 cfm/ft2 at a pressure differential of 0.3 inches water gauge* - 2015 Washington State Energy Code C402.5.1.2.3 Building test.
2. *Mechanical ventilation systems shall not exceed:

a. Corridors 0.12 CFM/SF
b. Dwelling units, 1.5 times the minimum code ventilation rates included in Washington State Mechanical Code,Table403.8.1 (dwelling unit), except,
    - Systems utilizing heat recovery
    - Local exhaust systems (bath, kitchen, utility) with controls that are readily accessible by the dwelling unit occupant.
    - Demand controlled variable air volume exhaust and make up air systems.

•Economizer cooling

TABLE 403.8.1
VENTILATION RATES FOR ALL GROUP R
PRIVATE DWELLINGS, SINGLE AND MULTIPLE
(Continuously Operating Systems)

Floor Area (ft^2)	Bedrooms[1]				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501 - 3000	45	60	75	90	105
3001 - 4500	60	75	90	105	120
4501 - 6000	75	90	105	120	135
6001 - 7500	90	105	120	135	150
>7500	105	120	135	150	165

[1]Ventilation rates in table are minimum outdoor airflow rates measured in cfm.

3. Fan power meeting code:
4. R403.6.1 Whole-house mechanical ventilation system fan efficacy OR C403.2.12.1 Allowable fan motor horsepower.
5. Test and verification of mechanical ventilation system performance is to be included in the commissioning plan.

*Indicates beyond code elements

High Efficiency Water Heating:

Individual unit water heating: Individual unit water heating shall be a heat pump meeting the NEEA tier 2 or 3 Northern Climate Specification. The water heater will have an EF greater than 2. The water heater shall be installed in a conditioned or semi conditioned space. The water heater shall include an exhaust air duct system that terminates to the exterior of the building.

Central Water Heating, Electric: Central heat pump water heater with a design COP greater than 2.0 that supplies DHW to all the units through a central water loop insulated with R-8 minimum pipe insulation throughout the building. The insulation may be omitted where the pipe passes through wood framing members.

Performance-based Approach:

Compliance with this section may be demonstrated using a performance-based approach. Using the performance based approach specified in the 2015 WSEC, Section C407, demonstrate that the proposed design will reduce energy use by 7 percent, compared to the code requirement.

2015 WSEC, "Section C407.3 Performance-based compliance. Compliance based on total building performance requires that a proposed building (proposed design) be shown to have an annual energy consumption based on site energy expressed in Btu and Btu per square foot of conditioned floor area that is less than or equal to ((the annual energy

consumption of)) 87 percent of that of the standard reference design."

Required Documentation for the Evergreen Project Plan:

For Single Family Homes, duplexes, townhomes or multi-family buildings three stories or less On the EPP form, state which credits will be implemented from WSEC 2015 Table 406.2. Or, if using 2015 WSEC R405, attach supporting documentation. *The 2015 WSEC Table 406.2 is included for reference in Appendix (?)*

Multifamily greater than 3 stories: On the EPP form, state which strategy will be used, Building Envelop or Ventilation Optimization. In addition, provide the following:

- *Building Envelop*: Attach the energy code compliance documentation, with the specified modifications to tables included in Appendix A. Provide a plan for assuring the beyond code measures will be installed and inspected in the project.
- *Ventilation Optimization*: On the EPP form, provide a description of the air sealing and ventilation plan specific to the proposed project demonstrating that the proposal will meet the requirements listed above. Make note of the elements to be included in the commissioning plan.
- *High Efficiency Water Heating* On the EPP form, provide a description of the water heating plan specific to the proposed project demonstrating that the proposal will meet the requirements listed above. Make note of the elements to be included in the commissioning plan.
- *Performance-based approach.* Attach the energy code documentation demonstrating compliance with the performance based approach. The documentation must demonstrate that the proposed design achieves a 7% reduction in energy use compared to the code requirement.

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 For Single Family Homes, duplexes, townhomes or multi-family buildings three stories or less:

If choosing incremental improvements compared to code:

- There are two options for demonstrating compliance. The 2015 WSEC requires applicants to choose additional energy efficiency improvements based on the requirements of 2015 WSEC Table 406.2. or demonstrate additional energy use reductions through the building performance

modeling method detailed in WSEC Section 405. ESDS applications using the section 405, building performance method must achieve an additional 7% savings compared to the code required value. When using the Table 406.2 method to show ESDS compliance, the applicant shall choose one more credit than required by code.

- A copy of table 406.2, ENERGY CREDITS is included in Appendix C. this if for preliminary planning only. Please consult the most recent edition of the energy code prior to making final submission.

New Multifamily Construction greater than three stories:
Building Envelop: Using the target U-values in Appendix A, demonstrate the proposed building UA is less than the target UA.

- Basic Steps:
  - Select the correct reference U-value table from Appendix A.
  - Document building UA using the calculation method described in the 2014 WSEC. For multifamily buildings greater than 3 stories use Section C402.1.3.3 UA calculation.
  - Facilitate verification of insulation, windows, and air sealing during construction.

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 points for new construction: 5-14 points for multifamily greater than three stories and up to 15 points for single family, duplex, townhomes and multifamily less than three stories

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

Requirements

Reduce overall energy usage using the following methodologies:

For Single Family, duplex, townhomes and multifamily less than 2 stories (up to 15 points)

Use the table below to determine how many ESDS points equate to additional 2015 WSEC code points.

Using Table 406.2 Energy Credits (in addition to code requirements)	Using R405.3 Performance-based compliance (in addition to code requirements)	ESDS Points
0.5	-3.50%	ESDS Mandatory
1	-7.00%	ESDS Mandatory
1.5	-10.00%	4
2	-13.00%	7
2.5	-16.00%	10
3	-19.00%	13
3.5	-21.00%	15

*Represents approximate incremental savings above the 2015 WSEC.

For Multifamily greater than 3 stories (5 -14 points):

ESDS section 5a requires the project to select one of 4 options for demonstrating compliance. Additional points will apply if the project provides additional savings as described below. Reduce overall energy usage using one of the options below:

Option #1: (4 points) Document building envelope UA that is 15% lower than that required by ESDS 5.1a.

Option #2: (8 points) Implement two of the three prescriptive options, Building Envelope, Optimize Ventilation strategies or Efficient Water Heating from ESDS 5.1a.

Option #3: (12points) Implement all three prescriptive options, Building Envelope, Optimize Ventilation strategies and Efficient Water Heating from ESDS 5.1a.

Option #4 (1-12 points) Demonstrate additional energy use reductions using the performance based approach. One point for each additional percent reduction in energy use.

Required Documentation for the Evergreen Project Plan:

Single Family, duplex, townhome, multifamily 3 stories or less: On the EPP form, identify how many ESDS Points this project will achieve. Also identify if energy savings will be achieved using strategies identified in ESDS 5.8a, 5.8c or 5.10. Attach supporting documentation.

Multifamily greater than three stories: On the EPP form, identify which option will be utilized. Attach supporting documentation.

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 SHADING FOR SOUTH FACING WINDOWS

Optional 4 points

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

REQUIREMENTS

For windows +/- 22 degrees of South

- Winter: 90% of glazing (by area) has direct solar access noon Dec 21.
- Summer: 85% of glazing (by area) is shaded at 10 AM and 2 PM, June 21
- Use standard time for all calculations
- There is no requirement to consider shading from trees, other buildings, etc, but these may be included.

Project Type	Potential Points & Guideline Requirements
Stand-alone building	(4 points) Meet all guidelines
Projects w/ multiple buildings	(1 points) 25% of the homes meets all guidelines (2 points) 50% of the homes meet all guidelines (3 points) 75% of the homes meet all guidelines (4 points) 100% of the homes meet all guidelines

Required Documentation for the Evergreen Project Plan:

Attach documentation that shading devices on the building will provide the described solar access and shading. Include an illustration demonstrating shading at the required date and times.

RATIONALE

Providing solar access to south facing windows can reduce the space heating loads of the building. But if they are not shaded during the most critical time periods, the solar gains can increase the cooling load. This is true regardless of window specifications or window area. This optional requirement provides a modest approach to solar control of buildings.

More detailed analytical analysis can provide more robust and certain energy savings. To take credit for more robust passive solar designs, use the performance-based compliance method in ESDS sections 5.1 and 5.2.

RECOMMENDATIONS

Most 3d drafting programs will create a location and time based shading illustrations. This includes Google sketch-up, a free, easy to use, 3d drawing program. We recommend using these tools to create a shading illustration.

- Sketchup: http://www.sketchup.com/
- Autodesk shading instructions: http://knowledge.autodesk.com/support/revit-products/learn-explore/caas/CloudHelp/cloudhelp/2016/ENU/Revit-Analyze/files/GUID-DC95789B-E7BA-4430-89B9-7B4C66F56684-htm.html

Calculation methods that provide both vertical and horizontal shading methods may be used. Several references on the development of shading models using calculation methods follow.

- Solar Geometry, Robert A. Young, University of Utah. http://faculty.arch.utah.edu/young/TEACHING/ARCH4350F14/A4350F14_13_SolarGeometry.ppt

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:
On the EPP form, state 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 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 or hook-ups. 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:
On the EPP form, state that the project will provide ENERGY STAR-labeled centralized laundry facilities and will not install in-unit washers or dryers or hook-ups. 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

Mandatory

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

REQUIREMENTS

90% of lighting shall be fitted with LED lamps or luminaires.

Note: The 2015 WSEC requires 75% of all luminaire installed in housing to be high efficiency.

Required Documentation for the Evergreen Project Plan:
On the EPP form, state that 90% of lighting shall be fitted with LED lamps or luminaires. 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. LED lighting products have been developed for all applications and very cost effective. .Reduced energy use lowers utility costs and greenhouse gas emissions.

RESOURCES

To assure high visual and operational quality, select lighting products supported by utility programs. Utilities in Washington are relying on the qualification listing provided by the Lighting Design Lab. https://www.lightingdesignlab.com/

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, state the 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, state the commitment to install individual or a sub-metered electric meter for each individual unit.

Rationale & Recommendations

See **ESDS 5.6a.**

5.8a 5.7A RENEWABLE ENERGY

Optional up to15 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.

ESDS points are awarded based on kWh year of on-site renewable energy production noted in the table below. Very small systems are discouraged. We recommend systems with 1200 kWh year or better production.

kWh/SF/Year	ESDS Points
0.14	1
0.28	2
0.42	3
0.56	4
0.7	5
0.84	6
0.98	7
1.12	8

kWh/SF/Year	ESDS Points
1.26	9
1.4	10
1.54	11
1.68	12
1.82	13
1.96	14
2.1	15

This criterion only Applies to Rehab projects for Single Family/duplex/townhome multifamily up to 3 stories AND Rehab or new construction for multifamily greater than three stories.

- *Rehab of Single Family/duplex/townhome or multifamily up to 3 stories:* For each 1200 kWh of electrical generation per housing unit provided annually by on-site wind or solar equipment, 5 points shall be awarded, up to 15 points.
- *New Construction or Rehab of Multifamily greater than three stories:* 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, state 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 5.7b 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 (does not apply to new construction of single family/duplex/townhomes), or multifamily less than three stories in height

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 collectors or system must be rated and certified by the Solar Rating and Certification Corporation (SRCC). http://www.solar-rating.org/
- For listed systems the energy output shall be determined by the SRCC listing for the most appropriate Washington location, (currently Seattle, Spokane or Yakima) OR
- For built up systems, the energy output shall be determined by the ASHRAE methodology documented on the SRCC web site

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.

NOTE: For new construction single family/duplexes/townhomes, and multifamily three stories of less, use ESDS 5.2a to demonstrate energy savings associated with renewable energy.

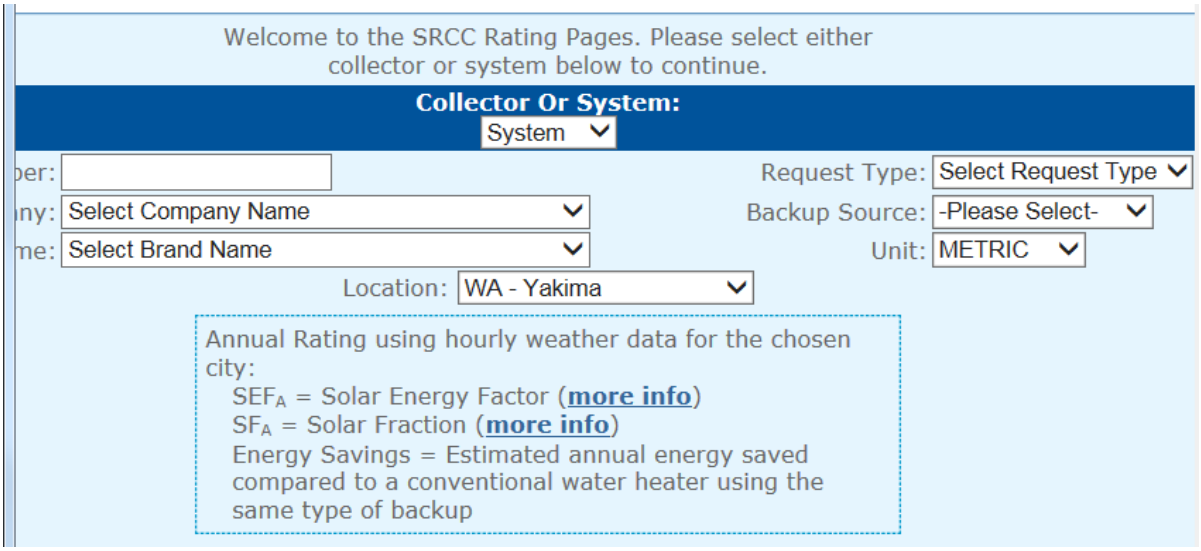
➥ **Required Documentation for the Evergreen Project Plan:**
Attach the plan for the size and type of solar water heating system including the mounted orientation, the annual performance, how it supplies the annual percentage of domestic hot water, how it was calculated and SRCC product information.

RATIONALE

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

RESOURCES

- SRCC ratings may be obtained from http://www.solar-rating.org/index.html
- For listed systems to the "Ratings" web page and input "system" and "Location" to obtain system output, system diagrams and certifications for the most appropriate Washington location. https://secure.solar-rating.org/Certification/Ratings/RatingsSummaryPage.aspx?type=2
    - Larger built up systems will require the development of an engineered design. Refer to the SRCC "commercial" page for methodology. http://www.solar-rating.org/commercial/index.html



5.9 DOMESTIC WATER HEATING

Mandatory

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

REQUIREMENTS

Residential Water Heaters must meet federal minimum standards.

Product class	Energy factor as of January 20, 2004	Energy factor as of April 16, 2015
Gas-fired Water Heater	0.67 – (0.0019 × Rated Storage Volume in gallons).	For tanks with a Rated Storage Volume at or below 55 gallons: EF = 0.675 – (0.0015 × Rated Storage Volume in gallons). For tanks with a Rated Storage Volume above 55 gallons: EF = 0.8012 – (0.00078 × Rated Storage Volume in gallons).
Oil-fired Water Heater	0.59 – (0.0019 × Rated Storage Volume in gallons).	EF = 0.68 – (0.0019 × Rated Storage Volume in gallons).
Electric Water Heater	0.97 – (0.00132 × Rated Storage Volume in gallons).	For tanks with a Rated Storage Volume at or below 55 gallons: EF = 0.960 – (0.0003 × Rated Storage Volume in gallons). For tanks with a Rated Storage Volume above 55 gallons: EF = 2.057 – (0.00113 × Rated Storage Volume in gallons).
Tabletop Water Heater	0.93 – (0.00132 × Rated Storage Volume in gallons).	EF = 0.93 – (0.00132 × Rated Storage Volume in gallons).
Instantaneous Gas-fired Water Heater.	0.62 – (0.0019 × Rated Storage Volume in gallons).	EF = 0.82 – (0.0019 × Rated Storage Volume in gallons).
Instantaneous Electric Water Heater.	0.93 – (0.00132 × Rated Storage Volume in gallons).	EF = 0.93 – (0.00132 × Rated Storage Volume in gallons).

Note: The Rated Storage Volume equals the water storage capacity of a water heater, in gallons, as specified by the manufacturer.

Commercial Water Heaters shall meet minimum code requirements published in the 2015 WSEC.

Required Documentation for the Evergreen Project Plan:

On the EPP form, state compliance with the applicable standard.

5.10 Domestic Water Heating

Optional 2-5 points (does not apply to new construction of single family/duplex/townhomes) or multifamily 3 stories or less

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 and select from the list of certified products. https://www.energystar.gov/products/certified-products/

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
Heat Pump (reverse cycle chiller)	COP>3	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.

Note: For new construction of single family/duplex/townhomes multifamily three stories or less, use ESDS 5.2a to demonstrate energy savings associated with superior performance domestic water heating.

Required Documentation for the Evergreen Project Plan:
On the EPP form, state 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, state 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 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, state 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, state the option chosen, how ducts will be fastened and sealed, and what insulation level will be installed. State 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.

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 Low/No VOC Paints & Primers

Mandatory

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

Requirements

All interior paints and primers must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by South Coast Air Quality Management District (SCAQMD) Rule 1113. Projects must follow the most recent revision available at time of product specification. For the latest rules: *www.aqmd.gov/home/regulations/rules*.

As of July 1, 2013, SCAQMD Rule 1113 thresholds are listed as:

Paint Type	Maximum VOC Limit
Coatings, Flats & Non-flats	50 g/L
Primer or Undercoat & Sealers	100 g/L
Opaque Floor coatings	50 g/L
Rust preventive coatings	100 g/L
Clear Wood Finishes	275 g/L

This table does not include colorant added at the point of Sale. If colorant is added at point of Sale, the VOC content of the colorant should not exceed 50 g/L for all paint types, except anti-corrosives at 150 g/L.

NOTE: These requirements do not apply to finishes that are factory applied or applied off site, except in modular construction

➥ **Required Documentation for the Evergreen Project Plan:**
On the EPP Form, state 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

Allow a two week flush out period at turnover.

6.2 Low/No VOC Adhesives & sealants

Mandatory

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

Requirements

All adhesives & sealants (including caulks) must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by the South Coast Air Quality Management District Rule 1168. Projects must follow the most recent revision available at time of product specification. See: http://www.aqmd.gov/home/regulations/rules for latest rule.

As of January 7, 2005, SCAQMD Rule 1168 thresholds are listed as:

VOC LIMIT PRODUCT TYPE	(G / L)
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT AND ASPHALT TILE ADHESIVES	50
DRYWALL AND PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
ARCHITECTURAL SEALANTS, INCLUDING CAULK	250

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, state that all interior adhesives will comply with the most recent version of Rule 1168 of the South Coast 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

- U.S. Department of Energy, National Renewable Energy Laboratory, "Weatherize Your

Home — Caulk and Weather Strip": *www.nrel.gov/docs/fy01osti/28039.pdf*

- 2012 IECC Climate Zones Map: A detailed map that shows Climate Zones zoomed into each state and county as well as the basic 2012 IECC Building Code requirements for each Climate Zone (see the *Appendix*).

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

*Method #2 – Material Specific(*construction waste and demolition debris). Provide receipts demonstrating compliance. (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 advanced framing plan that minimizes all waste by design (5 Points)

*Method #3- Minimizing Construction Waste (*New Construction only). Provide receipts demonstrating compliance.

- 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, state the method chosen. State that the approved contractor submittal of the construction waste plan will be available on the job site detailing 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 paint 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, hardware and fastners excluded
	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.

6.5a

6.5a Reduced Heat-Island Effect: Roofing

Optional 2 points

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

Requirements

Choose one of the following options:

Option #1 (5 points) - Use an ENERGY STAR–certified roofing product for 100% of the roof area.

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, state 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*

6.5b

6.5B Reduced Heat-Island Effect: Paving

Optional 2 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 0.3 over at least 50 percent of the site's hardscaped area.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state 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.

6.6

6.6 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 local manufactures (within 500 mile radius) that support a broader socially sustainable mission, outside of their environmental mission, including the safety and health of their own workers. 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, state that 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 Emit Low/No Formaldehyde

Mandatory

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

Requirements

All composite wood products exposed to the interior (inside the weather resistive barrier), including particle board, plywood, OSB, MDF, cabinetry, and any other applicable wood product, must be certified as compliant with California 93120 Phase 2. Or, if using a composite wood product that does not comply with California 93120 Phase 2, all exposed edges and sides must be sealed with low-VOC sealants, per Criterion 6.2.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state that all particleboard, plywood, OSB, medium density fiberboard, cabinetry and any other applicable wood products will be compliant with CARB Phase 2. 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

- Make this requirement part of the specifications for subcontractor submittals. Obtain the manufacturer's specifications to determine whether materials meet this requirement. Seek composite wood products compliant with California 93120 Phase 2. California 93120 is a regulation issued by the California Air Resources Board (CARB) limiting allowable formaldehyde emissions from composite wood products.
- Seek composite wood products with no added formaldehyde-based compounds in the contents. Seek composite wood products with CARB No Added Formaldehyde (NAF) certification.
- If feasible, specify formaldehyde-free hardwood, plywood, particleboard or medium-density fiberboard.

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.

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).
- 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.
- 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, state 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 6 points

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

Requirements

Use non-vinyl, non-carpet floor coverings throughout each building in the project. In addition, do not install flooring containing PVC or chlorine.

➡ **Required Documentation for the Evergreen Project Plan:**
On the EPP Form, state that no carpet flooring or flooring containing PVC or chlorine, will be used throughout each building.

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 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 an automatic timer, motion sensor, humidistat sensor, or that operate continuously.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state that 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 Exhaust Fans- Bathroom

Optional 3 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 an automatic timer, motion sensor, humidistat sensor, or that operate continuously.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state that Energy Star bathroom fans including how they will be controlled. Do not send in product literature or spec sheets with the EPP.

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, the exhaust fan must still vent to the exterior.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state that Energy Star kitchen fans will be installed and 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 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, state that Energy Star kitchen fans will be installed and vented to the outdoors. 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 each dwelling unit that that meets the Washington State Amendments to the International Mechanical Code Section 403. Ventilation system energy use shall meet the fan power limits in the Washington State Energy Code, Section R403 or C403.

Provide commissioning of the ventilation system. Test the airflow to individual housing units and verify that they meet the minimum standards, but do not exceed the design airflow by more than 20%. Verify that the controls are set to provide the operating

➥ **Required Documentation for the Evergreen Project Plan:**
On the EPP Form, state that whole-house ventilation will be installed according to the 2009 International Residential Code or 2010 ASHRAE 62.2. State the size of fan, how the size was determined, the location, and how it is controlled. Provide installer report of performance testing for the Third Party Verifier to review. 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 rigid-type ductwork (from the connection point to the exterior exhaust), except for condensing and heat pump dryers, which must be plumbed to a drain. Do not vent to attic or crawl space.

➡ **Required Documentation for the Evergreen Project Plan:**
On the EPP Form, state 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. Refer to requirements in 2015 WSEC

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state 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.

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.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state 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 Mold Prevention: Surfaces

Mandatory

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

Requirements

Use materials that have durable, cleanable surfaces throughout bathrooms, kitchens and laundry rooms. Materials installed in these rooms should not be prone to deterioration due to moisture intrusion or encourage the growth of mold. Do not use mold-propagating materials such as vinyl wallpaper and unsealed grout.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state durable, cleanable surfaces throughout bathrooms, kitchens and laundry rooms will be installed. 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.

7.9b Mold Prevention: Tub & Shower Enclosures

Mandatory

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

Requirements

Use moisture-resistant backing materials such as cement board, fiberglass faced gypsum board or equivalent behind tiled/grouted or multi-piece shower and tub enclosures. Projects using one piece fiberglass/plastic shower/tub enclosures may use paper-faced gypsum backer board that meets mold-resistant requirements per ASTM #D3273 with a score of at least 10, on all walls and ceiling facing the shower.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state 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.
- Immediately above the capillary break install at least 6-mil polyethylene sheeting overlapped at least 6 inches at the seams to serve as a vapor retarder in direct contact with the slab above.

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, state 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, state 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, state whether the project is in a high risk radon county. If so, continue with the following:

- *For New Construction*, on the EPP form state 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 state 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, state 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, state that all water drainage measures listed in this criterion will be followed. If rehab, all water drainage measures listed which apply to the scope of work are required.

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.

7.13a

7.13A Enhanced Building Envelope Design

Mandatory for New Construction and Substantial Rehabilitation

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

Requirements

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.*

➡ **Required documentation for Evergreen Project Plan:**
On the EPP form, state how the objective will be achieved. State that inspection reports and photos will be available on the 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.

7.13b

7.13B Enhanced Building Envelope Design

Optional 8 points for New Construction and Substantial Rehabilitation

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

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 by the project architect or Building Envelope Consultant, during the course of construction to ascertain whether construction has been performed in substantial compliance with the building enclosure design documents.

Option#2 (3 points): Provide full-size mock ups of 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.

Option #3 (3 points): Provide water penetration resistance testing of a representative sample of windows and window assembly 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, state the option(s) chosen and how the objective will be achieved. State that inspection reports and photos of any mockups will be available on the 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. 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
- Do not install ductwork or air handling equipment in a garage.
- All connecting doors between living space and garage must 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.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state 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, state 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 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. The contractor performing the work must be Renovation, Repair and Painting certified at a minimum.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state the year when the buildings were constructed. For structures built before 1978, state 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 Smoke-Free Building

Mandatory

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 foot perimeter around the exterior of all residential projects.. 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. The use of e-cigarettes is prohibited wherever smoking is prohibited.

Required Documentation for the Evergreen Project Plan:
On the EPP form, state 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 state 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 Guidance

Mandatory

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

Requirements

Develop Building Operations and Maintenance instructions that will be permanently affixed to the building. The instructions for each system should be located where maintenance staff will be handling the relevant equipment. For example, the irrigation instructions will be located on the wall next to the irrigation controls. In addition, provide a comprehensive walk-through and orientation for the maintenance and property manager(s) to review the Building Operations and Maintenance Guidance.

Building Operations and Maintenance Guidance Details

Each set of instructions should be written simply and concisely ensuring that maintenance staff with varied levels of experience will be able to understand them. The instructions should include (1) operations guidance, (2) maintenance schedule, (3) replacement schedule, and (4) any applicable performance goals. The instruction should be developed over the course of the project design, development and construction stages and should include the following topics:

- All mechanical and electrical equipment and appliances
- HVAC
- Lighting equipment
- Landscaping and hardscaping, including instructions for community gardens or growing spaces
- Green cleaning products
- Pest control
- Building accessibility for residents including security and safety protocols whether by leaving doors unlocked, by using a security device such as a card key, or by other measures (signage)
- Active recreation and play spaces (e.g. playgrounds, ground markings, exercise equipment) for adults, youth, and children
- Preventative maintenance schedules (i.e. duct cleaning, dryer duct cleaning, filter replacement, systems maintenance, etc.)
- Any other systems within the project, including renewable energy systems if applicable.

Required Documentation for the Evergreen Project Plan:

On the EPP Form, state that the project sponsor will submit copies of the instructions to Commerce before the project is completed; include an estimated date of submittal. In addition, include the date the walk-through and orientation will be completed.

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 "Template for Green Operations and Maintenance Manual": http://www.enterprisecommunity.com/resources/ResourceDetails?ID=63995.doc

8.2 EMERGENCY MANAGEMENT PLAN

Mandatory for multifamily

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

Provide a Plan on emergency operations targeted toward operations and maintenance staff and other building-level personnel. The Plan should address response and recovery to various types of emergencies, leading with those that have the greatest probability of negatively affecting the project. In addition, provide a comprehensive orientation for the maintenance staff and other building-level personnel to review the project's emergency plan.

Emergency Plan Details

The Plan should provide guidance as to how to sustain the delivery of adequate housing throughout an emergency and cover a range of topics including but not limited to:

1. Emergency Planning Education: how to prepare buildings, the site, and residents for the on-set of a emergency situation. Detail how to help residents plan for a potential emergency in which any of the following services may be disrupted: fire, water, energy, and vertical access. The details should also include how often residents will be educated on these topics.
2. How to evacuate and shelter in place
3. Communication plans for staff to staff and staff to resident
4. Contact information for public utility, service providers, and local jurisdiction emergency management organizations
5. Infrastructure and building "shutdown" procedures

6. Procedure for inspecting buildings and site following an emergency to ensure resident and staff safety
7. Re-housing of residents following an emergency situation
8. Proximity to shelters and other resources

This information should be readily available to all building residents, staff and visitors.

Required Documentation for the Evergreen Project Plan:
On the EPP Form, state that the project sponsor will submit the Emergency Management Manual to Commerce before the project is completed; include an estimated date of submittal. In addition, include the date the orientation will be completed.

Rationale

In the event of an emergency, time is of the essence. Creating and socializing a plan for building managers and residents before an emergency occurs increases the likelihood that disturbances due to the emergency (whether it be flooding, earthquake, power outages or another disturbance) can be appropriately mitigated.

Through resilience planning, a resident community will be better suited to maintain livable conditions in the event of natural disasters, loss of power or other interruptions in normally available services.

Recommendations

• Emergency Management Plans should be updated annually (at a minimum) in both digital and hard-copy formats, and located in a well-marked location.

• Reviewing and updating all Emergency Management Plans should be built into the job description and performance requirements of staff members.

• Consider having staff trained in first aid, cardiopulmonary resuscitation (CPR), and the use of automated external defibrillators (AEDs), and include information about these resources within your Emergency Management Plan.

Resources

• Enterprise Disaster Response Staffing Plan: www.enterprisecommunity.org/resources

• Ready is a public service campaign designed to education and empower Americans to prepare for and respond to emergencies, including natural and man-made disasters. The goal of the campaign is to get the public involved and ultimately to increase the level of basic preparedness across the nation. www.ready.gov/ or www.ready.gov/business/implementation/emergency

• Federal Emergency Management Agency (FEMA) - Plan, Prepare & Mitigate a Disaster: www.fema.gov/safer-stronger-protected-homes-communities• American Red Cross: www.redcross.org

• Seattle Office of Emergency Management provides many valuable resources, They can be accessed online at: www.seattle.gov/emergency/publications

• Urban Green, Building Resiliency Task Force Report, Ch. 4: Better Planning, June 2013. http://urbangreencouncil.org/sites/default/files/2013_brtf_summaryreport_0.pdf

8.3 RESIDENT MANUAL & ORIENTATION

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. In addition, provide a comprehensive walk-through and orientation for residents to review the details of the manual.

Resident Manual Details

The Guide should include any of the relevant information:

- 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

Resident Orientation Details

The records should include the date of the orientation, who in each household received the orientation, and who on the management team gave the orientation. Orientations are given initial lease-up and updated when there is turnover. Housing Trust Fund staff will monitor these records during site visits.

NOTE: Although not required, rather than a paper manual, consider creating videos covering the Resident Manual details to show to residents to free up staff time

Required Documentation for the Evergreen Project Plan:

(1) On the EPP Form, state that the Resident Manual will be submitted it to Commerce before the project is completed; include an estimated date of submittal.

(2) On the EPP Form, state 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

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.

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"

8.4 Project Data Collection

Optional up 8 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 one year, post occupancy. Provide a post occupancy report to Commerce.

Methods for data collection:

1. Collect and monitor whole building use; this includes all owner paid and tenant paid utilities. (3 points)

2. 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. (5 points)

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

3. 100% of residential use data (8 points)

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

- For tax credit properties, projects selecting option #3 may receive a utility allowance adjustment by following the WSHFC Tax Credit Compliance Manual Appendix O: http://wshfc.org/managers/ManualTaxCreditIndex.htm#O
- 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.
- Private, fee-based, benchmarking and utility tracking tools are available. Among others, these include: WegoWise: www.wegowise.com; Energy Score Cards: www.energyscorecards.com; eGauge: www.egauge.net

8.5 EDUCATIONAL SIGNAGE

Mandatory

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.

Appendix A: Energy Efficiency for New Multi-family Construction

Multifamily construction three stories or less above grade 2012 WSEC Table R402.1.3 Equivalent U- FACTORS[a] as modified for ESDS	
FENESTRATION U-FACTOR	0.27
SKYLIGHT U-FACTOR	0.5
CEILING U-FACTOR	0.026
WOOD FRAME WALL U-FACTOR	0.056
MASS WALL U-FACTOR	0.056
FLOOR U-FACTOR	0.029
BELOW GRADE U-FACTOR	0.042
SLAB F-VALUE	0.54

See next page for requirements on multifamily buildings greater than three stories.

Multifamily construction more than three stories above grade Opaque Thermal Envelope Assembly Requirements[a] ~~2012~~ 2015 WSEC Table C402.1.~~2~~ 4 as modified for ESDS		
	All (common areas or other commercial)	**Group R, Residential**
Roofs		
Insulation entirely above deck	U-0.034	U-0.031
Metal buildings	U-0.031	U-0.031
Attic and other	U-0.021	U-0.021
Walls, Above Grade		
Mass	U-0.~~104~~[d] 104[e]	U-0.057
Metal building	U-0.052	U-0.052
Steel framed	U-0.055	U-0.055
Wood framed and other	U-0.054	U-0.054
Walls, Below Grade		
Below-grade wall[b]	Same as above grade	Same as above grade
Floors		
Mass	U-0.031	U-0.031
Joist/framing	U-0.029	U-0.029
Slab-on-Grade Floors		
Unheated slabs	F-0.54	F-0.54
Heated slabs[c]	F-0.55	F-0.55

e The code exception provided in footnote e shall not be used for ESDS projects

Multifamily construction above three stories Building Envelope Requirements – Fenestration ~~2012~~ 2015 WSEC Table C402.3 as modified for ESDS[note:]	
Vertical Fenestration	
***U*-factor**	
Nonmetal framing (all)[a]	0.27
Metal framing (fixed)[b]	0.30
Metal framing (operable)[c]	0.30
Metal framing (entrance doors)[d]	0.40
SHGC	
SHGC	0.4
Skylights	

***U*-factor**	0.5
SHGC	0.35

note: ESDS projects shall not use C402.4.1.3 Increased vertical *fenestration* area with high-performance *fenestration* when demonstrating compliance with ESDS requirements.

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 Mechnaicl Code, Chapter 4 ~~Ventilation and Indoor Air Quality Code~~ or the most recent edition of 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

Members
Integrative Process Team Members. Explain the role of each person and how they will contribute to the overall sustainability goals for this project.

Goals
A statement of green development goals of the project and the expected outcomes from addressing those goals through the design, construction, and operation phases. Goals should address:

- Long-Term Durability
- Low-Maintenance
- Healthy Indoor & Outdoor environment
- Energy & Water efficiency

Integrative Process
A summary of the integrative process is used to select the green building strategies, systems, and materials that will be incorporated into the project.

Measuring Progress
Describe of how progress and success against these goals will be measured throughout the completion of design, construction and, if possible, operation to ensure that the green features are included and correctly installed.