Built Green Multifamily Handbook

Version 2021

BUILT GREEN®

Photo: S.Brousseau.Photography.

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INTRODUCTION

This handbook contains detailed information about how projects can meet each credit in the Built Green 2021 Multifamily Residential New Construction Checklist. For each credit the handbook identifies the party responsible for meeting the credit item, the intent behind the credit, the performance requirement, point breakdown, when the credit should be verified, and cross-references to other related credits or star-level requirements and resources.

ABOUT THE BUILT GREEN PROGRAM

Built Green is a holistic green home certification of the Master Builders Association of King and Snohomish Counties, developed in partnership with King County, Snohomish County, and other government agencies in Washington State. It was originally founded in 1999. Since then, over 21,000 projects and 40,000 housing units have been certified.

Built Green also serves as a network of architects, builders, developers, remodelers, subcontractors, product suppliers, lenders, and others involved in the green building industry. It is a resource on the human and environmental benefits of green building as well.

Built Green certifies residential construction of all kinds, with checklists for: single-family/townhomes, multifamily buildings, remodels, refits, and communities. Built Green's mission is to serve as the driving force for environmentally sound design, construction, and development practices in Washington's cities and communities.

BUILT GREEN PROCESS

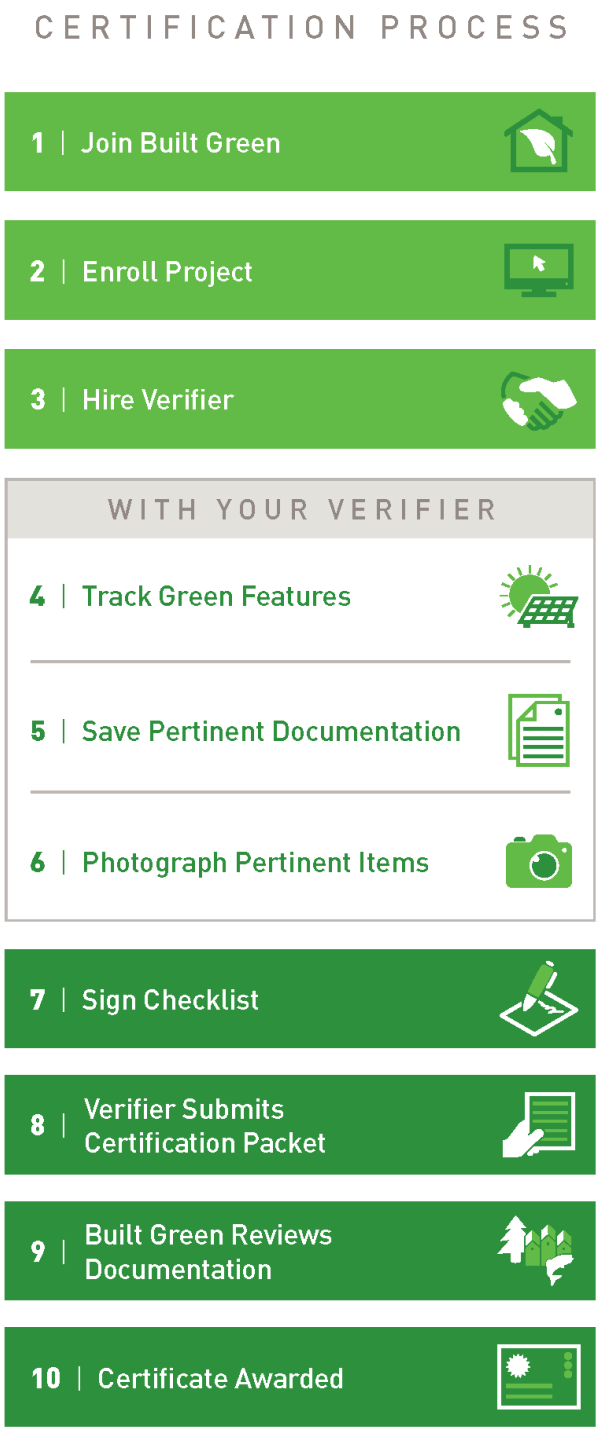
All companies seeking to certify their project must join Built Green as a member. Additionally, all projects must receive third-party verification. A list of approved verifiers and how to join can be found on builtgreen.net. To achieve a requisite star-level, the required Credit items and point thresholds for that level must be met. These are described in detail in this handbook.

Built Green Certification Program Administrators:

Western Washington (west of Cascades) Built Green projects and builders enroll with Master Builders Association of King and Snohomish Counties' Built Green program.

Eastern Washington (east of Cascades) Built Green projects and builders enroll with the Home Builders Association of Tri-Cities' Built Green program.

The following diagram outlines the certification process:



How to Use the Handbook

For ease of use, the 2021 Multifamily New Construction Checklist directly corresponds with Handbook Sections 1–8. The checklists are key-coded to help you find information about each measure. The first number indicates what section to look in followed by a second number indicating the order in which it appears.

Here's how it works, using Credit 2-21 from the checklist as an example: The action "Design to achieve 50%, 75%, or 90% effective pervious surface outside of building footprint" is described in Section Two (Site and Water), and is the 21st measure under the section.

Credit # and Description

Responsible Party: Those who are responsible for ensuring the credit requirements are met in the finished project. This may be developer, design and/or construction personnel.

Intent: The desired outcome resulting from meeting the requirements of the credit. This may be educational for the project team but is also helpful for the verifier in determining if the intent has been met.

Performance Requirement: Describes what the project team must do, as definitively as possible, to earn points for the credit. This gives the project team something clear to aim at, and the verifier something specific to measure against.

Points Breakdown: Points available, and how to earn different levels.

When Verified: Guidance on the most effective time and method for verification, helping both project team and verifier to plan site inspections and review meetings. This is a way to help teams and verifiers scope their verification plans for a project—it is a guide, not an absolute.

Cross-references: Referencing other relevant Credits in the checklist.

Resources: Specific, reliable resources for reference.

Project Enrollment and Checklist Considerations

Project Enrollment Online Process

Prior to enrolling a project with Built Green, the company or individual requester must become a Built Green Member. Once logged into your online Built Green account, you will be able to submit projects through the online Builder portal. Once the project is submitted, ensure that all enrollment fees have been paid, either by reviewing the payment

confirmation screen or the emailed payment receipt. Each submitted project is manually enrolled by the Built Green team, which may take 24- 48 hours. Once our team has completed setting up the project's ID numbers and verified that the enrollment fees have been processed, the project's enrollment letter will be emailed to the email address

> ***Have a Membership with Your Local Homebuilders Association?***
>
> Built Green offers significant discounts on membership and project enrollments fees for homebuilder association members. If you are planning on enrolling at least 3-6 units over the course of your yearly membership, then becoming a member of your local homebuilders association before becoming a Built Green member could save you hundreds or thousands of dollars in project enrollment fees. Discounts are extended to any Washington state builders association members. Here are some examples:
>
> - Master Builders Association of King and Snohomish Counties
> - Master Builders Association of Pierce County
> - Olympia Master Builders
> - Building Industry Association of Whatcom County
> - Skagit/Island Counties Builders Association
> - Kitsap Building Association
>
> Select the "This company is a member of a partner association" option on the Built Green membership application and list the association you have a membership with. The Built Green team will confirm your membership with that association and contact you to complete the membership setup process.

associated with the Built Green account that was used to submit the project and the verifier listed on the project. The enrollment letter is what you would provide to the local jurisdiction to comply with green building incentive or permit requirements.

Affordable Housing Projects

Multifamily projects developed by nonprofit organizations or public sector entities that are building affordable housing projects and using public funding may be eligible for significantly reduced enrollment fees. Please contact Built Green prior to enrollment to discuss project eligibility.

SECTION ONE: REQUIREMENTS

3-Star Requirements (300 points minimum)

Credit #	Category	Credit
1-1		Built Green assumes building meets local code regulations
1-2		Third-party verification
1-3		Achieve a minimum of 50 points from Sections 2-5
1-4	**Site & Water**	Document a water efficiency score through WERS or WRI of 70 or less, or certify under WaterSense 2.0 (Credit 2-39); OR Prescriptively all plumbing fixtures and appliances are low-flow (Credits 2-50 to 2-53)
1-5	**Energy**	Install all ENERGY STAR appliances and fans (if provided by builder)
1-6	**Energy**	Ventilation system flow rates are tested and within 20% of design flows. Controls and settings are consistent with design
1-7	**Energy**	Building performance modeled ERI of 58 or less OR BPF of at least 0.55; OR achieves prescriptive credits on the 2018 WSEC R406.3 (5.5 credits) or C406.1 (11 credits) tables (Credits 3-1, 3-2, 3-3, or 3-4). See Built Green 2018 WSEC Energy Modeling Guidelines
1-8	**IAQ**	CARB II compliant materials for cabinets and hard-surface flooring, Greenguard Gold or Formaldehyde-free insulation, and low-VOC paints and wet-applied interior finishes (Credits 4-15, 4-16, 4-21)
1-9	**IAQ**	If gas cooktop or range is installed: Provide range exhaust hood directly over cooking appliance. Exhaust hood shall vent directly to the exterior of the building. General kitchen exhaust or recirculating hoods shall not meet this requirement.
1-10	**Materials**	Post jobsite recycling plan on site and maintain at least three bins (Credits 5-5 and 5-15)
1-11	**Materials**	Recycle all clean wood, cardboard, new gypsum scrap, metal, asphalt paving/brick/concrete, electronics, and batteries (Credits 5-15, 5-16, 5-17)
1-12	**Materials**	Use no endangered species or old growth wood (Credit 5-26)
1-13	**ESJ**	Achieve at least 25 points in Equity and Social Justice Section (Section 6); not all points can come from EV charging

Ventilation System flow rates are tested and within +/- 20% of design flows. Controls and settings are consistent with design

Responsible Party: Mechanical Designer, Ventilation System Installers, Built Green Verifier

Intent: Ensure that the residential unit ventilation system is functioning as designed.

Performance Requirement: Ventilation design flows and control strategy is communicated in the CDs. The whole house ventilation system in a representative sample of units is properly installed and operating as designed; flow rates are within +/- 20% of design flows, and control set up is consistent with the design intent (continuous or intermittent, on/off or boost activation, delay timing). 20% of units tested by the Verifier or other independent party, according to the Built Green Performance Testing Requirements. NOTE: Non-compliances should result in root cause analysis and additional testing, in line with the sampling protocol.

Points Breakdown: 3-Star Requirement

When Verified: Completion of design, and final inspection.

CARB II compliant materials for cabinets and hard-surface flooring, Greenguard Gold or Formaldehyde-free insulation, and low-VOC paints and wet-applied interior finishes

Responsible Party: Architect, Interior Designer, General Contractor

Intent: Protect worker and occupant health from harmful off-gassing from added formaldehydes, volatile organic compounds (VOCs), and other potentially toxic fumes and solvents.

Performance Requirement: Specify and use only CARB II, NAUF or ULEF compliant materials for cabinets and hard-surface flooring. Wall insulation must be Greenguard Gold or formaldehyde-free certified. Low- or Zero-VOC paints and low-toxic wet-applied finishes for all interior applications and finishes (see Credits 4-15 for full list of applicable wet-applied finishes).

When Verified: Review of product documentation and visually verify during intermediate and final construction inspections.

Cross-references: 4-15, 4-16, 4-21

If gas cooktop or range is installed: provide range exhaust hood directly over cooking appliance. Exhaust hood shall vent directly to the exterior of the building. General kitchen exhaust or recirculating hoods shall not meet this requirement.

Responsible Party: Architect, Mechanical Engineer, General Contractor, Venting Installer

Intent: Ensure effective removal of contaminants from cooking through installation of effective range hoods.

Performance Requirement: Install a range hood over every gas range or cooktop, with a maximum flow rate of no less than 100 cfm, and no more than 300 cfm, and must be directly vented to the exterior. Microwave/rangehood combos may be used if they can meet the same flow rate and exhaust requirements as a stand-alone range hood. Flow rates will be tested and confirmed on a 15% sample of units, see Credit 4-58.

Points Breakdown: 4-Star Requirement

When Verified: Completion of design, Final construction inspection

Cross-references: 4-53, 4-58

Post jobsite recycling plan on site and maintain at least three bins (one for waste, one for recyclables, one for phase-appropriate source-separated recycling)

Responsible Party: General Contractor

Intent: Control and minimize waste generated on site.

Performance Requirement: Produce a jobsite recycling plan, clearly post it on site, and draw attention to it at regular safety meetings. Plan shall describe project waste management goals, clearly communicate the construction team's responsibility for implementing the plan, what collection bins are provided, where they are located, what materials should and should not go in them, and penalties for contamination of bins. At a minimum, there will be one bin for mixed recyclables and one for waste (nonrecyclables).

When Verified: At every site visit

Cross-references: 5-5, 5-15

4-Star Requirements (400 points minimum)

Credit #	Category	Credit
1-14		Meet 3-Star requirements
1-15		Achieve a minimum of 60 points from sections 2-5
1-16	**Site & Water**	Amend disturbed soil with compost to a depth of min. 10 inches to restore soil environmental functions (Credit 2-16)
1-17	**Site & Water**	Document a water efficiency score through WERS or WRI of 60 or less (Credit 2-39); OR Prescriptively all plumbing fixtures and appliances are low-flow (Credits 2-50 to 2-53) and emphasize drought-tolerant vegetation (food production excluded) (Credit 2-43)

1-18	**Energy**	Building performance modeled ERI of 55 or less OR BPF of at least 0.52; OR achieves prescriptive credits on the 2018 WSEC R406.3 (6 credits) or C406.1 (16 credits) tables (Credits 3-1, 3-2, 3-3, or 3-4). See Built Green 2018 WSEC Energy Modeling Guidelines
1-19	**Energy**	Set up automatic energy and water benchmarking in EnergyStar Portfolio Manager and share data with Built Green (Credits 2-63 and 3-45)
1-20	**Energy**	Design for solar readiness (see handbook for details)
1-21	**IAQ**	Do not install a gas-burning fireplace inside unit or building (direct-vent fireplaces excluded) (Credit 4-63)
1-22	**IAQ**	CARB II compliant or better for all finish woodwork, subfloors, plywood and composite wood materials, CRI Green Label Plus or better for all installed carpeting (Credits 4-15, 4-16, 4-21) (excludes structural lumber)
1-23	**IAQ**	Provide EnergyStar or HVI certified range exhaust hood directly over cooking appliance and vent directly to the exterior of the building. General kitchen exhaust or recirculating hoods shall not meet this requirement. (Credit 4-53)
1-24	**IAQ**	Provide track-off mats, carpets, and/or shoe grates at principal entryways to building (Credit 4-61)
1-25	**Materials**	Use at least one material or product with an HPD or EPD (Credit 4-23 or 5-88)
1-26	**Materials**	Achieve minimum recycling rate of 50% by weight (Credit 5-15)
1-27	**ESJ**	Create a project-specific ESJ plan (Credit 6-9) and achieve at least 30 points in Equity and Social Justice Section; not all points can come from Universal Design or required ESJ plan

Set up automatic energy benchmarking in Portfolio Manager and share data with Built Green

Responsible Party: Owner, Property Management

Intent: Increase access to whole building energy consumption data for building performance measurement purposes

Performance Requirement: Create a building account in ENERGY STAR Portfolio Manager (ESPM) and set up a system for automatically or manually uploading monthly energy consumption data from utility bills and entering it into ESPM. Third-party billing services

and building performance monitoring services can provide this service. Share the ESPM Account with the Built Green Program Manager Account (builtgreen@mbaks.com).

Points Breakdown: 4-Star Requirement

When Verified: Review ESPM account, and utility data collection plan at time of final inspection

Cross-references: 2-63, 3-45

Resources: ENERGY STAR Portfolio Manager: www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager

Design for Solar Readiness

Responsible Party: Architect/Designer

Intent: Optimize the building's potential for future installation of renewable energy systems to minimize non-renewable fuel consumption

Performance Requirement:

A solar zone shall be provided on the roof of the building or elsewhere on the building site. The area of the solar zone shall be the lesser of:

- 40% of the gross roof area (less area occupied by skylights and/or rooftop decks).
- Sized for an array capacity equal to 20% of the building's electrical service size.

Structural provisions shall be provided to address the future solar system.

Provisions for either photovoltaic arrays, or solar thermal arrays, or both, shall be provided.

For future PV:

- A capped roof penetration sleeve shall be provided in the vicinity of the future inverter, sized to accommodate the future PV system conduit.
- Means of interconnection at the main service panel shall be identified.
- Locations for future inverters, metering equipment and overcurrent device, and routing for future wiring shall be identified on As-built plans, provided to the owner/management.

For future solar thermal:

- Two capped pipe tees shall be provided upstream of hot water heating equipment for future interconnection of the solar water heating system

- Two roof penetration sleeves shall be provided, capable of accommodating supply and return piping for a future solar water heating system.
- Future location of thermal storage tanks and route for future piping shall be identified on plans.

Points Breakdown: 4-Star Requirement

When Verified: Completion of design, Final inspection

CARB II compliant or better for all finish woodwork, subfloors, plywood and composite wood materials, CRI Green Label Plus or better for all installed carpeting

Responsible Party: Architect, Interior Designer, General Contractor

Intent: Protect worker and occupant health from harmful off-gassing from added formaldehydes, volatile organic compounds (VOCs), and other potentially toxic fumes and solvents.

Performance Requirement: Specify and use only CARB II, NAUF or ULEF compliant materials for all interior finish woodwork, subfloors, plywood, and composite wood materials. Structural lumber that is enclosed in the building envelope or not exposed to the interior of the home is excluded. All installed carpeting must be CRI Green Label Plus certified or better.

When Verified: Review of product documentation and visually verify during intermediate and final construction inspections.

Cross-references: 4-15, 4-16, 4-21

5-Star Requirements (600 points minimum)

Credit #	Category	Credit
1-28		Meet 4-Star requirements
1-29		Achieve a minimum of 90 points from Sections 2-5
1-30	**Site & Water**	Document a water efficiency score through WERS or WRI of 50 or less (Credit 2-39); OR Prescriptively all plumbing fixtures and appliances are low-flow (Credits 2-50 to 2-53) and landscaping requires no potable water irrigation after establishment period (Credit 2-47)
1-31	**Site & Water**	Manage at least 60% of stormwater on site (Credit 2-20)
1-32	**Energy**	Building performance modeled ERI of 47 or less OR BPF of at least 0.48; OR achieves prescriptive credits on the 2018 WSEC R406.3 (7 credits) or C406.1 (28 credits) tables (Credits 3-1, 3-2, 3-

		3, or 3-4). See Built Green 2018 WSEC Energy Modeling Guidelines
1-33	**Energy**	Install solar PV producing 150 kWh for every 1000 sq ft (Credit 3-44)
1-34	**IAQ**	All hard surface flooring must contain no orthophthalates (Credit 4-18)
1-35	**IAQ**	All carpet must contain no fly ash (Credit 4-21)
1-36	**Materials**	Achieve a minimum recycling rate of 75% of waste by weight (Credit 5-16)
1-37	**Materials**	Calculate embodied carbon (Credit 5-90)
1-38	**ESJ**	Achieve at least 35 points in Equity and Social Justice Section

Net Zero Energy Label (Optional)

Credit #	Category	Credit
1-39		Meet any star-level requirements plus point minimum
1-40	**Energy**	Demonstrate net zero energy performance over the course of a year
1-41	**Energy**	Provide an energy performance disclosure waiver

SECTION TWO: SITE AND WATER

SITE PROTECTION

OVERALL

2-1: Build on an infill lot to take advantage of existing infrastructure and reduce development of virgin sites

Responsible Party: Owner/Developer

Intent: Optimize the use of existing infrastructure (including services and transit), avoid infrastructure extensions and protect undeveloped productive agricultural land and natural habitat.

Performance Requirement: Demonstrate the lot boundary is within 100 ft of existing water, sewer and electrical service, and does not extend main gas line.

Infill lots are in areas in which each lot being developed already has access to municipal water and sewer, electricity, and roads, but *excluding* lots in designated critical areas or overly steep slopes. Land development and infrastructure installation must have been completed at least 5 years before the project site was acquired by the owner.

In those cases where a building already exists on the lot, Built Green encourages renovation of the existing structures if possible, or removal of the structure to another site to allow the highest use of zoning allowances. If the building is not structurally sound, then deconstruction, salvage and recycling of materials becomes the secondary goal.

Points: 10 points

When verified: Design Phase

Cross-reference: 2-3

2-2: Build in a planned Built Green development or certified Built Green Community

Responsible Party: Owner/Developer

Intent: Focus new construction in developments that are ecologically sound, and pedestrian and transit oriented.

Performance Requirement: Locate your project in a development that is already certified under the Built Green Community program, or which is requiring Built Green certification for projects within it.

Points: 10 points

When verified: Design phase

2-3: Build on a greyfield or brownfield site

Responsible Party: Owner/Developer

Intent: To enhance the utilization of previously developed sites that are currently under-utilized due to abandonment, or contamination.

Performance Requirement: Select a site which is either:

- Greyfield – Existing development is economically obsolescent, failing, moribund or underused, and at least 50% impervious surface. Provide a determination by an authority having jurisdiction, or an assessment by a qualified community economic development authority; or

- Brownfield – where development or reuse may be complicated by the presence or potential presence of hazardous pollutants. Provide a determination by an authority having jurisdiction over the site, or the finding of a Phase 1 or Phase 2 Environmental Site Assessment

Points: 20 points

When verified: Design phase

2-4: Create a low impact development as defined in handbook

Responsible Party: Owner/Developer, Civil Engineer

Intent: Prevent measurable physical, chemical, or biological degradation to streams, lakes, wetlands and other natural aquatic systems from real estate development sites. Low impact development (LID) defines an approach to site design and planning based on preserving or restoring the watershed's natural hydrologic functions as the natural site water management system. The goal is to create a site that provides the hydrologic functionally equivalent performance of the pre-development (native) forested hydrologic condition. Achieving this goal requires a comprehensive approach to planning and designing the site. Not all sites are appropriate for this comprehensive approach; however, there are individual techniques that can be used for any project.

Performance Requirement: To earn this credit, the project must meet the applicable local stormwater flow control code requirement using only groundwater infiltration, and on-site low impact development BMPs, as required in the 2019 Stormwater Management Manual for Western Washington and including rainwater harvesting for indoor reuse. I.E., the need for detention and other conventional stormwater BMPs is eliminated. There should be no overland flow or storm sewer conveyance off the site. Not all sites will be suitable for 100% retention, and credit can be earned for implementation of individual LID strategies under other credits in the Site and Water section.

Points: 30 points

When Verified: Review surface water management design prior to construction. Visual verification of installed BMPs at time of final inspections.

Cross-References: 2-8, 2-9, 2-10, 2-16, 2-20, 2-21, 2-22, 2-60

Resources:

Western and Eastern Washington Stormwater Manuals:
https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals

Low Impact Development Guidance: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Low-Impact-Development-guidance

Washington Stormwater Center: https://www.wastormwatercenter.org/low-impact-development/

The Low Impact Development Center, Inc.: www.lowimpactdevelopment.org

Washington State Nursery & Landscape Association LID Resources: https://www.wsnla.org/page/lowimpactdevelopment

Salmon Safe Certification: www.salmonsafe.org

2-5: Meet or exceed City of Seattle's Green Factor standards

Responsible Party: Owner/developer, civil engineer, landscape designer

Intent: Seattle Green Factor is a score-based code requirement that increases the amount of and improves the quality of landscaping in new development. Landscaping plays an important role in how new development looks and functions. Green Factor is required in some zones and for some building types in Seattle

Performance Requirement: For Seattle projects which have a Green Factor requirement, demonstrate compliance with Green Factor requirements using Landscape design documents and use the Green Factor calculator to calculate and document the Green Factor for the project.

Points Breakdown:

- Green Factor 0.6 5 points
- Green Factor 0.7 10 points
- Green Factor 0.8 15 points
- Green Factor 0.8 20 points
- Green Factor 1.0 25 points

When Verified: Design documents and Green Factor calculation should be reviewed prior to construction. Landscape should be visually verified when fully installed.

Resources:

Seattle Green Factor: https://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/seattle-green-factor

2-6: Bonus points: Use of Green Factor where it is not part of the project's jurisdictional development requirements

Responsible Party: Owner/developer, civil engineer, landscape designer

Intent: Seattle Green Factor is a score-based code requirement that increases the amount of and improves the quality of landscaping in new development. Landscaping plays an important role in how new development looks and functions. Green Factor is currently required in some zones and for some building types in Seattle.

Performance Requirement: For projects which do not have a Green Factor requirement (in Seattle or elsewhere), complete Credit 2-5 and earn additional points for a higher Green Factor score.

Points Breakdown:

- Green Factor 0.3 1 point
- Green Factor 0.4 2 points
- Green Factor 0.5 3 points
- Green Factor 0.6 4 points
- Green Factor 0.7 4 points
- Green Factor 0.8 4 points
- Green Factor 0.8 5 points
- Green Factor 1.0 5 points

These points are cumulative with those claimed in 2-5.

When Verified: Design documents and Green Factor calculation should be reviewed prior to construction. Landscape should be visually verified when fully installed.

Cross-references: 2-5

Resources:

Seattle Green Factor: https://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/seattle-green-factor

2-7: For each acre of development, set aside an equal amount of land as a conservation easement or transfer of development rights

Responsible Party: Owner

Intent: Limit the long-term ecological impact of new development by protecting areas of higher ecological value

Performance Requirement: Set up a permanent conservation easement on land of equal or greater size and ecological value than the development site; donate it to a community land trust; or enroll it in a Transfer of Development Rights (TDR) program where available.

Points: 20 points

When Verified: Documentation review at time of final inspection

Cross-reference: 2-11

Resources:

King County TDR program - http://www.kingcounty.gov/services/environment/stewardship/sustainable-building/transfer-development-rights.aspx

Snohomish County TDR program - https://snohomishcountywa.gov/1523/Transfer-of-Development-Rights

Washington Land Trusts - www.walandtrusts.org

The Land Trust Alliance - www.landtrustalliance.org

The Nature Conservancy - www.nature.org

The Trust for Public Land: https://www.tpl.org/

2-8: Avoid soil compaction by limiting heavy equipment use to building footprint and construction entrance

Responsible Party: General Contractor

Intent: Maintain the hydrological performance of the site

Performance Requirement: Develop and implement a soil protection plan, clearly identify areas where heavy equipment is allowed with construction fencing and signage, and communicate penalties for anyone operating equipment outside those areas

Points: 3 points

When Verified: Visually verify during intermediate construction inspections, with review of plan

2-9: Preserve existing native vegetation as landscaping (min. 25% preserved)

Responsible Party: Landscape Designer, General Contractor

Intent: Maintaining ecological and hydrological function on the site. Retaining mature native and climate adaptive vegetation in a landscape (rather than removing and then

replanting) reduces landscape maintenance, fertilizer and pesticide use, and also provides excellent erosion, sediment, dust, and pollution control.

Performance Requirement: Preserve existing native and climate-adaptive species on 25% or more of the vegetated area of the finished project.

During building layout, identify existing native plants, including trees and understory plants that you want to save. Identify and remove any non-native and invasive species as part of the preservation plan. Precautions during site preparation include the following:

- Define protected areas on plans and field stake or flag on site. Identify or flag non-clearing buffers, open spaces, and setbacks from streams, wetlands, and steep slopes as indicated on plat maps.
- Clear only actual areas needed to install driveways, parking areas, and building foundations.
- Review site areas to be graded with excavation crew to ensure compliance with preservation plan.
- Provide fencing for critical areas, such as tree root zones, to prevent crushing or filling.
- If trees only (not understory) are designated for protection, hand clearing of understory will help protect tree roots. Be careful, however, about exposing some trees by clearing around them—they may become hazards in strong winds or rain. Check with an arborist.
- Check grading operations frequently to prevent accidental damage to marked areas.
- Never park heavy equipment or store heavy materials under trees.

Points: 3 points

When verified: Design phase landscape plan review, visual verification during intermediate construction and final inspections

Cross-references: 2-8, 2-10

2-10: Retain trees on site

Responsible Party: Owner/Developer, Landscape Designer, General Contractor

Intent: Retain and protect mature trees to preserve the ecological and hydrological function of the site and provide shade and transpiration cooling.

Performance Requirement: Perform a tree survey and preserve a percentage of the existing healthy trees on site. Trees determined to be unhealthy or hazardous should be excluded from the calculation. Tree preservation plan must include tree protection measures during construction.

Points Breakdown: 1 point for each 20% of existing trees retained.

When Verified: Tree survey verified during design. Tree protection measures visually verified at intermediate inspection and final tree count at substantial completion.

Cross-reference: 2-8

2-11: Restore percentage of site outside the footprint for the life of the building

Responsible Party: Owner/Developer, Landscape Designer, General Contractor

Intent: Maintaining the hydrological and ecological function of the site. Preserving areas of healthy, organic soil, in situ, is the best solution for hydrological and ecological function. Setting aside undisturbed areas of the site helps preserve soil stability, structure and biological diversity, and complexity. Healthy soils support healthy vegetation and clean contaminants from stormwater runoff before they enter receiving water bodies. Natural, vegetated filter areas also allow rainwater to stay on site and soak into the ground, recharging groundwater, instead of running off site. In addition, they provide a cost effective head start on landscaping.

Performance Requirement: Leave a percentage of the site, including native and adaptive plant species undisturbed. Area should be fully protected during construction – no vehicles or lay down areas, or sediment on-flow. Invasive species should be removed to the extent feasible.

Where there are no significant undisturbed areas, the developer can choose an appropriate area in which to restore soil, water function and vegetation to mimic natural systems. Design work should be completed by someone with training and expertise in ecological restoration.

This area must be protected for the life of the building with a Conservation Easement, or equivalent covenant. Talk to local Community Land Trust organizations, or King County Parks.

Points Breakdown:

10% 10 points

20% 12 points

30% 15 points

When Verified: Set aside area verified during design. Conservation set aside reviewed no later than substantial completion of construction. Set aside area and protection measures visually verified at intermediate inspection and at substantial completion.

References:

Washington Land Trusts - www.walandtrusts.org

The Land Trust Alliance - www.landtrustalliance.org

The Nature Conservancy - www.nature.org

The Trust for Public Land: https://www.tpl.org/

Protect Natural Processes On-Site

2-12: Install and maintain temporary erosion control devices that significantly reduce sediment discharge from the site beyond code requirements

Responsible Party: Civil Engineer, General Contractor

Intent: Avoid stormwater related problems (erosion and increased runoff during construction), which can physical, chemical and biological degradation to receiving waters, delay construction, add costs, and damage public and private properties down-stream.

Performance Requirement: Develop and implement a temporary erosion and sedimentation control (TESC) Plan that exceeds minimum requirements (by including redundant, back-up BMPs, for example) and actively monitor and maintain all BMPs throughout the project

Points: 2 points

When Verified: Review erosion control plan prior to the start of construction. Visually verified at intermediate and final inspections.

Cross-references: 2-13, 2-14

Resources:

Salmon Safe Certification: www.salmonsafe.org

King County Erosion & Sediment Control Standards: https://your.kingcounty.gov/dnrp/library/water-and-land/stormwater/surface-water-design-manual/Appendix_D_FINAL_4_18_2016.pdf

2-13: Use compost to stabilize disturbed slopes during construction

Responsible Party: Civil Engineer, General Contractor

Intent: Minimize erosion and increased runoff during construction) and improve soil quality and health.

Performance Requirement: This credit only available on sites with defined slopes greater than 20%. Apply compost to cover the entire exposed soil surface, extending approximately 3 feet over the top of the slope or meshing into existing vegetation. The compost application rate will vary depending upon degree of slope, soil type, and compost characteristics. If slope is greater than 50% (2 horizontal to 1 vertical), do not use compost blanket; slope should be terraced with retaining walls.

Points: 3 points

When Verified: Visually verified during intermediate inspections

Cross-references: 2-12, 2-14

Resources:

King County Erosion & Sediment Control Standards:
https://your.kingcounty.gov/dnrp/library/water-and-land/stormwater/surface-water-design-manual/Appendix_D_FINAL_4_18_2016.pdf

2-14: Retain all native topsoil in-situ, or stockpile and protect from erosion

Responsible Party: Civil Engineer, General Contractor

Intent: Maintaining the hydrological and ecological function of the site. Native topsoil is the top layer of organic soil at the site. Undisturbed native topsoil is valuable because it has developed on the site over time and is well adapted to the climate and local vegetation. Even when disturbed and then replaced, will regain optimal performance sooner than imported soil. Imported topsoils are not as well adapted to your site and will not develop optimal nutrient structure, disease resistance, or hydrologic capabilities for several years.

Performance Requirement: Prepare a Soil Management Plan. Retain native topsoil in place and uncompacted as much as possible. Where it must be removed to expose structural soil, it should be separated, stockpiled and reused on site as a top layer in grading planting areas. Protect stockpiled topsoil from erosion by covering with compost or mulch, surround with a reusable silt fence and inspect regularly for proper coverage or sign of erosion until ready for reuse.

Points Breakdown:

Retain native topsoil outside the building footprint in-situ	5 points
Stockpile and protect topsoil for reuse at final grading	2 points

When Verified: Visually verified during intermediate and final construction inspections.

Resources:

King County Erosion & Sediment Control Standards: https://your.kingcounty.gov/dnrp/library/water-and-land/stormwater/surface-water-design-manual/Appendix_D_FINAL_4_18_2016.pdf

King County: Achieving the Post-Construction Soil Standard: https://kingcounty.gov/depts/dnrp/solid-waste/compost-calculator.aspx

King County Soil Management Plan: http://your.kingcounty.gov/solidwaste/documents/soil-management-plan.pdf

2-15: Balance cut and fill, while minimizing change to original topography

Responsible Party: Civil Engineer, General Contractor

Intent: Maintain hydrological function of the site and minimize the import and export of structural and organic soils

Performance Requirement: Develop and implement a detailed grading plan that avoids major alterations to the natural topography

Points: 3 points

When Verified: Review plan pre-construction, and visually verify during intermediate construction inspections

2-16: Amend disturbed soil with compost to a depth of min. 10 inches to restore soil environmental functions

Responsible Party: Civil Engineer, General Contractor

Intent: Improve soil quality and hydrological function. Compost amendments improve water infiltration and retention, reduce summer irrigation demand, and improve landscape health.

Performance Requirement: Prepare a Soil Management Plan. Amend soil to a depth of 10” or more with mature, stable compost. As a rule of thumb, a 2 to 1 ratio of existing soil to compost, by loose volume, will achieve the desired organics level of 8% to 13% by soil weight. The final depth of the amended soil will be between ten and twelve inches, depending upon the equipment you use.

Points: 4 points

When Verified: Visually verify at time of final inspections, with review of soil management plan

Cross-references: 2-3, 2-4, 2-11

Resources:

King County: Achieving the Post-Construction Soil Standard: https://kingcounty.gov/depts/dnrp/solid-waste/compost-calculator.aspx

King County Soil Management Plan: http://your.kingcounty.gov/solidwaste/documents/soil-management-plan.pdf

2-17: Replant or donate removed vegetation for immediate reuse

Responsible Party: Landscape Contractor, General Contractor

Intent: Preserve the ecological value of mature plants

Performance Requirement: Identify healthy mature vegetation for removal. Take appropriate steps to ensure plant survival – replant as soon as possible or keep shaded, protect root balls and maintain moisture levels during storage

Points: 2 points

When Verified: Review documentation on plant donations or visually verify on site replanting during construction.

Cross-reference: 2-9

2-18: Use plants salvaged from another site

Responsible Party: Landscape Contractor, General Contractor

Intent: Preserve the ecological value of mature plants

Performance Requirement: Install mature plants that have been salvaged from another site, either through a plant salvage program, or through direct collaboration with the owner

Points: 2 points

When Verified: Review documentation and visually verify mature plants at final inspection

Cross-reference: 2-17

2-19: Grind land clearing wood and stumps for reuse on site

Responsible Party: General Contractor

Intent: Cost effective way to reduce jobsite waste and amend the soil. Can also be used to protect stockpiled topsoil.

Performance Requirement: Use a chipper and/or tub grinder onsite to convert land clearing waste to mulch for erosion control mulch

Points: 3 points

When Verified: Visually verify in early construction or photo documentation

2-20: Manage specified percentage of stormwater from roof and site on site by 60%, 80% or 100%

Responsible Party: Architect, Civil Engineer, Landscape Designer

Intent: Reduce measurable physical, chemical, or biological degradation to streams, lakes, wetlands and other natural aquatic systems from real estate development sites, by limiting and buffering stormwater runoff from the site.

Performance Requirement: Design and install on-site storm water management BMPs that that are sized to retain on-site a percentage of the roof and impervious surface runoff from the 2-year, 24-hour storm event instead of directing it to the municipal storm system.

Points Breakdown:

60%	10 points
80%	20 points
100%	30 points

When Verified: Review sizing calculations at completion of design, visually verify BMPs at final inspections

Cross-references: 1-29, 2-4, 2-21

Resources:

Western and Eastern Washington Stormwater Manuals:
https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals

Low Impact Development Guidance: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Low-Impact-Development-guidance

Washington Stormwater Center: https://www.wastormwatercenter.org/low-impact-development/

The Low Impact Development Center, Inc.: www.lowimpactdevelopment.org

Washington State Nursery & Landscape Association LID Resources: https://www.wsnla.org/page/lowimpactdevelopment

HARDSCAPES

2-21: Design to achieve 50%, 75% or 90% effective pervious surface outside of building footprint; pervious hardscapes must meet minimum ASTM infiltration testing requirements to earn credit

Responsible Party: General Contractor, Civil Engineer, Pervious Pavement Installer

Intent: Pervious surfaces help to restore and maintain water hydrology of the site. They reduce measurable physical, chemical, or biological degradation to streams, lakes, wetlands and other natural aquatic systems from real estate development sites, by limiting and buffering stormwater runoff from the site. Stormwater best management practices include vegetated and pervious hardscaping stormwater facilities to treat stormwater on-site. Pervious paving materials may initially cost more than conventional paving materials (such as asphalt), but with proper design most conventional stormwater conveyance systems are eliminated. Applicable of pervious paving options include:

- Pervious concrete[1]
- Permeable pavers or permeable interlocking concrete pavers (PICP)[1]
- Porous asphalt[1]
- Uncompacted gravel or crushed stone[1]
- Open-cell concrete block pavers or grass pavers[1,2]
- Cast-in-place slab pavers or "Hollywood" driveway design[3]
- Non-grouted natural stone or wood pavers[4]
- Flexible porous mat using recycled composite materials[4]

Material Notes:

1. Rated for emergency access vehicles
2. Gravel, crushed stone, and grass pavers are not considered pervious for areas with routine vehicle traffic (e.g., driveways, drivelanes, or parking areas). These materials

and pavement systems will compact under repeated vehicle traffic. Additionally, grass pavers require watering in dry months to maintain their aesthetic appeal. Use these materials for walkways and other light-traffic areas.

   a. Exception: If the uncompacted gravel or crushed stone is reinforced with either an open-cell concrete block paver or a cellular containment product then it is considered pervious in vehicle traffic areas. Look for cellular containment systems that contain 100% recycled content.

3. A Hollywood driveway is made of two long strips of pavement for car support. The area between should be vegetated (preferably with a low-grow turf or walkable groundcover) or filled with uncompacted gravel or stone. Vegetated strips provide some infiltration of runoff, sediment filtering, and pollutant removal.

4. Not rated for vehicle loads

Pervious pavement design considerations:

Require a site-specific soil infiltration test (using ASTM D-3385 protocols) to be included in the geotechnical engineer's soil report—this is not typically standard. With site-specific soil infiltration information, the permeable pavement system can be accurately sized to optimize cost-effectiveness, even for type D soils with infiltration rates of less than 0.5 inches. The base/subbase thickness is determined for structural traffic loads and water storage hydrologic sizing using dynamic modeling over time. Using conventional static volume system modeling will result in a costly oversized baserock reservoir layer and unnecessary underdrains. If an underdrain is required for code approval, position the perforated pipe at least 4 inches above the bottom of the reservoir baserock layer to allow for water storage and infiltration. Perforated pipe placed at the bottom of the baserock bed or a trench will not allow for storage and infiltration.

"Disconnecting" impervious surfaces onsite is as important as the materials you select. Avoid situations in which one impervious surface drains onto another impervious surface, which magnifies stormwater runoff problems. Try to separate impervious surfaces with areas of turf, other vegetation, or gravel. Do not allow any roof drains, vegetated areas, or asphalt paved surfaces to drain onto the surface of pervious pavements. Runoff from these areas carry sediment that will greatly decrease pavement's infiltration rate and increase maintenance. Shedding asphalt fines is the only thing that will permanently clog previous pavements. Check dams in the reservoir base layer may be utilized on steeper slopes to aid infiltration, but pervious pavements should not be used on slopes greater than 15%.

Many jurisdictions have strict requirements for paving materials for city sidewalks, until pervious pavements are more widely accepted by jurisdictions as a public sidewalk

material they are excluded from the area of consideration of this credit. For those interested in the Built Green Communities checklist and including permeable sidewalks or roads in the project be sure to check with the city's civil engineer for requirements and approved materials.

Performance Requirement: Design landscape and engineered stormwater management facilities so that a percentage of the site outside the building footprint is either pervious (vegetated surfaces, pervious paving, etc.) or drains to an engineered stormwater facility designed to retain and infiltrate 100% of the runoff from that surface in a 50- or 100-year, 24-hour storm event without overflow to the municipal storm system.

All pervious pavements should be designed using Dynamic modeling to manage, at minimum, a 50- or 100-year storm event's hourly rainfall intensity pattern over a 24-hour period. Test pavement's infiltration rate at final inspection of pavement prior to vehicle traffic use. All pavement systems need to be tested using the material's appropriate ASTM infiltration testing protocol and meet the following infiltration performance requirement to be considered pervious surfacing:

Pervious Concrete: ASTM C-1701—Typical infiltration rate should be between 700–1500 inches of water/hr, with a minimum accepted rate of 350 inches. Three tests per 10,000 sq. ft. for multiple structure developments or two (2) tests per 5,000 sq. ft. for single structure developments (excluding DADUs); results should be averaged. Test locations should be at least 10 feet from each other. No test may be under 100 inches of water/hr. Qualified testers shall be certified as a NRMCA Certified Pervious Concrete Technician or higher.

Permeable Pavers or PICP: ASTM C-1781—Minimum infiltration rate of 10 inches of water/hour, or per manufacturer's performance specifications. Three tests per 10,000 sq. ft. for multiple structure developments or two (2) tests per 5,000 sq. ft. for single structure developments (excluding DADUs), results should be averaged. Test locations should be at least 10 feet from each other. No test may be under five (5) inches of water/hr.

Porous Asphalt: ASTM C-1701 - Typical infiltration rate should be between 700-1500 inches of water/hr, with a minimum accepted rate of 350 inches. Three tests per 10,000 sq. ft. for multiple structure developments or 2 tests per 5,000 sq. ft. for single structure developments (excluding DADUs), results should be averaged. Test locations should be at least 10' from each other. No test may be under 100 inches of water/hr.

All other pervious paving materials should perform at the manufacturer's minimum infiltration performance specifications or better.

List the infiltration test results in the checklist comments section. Only those areas that meet required infiltration rates may be counted towards the percentage of pervious hardscape.

Points Breakdown:

50% effective pervious surface	5 points
75% effective pervious surface	10 points
90% effective pervious surface	15 points

When Verified: Review of sizing calculations at completion of design. Visually verify BMPs at final inspections

Cross-references: 2-4, 2-5, 2-6, 2-20

Western and Eastern Washington Stormwater Manuals: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals

Low Impact Development Guidance: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Low-Impact-Development-guidance

Washington Stormwater Center: https://www.wastormwatercenter.org/low-impact-development/

The Low Impact Development Center, Inc.: www.lowimpactdevelopment.org

Washington State Nursery & Landscape Association LID Resources: https://www.wsnla.org/page/lowimpactdevelopment

Pervious concrete specifications, maintenance, and design details: http://www.bayareaperviousconcrete.com/resources

Interlocking Concrete Pavement Institute technical resources: https://icpi.org/technical-center

Porous Asphalt Technical information: https://www.wastormwatercenter.org/wp-content/uploads/Module-3.3-Porous-asphalt-10-20-14-1-slide.pdf

Seattle, SPU Allowable Permeable Pavement Wearing Course Materials: https://www.seattle.gov/Documents/Departments/SDCI/Codes/StormwaterSPUAllowablePermeablePavement.pdf

2-22: Install vegetated roof system (e.g. green roof) to reduce impervious surface on 25%, 50%, or 90%+ of total roof surface

Responsible Party: Architect, General Contractor

Intent: Vegetated roof systems (e.g., green roofs) are best suited for low-slope roofs. They are designed to protect the roof, enable rooftop plantings, provide energy benefits, and provide initial water quality benefits. Green roofs can detain over 50% of rainwater from a typical storm, reducing peak flow rates and improving water quality.

Multilayered green-roof systems are thicker than conventional roofs. Space must be allocated for the unusual insulation and roofing membranes. A green roof includes a synthetic waterproof membrane, a drainage layer, a thin soil layer (2 to 4 inches), and a cover with specific plant species adapted to the extremes of a rooftop environment. A thick sod of native grasses interspersed with wildflowers can be a wonderful architectural element and provide habitat for wildlife.

Green roofs can be very low maintenance and self-sustaining without need of irrigation, fertilizers, or pesticides. The initial cost might be higher than a good-quality conventional roof, but they last about twice as long so have a relatively low lifecycle cost. They also help to reduce building heat gain and urban heat islands. Additionally, the plantings sequester carbon dioxide and other air pollutants. Consult an expert on installation and maintenance needs.

Performance Requirement: Install vegetated roof system on 25%, 50% or 90%+ of roof surface. Minimum of 25% of the available roof area is dedicated to a vegetated roof system. Available roof area is considered the total roof area that is compatible with the installation of a vegetated roof system and excluding space necessary for exhaust piping, or mechanical systems. If the vegetated roof system is designed in a way that allows it to manage more stormwater than its physical footprint on the roof you may use the percentage of the roof's managed stormwater to determine the amount of points earned, rather than the physical area it takes up.

Points Breakdown:

25% 10 points

50% 15 points

90% 25 points

When Verified: Review of sizing calculations. Visually verify installation at final inspection

Cross-references: 2-4, 2-5, 2-6, 2-20

2-23: Integrate landscaping with parking area beyond code

Responsible Party: Architect, Landscape Designer, General Contractor

Intent: Reduce stormwater runoff, enhance appearance, reduce heat island effect, and provide habitat for wildlife and shade for cars

Performance Requirement: Exceed local code requirements for integrating landscaping into parking area by total square footage. Direct stormwater runoff from paving into landscape areas where appropriate.

Points: 1 point

When Verified: Visually verify during final inspections

Cross-references: 2-4, 2-20, 2-21, 2-25, 2-26

Reduce Urban Heat Island Effect

2-24: Install an ENERGY STAR qualified roof

Responsible Party: Architect, General Contractor

Intent: Using a high-albedo roof, as certified by ENERGY STAR, will reduce heat island effect – where ambient temperatures in built up areas increase due to the absorption and re-radiation of solar energy. In buildings with air conditioning, ENERGY STAR roofing may reduce summertime cooling loads, by reducing direct radiant gain, as well as reducing the temperature of ventilation air drawn through roof-top air handlers.

Performance Requirement: Specify and install an ENERGY STAR qualified roofing product for 90% of the roofing area not covered by vegetated roof, mechanical equipment, and accessible amenity areas.

Building operation and maintenance manuals should include periodic monitoring and cleaning plan (see manufacturer guidelines) to maintain the roof's reflectance.

Points: 5 points

When Verified: Visually verified at final inspection

Cross-references: 2-35, 5-70, 5-71, 5-72

2-25: Provide shading for 30% of hardscapes by using landscape, landscape features, or overhangs

Responsible Party: Architect, Landscape Designer

Intent: Reduce heat island effect and building heat gain

Performance Requirement: Install landscape or overhangs to cover at least 30% of hardscapes. Shading should be calculated at 12 noon Pacific Standard Time on June 21, with tree canopy at 5 years growth.

Points: 5 points

When Verified: Review of calculations at completion of design and visually verified during final inspections

Cross-references: 2-23, 3-15, 4-38

2-26: For all exterior hardscape, including surface parking, use only light-colored pavement for 90% of project area (Solar Reflective Index of .28 or better)

Responsible Party: Architect, General Contractor

Intent: Using light-colored, high-albedo paving materials will reduce heat island effect – where ambient temperatures in built up areas increase due to the absorption and re-radiation of solar energy. In buildings with air conditioning, light-colored paving around the building may reduce summertime cooling loads, by reducing the ambient temperature of ventilation air drawn into the building.

Performance Requirement: Install paving materials with an aged Solar Reflectance of 0.28 (or initial Solar Reflectance of 0.33) or better, or open pavers that are 50% vegetation, for 90% of the paved hardscape area of the project that will not be shaded by structure or vegetation at 5-year maturity.

Building operation and maintenance manuals should include periodic monitoring and cleaning plan to maintain the reflectance of the paving materials.

Points: 5 points

When Verified: Visually verified at final inspection

Eliminate Water Pollutants

2-27: Wash out concrete trucks in slab or pavement subbase areas, or use washout boxes

Responsible Party: General Contractor

Intent: Maintain hydrological function of site

Performance Requirement: Either use concrete washout boxes to capture concrete washout and break it up for recycling, or wash trucks out only in sub-base areas that will support impervious surfaces

Points: 1 point

When Verified: Visually verified during site construction visits

2-28: Establish and post clean up procedures for spills to prevent illegal discharges

Responsible Party: General Contractor

Intent: Prevent runoff from spills from contaminating the site, local waterways, and surrounding stormwater systems.

Performance Requirement: Create clean-up procedures plan that includes clean up procedures for materials that will be used on site. Post the plan prominently in a central location on site and refer to them regularly during safety meetings.

Points: 3 points

When Verified: Visually verified during site construction visits

2-29: Reduce hazardous waste through good jobsite housekeeping

Responsible Party: Architect, General Contractor

Intent: Prevent runoff from hazardous waste from contaminating the site, local waterways, and surrounding stormwater systems; limit worker exposure; and reduce the risk of accidental spills and cleanup liability.

Performance Requirement: Add requirements for use of non-hazardous alternative materials, when available, to Specifications. Create a good jobsite housekeeping plan. Post the plan prominently in a central location on site and refer to them regularly during safety meetings.

Points: 1 point

When Verified: Review specifications and visually verify during site construction visits

2-30: Construct tire wash, establish and post clean up protocol for use

Responsible Party: Civil Engineer, General Contractor

Intent: Limit the export of site sediments outside the temporary erosion and sediment control boundary (TESC).

Performance Requirement: Include on-site tire wash in TESC plan. Tire wash must be well marked as a wash area; be no larger than the largest vehicle; and posted with a sign that forbids washing with solvents or changing oil and indicates nearest oil recycling area. If the wash area is connected to the sanitary sewer, it must be paved and drain to an oil water separator. Otherwise, direct tire wash water to other sediment trap or pond. Provide temporary gravel base on site to keep vehicles clean. Post tire wash protocol for all trades or field labor using vehicles on site.

Points: 2 points

When Verified: Visually verified during on site construction visits

2-31: Use slow release organic fertilizers to establish vegetation

Responsible Party: Landscape designer, Landscape Installer

Intent: To protect surface- and ground-water from high concentrations of nutrients in stormwater runoff, which can cause algal blooms, reduce water quality and impede aquatic lifecycles.

Performance Requirement: All fertilizer used to establish newly installed landscaping should meet the following labelled requirements, defined by the Washington State Department of Agriculture:

- Slow release - At least 60% of the available nitrogen should be water insoluble, pelletized or slow release (excluding any coated urea).

Sufficient fertilizer to complete establishment should be provided to the building management (or included with a maintenance contract) and these labeling requirements should be included in the Operation & Maintenance documents.

Points: 2 points

When Verified: Final inspection or photo documentation

Resources:

Grow Smart, Grow Safe:
https://www.growsmartgrowsafe.org/NaturalYardCare/SoilAmendments

WSDA Pesticides and Fertilizer resources: https://agr.wa.gov/departments/pesticides-and-fertilizers

2-32: Use less toxic form release agent

Responsible Party: Concrete installers

Intent: To maintain site safety standards and protect surface- and ground water from contamination, by avoiding the use of common toxic concrete form release agents, such as diesel fuel, or hydraulic oil, which can contaminate storm water runoff

Performance Requirement: Form release agents must have total VOC levels of 250 g/L or less and must not contain petroleum solvent as the carrying agent.

Points: 2 points

When Verified: Visual verification during intermediate construction inspections, cut sheet or photo documentation

2-33: Use non-toxic or low-toxic outdoor materials for all landscaping

Responsible Party: Landscape Designer, General Contractor

Intent: Protect soil health and runoff water quality by eliminating toxins in the landscape

Performance Requirement: At least 75% (by cost or square footage) of landscaping structural and retaining materials should be either non-toxic (stone, concrete, naturally rot-resistant wood) or low-toxic (inert plastics, untreated ferrous metals, borate-treated wood).

Points Breakdown:

100% non-toxic: 10 points

Mix of non-toxic and low-toxic: 8 points

When Verified: Installed materials visually verified at final inspection, with review of product documentation if needed.

Cross-references: 5-13, 5-14, 5-82 through 5-86

2-34: Use only "Low Hazard" pesticides and herbicides for landscape installation and in Operations & Maintenance Plan

Responsible Party: Contractor**,** Owner, Property Management

Intent: Avoid the introduction of chemicals that are hazardous to humans, terrestrial and aquatic ecosystems

Performance Requirement: All pesticides and herbicides used in the preparation and installation of landscaping must only contain active ingredients that are rated as "Low Hazard/Green" on www.GrowSmartGrowSafe.org website. Avoid products whose active ingredient is rated "Red" for one or more sub-categories (Human, Pet & Wildlife, Aquatic Life or Water Pollution).

Include Grow Smart, Grow Safe documentation for the selected products in the landscape O&M manual, along with the language of this requirement for replacement products.

Points: 5 points

When Verified: Verify product documentation, landscape O&M language, and visually verify use on-site at time of final inspection

Cross-reference: 2-31

Resources:

Grow Smart, Grow Safe: www.growsmartgrowsafe.org

2-35: Do not use galvanized metal, EPDM, or PVC roofing materials

Responsible Party: Architect, General Contractor

Intent: Reduce chemical and biological degradation of nearby receiving waters and protect soil health and runoff water quality by reducing toxic chemicals, primarily heavy metals in roof runoff. Galvanized metal, EPDM and PVC roofing membranes have been shown to contribute significant levels of heavy metals to roof runoff water.

Performance Requirement: Project must use no galvanized metal, EPDM or PVC material for roofing.

Points: 5 points

When Verified: Visually verified at final inspection, with review of product documentation

Cross-references: 2-22, 2-24, 5-70, 5-71, 5-72

Resources:

Department of Ecology: Toxic chemicals in roof runoff:
https://apps.ecology.wa.gov/publications/documents/1403041.pdf

2-36: Use a modified bitumen built-up or TPO membrane roof

Responsible Party: Architect, General Contractor

Intent: Reduce heavy metal and other contaminants in roof run-off

Performance Requirement: Specify and install either modified bitumen built up roofing, or a TPO membrane roof, as the primary roofing system for the project. Both these roofing materials are proven to contribute fewer contaminants to roof runoff than other flat- or low angle roof products.

Points: 2 points

When Verified: Product documentation reviewed and visually verified at intermediate or final site visit

2-37: No clearing or grading during wet weather periods (November – April)

Responsible Party: Owner/Developer, Architect, General Contractor

Intent: Minimize loss of site soils and physical degradation of nearby receiving waters due to erosion and sediment transportation during rainy periods

Performance Requirement: No land clearing or grading work is done between November and April.

Points: 5 points

When Verified: Review construction schedule and verify actual clearing and grading dates after these activities are complete.

Cross-references: 2-8, 2-12, 2-13, 2-14, 2-15, 2-16

2-38: On-site wastewater treatment for greywater only or for blackwater and greywater, min. 50% captured

Responsible Party: Architect, Plumbing Engineer, Civil Engineer

Intent: Reduce dependence on centralized water treatment facilities

Performance Requirement: Install on-site treatment system sized to manage at least 50% of greywater, or 50% of combined blackwater and greywater generated on-site. Treated water should be reused on-site for toilettoilet flushing, irrigation, surface washdown, or other replacement for potable water.

Project teams must check with their local, health and building departments to determine what greywater and blackwater reuse options are allowed BEFORE pursuing this Credit.

Points Breakdown:

Greywater only: 40 points

Blackwater and greywater: 50 points

When Verified: Review design and sizing calculations and visually verify during site construction visit

Cross-references: 2-55, 2-56

Resources:

WA Water Reuse Permit Map: https://living-future.org/wp-content/uploads/2019/01/permit-map-Washington.pdf
(NOTE: Local regulations may vary from State standards)

ILFI A Decision-Maker's Guide to Cost-Effective Residential Potable Water Reduction in Seattle, WA: https://www2.living-future.org/potable-water-reduction

WA Dept of Health-Greywater Reuse: https://www.doh.wa.gov/communityandenvironment/wastewatermanagement/greywaterreuse

WATER CONSERVATION

OCCUPANT WATER REDUCTION

Climate change, population growth, and increasing development are placing ever more pressure on Washington's potable water sources. Warmer winters are reducing annual snow pact levels and causing melting earlier rather than later in the dry summer months. Summers are also increasingly drier and hotter. All these climatic changes will put significant strain on water supply and increase costs for those most vulnerable.

The case for water conservation was laid out succinctly by the International Living Future Institute (ILFI) in its 2021 report, *A Decision-Maker's Guide to Cost-Effective Residential Potable Water Reduction in Seattle, WA:* "Water-related utility rates in the city of Seattle are among the highest in the nation and will continue to rise over time. For a city that receives consistent rainfall for eight to nine months of the year, this may come as a surprise. According to Circle of Blue, Seattle's water, sewer, and stormwater rates are amongst the four highest in the nation and are higher than any city in California... Utility rates continue to rise every year as the city of Seattle grows, and Seattle Public Utilities must upgrade their infrastructure to meet the expanding demand. Seattle's 2020 rates increased by 3.7 percent and are expected to increase at a similar rate in the future. Homes and buildings with inefficient water use will have higher monthly bills as a result, potentially creating hardship and financial instability, especially for low-income residents. Small investments in water-efficient fixtures and additional investments in water reuse systems can reduce potable water usage and utility bills by 30 to 70 percent, depending on the building scale and rates charged by the utility. In some cases, water use reduction can result in savings of up to $500 annually per household—a significant amount that can justify the initial investment in water-saving infrastructure."

Potable water reduction strategies can increase a building's resilience in the event of municipal water system failure or drought and ensure that our watersheds remain healthy and supportive of both human and ecological needs in the future. ILFI provided the

following summary matrix for potable water reductions strategies for single-family homes based upon their 10 decision-making criteria:

Table 8. Analysis of Potable Water Reduction Strategies for 30-Unit Multifamily Project

MULTIFAMILY PROJECT											
System Type	Equipment Cost	Installation Cost	Capital Cost per Unit	O&M Cost	Ease of Installation	Ease of Permitting	Space Requirements (sq.ft)	% of Potable Water Savings	Paypack Period	Marketing + Storytelling Potential	Resiliency
Low-flow Fixtures	No additional cost	No additional cost	No additional cost	None	Easy	N/A	0	17%	0	Low	Low
Rainwater for Irrigation	$20,000	$2,000	$733	$1,000	Medium	Medium	270	2%	90	High	Medium
Greywater for Irrigation	$45,000	$5,000	$1,667	$5,000	Medium	Medium	430	8%	25	Medium	Low
Rainwater for Toilet Flushing	$3,000	$300	$110	$2,000	Medium	Medium	20	2%	25	High	High
Greywater for Non-Potable	$80,000	$8,000	$2,933	$8,000	Complex	Complex	100	49%	8	Medium	Medium

Table 12. Analysis of Potable Water Reduction Strategies for 100-Unit Multifamily Project

100-UNIT MULTIFAMILY PROJECT											
System Type	Equipment Cost	Installation Cost	Capital Cost per Unit	O&M Cost	Ease of Installation	Ease of Permitting	Space Requirements (sq.ft)	% of Potable Water Savings	Paypack Period	Marketing + Storytelling Potential	Resiliency
Low-flow Fixtures	No additional cost	No additional cost	No additional cost	None	Easy	N/A	0%	17%	0%	Low	Low
Rainwater for Irrigation	$15,000	$2,000	$170	$1,000	Medium	Medium	180	0.22%	110	High	Medium
Greywater for Irrigation	$100,000	$10,000	$1,100	$5,000	Medium	Medium	570	6%	21	Medium	Low
Rainwater for Toilet Flushing	$2,000	$200	$22	$2,000	Medium	Easy	20	0.22%	45	High	High
Greywater for Non-Potable	$145,000	$15,000	$1,600	$12,000	Complex	Complex	170	50%	4	Medium	Medium

(Source: ILFI, A Decision-Maker's Guide to Cost-Effective Residential Potable Water Reduction in Seattle, WA: https://www2.living-future.org/potable-water-reduction)

To maximize water and financial savings, multifamily developers are encouraged to invest in low-flow fixtures and vacuum-flush toilets, invest in greywater to non-potable infrastructure to supply water for flushing toilets, and capture rainwater for irrigation use. ***This combination of strategies is calculated to result in a 67-68% potable water savings per year.*** The greywater to non-potable infrastructure to supply toilets was calculated to have a payback period of only 4-8 years and with a potable water savings of 49-50%.

Moreover, water reuse systems are extremely expensive and disruptive to install into an existing building and are only feasible during a major remodel of the building. So, it is critical to consider stubbing-in or installing water reuse systems when the building is being built to reduce the burden of implementing these systems now, or in the future, as water

becomes more scarce and expensive. If water conservation is not prioritized now, in the coming decades it could be a significant limiting factor to development—impacting human health, equity, ecosystems, and the residential building industry's ability to thrive.

Developers and General Contractors must select between either a performance or prescriptive pathway to reduce occupant water use on their Built Green projects.

PERFORMANCE PATHWAY

2-39: Document a Water Efficiency Rating through WERS or WRI of 70 or less

Responsible Party: General Contractor, Plumbing Engineer, Landscape Architect, Verifier

Intent: Climate change is making historic precipitation patterns less reliable and droughts more frequent in Washington. While we can't predict which years will see drought, we know that climate change will increase pressures on existing water resources for both people and wildlife. To better measure our efforts and impacts in this area we have developed a performance pathway to demonstrate and communicate the impact water-conscious design can have in a measurable way.

Just like using energy performance models that predict and measure a home's energy efficiency (e.g., HERS), a water efficiency score can do the same for a home's water consumption. Having a measurable water use reduction metric is beneficial for developers, general contractors, occupants, and Built Green. Developers and realtors will be able to effectively communicate the expected water bill savings they are providing to potential buyers and residents. Residents will be better equipped to compare prospective homes by their expected cost of living. Built Green will be able to accurately measure the water savings of all Built Green homes and draw on those metrics to help local jurisdictions develop more green building incentives for our members.

> *Water Efficiency Rating Score* (WERS) calculates indoor water use empirically, based on the estimated loading from the main plumbing fixtures, clothes washers and pipe priming, while taking into account their associated efficiencies. WERS also includes the ability to account for outdoor water use, which includes rainwater and greywater catchment calculations. Requires a WERS qualified verifier.
>
> *Water Rating Index* (WRI), introduced in 2020 by National Green Building Standard (NGBS), indicates a property's total indoor and outdoor water use compared to a baseline. Only NGBS Green Verifiers with specialized training are eligible to score and verify for a home's features for a certified WRI score.
>
> *WaterSense 2.0* ensures that homes are at least 30 percent more water-efficient than a comparable home using typical new construction and meet homeowner

expectations for performance. Requires a WaterSense approved Home Certification Organization and Verifier. The WRI is one of the approved certifications to achieve WaterSense 2.0 certification. This is only applicable to projects pursuing Built Green 3-star certification.

Just like with the Home Energy Rating System (HERS) and the Energy Rating Index (ERI), scores are calculated and verified through 3rd party verifiers and given a value between 0-100; a lower score through WERS and WRI demonstrates higher efficiency. A score of 0 achieves Net Zero Water.

Performance Requirement: Use one of the following modeling options to document the required reduction in total water use. Food production areas are excluded. Rainwater harvesting and greywater systems can be utilized to offset potable water consumption.

Modeling options:

1. Certify through Water Rating Index (WRI) or Water Efficiency Rating Score (WERS). Provide final WRI or WERS score summary report. Built Green 3-Star projects may certify under WaterSense 2.0 to document 30% reduction. See Credit 2-40 for additional points available for these modeling pathways.

Points Breakdown:

WERS/ WRI of 70 or less/ EPA WaterSense 2.0 Certification	30 points	3-Star Requirement
WERS/ WRI of 60 or less	50 points	4-Star Requirement
WERS/ WRI of 50 or less	80 points	5-Star Requirement
WERS/WRI of 0 (net zero water)	100 points	

When Verified: Review preliminary modeling at completion of design. Visually verify water-saving strategies during intermediate construction and final inspections. Report final water use reduction calculations after final inspections.

Cross-reference: 1-4, 1-16, 1-30, 2-40

Resources:

Certification Modeling Pathways:

WERS Certification and calculator: https://www.wers.us/

Water Rating Index (NGBS): https://www.homeinnovation.com/services/certification/green_homes/certified_water_rating

EPA WaterSense Certification, Version 2.0: https://www.epa.gov/watersense/homes-specification#version2homes

2-40: Bonus: achieve EPA WaterSense 2.0 certification or Water Efficiency Rating Score (WERS or WRI) certification of 70 or less

Responsible Party: General Contractor, Verifier

Intent: Just like using energy performance models that predict and measure a building's energy efficiency (e.g., HERS), a water efficiency score can do the same for a building's water consumption. Having a measurable water use reduction metric is beneficial for Developers, owners, occupants, and Built Green. Through 3rd party certification developers and owners will be able to effectively communicate the expected water bill and operational savings they are providing to potential residents. Residents will be better equipped to compare prospective homes by their expected cost of living. Built Green will be able to accurately measure the water savings of all Built Green buildings and draw on those metrics to help local jurisdictions develop more green building incentives for our members. Incorporating an independent certification provides an additional level of quality assurance to the water efficiency score of a building.

Performance Requirement: Achieve additional certification through WERS or WRI with a score of 70 or less or EPA WaterSense 2.0. Provide certificate in verification packet.

Points: 10 points

When Verified: Review project enrollment with WERS, WRI or EPA WaterSense 2.0 at completion of design. Water efficiency score or certificate verified at project completion.

Cross-reference: 1-4, 1-16, 1-30, 2-39

Resources:

WERS Verifiers, Certification, and calculator: https://www.wers.us/

Water Rating Index (NGBS): https://www.homeinnovation.com/services/certification/green_homes/certified_water_rating

EPA WaterSense Certification, Version 2.0: https://www.epa.gov/watersense/homes-specification#version2homes

PRESCRIPTIVE PATHWAY

2-41: Mulch landscape beds with 4 inches of organic mulch

Responsible Party: Landscape designer, General Contractor

Intent: Enhance soil and landscape health, and water retention potential, and limit soil erosion.

Performance Requirement: Mulch all landscape beds with a minimum of 4 inches of organic mulch

Points: 2 points

When Verified: Visually verified during final inspection

2-42 Limit use of turf grass, or use no turf grass

Responsible Party: Landscape Designer, General Contractor

Intent: Reduce surface water runoff, protect water quality, and increase wildlife habitat and shading

Performance Requirement: Install landscaping other than turf grass for a percentage of the landscaped area. All landscaped areas, including public right-of-way areas (e.g., sidewalk strips and setbacks), are included to determine the percentage of area that turf grass was used. Clump grass, legume and wildflower mixes that will be mowed no more than twice per year are an acceptable alternative but should not be used for the entire non-turf area.

Turfgrass Water Conservation Alliance (TWCA) Qualified drought-tolerant turf grasses are considered drought-tolerant.

Points Breakdown:

25% of landscape not turf grass: 3 points

50% of landscape not turf grass: 6 points

75% of landscape not turf grass: 9 points

100% of landscape not turf grass: 12 points

When Verified: Review grass species specified in landscape plan and landscape area calculations at completion of design. Review receipts for species planted and visually verify at final inspection.

Cross-references: 1-16, 2-4, 2-5, 2-6, 2-9, 2-10, 2-11, 2-18, 2-25, 2-43, 2-47

Resources:

TWCA qualified turf products: https://www.tgwca.org/list-of-qualified-products.html

2-43: Landscape with plants appropriate for site topography and soil types, emphasizing use of plants with low watering requirements (drought tolerant)

Responsible Party: Landscape Designer, General Contractor

Intent: Reduce water use, maintenance, and chemical inputs for landscaping.

Performance Requirement: At least 90% of retained existing and newly installed landscaping must be appropriate to the topography and soil types, and be drought tolerant

Points Breakdown:

Drought tolerant: 5 points

Drought tolerant and native or pollinator-friendly: 8 points

When Verified: Review landscape plan and planting lists at completion of design, visually verify at final inspection

Cross-references: 1-16, 2-47

Resources:

Saving Water Partnership: Plant Lists: https://www.savingwater.org/lawn-garden/plants/plant-lists/

Seattle Green Factor drought tolerant plant list: http://www.seattle.gov/util/cs/groups/public/@spu/@usm/documents/webcontent/01_012309.pdf

TWCA qualified turf products: https://www.tgwca.org/list-of-qualified-products.html

Drought Tolerant "stepables": https://www.stepables.com/1/All_Drought-Wise_Drought_Tolerant_STEPABLES.html

Washington Native Plant Society Plant Lists: https://www.wnps.org/plant-lists

RainWise Planting Plan: https://eatyouryard.com/wp-content/uploads/2015/11/RainWise-Planting-Plan-1.pdf

Native Plants in the Coastal Garden: A Guide for Gardeners in BC and the Pacific Northwest, April Pettinger with Brenda Costanzo. - Rev. ed. - North Vancouver, B.C.: Whitecap Books, 2002. ISBN:1552853314

Real Gardens Grow Natives: Design, Plant & Enjoy a Healthy Northwest Garden, Eileen M. Stark. - Seattle: Skipstone, an imprint of Mountaineers Books, 2014. ISBN:9781594858666

Native Pollinator Habitat Restoration Guide: https://www.earthcorps.org/wp-content/uploads/The-Native-Pollinator-Habitat-Restoration-Guide-EarthCorps.pdf

Pollinator planting guides by zip code: https://www.pollinator.org/guides

2-44: Install sub-surface or drip systems for irrigation with controls for each zone, including weather or soil moisture-based modulation

Responsible Party: Landscape Designer, General Contractor

Intent: Reduce water consumption for irrigation through the use of appropriate, efficient irrigation systems, with proper controls.

Performance Requirement: Use surface or sub-surface drip irrigation in landscape planting beds (except ground-cover plants). Plantings should be hydro-zoned so that plants with dissimilar watering requirements are not located in the same irrigation zone. Irrigation control must allow for different time and duration of watering for each zone, and should have a soil-moisture sensor, on-site or internet-enabled weather interface to modulate irrigation in coordination with natural precipitation.

Commissioning of irrigation system by the designer or a third-party auditor, prior to turnover, is highly recommended

Points: 2 points

When Verified: Visually verified at final inspection

Cross-references: 2-45, 2-46, 2-48

2-45: Install a WaterSense irrigation system

Responsible Party: Landscape Designer, General Contractor

Intent: Reduce water consumption for landscape irrigation through appropriate irrigation system design.

Performance Requirement: Irrigation system must be designed by a WaterSense certified design professional and must include a WaterSense certified irrigation controller.

Points: 5 points

When Verified: Visually verify at final inspection, with review of designer credential and controller documentation

Commissioning of irrigation system by the designer or a third party WaterSense auditor, prior to turnover, is highly recommended

Cross-references: 2-42, 2-44, 2-46, 2-48

Resources:

EPA WaterSense Outdoors: www.epa.gov/watersense/outdoors

2-46: Irrigation system commissioned by a professional to ensure no leaks, efficient system

Responsible Party: Owner, Landscape Designer, General Contractor

Intent: Ensure that the irrigation system is installed per the design, is functioning properly and has accurate, understandable operating instructions provided to the property management company.

Performance Requirement: Irrigation designer must specify the basis of design for the operation of the system. At completion of installation and when water is hooked up, the irrigation system must be tested for leaks, for no overspray and head to head coverage of broadcast emitters, proper delivery of water per design, proper setting and operation of the controls (consistent with the WaterSense irrigation audit requirements). Commissioning can be performed by the WaterSense Certified irrigation designer, another WaterSense accredited professional, or equivalent qualified irrigation professional as approved by Built Green.

Points: 3 points

When Verified: Verify the irrigation commissioning report at completion of construction.

Cross-references: 2-44, 2-45, 2-48

Resources:

EPA WaterSense Outdoors: www.epa.gov/watersense/outdoors

2-47: Install landscaping that requires no potable water for irrigation whatsoever after initial establishment period (approximately 2 years)

Responsible Party: Landscape Designer, Plumbing Engineer, General Contractor

Intent: Reduce potable water use for landscaping

Performance Requirement: 100% of landscaping either requires no watering after two years or greywater or rainwater systems are installed for ongoing watering. Landscape designer must provide written statement of design intent to meet this requirement, must confirm the installation meets the design intent, and provide landscape maintenance requirements for the establishment and post-establishment periods.

If using non-potable water for irrigation, landscape designer must also calculate landscape irrigation demand, and show that rainwater harvest/storage, and/or greywater treatment

capacity is sufficient to meet demand. Water system designer must provide Operations & Maintenance requirements for the system. May be combined with Credit 2-43.

Points: 10 points

When Verified: Review statement of design intent and maintenance requirement at time of final inspections. Visually verify salvaged water system and review sizing calculations

Cross-references: 1-30, 2-43

2-48: Install rainwater collection system (cistern) that reduces water consumption for irrigation

Responsible Party: Architect, Landscape Designer, Plumbing Designer, General Contractor

Intent: Reduce potable water use for landscaping

Performance Requirement: Install rainwater collection system where the water collected can be used for irrigation for at least 25% of irrigation needs

Points Breakdown:

25% of irrigation needs met by cistern	5 points
50% of irrigation needs met by cistern	10 points
75% of irrigation needs met by cistern	15 points
100% of irrigation needs met by cistern	20 points

When Verified: Review sizing calculations and visually verify at final inspection

Cross-references: 2-45, 2-46, 2-47, 2-49

Resources:

WA Dept of Health-Greywater Reuse: https://www.doh.wa.gov/communityandenvironment/wastewatermanagement/greywaterreuse

Ecotrope Cistern Sizing Tool: http://ecotope.com/cistern-sizing-tool/

2-49: Provide 100% of building and landscaping water use with captured precipitation or reused water purified without the use of chemicals

Responsible Party: Architect, Landscape Designer

Intent: Net zero water! Project lives within the constraints of the site's natural water income from precipitation.

Performance Requirement: After an initial startup volume of imported water, the building does not receive any potable water from an outside utility. All water is supplied on site from captured rainwater or reused water purified without the use of chemicals.

Project teams must check with their local, Health and Building Departments to determine what greywater and blackwater reuse options are allowed BEFORE pursuing this Action Item.

Points: 80 points

When Verified: Review design and calculations at completion of design, visually verify all components at final inspection

Cross-references: Credits under Occupant Water Reduction, 2-42 through 2-56

Resources:

ILFI A Decision-Maker's Guide to Cost-Effective Residential Potable Water Reduction in Seattle, WA: https://www2.living-future.org/potable-water-reduction

WA Dept of Health-Greywater Reuse: https://www.doh.wa.gov/communityandenvironment/wastewatermanagement/greywaterreuse

Ecotrope Cistern Sizing Tool: http://ecotope.com/cistern-sizing-tool/

WA Water Reuse Permit Map: https://living-future.org/wp-content/uploads/2019/01/permit-map-Washington.pdf
(NOTE: Local regulations may vary from State standards)

ILFI: Toward Net Zero Water: https://living-future.org/wp-content/uploads/2016/11/Toward_Net-Zero_Water.pdf

2-50: Install ALL bathroom faucets with 1.0gpm 0.5 gpm, or less, must be WaterSense labelled

Responsible Party: Architect, Plumbing Engineer, Plumbing Subcontractor

Intent: Reduce consumption to conserve water and energy associated with the delivery and treatment of water and wastewater and reduce building operating expenses.

Performance Requirement: All bathroom faucets/aerators (in units AND common areas) should be WaterSense labelled and must deliver 1 gpm or less in normal operating conditions. Rebates may be available for low-flow fixtures.

NOTE: If using 0.5gpm fixtures, ensure that fixture branch lines from hot water source to faucet are small diameter, and as short as possible, to minimize hot water wait times. 50 feet of ½" PEX contains 0.5 gallons of water, which takes 60 seconds to run through to hot.

Points Breakdown:

≤ 1gpm 1 point

≤ 0.5gpm 3 points

When Verified: Verify by flow test at final inspection

Cross-reference: 1-16

Resources:

EPA WaterSense Home: www.epa.gov/watersense

Saving Water Partnership Home: www.savingwater.org

2-51: Install ALL kitchen faucets with 1.8 gpm or less

Responsible Party: Architect, Plumbing Engineer, Plumbing subcontractor

Intent: Reduce consumption to conserve water and energy associated with the delivery and treatment of water and wastewater and reduce building operating expenses.

Performance Requirement: All kitchen faucets/aerators (in units AND common areas) should be WaterSense labelled and must deliver 1.8 gpm or less in normal operating conditions. Rebates may be available for low-flow fixtures.

Points: 3 points

When Verified: Verify by flow test at final inspection

Cross-reference: 1-16

Resources:

EPA WaterSense Home: www.epa.gov/watersense

Saving Water Partnership Home: www.savingwater.org

2-52: Install ALL showerheads with 1.75 gpm, 1.5 gpm or less, must be WaterSense labelled

Responsible Party: Architect, Plumbing Engineer, Plumbing subcontractor

Intent: Reduce consumption to conserve water and energy associated with the delivery and treatment of water and wastewater and reduce building operating expenses.

Performance Requirement: All showerheads (in units AND common areas) should be WaterSense labelled and must deliver 1.75 gpm or less in normal operating conditions. Rebates may be available for low-flow fixtures.

Points Breakdown:

1.75 GPM	5 points
1.5 GPM or less	7 points

When Verified: Verify by flow test at final inspection

Cross-reference: 1-16

Resources:

EPA WaterSense Home: www.epa.gov/watersense

Saving Water Partnership Home: www.savingwater.org

2-53: Install WaterSense labelled toilets

Responsible Party: Plumbing Designer, General contractor

Intent: Reduce indoor water consumption through the use of reliable, high efficiency toilets in units and amenity areas.

Performance Requirement: Install WaterSense-labelled, high efficiency toilets in all units and common areas. All toilets must comply to earn the points for each threshold. If using toilets with different flush rates, calculate the weighted average flush rate to demonstrate compliance.

Points Breakdown:

Average 1.28 gallons per flush (gpf)	4 points
Average 1.1 gpf	8 points
Average 0.8 gpf	12 points

(NOTE: At time of publication, WaterSense does not have a labelling standard for flushometer toilets. Therefore, if you install flushometer toilets they are exempt from the WaterSense labelling requirement, but must be specified as 1.28 gpf or less)

When Verified: Visually verified at final inspection, including confirmation that toilets fill to the max water level marked in the tank. Review product documentation.

Cross-reference: 1-16

2-54: Install no-cartridge waterless urinals or 1/8 gallon urinals and 1.28 gpf maximum (WaterSense if not flushometer) toilets in all common areas

Responsible Party: Plumbing Engineer, Plumbing Contractor

Intent: Reduce indoor water consumption through the use of reliable, high efficiency urinals in common/amenity areas

Performance Requirement: Install no-cartridge waterless or 1/8 gallon urinals; and 1.28 gpf WaterSense or flushometer toilets in all common areas.

Points: 4 points

When Verified: Visually verify at final inspection, with review of product documentation

Cross-reference: 1-16

2-55: Stub-in plumbing to use greywater for toilet flushing (must test for leaks)

Responsible Party: Plumbing Engineer, General Contractor, Plumbing Subcontractor

Intent: Future-proof the building to preserve potable water sources when greywater treatment becomes more widely available.

Performance Requirement: Keep greywater and blackwater separate until it exits the building and route greywater to a location where it can be tapped for future treatment system. Run purple "reclaimed water" supply piping to all toilet locations and stub out at wall near potable supply, for future switch out. Pressure test and label system. Provide as-built details to owner.

Points: 15 points

When Verified: Visually verify during intermediate construction inspections

Cross-references: 2-38, 2-49

Resources:

ILFI A Decision-Maker's Guide to Cost-Effective Residential Potable Water Reduction in Seattle, WA: https://www2.living-future.org/potable-water-reduction

WA Dept of Health-Greywater Reuse: https://www.doh.wa.gov/communityandenvironment/wastewatermanagement/greywaterreuse

WA Water Reuse Permit Map: https://living-future.org/wp-content/uploads/2019/01/permit-map-Washington.pdf
(NOTE: Local regulations may vary from State standards)

2-56: Use greywater or rainwater for toilet flushing

Responsible Party: Architect, Plumbing Engineer, Plumbing subcontractor

Intent: Reduce use of potable water, and reduce flow volumes in sanitary and storm sewer systems

Performance Requirement: Install an on-site greywater or rainwater collection and storage system that is large enough to provide flushing water for entire project and plumb all toilets to flush from this system, using purple, "reclaimed water" piping, appropriately labelled. Provide specific Operations & Maintenance guidance to owner/property management. May be combined with Credit 2-38, but not 2-48 and 2-49.

Project teams must check with their local, health and building departments to determine what greywater and rainwater reuse options are allowed BEFORE pursuing this credit.

Points: 30 points

When Verified: Review of plans and sizing calculations and visually verify plumbing at pre-drywall inspection

Cross-references: 2-38, 2-55

Resources:

ILFI A Decision-Maker's Guide to Cost-Effective Residential Potable Water Reduction in Seattle, WA: https://www2.living-future.org/potable-water-reduction

WA Dept of Health-Greywater Reuse: https://www.doh.wa.gov/communityandenvironment/wastewatermanagement/greywaterreuse

WA Water Reuse Permit Map: https://living-future.org/wp-content/uploads/2019/01/permit-map-Washington.pdf
(NOTE: Local regulations may vary from State standards)

2-57: Provide water sub-metering for each unit

Responsible Party: Owner, Plumbing Designer

Intent: Facilitate water conservation by providing consumption feedback to consumers, and the potential to charge for water based on actual consumption. Also provides greater granularity to leak detection analysis.

Performance Requirement: Install sub-meters on cold water supply to each unit, and hot water if centrally heated. Consumption data must be made available to tenants either via through a direct utility billing service, written statement or access to a web-based utility consumption dashboard.

Points: 3 points

When Verified: Visually verified at final inspection, including evidence of consumption data communication system.

2-58: Limit pipe volume between water heat source and furthest fixture

Responsible Party: Architect, Plumbing Engineer, Plumbing Contractor

Intent: Reduce water and energy consumption

Performance Requirement: Pipe run between hot water source (tank, recirc loop, or unit manifold) and furthest fixture should store no more than 0.5 gallons of water. Floorplans must facilitate short pipe runs and plumbing design should use smallest allowable pipe diameter. Document sizing calculations for all typical unit types.

Points Breakdown:

0.5 gallons stored 3 points

0.3 gallons stored 5 points

When Verified: Review sizing calculations at completion of design, and visually verify typical pipe runs during intermediate construction inspections

Cross-references: 3-28, 3-29, 3-31

Resources: 0.5 gallons represents the following maximum pipe runs from the hot water source (tank, recirc loop or unit manifold) to the furthest fixture. For 0.3 gallons, multiply run length by 0.6. For a branch with multiple diameters, calculate the aggregate volume.

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

ELIMINATE WATER POLLUTANTS

2-59: Do not install garbage disposal

Responsible Party: Architect, General Contractor

Intent: Reduce potable water use and negative impacts on water quality and sewage treatment facilities.

Performance Requirement: No garbage disposals are installed in any unit or common area sinks

Points: 1 point

When Verified: Visually verified at final inspection

DESIGN ALTERNATIVES

2-60: Follow comprehensive integrated design plan for site and structure

Responsible Party: Owner, Architect, Contractor

Intent: Optimize the water quality and conservation performance outcomes of site and building by setting clear objectives; designing the most effective, constructible solutions; clearly communicating performance objectives and expectations; checking progress and confirming objectives are achieved.

Performance Requirement: At a minimum, maintain a log of the following elements of your development process:

1. A statement of the owner's functional, environmental, and financial goals for the project.
2. A description of how progress and success towards these goals will be measured through design, construction and operation to ensure that the green features are included and correctly installed.
3. Identify members of the project team, with an explanation of the role of each person, their contribution to the achievement of your Built Green certification, and how and when they will be involved.
4. A summary of the process used to select the green building strategies, systems, and materials that will be incorporated into the project.
5. A description of how achievement of objectives will be monitored in construction and confirmed at completion.

6. A plan for how issues will be resolved, if progress on certain goals are not meeting targets.

Points: 10 Points

When Verified: In design and construction, with document review at time of final inspection

2-61: Take advantage of parking reduction credits that are available in your jurisdiction, or no parking

Responsible Party: Architect

Intent: Reduce impervious surface and excess land usage for surface parking; or materials needed for structured parking

Performance Requirement: Reduce parking below the minimum standard for the zone, by pursuing offered reduction credits. Incorporate into design and operating policies any parking reduction strategies that are offered by local jurisdiction – such as providing additional affordable units, senior-assisted living, provision of alternate transportation options, etc. If no on-site parking is provided then the project is required to also earn Credit 6-26, 6-28, or 6-34 to provide adequate access to alternative transportation options.

Points Breakdown:

Parking reduced below minimum standard for the zone: 2 points

No parking provided (requires Credit 6-26, 6-28, or 6-34): 10 points

When Verified: Review documentation, and visually verify any required parking provisions at time of final inspection.

Cross-references: 2-62, 6-26, 6-28, 6-34

2-62: Provide structured parking within the proposed building footprint at a 50% minimum or 100%

Responsible Party: Architect

Intent: Reduce stormwater management and excess land usage of surface parking

Performance Requirement: Provide at least 50% of project parking stalls in structured parking within the building footprint

Points Breakdown: 50% minimum and 1 point per 10% after that. Maximum 10 points.

50% of parking within building footprint 5 points

100% of parking within building footprint 10 points

When Verified: Visually verified at final inspection

Cross-reference: 2-61

BENCHMARKING

2-63: Commit to annual benchmarking of building water consumption using ENERGY STAR Portfolio Manager and to sharing this information with Built Green

Responsible Party: Owner, Property Management

Intent: Increase access to whole building water consumption data for building performance measurement purposes

Performance Requirement: Create a building account in ENERGY STAR Portfolio Manager (ESPM) and set up a system for collecting monthly water consumption data from utility bills and entering it into ESPM. Third-party billing services, and building performance monitoring services can provide this service. Share the ESPM Account with the Built Green Program Manager Account (builtgreen@mbaks.com).

Points: 5 points

When Verified: Review ESPM account, and utility data collection plan at time of final inspection. Confirm sharing was successful with Built Green's ESPM account.

Cross-references: 3-45, 3-46

Resources:

ENERGY STAR Portfolio Manager: www.energystar.gov/buildings/facilityowners-and-managers/existing-buildings/use-portfolio-manager

2-64: Install a prominent water use display in high traffic common area

Responsible Party: Owner, Plumbing Designer

Intent: Employ smart technology to raise awareness of distribution and consumption of water resources

Performance Requirement: Track building water use through ENERGY STAR Portfolio Manager or similar tool, and display building water performance prominently on an installed or virtual building performance dashboard.

Points: 7 points

When Verified: Visually verify installation and tracking plan at final inspection

Extra Credit for Site and Water

2-65: Extra credit for innovation in Site and Water, subject to approval by Built Green Program Manager

You may submit a site or water saving strategy or system, not specifically called out in this Section, for consideration for an Extra Credit for Innovation. All extra credits are subject to approval by the Built Green Program Manager. If approved, add up to 10 points to your Section total.

Section Three: Energy

Energy Improvement

MULTIFAMILY PERMITTED UNDER RESIDENTIAL CODE (SELECT ONE)

3-1: Document a building performance ERI of 62 or less, before PV Solar generation is included

Responsible Party: Architect, Energy Consultant, MEP Engineers

Intent: Improve the energy performance of buildings by simulating performance and assessing the cost/benefit of energy conservation measures. The Energy Rating Index (ERI) is a scale with numbers that range from 0 (to represent Net Zero Energy) to 100 (to represent the approximate efficiency of a home built to the 2006 IECC). Each number on the ERI scale represents a 1% change in the relative energy efficiency of the building. Each point higher is 1% less efficient, and each point lower is 1% more efficient. Using ERI for compliance allows more flexibility in how developers obtain energy efficiency in their projects than prescriptive energy code credits. It also makes it easier for developers, owners, and potential residents to compare and appraise green homes across different markets and certifications.

Performance Requirement: Follow RESNET/ANSI Standards, IECC ERI Guidance, and see Built Green 2018 WSEC Energy Modeling Guidelines. Required documentation: summary modeling report showing the pre-solar ERI and post-solar ERI (if applicable). The base ERI requirement of 62 or less must be met before any additional gains to ERI from PV solar are included. Cannot be combined with credits 3-2.

Points Breakdown:

ERI 62-56	30 points	3-star requirement
ERI 55-48	50 points	4-star requirement
ERI 47 or less	80 points	5-star requirement

When Verified: The energy model should be completed at the earliest feasible opportunity in order to help inform design decisions. The energy model output reports that document energy savings should be reviewed and verified once the design is finalized. In many cases this may be close to substantial completion, as in cases of "as-built" changes to the equipment specs.

Cross-references: 1-7, 1-17, 1-31

Resources:

Built Green 2018 WSEC Energy Modeling Guidelines: https://builtgreen.net/certification/#checklistandhandbook

Implementation Guidelines for the ERI Performance Path: https://www.resnet.us/wp-content/uploads/Implementation-Guidelines-for-the-ERI-Performance-Path.pdf

RENET Standards Technical Requirements: https://standards.resnet.us/#t=minhers_adv%2FCh_3%2FTechnical_Requirements.htm&rhsearch=Table%204.5.2(1)&rhhlterm=Table%204.5.2(1)&rhsyns=

Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index: https://www.resnet.us/wp-content/uploads/PDS-01-of-BSRRESNETICC-301-2014-Addendum-D-201x.pdf

Standard for Grading the Installation of HVAC Systems: http://www.resnet.us/wp-content/uploads/archive/resblog/2019/03/WD02_RESNETACCA_310-2019-03-24_clean.pdf

Standard for Testing Airtightness: https://www.resnet.us/wp-content/uploads/ANSIRESNETICC_380-2019_vf1.24.19_cover%5E0TOC-2.pdf

The IECC Energy Rating Index and HERS Index: What's the Difference?: https://www.resnet.us/articles/the-iecc-energy-rating-index-and-hers-index-whats-the-difference/

3-2: Document building improvements beyond 2018 WSEC using a prescriptive approach by earning at least 5.5 credits on R406.3 table, less than 50% of points may come from PV solar generation

Responsible Party: Architect/Designer, Energy Consultant, Mechanical Electrical Plumbing Engineers

Intent: Provides a prescriptive approach to incorporating above-code energy and carbon reductions. Theoretically, each additional 1.0 energy efficiency credit earned from table R406.3 represents an additional 6% savings in building energy use.

Performance Requirement: Section Appendix RA/RB "Optional Energy Efficiency Measures" section of the 2018 WSEC (page 98 of code PDF language). Provide a table of which energy credits from table R406.3 were earned, including total amount of credits earned. Show the details in the construction documents, pictures, and receipts as applicable. Less than 50% of WSEC credits may come from PV solar generation, and the size of the system (in kWh) must be documented. Cannot be combined with credits 3-1.

Points Breakdown:

5.5 credits	30 points	3-star requirement
6 credits	50 points	4-star requirement
7 credits	80 points	5-star requirement

When Verified: Visually verify documents during design, as-builts during pre-drywall, commissioning, and final inspection.

Cross-references: 1-7, 1-17, 1-31

Resources:

2018 Washington State Energy Code Residential:
https://sbcc.wa.gov/sites/default/files/2021-01/2018%20WSEC_R%20Final%20package2.pdf

Built Green 2018 WSEC Energy Modeling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

MULTIFAMILY PERMITTED UNDER COMMERCIAL CODE (SELECT ONE)

Mixed-use buildings must comply with the following: of the building's occupiable square footage up to 20% of leased square footage may be for non-residential use, and all leased non-residential tenant floor area is limited to the ground/street level. Occupiable square footage is considered all areas developed for tenant use whether it is for residential dwelling units or leased non-residential space (required space for parking and MEP systems is excluded). Residential tenant common/amenity areas, including halls, stairs and elevators, are considered a part of residential use.

3-3: Document a building performance factor of 0.55 or less

Responsible party: Architect, Energy Consultant, MEP Engineers

Intent: Reduce the energy consumption and carbon emissions of buildings by simulating performance and assessing the cost/benefit of energy conservation measures. Use the energy modeling compliance path dictated by 2018 WSEC C407 Total Building Performance to document that the project has a lower energy-code-defined Performance Cost Index (PCI) than the baseline allowance when applying the appropriate Building Performance Factor (BPF) for the target Built Green Star Rating.

Note: The WSEC has redefined the PCI in terms of energy related carbon emissions rather than energy cost but did not rename the metric.

Performance Requirement: The 2018 WSEC energy modeling compliance path, C407 Total Building Performance, is a modified version of the AHSRAE 90.1-2016 Appendix G Performance Rating Method. Follow the C407 methodology, to create an energy model of the Proposed design as well as an Appendix G Baseline design. Code-prescribed Carbon Emission Factors in Table C407.3(1) are applied to the energy models' annual energy consumption predictions to convert to a carbon emission metric. A Building Performance Factor (BPF) multiplier is applied to all regulated (energy code defined) energy use in the Baseline model, which then sets the maximum annual carbon emission allowance that the Proposed model must be *lower* than to show compliance. Cannot be combined with credit 3-4.

Point Breakdown:

Achieve a BPF of 0.55	30 points	3-star requirement
Achieve a BPF of 0.52	50 points	4-star requirement
Achieve a BPF of 0.48	80 points	5-star requirement

When Verified: The energy model should be completed at the earliest feasible opportunity in order to help inform design decisions. The energy model output reports that document energy savings should be reviewed and verified once the design is finalized. In many cases this may be close to substantial completion, as in cases of "as-built" changes to the equipment specs.

Cross-references: 1-7, 1-17, 1-31

Resources:

2018 Washington State Energy Code Commercial:
https://sbcc.wa.gov/sites/default/files/2020-04/2018%20WSEC_C%202nd%20print.pdf

Built Green 2018 WSEC Energy Modeling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

PNNL – Developing Performance Cost Index Targets for ASHRAE Standard 90.1 Appendix G – Performance Rating Method: https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-25202Rev1.pdf

ASHRAE 90.1-2016 Energy Standard for Buildings Except Low-Rise Residential Buildings: Read-Only Versions of ASHRAE Standards {Scroll down to the "Standards And Guidelines Referenced in Code" section}

3-4: Document building improvements beyond 2018 WSEC using a prescriptive approach; earning at least 11 credits on the C406.1 table

Responsible Party: Architect/Designer, Energy Consultant, Mechanical Electrical Plumbing Engineers

Intent: Provides a prescriptive approach to incorporating above-code energy and carbon emissions reductions. Theoretically, each additional 1.0 energy efficiency credit earned from table C406.1 represents an additional 6% savings in building energy use.

Performance Requirement: Provide a table of which energy credits from table C406.1 were earned, including total amount of credits earned. Show the details in the construction documents, pictures, and receipts as applicable. Less than 50% of WSEC credits may come from PV solar generation, and the size of the system (in kWh) must be documented. Cannot be combined with credits 3-3.

Mixed-Use buildings: Initial construction of unimproved tenant space and their related accessory areas that will be completed and occupied under a separate permit (i.e. core-and-shell space) shall achieve at least 1 credit from Table C406.1. Low energy spaces shall achieve a minimum number of credits from Table C406.1 based on star level (three credits for 3-Star certification, four credits for 4-Star certification, and five credits for 5-star certification). These are the only Built Green requirement for Low energy spaces and unimproved future tenant space with their accessory areas, and these areas shall be EXCLUDED from the area weighted C406 calculations for the rest of the project. Please see the Built Green Energy Modeling Guidelines Appendix A for further details.

Points Breakdown:

11 credits	30 points	3-star requirement
16 credits	50 points	4-star requirement
23 credits	80 points	5-star requirement

When Verified: Visually verify documents during design, as-builts during pre-drywall, commissioning, and final inspection.

Cross-references: 1-7, 1-17, 1-31

Resources:

2018 Washington State Energy Code Commercial:
https://sbcc.wa.gov/sites/default/files/2020-04/2018%20WSEC_C%202nd%20print.pdf

Built Green 2018 WSEC Energy Modeling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

ADDITIONAL CERTIFICATIONS

3-5: Build a net zero or net positive energy building that draws zero outside power or fuel on a net annual basis

Responsible Party: Architect, Energy Consultant

Intent: Design and construct buildings that the annual site energy consumption of the building is roughly equivalent to the annual energy production capacity of renewable energy generation systems installed on-site, e.g., Net Zero Energy (NZE). Alternatively, demonstrate that the building can generate more energy than it needs on a net annual basis, e.g., Net Positive Energy (NPE). Typically, the excess energy generated on-site is used to provide power for electric vehicle charging.

Performance Requirement: Demonstrate Follow RESNET/ANSI Standards, IECC ERI Guidance, and see Built Green 2018 WSEC Energy Modeling Guidelines. Required documentation: summary modeling report showing pre-solar energy performance and post-solar energy performance. HERS scores of 0 or less will also be accepted. NZE and NPE buildings must be all-electric, with no fossil-fuel combustion on-site (Credit 3-40). May be combined with Credits 3-1 and 3-3.

Points Breakdown:

Net Zero Energy	30 points
Net Positive Energy	40 points

When Verified: Modeling verified at completion of design phase. Energy measures verified in construction and at completion.

Cross-references: 1-38, 1-39, 1-40, 3-1, 3-2, 3-3, 3-4, 3-7

Resources:

Built Green 2018 WSEC Energy Modeling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

RESNET Guidelines for Multifamily Energy Ratings: https://www.resnet.us/wp-content/uploads/Adopted_RESNET_Guidlines_for_Multifamily_Ratings_8-29-14.pdf

Transforming New Multifamily Construction to Zero: Strategies for Implementing Energy Targets and Design Pathways: https://www.nrel.gov/docs/fy20osti/77013.pdf

NBI: How to Get to Zero Energy in Multifamily: https://betterbuildingssolutioncenter.energy.gov/sites/default/files/Wednesday%20-%20How%20to%20get%20to%20zero%20energy%20in%20Multifamily.pdf

A Zero Emissions All-Electric Multifamily Construction Guide: https://fossilfreebuildings.org/ElectricMFGuide.pdf

Net Zero Energy Developments and Multifamily Project Case studies:

https://zeroenergyproject.org/2015/11/12/zero-energy-multifamily-buildings-three-case-studies/

Net Zero Energy Developments and Multifamily Project Examples: https://zeroenergyproject.org/find/zero-energy-home-developments-multi-family-projects/

3-6: Achieve Energy Star Multifamily, DOE Zero Energy Ready, or PHIUS+ certifications

Responsible Party: Energy Consultant

Intent:

ENERGY STAR Multifamily is a joint program of the Environmental Protection Agency (EPA) and the Department of Energy (DOE to promote smart consumer choices for products, building upgrades, and homes that go beyond local codes to save money while preventing pollution.

DOE Zero Energy Ready Multifamily Program is a multifamily-specific specification that better aligns with the recently developed ENERGY STAR Multifamily New Construction (ESMFNC) program. In developing the ZERH-Multifamily program, DOE has sought to achieve meaningful energy savings and performance benefits beyond ESMFNC by utilizing cost-effective and market-ready technologies and building systems.

Passive House Institute US (PHIUS) is a performance-based standard with some prescriptive requirements that appear mostly in the design-review phase. These requirements are essential to take care of ahead of time because the bulk of the PHIUS+ standard is a performance-based standard.

Performance Requirement: Provide project's Energy Star Multifamily, DOE, or PHIUS+ certificate. Certificates cannot be used as compliance with Built Green energy efficiency requirements or in lieu of performance or prescriptive performance pathways.

Points Breakdown:

Energy Star Multifamily Certified	5 points
DOE Zero Energy Ready Multifamily or PHIUS+2015 Certified	10 points

When Verified: Review of certification documentation and visually verified at final inspection.

Cross-references: 3-1, 3-3

Resources:

Energy Star Multifamily Program: https://www.energystar.gov/partner_resources/residential_new/homes_prog_reqs/washington?mfpath=eri

DOE Net Zero Energy Multifamily Program: https://www.energy.gov/eere/buildings/zero-energy-ready-home-multifamily-program

PHIUS Multifamily: https://multifamily.phius.org/

3-7: Register project with RESNET or Utility Program of equal or greater quality assurance

Responsible Party: Energy Consultant, RESNET Rater

Intent: Increase quality assurance (QA) for energy performance modeling on all Built Green projects. QA provides a framework to ensure program standards are met and closes the feedback loop in order to assess and improve program processes. Built Green benefits from increased QA by maintaining and growing its program integrity and trust among local jurisdictions and state lawmakers. This allows Built Green to effectively advocate for green building incentives for our members. It also paves the way for Built Green certification to be used as code compliance to meet local plan reviews, inspection, and state energy codes—simplifying permitting and project closeout and saving the Developer/Builder valuable time and money.

The Home Energy Rating System (HERS) Index is an industry standard that measures a home's energy efficiency with a score. A certified Home Energy Rater assesses the energy efficiency of a home, assigning it a relative performance score. The lower the number, the more energy efficient the building. The U.S. Department of Energy has determined that a

typical existing home scores 130 on the HERS Index, while a standard new home is awarded a rating of 100. For example, a building with a HERS Index Score of 70 is 30% more energy efficient than a standard new home. RESNET's modeling protocols are a nationally recognized system for inspecting and calculating a home's energy performance and provides an additional level of QA for the building's performance to developers, builders, certification programs, and jurisdictions. RESNET requires 1% of field QA for all RESNET registered projects.

Washington State Utility Commission requires minimum of 5% field QA. So alternative QA programs would need to meet this requirement. Please check with to see if your local utility program provides at least 5% field QA.

Performance Requirement: Provide project's HERS Index scorecard. Excluding Credit 3-5 for net zero and net positive energy compliance, HERS scores cannot be used as compliance with Built Green energy efficiency requirements or in lieu of performance or prescriptive performance pathways. Alternatively, use a utility program that requires at least 5% field QA (utility program must be approved by Built Green prior to use).

Points: 3 Points

When Verified: Review of program documentation and visually verified at final inspection.

Resources:

RESNET HERS Index: https://www.hersindex.com/hers-index/

RESNET Guidelines for Multifamily Energy Ratings: https://www.resnet.us/wp-content/uploads/Adopted_RESNET_Guidlines_for_Multifamily_Ratings_8-29-14.pdf

Washington State HERS Raters: https://www.hersindex.com/resnet-hers-raters/?state=WA

Systems Commissioning

3-8: Provide fundamental cFundamental ommissioning of building systems

Responsible Party: Owner, Commissioning Professional

Intent: Ensure that installed building systems are designed to meet the owner's performance requirements, and that they will function as designed when the building is turned over to ownership/occupancy.

Performance Requirement: Contract with a qualified Commissioning Professional (CxP) to provide fundamental commissioning on central systems (including common area and any central HVAC systems, electrical systems, central domestic hot water systems, renewable

energy systems, and common area lighting controls) in accordance with accepted process (such as ASHRAE 202 or LEED Fundamental Commissioning).

A qualified CxP must meet the following:

- The CxP must have documented commissioning process experience on at least two building projects with a similar scope of work. The experience must extend from early design phase through at least 10 months of occupancy;
- The CxP may be a qualified employee of the owner, an independent consultant, or an employee of the design or construction firm who is not part of the project's design or construction team, or a disinterested subcontractor of the design or construction team.

Suggested: CxP reviews systems design against Owners Project Requirements and provides suggested improvements; CxP performs recommissioning prior to 12 months

Points Breakdown:

Central and Common Area HVAC only: 5 points

HVAC, central hot water, common area lighting controls: 10 points

HVAC, electrical systems, central hot water, renewable energy, common area lighting controls, any non-utility submeters: 15 points

When Verified: At completion of the building commissioning process

Resources:

ASHRAE Guidelines 0 and 202, Building Commissioning Association, www.BCXA.org, LEED v4 Fundamental Commissioning and Verification; Enhanced Commissioning

Air Sealing

3-9: Exceed air sealing target for the assumed performance model

Responsible Party: Architect, General Contractor, Commissioner

Intent: Air sealing targets or building tightness testing has become an increasingly more important and valuable mechanism for reducing energy usage in multifamily buildings as ventilation requirements have increased, reducing the risks of building degradation and poor Indoor Air Quality. For this credit, as well as for 3-16 and 3-19, Built Green references ANSI/RESNET Standard 380 – 2019 for Lowrise buildings and Air Barrier Association of America (ABAA) Standard Method for Building Enclosure Airtightness Compliance Testing 2016 (or newer) for low, mid, and high-rise buildings.

Performance Requirement: The building must test below or "tighter" than the target put into the energy model for any performance-based approach to code compliance and Built Green points/requirements. For instance, if the energy model assumed 0.30 cfm/sq ft.

Point: 3 points

When Verified: These compliance tests are generally performed when all air barriers are installed in the building, power is available, mechanical and insulation systems are installed, but prior to final trim pieces. If the building does NOT meet the performance requirement thresholds, the building can be retested just prior to occupancy, with all trim installed.

Cross-references: 3-16, 3-19

3-10: Use airtight building method, such as SIP or ICF for all walls

Responsible Party: Architect, General Contractor

Intent: Significantly reduce air infiltration and exfiltration through the building envelope

Performance Requirement: Use Structural Insulated Panels, Insulated Concrete Forms or similar air-tight building systems for more than 70% of the above-grade walls of the building/s. Follow manufacturers installation and air-sealing requirements to ensure optimum performance

Points: 10 points

When Verified: Visually verified during intermediate construction inspections

Cross-references: 5-31, 5-32

3-11: Use of continuous insulation

Responsible Party: Architect, General Contractor

Intent: Continuous insulation (CI) provides a thermal break on walls between the conditioned spaces of the building and ambient conditions when integrated into the thermal boundary of the building. Most commonly installed CI is located on the exterior building sheathing, beneath the siding. Over the past decade, numerous products that act as both CI and sheathing or ci and siding have hit the market. In addition to exterior CI products, some products may be installed on the interior of a wall system, between the drywall/interior finish and the studs. In some framing designs, such as staggered studs, double wall, and SIPS, the CI may be incorporated in the framing depth of the wall itself.

Performance Requirement: Install a minimum of R 2.5 (typically ½ inch of GPX or rock wool panels) continuous insulation on all exterior walls, incorporated into the overall

building's thermal boundary. Provide documentation of continuous insulation in designs/plans, including R value of products or processes used. Use Rated R Values as identified in applicable State Energy Codes, IECC, or ASHRAE Handbook of Fundamentals. If using a product that is not rated currently in applicable codes and standards, only use manufacturer claimed R values if generated by third party testing facilities and meet applicable ASTM standards for testing insulation.

Point: 2 points

When Verified: Typically verified post insulation installation and prior to siding installation. Documentation of design, images, thermal imagery, and checklists can all be helpful

Cross-references: 3-15, 3-17

Resources:

Building Envelope Thermal Bridging Guide: https://morrisonhershfield.com/bpa_library/latest-version-of-the-building-envelope-thermal-bridging-guide-provides-new-and-timely-data-to-help-with-calculations-required-by-emerging-energy-codes-and-standards/

ContinuousInsulation.org: https://www.continuousinsulation.org/

BetterBuiltNW.com and NEEA.org

https://betterbuiltnw.com/resources/advanced-walls-thermal-break-shear-wall-fact-sheet

https://betterbuiltnw.com/resources/thermal-enclosure-efficient-walls-and-airtightness-poster

https://neea.org/resources/market-ready-high-performance-walls-phase-1-report

https://neea.org/resources/market-ready-high-performance-walls-phase-2-report

3-12: Conduct unit compartmentalization test with sample rate of 1 and 10 or less, must meet shall pass 0.30 CFM per SF or less

Responsible Party: General Contractor, Commissioner

Intent: This form of testing allows for testing of individual units, instead of the entire building. The ABAA standard recommends "guarded" tests of individual units, while RESNET Standard 380 and ENERGY STAR allow for compartmentalized testing. Please confirm with your local Authority Having Jurisdiction to confirm that compartmentalization and sampling is accepted for energy code compliance.

Performance Requirement: Either "guarded" or "unguarded" blower door tests are performed on 1 out of 10 units in the building, with a fair representation of unit sizes, floor location, and edge/interior locations (corner units, central units, mid-floor corner units, etc..)

Point: 3 points

When Verified: These compliance tests are generally performed when all air barriers are installed in the building, power is available, mechanical and insulation systems are installed, but prior to final trim pieces. If the building does NOT meet the thresholds for points identified below, the building can be retested just prior to occupancy, with all trim installed.

Cross-references: 3-14, 3-18

Resources:

ANSI/RESNET Standard 380: https://www.resnet.us/wp-content/uploads/ANSIRESNETICC_380-2019_vf1.24.19_cover%5E0TOC-2.pdf

ABAA Standard Method for Building Enclosure Air Tightness Compliance Testing: https://www.airbarrier.org/wp-content/uploads/2017/12/D-115-016-rev-0-ABAA-Standard-Method-for-Building-Enclosure-Airtightness-Compliance-Testing-1.pdf [Note: a new version of this standard may be published during this current code cycle]

3-13: Use a blown-in wall insulation system (i.e. BIBs, cellulose)

Responsible Party: Architect, General Contractor

Intent: Improve the comfort and energy efficiency of the building envelope by improving thermal performance and air tightness of the building envelope. Dense-packed insulation fills building cavities more effectively and reduces air movement through the wall assemblies.

Performance Requirement: At least 90% of all above grade, exterior wall assemblies should be insulated using dense-packed, blown-in insulation, such as:

- Dense-packed cellulose at around 3.5 lbs/ft^3
- Dense-packed fiberglass at around 2.5 lbs/ft^3

Requires visual inspection and density confirmation by touch or core sample.

Points: 5 points

When Verified: Pre-drywall inspection

3-14: Conduct blower door test for the whole building with results better than base code requirement

Responsible Party: Architect, General Contractor

Intent: In the temperate marine climate of King and Snohomish Counties, uncontrolled envelope infiltration can lead to excessive energy consumption for space conditioning and ventilation. It can also result in moisture ingress into building cavities, which may lead to durability issues.

By clearly defining the air barrier at all points in the building envelope, and ensuring its continuity at all transitions and penetrations, with good construction quality assurance and quality control brings control of air movement in and out of the building.

Performance Requirement: Architect must design and communicate to the GC a continuous air barrier at, or in close alignment with the weather resistive barrier (WRB). This is generally achieved with a membrane or wet-applied WRB, or with rigid sheet goods (sheathing, glazing, curtain-wall assemblies) and framing members. The GC must ensure that the sub-contractors responsible for ensuring unit air tightness (those providing plumbing, electrical, fire-stopping, and acoustic as well as thermal sealing details) understand the importance of making clean penetrations and air-tight seals wherever possible.

Performance is confirmed with a blower door test, typically using the WSEC envelope testing protocol, which varies between lowrise (Residential) and Mid/highrise (Commercial) building types. Other, equivalent approaches may be allowed if accepted as an alternate for code compliance.

Points Breakdown: The project must demonstrate compliance with the performance thresholds to earn points:

Lowrise (up to three stories above grade)

- 3.0 Air Changes per Hour at 50 Pascals pressure difference or 0.3 cfm/sq. ft. of building enclosure at 75 pascals pressure difference: 5 points
- 2.0 Air Changes per Hour at 50 Pascals pressure difference or 0.25 cfm/sq. ft. of building enclosure at 75 pascals pressure difference: 10 points
- 1.5 Air Changes per Hour at 50 Pascals pressure difference 0.20 cfm/sq. ft. of building enclosure at 75 pascals pressure difference: 15 points

Midrise and highrise (four stories or more above grade)

- 0.30 cfm/sq. ft. of building enclosure at 75 pascals pressure difference: 5 points

- 0.25 cfm/sq. ft. of building enclosure at 75 pascals pressure difference: 10 points
- 0.20 cfm/sq. ft. of building enclosure at 75 pascals pressure difference: 15 points

When Verified: Typically, the envelope infiltration test is performed at the time of building completion. Test certificate is required as documentation.

Cross-references: 3-9, 3-10, 3-12

Responsible Party: General Contractor, HVAC subcontractor

Intent: Quality control test to ensure minimal waste of energy through duct leakage losses

Performance Requirement: Exceed the WSEC code requirement for total duct leakage (2015 WSEC requirement is ≤4cfm25/100 sq. ft. of conditioned floor area). Contract with a qualified 3rd Party (such as the Built Green verifier, or HERS Rater) to perform duct leakage testing in accordance with WSEC, or ENERGY STAR standards.

Points Breakdown: 5 points if at least 25% less than code, 10 points if at least 50%

When Verified: Testing at rough-in is recommended to allow access for corrective sealing

Resources: www.energystar.gov

Passive Design Features

3-15: Passive solar: three of the below strategies or five

Responsible Party: Architect, Energy Consultant

Intent: Minimize space heating and cooling loads through the use of synergistic passive solar design strategies

Performance Requirement: Incorporate three or five integrated strategies (see options a – e below) into the building design. Strategies should impact at least 70% of the building's conditioned floor area.

Points Breakdown: 6 points for three strategies or 12 points for five strategies

When Verified: Reviewed at completion of design. Visually verified at final inspection.

a: East/West orientation

Responsible Party: Architect

Intent: By orienting the long axis of the building east and west, a larger proportion of glazing can be oriented towards the south and north. This creates the best opportunity to control solar gain through passive strategies, such as exterior shading.

Performance Requirement: Orient the long axis of the building within 22 degrees of East/West.

When Verified: During design or in the Construction documents.

b: Glazing is tuned to the orientation of the building

Responsible Party: Architect

Intent: Optimally orient the majority of glazing in the building to face within 22 degrees of due south, to enable control of solar heat gain through the use of passive architectural features, such as exterior, fixed, horizontal shading.

Performance Requirement: More than 50% of the view glazing area must face within 22 degrees of due south.

South facing glazing must be protected from summertime sun by fixed or operable shading devices designed to automatically shade glazing during the middle of the day from May through August.

When Verified: During design or in the Construction Documents

c: Proper overhang sizing on south and movable shades on west glazing

Responsible Party: Architect, Energy Consultant

Intent: For the best performance results from building orientation and optimal glazing design, horizontal shading should be sized appropriately to properly shade the windows during the middle of the day in summertime.

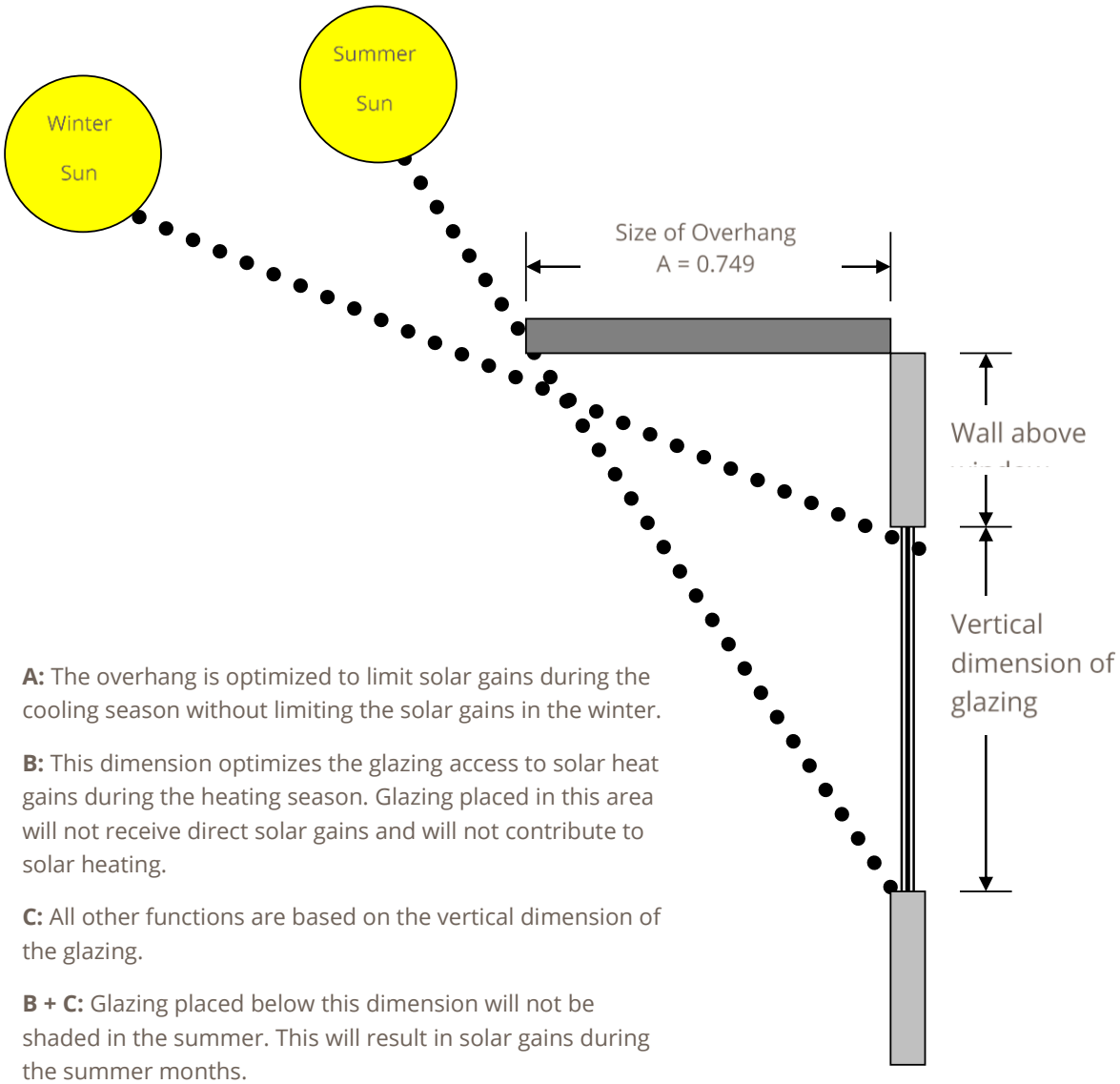
Performance Requirement: Use the shading design guidance below to design and install shading for at least 85% of the south-facing glass, or use a shading model to demonstrate that 85% of the south facing glazing is shaded between 10am and 2 pm on June 21 (Pacific Standard Time, not Daylight Savings Time).

Other passive shading strategies may be used if they can be shown to meet the Performance Requirement

When Verified: Verify during design or in the Contract Documents

Figure 3-15c —Overhangs

(Source: Washington State University Cooperative Extension Energy Program)



A: The overhang is optimized to limit solar gains during the cooling season without limiting the solar gains in the winter.

B: This dimension optimizes the glazing access to solar heat gains during the heating season. Glazing placed in this area will not receive direct solar gains and will not contribute to solar heating.

C: All other functions are based on the vertical dimension of the glazing.

B + C: Glazing placed below this dimension will not be shaded in the summer. This will result in solar gains during the summer months.

This figure is for buildings built in Seattle, or other sites at 47.5 degrees latitude. The effectiveness of the shading diminishes if the building orientation changes. Within 30 degrees of due south, this formula will provide relatively good results. East and West facing glazing require shading by other means such as exterior blinds, or landscaping.

d: Natural shading on south side with trees

Responsible Party: Architect, Landscape Designer

Intent: Reduce summertime heat gain by retaining existing mature trees to shade exposed walls and windows facing walls and glazing from summertime solar heat gain.

Performance Requirement: Retain existing mature trees that shade the east, south and/or west sides of the building that are exposed to summertime sun. Horizontal extent of tree canopy (in feet) must be at least 30% of the length of adjacent wall it protects. Establish and enforce Tree Protection Zones at the drip line to protect tree roots from damage and soil compaction during construction.

When Verified: In Construction Documents, during construction, and at completion.

e: Limit glazing to 20-25% of wall area

Responsible Party: Architect, General Contractor

Intent: Reduce heating/cooling loads resulting from thermal losses and solar gain

Performance Requirement: Use glazing with a Solar Heat Gain Coefficient (SHGC) of 0.40 or less on at least 70% of east, south, and west facing glazing that receives direct solar gain on June 21.

When Verified: Visually verified during construction or final inspections

3-16: Operable windows that create cross ventilation in both units and common areas

Responsible Party: Architect

Intent: Improve natural ventilation and night cooling

Performance Requirement: Provide windows with operable area at least 30% greater than WSMC code minimum requirement for natural ventilation in both residential units and common areas. Window openings are to be located on opposite or opposing sides of the room to provide cross ventilation.

Points: 2 points

When Verified: During intermediate construction or final inspections

HEATING/COOLING

DISTRIBUTION

3-17: Install ENERGY STAR ceiling fans in all units that is 5 CFM/ watt or greater - minimum one per unit

Responsible Party: Architect, General Contractor

Intent: Improve thermal comfort by enhancing air movement and reducing stratification

Performance Requirement: Install at least one ENERGY STAR qualified ceiling fan in each unit (living space or bedroom) that is 5 CFM/watt or greater.

Points: 3 points

When Verified: Visually verified at final inspection

3-18: Third-party total duct leakage performance test

Responsible Party: General Contractor, HVAC subcontractor

Intent: Quality control test to ensure minimal waste of energy through duct leakage losses

Performance Requirement: Exceed the WSEC code requirement for total duct leakage

- Ducts in spaces outside of the building thermal boundary (vented attics, vented crawl spaces, vented garages) ≤**4**cfm25/100 sq. ft. of conditioned floor area.
- Ducts deeply buried in insulation in spaces outside of the building thermal boundary or in hybrid, semi conditioned spaces ≤**3**cfm25/100 sq. ft. of conditioned floor area.
- Ducts fully inside the building thermal boundary should still be sealed and ideally tested to ensure conditioned air will be delivered to the intended locations within the building. For these systems, a successfully tight system for air delivery would meet ≤**8**cfm25/100 sq. ft. of conditioned floor area.
- Energy/Heat Recovery DOAS Systems do not require duct leakage testing, unless connected to the heating and cooling distribution system. In these cases, the supply portion of the DOAS should be tested to the performance requirements that align with the ducts location relative to the building's thermal boundary.
- Contract with a qualified 3rd Party (such as the Built Green verifier, or HERS Rater) to perform duct leakage testing in accordance with WSEC, or ENERGY STAR standards.

Points Breakdown: 5 points if at least 25% less than code, 10 points if at least 50%

When Verified: Testing at rough-in is recommended to allow access for corrective sealing

Resources:

ANSI/RESNET Standard 380 – 2019: https://www.resnet.us/wp-content/uploads/ANSIRESNETICC_380-2019_vf1.24.19_cover%5E0TOC-2.pdf

3-19: All ducts are in conditioned space

Responsible Party: Architect, Mechanical Designer, General Contractor

Intent: Eliminate loss of conditioned air outside the thermal envelope of the unit or building

Performance Requirement: All conditioned air distribution duct work and air handler must be located inside the thermal and air barrier of the unit or building.

Points: 2 points

When Verified: Visually verified during intermediate construction inspections

3-20: Locate heating/cooling equipment inside the conditioned space

Responsible Party: Architect, Mechanical Designer, General Contractor

Intent: Significantly reduce thermal losses outside the thermal envelope of the unit or building

Performance Requirement: All heating and cooling equipment must be located inside the thermal and air barrier of the unit or building. Air conditioning/heat pump condensers should generally be located outside conditioned space. Package Terminal and Vertical Terminal AC/HP units will have the condenser unit inside the thermal envelope, but draw outside air through them via ducting

Points: 3 points

When Verified: Visually verified during intermediate construction inspections

CONTROLS

3-21: Install programmable thermostats for all individual heating zones

Responsible Party: Mechanical designer, General Contractor, Electrical subcontractor

Intent: Improve the occupant's ability to achieve thermal comfort while minimizing energy waste

Performance Requirement: Install wall mounted, programmable thermostats to control each thermal zone. At minimum, the thermostat must offer at least two programmable heating set points (and two cooling set points, if AC is provided), at least two time or occupancy programs, and allow temporary override without affecting program.

Points: 2 points

When Verified: Visually verified at final inspection

Cross-reference: 6-23

3-22: Provide separate switching for bathrooms fan/heat lamp and fan/light combination fixtures

Responsible Party: Electrical Designer, General Contractor, Electrical Subcontractor

Intent: Avoid unnecessary operation of energy-consuming equipment

Performance Requirement: Provide separate switch controls for bathroom fans and lighting in all in-unit bathrooms

Points: 1 point

When Verified: Visually verified at final inspection

3-23: Provide electricity and/or natural gas direct metering for each unit

Responsible Party: Owner, Mechanical and Electrical Designers, General Contractor

Intent: Provide residents with direct feedback on their energy consumption

Performance Requirement: Provide electric and/or gas meters for each living unit, directly billed by the utility

Points: 3 Points

When Verified: Visually verified at final inspection

3-24: Install window switch and thermostats with temperature setbacks to react to operable window use

Responsible Party: Mechanical designer, HVAC Subcontractor

Intent: Improve the occupant's ability to achieve thermal comfort while minimizing energy waste in unoccupied zones

Performance Requirement: For heating systems other than zonal-electric resistance, provide separate living and sleep zones with separate controls

Points: 5 Points

When Verified: Visually verified at final inspection

Cross-reference: 6-23

3-25: Black or smart switches in all units for turning off associated outlets

Responsible Party: Electrical Designer, Electrical Subcontractor

Intent: Provide a convenient way for occupants to reduce "phantom" electrical loads by turning off a pre-determined set of electrical outlets.

Performance Requirement: Place an identified set of outlets, in one or more rooms, on a single circuit that can conveniently be turned off with a wall switch, be placed on an occupancy sensor or timer, or be "web-addressable" so they can be activated or deactivated from a remote/mobile device. Outlets on this circuit must be clearly identified – color coded, for example, and should include locations where "always on" devices such as televisions, sound systems and other non-essential electronic devices will be used.

Points: 3 Points

When Verified: Visual verification and confirmation testing at final inspection

Cross-reference: 6-23

HEAT RECOVERY

3-26: Install a heat recovery ventilator (HRV) or an energy recovery ventilator (ERV) with fan power limited to 0.8 watts/CFM or less (not applicable if using performance pathway)

Responsible Party: HVAC Designer and/or Installer

Intent: Installing an HRV or ERV provides balanced ventilation and reduces the energy penalty associated with providing effective fresh air ventilation, particularly in very air-tight buildings. It also allows for filtration of supplied outside air.

Performance Requirement: Install an HRV or ERV with the following performance specifications (based on ENERGY STAR label thresholds):

- Sensible Recovery Efficiency (SRE) ≥60% at 32F ambient temperature;
- Fan Efficacy ≥0.8cfm/Watt at 0.25" w.c.

System may use dedicated duct work or be connected to central forced air conditioning system. At a minimum, the ventilation system should exhaust from one or more

conditioned air sources and supply fresh outside air to one or more living and sleeping zones. The system, including duct design, must be sized and controlled appropriately to meet WSMC requirements.

Points Breakdown:

Centralized system serving three or more living units per appliance	5 points
Common area/corridor system	10 points

When Verified: Visually verified at intermediate or final inspection.

Cross-references: 3-1, 3-3, 3-14, 3-18, 3-27, 4-58

Resources:

Home Ventilating Institute product directory: www.HVI.org

3-27: If HRV or ERV installed in low-rise building, commission and make sure system is balanced

Responsible Party: Mechanical designer, HVAC Installer, Commissioning Professional (CxP)

Intent: Ensure that the investment in energy recovery ventilation yields optimal returns in ventilation performance and energy savings during occupancy.

Performance Requirement: Properly commission HRVs and ERVs prior to occupancy. Confirm:

- Supply and exhaust flows are within 10% of design flows;
- Supply and exhaust are balanced or slightly negative;
- Any timer controls are properly set up and operating to the design;
- Any boost controls, such as occupancy or humidity sensors are functioning to the design.
- Controls are clearly marked, and adequate education is provided to those responsible for maintenance of the equipment, and to occupants to understand the benefits of energy recovery ventilation, and how to optimize performance.

May be combined with Credit 3-26.

Points: 2 points

When Verified: At completion of construction during commissioning.

Cross-reference: 3-26

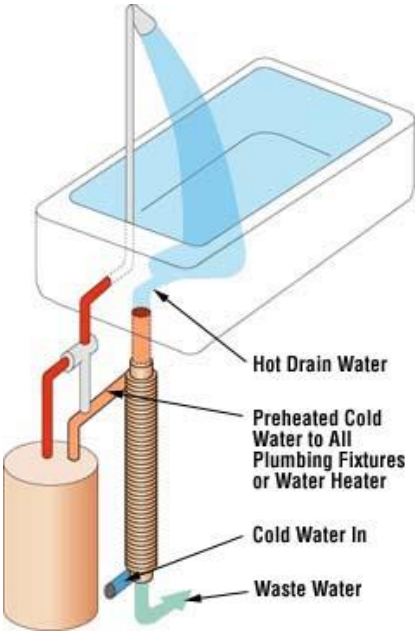
WATER HEATING

OVERALL

3-28: Install drainwater heat recovery system (DHR)

Responsible Party: Plumbing Designer and Installer, General Contractor

Intent: Reduce domestic hot water heating consumption by recovering heat from flowing waste water.



From EERE, from Toolbase Services

Performance Requirement: Install drain water heat recovery systems that serve at least 50% of the shower stalls in the building. Recovered heat should be used to preheat supply water to the water heating system.

Points: 5 points

When Verified: Visually verified during intermediate construction inspections

3-29: Install whole building "smart" variable-speed recirculation pump

Responsible Party: Plumbing Designer, General Contractor

Intent: Reduce domestic hot water distribution loses and associated pump energy consumption by optimizing the recirculation of hot water in the building

Performance Requirement: Install a hot water recirculation system that has both thermal and demand controls, which monitors and responds to building demand patterns, and which has a variable-speed/ECM pump motor for efficient operation. System must be included in system commissioning scope under Credit 3-8 to earn credit.

Points: 2 points

When Verified: Visually verified at final inspection

Cross-references: 3-8, 3-31

3-30: Install the water heater inside the heated space (electric, direct vent, or sealed venting only)

Responsible Party: Architect, Plumbing Designer

Intent: Minimize the loss of heat from the water heating system outside the thermal envelope of the building

Performance Requirement: Install all water heating equipment inside the thermal and air barriers of the building (Electric, and closed combustion/direct vent gas equipment only).

NOTE: Heat pump water heater storage tanks should be located inside, with exhaust ducted outside, or condenser unit may be located outside

Points: 2 points

When Verified: Visually verified at intermediate or final inspections

DISTRIBUTION

3-32: Insulate all hot water recirculation lines above code and include thermally broken hangers

Responsible Party: Architect, Plumbing Designer, Plumbing Subcontractor

Intent: Minimize thermal losses from the distribution of hot water

Performance Requirement: Domestic hot water risers and returns must be insulated with foam insulation with thickness equal to the nominal diameter of the pipe, max 2”. Full insulation is required at elbows, junctions and support clamps. Pipes embedded in walls filled with fiberglass or densepack cellulose are also accepted.

Points: 10 points

When Verified: Visually verified during intermediate construction inspections

Cross-reference: 3-29

Efficient Lighting

3-33: Install lighting dimmer, photo cells, timers, and/or motion detectors for high efficiency fixtures – common areas and in-unit lighting

Responsible Party: Lighting Designer, Electrical/Lighting Subcontractor

Intent: Reduce unnecessary lighting energy consumption

Performance Requirement: Install appropriate lighting controls to reduce unnecessary lighting of unoccupied spaces.

Points Breakdown:

Common areas – at least 80% of residential corridors and stairwells (by fixture count or total power): 1 point

In-unit – vacancy sensor on any one or more occasionally occupied space (such as laundry or storage closet or bathroom) in at least 90% of units: 1 point

When Verified: Visually verified

Cross-references: 3-22, 6-23

3-34: Install motion detectors for minimum 90% of exterior fixtures

Responsible Party: Lighting Designer, Electrical/Lighting Subcontractor

Intent: Reduce unnecessary lighting energy consumption

Performance Requirement: Install motion sensors on at least 90% or exterior lighting sensors, in addition to photocell and/or timer controls

Points: 2 points

When Verified: Visually verified at final inspection

Cross-references: 3-22, 6-23

Appliances

3-35: Install heat pump clothes dryers in all units

Responsible Party: Owner, General Contractor

Intent: Optimize the use of reliable, energy efficient domestic appliances

Performance Requirement: Install ENERGY STAR heat pump clothes dryers in all residential units.

Points: 1 point

When Verified: Visually verified at final inspection

Cross-references: 1-5, 3-40

Resources:

Energy Star Dryers: www.energystar.gov/products/appliances/clothes_dryersEnergy Star Dryers: www.energystar.gov/products/appliances/clothes_dryers

3-36: Install heat pump clothes dryers in common laundry facilities instead of in each unit

Responsible Party: Owner, General Contractor

Intent: Optimize the use of reliable, energy efficient domestic appliances

Performance Requirement: Install ENERGY STAR heat pump clothes dryers in all common laundry facilities.

Points: 2 points

When Verified: Visually verified at final inspections

Cross-references: 1-5, 3-40

Resources:

Energy Star Dryers: www.energystar.gov/products/appliances/clothes_dryersEnergy Star Dryers: www.energystar.gov/products/appliances/clothes_dryers

3-37: Do not use conditioned air for common laundry dryer make-up air

Responsible Party: General Contractor, Mechanical Consultant, Commissioner

Intent: When vented dryers are in operation, they create the demand for a significant volume of make-up air to replace the air they pull from the space. If this make-up air is provided from fully-conditioned spaces, this can result in significant energy waste. Design systems that minimize the energy required to condition laundry make-up air.

Performance Requirement: Either provide non-vented heat-pump dryers (no make-up air requirements) or dedicated make-up-air units that provide only tempered make-up air, not fully conditioned air, as the source for the dryer exhaust make-up.

Points: 2 point

When Verified: Visually verified during intermediate construction inspections and ventilation commissioning.

3-38: Provide clotheslines to each tenant and "wet room" or outside space in unit or common area for hang drying clothes

Responsible Party: Architect, Owner/Property Manager

Intent: Providing facilities for air-drying laundry can significantly reduce the energy consumed to operate an electric or gas tumble dryer. It is vital to ensure adequate ventilation and moisture-resistant flooring to prevent condensation and moisture-related problems during occupancy.

Performance Requirement: In at least 90% of units in the building, install a retractable clothesline or drying rack in a “wet room” or outside space (such as a patio or balcony). Indoor clothesline location must include water-resistant floors and a humidistat-controlled exhaust fan, which is commissioned prior to occupancy. Ensure that air-drying clothes is explicitly allowed and encouraged in the lease language. Provide tenant education about the safe and effective use of drying equipment.

Points: 2 points

When Verified: Visually verified at final inspection, including fan flow test. Review lease and education materials.

3-39: Install induction cooktop in all units

Responsible Party: Owner, General Contractor

Intent: Reduce energy consumption for cooking, and avoid combustion hazards associated with gas stoves

Performance Requirement: Install electric induction cooktops in all residential units.

Points: 2 points

When Verified: Visually verified at final inspection

Cross-references: 1-5, 3-40

Resources:

Dousing A Love Affair with Gas Stoves: https://builtgreen.net/blog-detail/builtgreenblog/2021/11/30/dousing-a-love-affair-with-gas-stoves

3-40: Install ENERGY STAR exhaust fans in all units, with fan sone rating of 0.3 or less

Responsible Party: Mechanical/Electrical Designer, Electrical Subcontractor

Intent: Reduce the energy used to provide quiet, effective ventilation

Performance Requirement: Install ENERGY STAR qualified exhaust fans in all bathroom and laundry locations where fans are required in 100% of units. Ducts must be designed in accordance with WSMC and manufacturers installation guidance. Sone rating at the design flow rate (at 0.1" w.c.) must be documented

NOTE: Remotely-mounted inline fans are exempt from this requirement

Points: 2 points

When Verified: Visually verified from equipment nameplates against specification at final inspection

Cross-reference: 1-5, 3-40

Resources:

Energy Star Ventilation Fans: https://www.energystar.gov/products/ventilation_fans

Building Energy Fuel Type

3-40: 100% Electric building. No combustion fuel sources used in the building.

Responsible Party: Mechanical/Electrical Designer, Electrical Subcontractor

Intent: Washington state has mandated that the state energy code must reach net zero energy by 2030. This can only be achieved by removing fossil fuels from a building's energy use and replacing appliances that are currently powered by fossil fuels with electric-powered appliances. Seattle's Green Building Standard and priority green expedited permitting programs require 100% electrification for residential projects. Seattle also passed an ordinance to ban natural gas to be used for space and domestic water heating in commercial buildings. Other local jurisdictions are also considering requirements for electrification or natural gas bans for new construction and retrofits. The benefits of electrification include healthier and safer homes, saving both money and energy, reduction of carbon emissions in the home and in the outside environment, and local clean energy jobs. Electrification from the start will save building owners thousands of dollars in gas mains, services and meters and fuel-source conversation costs when systems will need to be upgraded and replaced. While building electrification has promising benefits for residents and for the state, it must be pursued equitably—ensuring that all communities can benefit and are not left behind with polluting and increasingly expensive gas appliances. This is especially true for communities of color and underserved populations that suffer higher rates of poor indoor and outdoor air quality and are disproportionately impacted by higher instances of asthma, see Credit 6-12.

Performance Requirement: No fixed combustion fuel burning infrastructure or equipment to be installed to and in the unit. Non-fixed furniture and equipment may use combustion fuels if located outdoors (e.g., grills, fire pits, back-up generators). This is a requirement for all NZE and NPE buildings, see Credit 3-5. Not applicable for sites located in jurisdictions with code-required electrification or a fossil-fuel ban for new construction (excludes green building incentive program requirements)

Points: 10 points

When Verified: Reviewed at completion of design. Visually verified at final inspection.

Cross-References: 1-38, 3-5, 3-34, 3-35, 3-38, 4-63

Resources:

Equitable Building Electrification- A Framework for Powering Resilient Communities: http://greenlining.org/wp-content/uploads/2019/09/Greenlining_EquitableElectrificationReport_2019_WEB.pdf

RMI, The Impact of Fossil Fuels in Buildings: https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings/

RMI, The Economics of Electrifying Buildings: https://rmi.org/insight/the-economics-of-electrifying-buildings/

A Zero Emissions All-Electric Multifamily Construction Guide: https://fossilfreebuildings.org/ElectricMFGuide.pdf

Consumers Energy All-Electric Multifamily Design Guide: https://www.consumersenergy.com/-/media/CE/Documents/Energy%20Efficiency/business/zne-multifamily-design-guide

Alternative Energy

3-41: Participate in the local utility's electricity program for renewable electricity sources (covers minimum 25% of energy used)

Responsible Party: General Contractor, Owner

Intent: Reduce the use of fossil-fuel derived electricity

Performance Requirement: Developer or General Contractor must enroll in the utility's renewable energy program to cover a minimum of 25% of the project's construction meter electricity consumption. Write a minimum 2-year renewable energy program participation agreement to cover a minimum of 25% of the project's annual house meter electricity

consumption. Document estimated project house meter electricity consumption as basis for agreement.

Points: 7 points

When Verified: Verify utility bill and agreement documentation at time of final inspections

3-42: Develop incentive program for tenants to purchase Green-e certified RECs

Responsible Party: Owner

Intent: Facilitate support for the development and expansion of renewable energy generation

Performance Requirement: Provide an opportunity to residents at time of lease/renewal or sale, to sign up to purchase Renewable Energy Credits to offset their individual energy consumption. Promote the program in marketing and new resident orientation materials, and resident events

Points: 4 points

When Verified: Verify program details at time of final inspections

Resources: www.energystar.gov/products/appliances/clothes washers

3-43: Solar-powered or low-voltage walkway or outdoor area lighting

Responsible Party: Landscape Designer, Installation Subcontractor

Intent: Reduce use of grid electricity for lighting

Performance Requirement: Install solar powered or low-voltage lighting in at least one significant location in the project landscaped area.

Points: 1 point

When Verified: Visually verified at final inspection

3-44: Install photovoltaic system (excluding solar hot water)

Responsible Party: Architect, Mechanical, Electrical, Plumbing Engineers and Subcontractors

Intent: Include renewable energy systems to reduce non-renewable fuel consumption and minimize operating expenses

Performance Requirement: Install a photovoltaic array, sized at a minimum of 300W per 1000 sq. ft. of conditioned floor area (CFA) in the building. This will require approximately 20 - 25 sq. ft. of roof area per 1000 sq. ft. of CFA, depending on module efficiency. (in

Western Washington, assume 1 kW installed peak capacity will generate 1,000 kWh/year). Projects located in jurisdictions that included code-required installed Solar PV systems may only claim points for the amount of generation that exceeds any code-required minimum.

Points Breakdown: 5 pts for 300 W/1000 sq ft and 5 pts for each additional 150 W/1000 sq ft.; up to 25 points

NOTE: 5-Star Requirement – 150 W/1000 sq ft.

When Verified: Visually verified at final inspection, including review of sizing calculations

Cross-references: 1-32, 3-1, 3-2, 3-3, 3-4, 3-5, 3-40

BENCHMARKING

3-45: Provide whole building benchmarking using Energy Star Portfolio Manager and share with Built Green

Responsible Party: Owner, Property Management

Intent: Increase access to whole building energy consumption data for building performance measurement purposes

Performance Requirement: Create a building account in ENERGY STAR Portfolio Manager (ESPM) and set up a system for automatically or manually uploading monthly energy consumption data from utility bills and entering it into ESPM. Third-party billing services and building performance monitoring services can provide this service. Share the ESPM Account with the Built Green Program Manager Account (builtgreen@mbaks.com).

Points: 5 points

NOTE: 4-Star Requirement

When Verified: Review ESPM account, and utility data collection plan at time of final inspection

Cross-references: 1-18, 2-61, 3-45, 3-46

Resources: ENERGY STAR Portfolio Manager - www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager

3-46: Include provisions in tenant leases releasing utility consumption and billing data to building owner and authorized agents

Responsible Party: Owner, property manager

Intent: Increase access to unit by unit energy consumption data for building performance measurement purposes

Performance Requirement: Include utility billing release as the default in apartment leases, requiring the tenant to choose to opt out. Secure release forms from your electric and gas utilities (and water if units are direct billed for water/sewer). Use ENERGY STAR Portfolio Manager (ESPM) to track building performance.

Points: 5 points

When Verified: Review lease language and ESPM account at time of final inspection

Cross-reference: 3-45

3-47: Commit to performing a post-occupancy comparison of modeled vs. actual energy performance and to sharing with Built Green through Energy Star Portfolio Manager

Responsible Party: Owner/Property Management

Intent: Comparing the occupancy-phase performance of a building to the pre-construction energy model by normalizing the energy model to the actual weather data for the performance period, analyzing the building's energy profile and adjusting the model to match the building profile is called energy model validation. This improves the accuracy of energy modeling. A validated energy model allows the building owner/manager to more accurately predict the performance impacts of changes to equipment specifications, occupancy schedules and other variables, and may help identify the cause of excessive energy consumption when the building is underperforming.

Performance Requirement: The project team commits, in writing, to perform a post-occupancy comparison of modeled vs actual performance, in accordance with ASHRAE Std 209, Post Occupancy Modeling guidance. A report of the process and results of the study must be shared with the Built Green program mProgram anager, to help inform the program about the performance benefits of Built Green certification.

Points: 10 points

When Verified: The written commitment to meeting the requirements of this credit should be submitted and reviewed as part of the project certification submittal. The report should be submitted no more than 3 years after project certification.

Cross-references: 1-18, 3-1, 3-2, 3-3, 3-4, 3-5, 3-45, 3-46

EXTRA CREDIT FOR ENERGY

3-48: Extra credit for innovation in Energy, subject to approval by Built Green Program Manager

You may submit an energy saving strategy or system, not specifically called out in this Section, for consideration for an Extra Credit for Innovation. All extra credits are subject to approval by the Built Green program mProgram anager. If approved, add up to 10 points.

SECTION FOUR: HEALTH AND INDOOR AIR QUALITY

OVERALL

4-1: A WELL Accredited Professional is a member of the project design or build team

Responsible Party: Architect or General Contractor

Intent: Equip the project team with accurate and up-to-date information on indoor air quality issues and strategies for improving indoor air quality and occupant health

Performance Requirement: Builder, architect, or project consultant that is a part of the design or build team is a WELL Accredited Professional or holds a certificate of completion in an equivalent IAQ accreditation program approved by the Built Green Program Manager

Points: 5 points

When Verified: Course must be completed prior to the certificate holder's active role on the project

4-2: Certify the building through a third-party verified program emphasizing indoor air quality (e.g., WELL, EPA Indoor Air Plus)

Responsible Party: Owner/Developer

Intent: Improve indoor air quality with third-party certification in IAQ specific programs

Performance Requirement: Provide certification documentation under approved IAQ program, such as EPA Indoor Air Plus or WELL.

Points: 15 points

When Verified: Document review at time of project completion. Evidence of certification in progress may be accepted in lieu of final certificate

Resources:

EPA Indoor airPLUS - www.epa.gov/indoorairplus

WELL Building Standard - www.wellcertified.com/

4-3: Building is designated non-smoking

Responsible Party: Owner, Property Manger

Intent: Reduce exposure to secondhand tobacco smoke

Performance Requirement: The entire building must be designated as non-smoking. If there are multiple buildings, at least 80% of the conditioned floor area of the facility shall be designate as non-smoking. Designated smoking areas shall be in a fully separate building, full compartmentalized and with a separate HVAC system. For privately owned condominiums, the non-smoking provision shall be incorporated into the covenants and by-laws; and for rental properties, similar language should be incorporated into leases. An outdoor designated smoking area, if included, must be located no less than 25ft from any window, door or ventilation intake, and restrictions clearly communicated with signage.

Points: 1 point

When Verified: Review of policy prior to occupancy

Cross-references: 4-1, 4-2

Jobsite Operations

4-4: Use less-toxic cleaners

Responsible Party: Owner, Property Manager, General Contractor

Intent: Reduce worker and occupant exposure to potentially harmful chemicals, and reduce chemical degradation of nearby aquatic systems

Performance Requirement: Create a green housekeeping plan for construction clean-up, and for building operation and maintenance. Include plan requirements in any property management and maintenance service agreement.

Avoid products that are given a health hazards rating higher than “1” in the product MSDS. In addition, avoid as much as possible products with ingredients that the MSDS classifies as toxic (poisonous), flammable, caustic (causes burns), or chemically reactive. Leftovers of these products will be hazardous waste. Use environmentally friendly alternatives, including biodegradable products and those that are zero VOC or low VOC (no to low volatile organic compounds).

Points: 1 point

When Verified: Review of green housekeeping plan prior to occupancy

Cross-references: 2-28, 2-29

4-5: Require workers to use VOC-safe masks when applying VOC containing wet products and N-95 dust masks when generating dust

Responsible Party: General Contractor

Intent: Protect worker health by limiting exposure to VOCs and dust

Performance Requirement: Require workers to use VOC-safe masks when applying wet products containing VOCs and N-95 dust masks when generating dust.

Points: 1 point

When Verified: Review of policy requiring use of masks and visually verified during intermediate construction and final inspections

Cross-reference: 4-13

4-6: Take measures during construction operations to avoid moisture problems later

Responsible Party: Architect, General Contractor

Intent: Reduce the risk of moisture-related indoor air quality and durability issues during building occupancy

Performance Requirement: Do one or more of the following measures:

- Keep stored materials dry with tarps or in a protected place, or use "just in time" delivery to avoid problems with stored materials
- Use a moisture meter to make sure moisture content of underlayment, sheathing, and framing materials does not exceed 15%. If readings exceed 15%, dehumidify before installing insulation and drywall
- Pump or drain standing water out of the structure immediately after major rainstorms
- Hook up installed rain gutters to temporary pipes to draw water away from foundation
- Install dimpled drainage mats at foundation walls
- Use flashing instead of caulking to seal above doors, windows, and other openings
- Properly counter-flash chimneys, and build a cricket above chimney to divert water
- Properly flash all roof to wall intersections

- Pitch all roofs at 2:12 or steeper
- During construction, do not use direct combustion heaters in the building. Remove unwanted moisture with a dehumidifier.

Points Breakdown: 1 point per action, up to 5 points

When Verified: Visually verified at intermediate construction and final inspections

4-7: Take measures to avoid problems due to construction dust

Responsible Party: General Contractor

Intent: Avoid introducing dust into HVAC systems and building cavities that could negatively impact indoor air quality during occupancy, and may protect warranties and extend the operating life of HVAC equipment

Performance Requirement: Implement a minimum of four (4) of the following measures:

- Train all subs on healthy jobsite practices, and include in regular safety meetings
- Clean/vacuum up dirt, dust, and wood shavings as you go – use vacuums instead of brooms
- Cover all duct openings and air handlers/fans during construction, both staged and installed, and mask floor registers after installation to prevent debris from accumulating prior to move-in
- Vacuum stud bays before sheetrocking
- Use wet sanding for gypsum board assemblies; or
- If dry sanding, use vacuum-assisted drywall sanding equipment*
- Vacuum the floors before final flooring installation
- Install construction filters—change them after construction is done, then flush and change them again.

** Use wet sanding for gypsum board assemblies. Dry sanding is acceptable if the following measures are taken:*

1. *Full isolation of space under finishing*
2. *Plastic protection sheeting is installed to provide air sealing during the sanding*
3. *Closure of all air system devices and ductwork*
4. *Sequencing of construction precludes the possibility of contamination of other spaces with gypsum dust*
5. *Worker protection is provided. Use safety meetings, signage, and subcontractor agreements to communicate the goals of the construction indoor air quality plan.*

Points Breakdown: Minimum of four measures

Four measures	2 points
All measures	4 points

When Verified: Visually verified at intermediate construction and final inspections

Cross-references: 4-5, 4-10, 4-13

4-8: Ventilate during all new wet finish applications

Responsible Party: Architect, General Contractor

Intent: Protect worker health and prevent interior materials from absorbing contaminants during finish curing

Performance Requirement: Require an indoor air quality management plan in the construction documents. Complete most wet applied finishing before installing "soft" finishes such as carpet and acoustic tiles. Use box fans or purpose-built ventilation equipment to provide fresh outside air to wet work areas, and exhaust contaminants to the outside.

Points: 3 points

When Verified: Visually verified during intermediate construction inspections, or photo documentation

Cross-reference: 4-13

4-9: No use of unvented combustion heaters during construction

Responsible Party: Architect, General Contractor

Intent: Protect workers from hazardous fumes and prevent excess moisture from being absorbed by structure during construction

Performance Requirement: Create policy prohibiting the use of unvented combustion heaters during construction. Construction heaters must not blow combustion air directly into the building. Communicate policy to all sub-contractors impacted by policy. Use dehumidifiers if a "dry-out" is needed.

Points: 2 points

When Verified: Visually verified at intermediate construction inspections

Cross-reference: 4-6

4-10: Clean duct, furnace, and filter thoroughly before occupancy

Responsible Party: Architect, General Contractor

Intent: Remove fine particles that can become respiratory irritants from ducts

Performance Requirement: Thoroughly clean and vacuum ducts after final construction stages and prior to occupancy; replace all filters that were in place during construction. Include in construction IAQ plan where feasible

Points: 3 points

When Verified: Visually verified at final inspection

Cross-reference: 4-6

4-11: Institute a jobsite anti-idling program for construction vehicles

Responsible Party: General Contractor

Intent: Prevent unnecessary idling and consequent emissions. Idling of non-road equipment wastes an average of one gallon of fuel per hour, increases wear-and-tear on the engine, and harms the vehicle's operator and the people who live and work near the construction site. Eliminating unnecessary idling saves money, increases the life of your equipment, and helps everyone breathe easier!

- Diesel exhaust includes sooty particles layered in heavy metals and toxic gases including formaldehyde and benzene.
- Diesel exhaust can contain up to 40 hazardous substances including many of Washington's worst toxic air pollutants.
- Diesel's sooty particles (PM 2.5) are more toxic than particles from wood smoke or car exhaust.
- Soot ranges in size from a sand grain to "nano-particles" so small they can move from lungs to the bloodstream.

Consider using alternative fuel or electric construction equipment and vehicles (see Credit 4-12).

Performance Requirement: Enforce a policy that does not allow construction vehicles to idle for more than five (5) consecutive minutes if the vehicle is not in motion. Examples include hydraulic lifts, cranes, cement mixers, cherry pickers, boom lifts, excavation equipment, skid steers, or similar equipment.

Points: 3 points

When Verified: Review policy and verify practice on-site during intermediate construction inspections

Cross-reference: 4-12

Resources:

Diesel Particulate Emission Reduction Strategy for Washington State: https://apps.ecology.wa.gov/publications/documents/0602022.pdf

The Dirt on Diesel: https://www.oregonlegislature.gov/dembrow/workgroupitems/5-27%20OEC%20Dirt%20on%20Diesel%20Report%202016.pdf

Concerns about Adverse Health Effects of Diesel Engine Emissions: https://apps.ecology.wa.gov/publications/documents/0802032.pdf

4-12: Use non-diesel alternative fuels in construction equipment: electricity, propane, or natural gas (3 pts per 25% of equipment using alternative fuels)

Responsible Party: Owner/architect (include expectation and submittal requirements in specifications or contract documents), General Contractor, subcontractors

Intent: Protect human health by reducing local and regional pollution due to diesel exhaust; reduce dependency on fossil fuels. Priority should be given to non-fossil-fuel-burning vehicles and equipment (e.g., electric and hydrogen). More and more electric vehicles and construction equipment are available on the market, and more are in development. The EPA offers funding through the Diesel Emissions Reduction Act (DERA) for projects that reduce emissions from existing diesel engines.

Companies like JCP have developed a wide range of zero-emissions construction equipment with rapid charging capability, such as Loadall telescopic handlers, site dumpers, and electric mini excavators. These machines run for many hours and have rapid charging capability and reduce noise and air pollution on construction sites. Electric construction equipment offers cost savings from higher, fluctuating diesel and gas prices, and lower maintenance costs.

Performance Requirement: Architect must include expectation and submittal requirements in specifications or contract documents. Contractor must distribute a letter to all subcontractors to use of non-petroleum alternatives when available; contractor to provide a table/spreadsheet to the verifier that lists all construction equipment used onsite and its fuel type. Hybrid passenger vehicles do not meet the intent of this credit. Gasless generators, dryers, heaters, and landscaping equipment frequently used during construction are applicable.

Points Breakdown:

25% 3 points

50% 6 points

75% 9 points

100% 12 points

When Verified: Visual verification during intermediate construction inspections. Review of completed table at final inspection

Resources:

Reducing Diesel Emissions from Construction and Agriculture: https://www.epa.gov/dera/reducing-diesel-emissions-construction-and-agriculture

Impacts of Diesel Exhaust and the Diesel Emissions Reduction Act (DERA): https://www.epa.gov/dera

Washington Laws and Incentives for Alternative Fuel: https://afdc.energy.gov/laws/state_summary?state=WA

Upcoming Electric Trucks: https://insideevs.com/car-lists/electric-trucks/

Fully Charged Digs Deeper Into Electrification: Electric Excavator: https://insideevs.com/news/368573/fully-charged-electric-excavator/

JCB Expands Electric Machine Offering for Zero-Emissions Operations: https://www.oemoffhighway.com/trends/electrification/article/21244426/jcb-expands-electric-machine-offering-for-zeroemissions-operations

4-13: Require healthy jobsite plan for workers' compliance

Responsible Party: Architect, General Contractor

Intent: To protect workers' health and safety; and improve indoor air quality and durability during occupancy

Performance Requirement: Include healthy job site plan requirements in contract documents

Points: 4 points

When Verified: Review plan requirement language in CDs

Cross-references: 4-7, 4-9, 4-12, 4-14

4-14: Implement construction management plan to ensure healthy jobsite plan is implemented optimally and adhered to

Responsible Party: General Contractor

Intent: To protect workers health and safety; and improve indoor air quality during occupancy

Performance Requirement: Integrate health jobsite plan requirements in the construction safety and quality management systems to make construction management team accountable and actively engage sub-contractors in following healthy jobsite practices

Points: 4 points

When Verified: Review of healthy jobsite plan and visually verified during intermediate construction and final inspections

Cross-references: 4-7, 4-9, 4-12

Layout And Material Selection

4-15: Inside the building envelope use only low-VOC, low-toxic, water-based, solvent-free sealers, grouts, mortars, caulks, adhesives, stains, pigments, and additives on all wet-applied applications

Responsible Party: General Contractor

Intent: Protect workers and occupants from potential negative respiratory health impacts. Many construction products used to finish, seal or adhere materials off-gas trace amounts of volatile organic compounds (VOCs) for months following application, which can cause upper respiratory irritation in occupants. Zero-VOC or low-VOC water-based adhesives, finishing, and sealing products are generally safer to handle, can be cleaned up with water, and produce little or no off-gassing. For most indoor applications, there is almost no difference in performance traditional and low-VOC products. Many low-VOC products are comparable in price to conventional products.

An accepted industry standard for low-VOC adhesives and sealants is the State of California, South Coast Air Quality Management District (SCAQMD) Rule #1168. See resources for acceptable VOC limits for adhesive and sealants. GreenGuard Gold certified products are also accepted.

Performance Requirement: Compliant materials should be used for 100% of an application when wet-applied on site. Compliant materials are either GreenGuard Gold certified or conform to SCAQMD Rule #1168 VOC limits.

Points: 6 points

When Verified: Product data sheets reviewed during procurement, and visually verified during intermediate construction and final inspections.

Cross-references: 1-8, 1-21

Resources:

SCAQMD Rule #1168, Table 1 VOC Limits (amended 2017): http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1168.pdf?sfvrsn=9

Certified Clean Air Solvents: https://www.aqmd.gov/home/programs/business/business-detail?title=certified-clean-air-solvents&parent=certified-products

4-16: Use No Added Urea Formaldehyde (NAUF), No-Added Formaldehyde (NAF) or Ultra-Low Emitting Formaldehyde (ULEF) finishes and materials (including adhesives and resins)

Responsible Party: General Contractor, Architect

Intent: Urea-formaldehyde in the indoor environment can cause health problems for occupants, including headaches and flu like symptoms, and sick building syndrome. Some shelving, window trim, door trim, base molding, and other interior trim and wood products may also use urea-formaldehyde glue as a binder. With an off-gassing half-life of about 10 years, urea-formaldehyde continues to off-gas formaldehyde for years after application.

Specialty medium-density fiberboard (MDF), particle board (PB), and hardwood plywood (HWP), including veneer and composite core products, are certified by Scientific Certification Services (SCS) for wood fiber content and for having no added formaldehyde (lab tested to 0.05 ppm); i.e., CARB ATCM 93120 compliant. Products manufactured using polyurea resin in place of the urea-formaldehyde resin commonly used in MDF and particleboard can be used for these applications. Some finish contractors do not like working with MDF products for trim and molding applications because it is so brittle. Consider MDF for flat trim areas such as mantles, wall panels, and wainscoting. Plaster options are also available. Look for plywood and composites used in flooring and cabinetry products that use NAUF or ULEF resins or adhesives as binders.

Specify the following designations or certifications on insulation and wood products:

NAUF: No added urea-formaldehyde

ULEF: Ultra-low-emitting formaldehyde

Performance Requirement: Use NAUF or ULEF materials for at least 90% of insulation and woodwork; see point breakdown for applicable applications and associated points. CARB II compliance does not meet the intent of this credit.

Points Breakdown: May be earned individually or combined for a total of 18 points.

Insulation or Greenguard Gold certified insulation product	3 Points
Plywood and composites of exterior grade for interior use	3 Points
Finish work (e.g. window trim, door trim, base molding, etc.)	2 Points
Cabinets and shelving	5 Points
Flooring material (carpet excluded)	5 Points
Interior Doors	5 points

When Verified: Review of product documentation and visually verified during intermediate construction and final inspections.

Cross-references: 1-8, 1-21

Resources:

CARB ATCM 93120 standard: https://ww2.arb.ca.gov/our-work/programs/composite-wood-products-program

4-17: Use pre-finished flooring

Intent: Protect workers and occupants from potential negative respiratory health impacts.

Performance Requirement: All wood finish flooring installed is pre-finished off site.

Points: 1 point

When Verified: Visually verified at final inspection

4-18: Use hard surface flooring without orthophthalate plasticizers

Intent: Protect workers and occupants from potential negative respiratory health impacts.

Performance Requirement: Specify and install resilient sheet, plank and tile flooring that does not contain orthophthalate plasticizers. Required Health Product Declaration or other documentation with submittal.

Points: 5 points

When Verified: Review product documentation and visually verified at final inspection

Cross-references: 1-33, 4-23

4-19: Do not install insulation or carpet padding that contains brominated flame retardant (BFR)

Responsible Party: Architect, General Contractor

Intent: Reduce the introduction of persistent, bioaccumulative toxins into the environment, which poses a risk of causing adverse impacts on human and wildlife health.

Performance Requirement: Do not specify or install insulation or carpet padding that contains brominated flame retardant (BFR)

Points: 1 point

When Verified: Review product documentation and visually verify during intermediate construction inspections

4-20: No carpet in units

Responsible Party: Architect

Intent: Reduce off-gassing from carpets and carpet pads; and negative indoor air quality impacts of dust and allergens during occupancy. Reduce disposal of carpet at unit turnovers

Performance Requirement: Do not install carpet in residential units. Cannot be combined with 4-21.

Points: 10 points.

When Verified: Visually verified at final inspection

4-21: When installing carpet reduce indoor air pollutants

Responsible Party: Architect, General Contractor

Intent: Reduce off-gassing from carpets and carpet pads; and negative indoor air quality impacts of dust and allergens during occupancy. Reduce disposal of carpet at unit turnovers. Protect worker and occupant health from harmful off-gassing from formaldehyde and VOCs

Performance Requirement: When installing carpet use the following strategies for at least 90% of the carpeting in the building or units (unless noted differently in point breakdown); see point breakdown for applicable applications and associated points.

Points Breakdown:

Limit use of carpet to one-third of unit's square footage	2 points
Specify and use CRI Green Label Plus or Greenguard certified products for carpet, pad, and adhesive for 100% of carpeting	1 point
Specify and use carpet, pad or adhesive that does not contain fly ash filler in backing for 100% of carpeting	5 points
Install carpeting by dry method	1 point
Install low pile or less allergen-attracting carpet and pad	1 point
Install natural fiber (e.g., wool) carpeting with no synthetic chemical treatments for at least 50% of non-hard surface floors in the project	5 points
Avoid installing carpet in environments where it can get wet (kitchen, bathroom, near entries)	1 point

When Verified: Review product documentation and visually verify during intermediate construction inspections

Cross-references: 5-41, 5-45, 5-46, 5-47

4-22: Select materials such that the building is free from all of the materials and chemicals listed in the handbook. Please discuss with program manager before claiming this point

Responsible Party: Architect, General Contractor

Intent: Improve indoor air quality by avoiding the use of materials and material additives that contain chemicals and toxins know to be hazardous to harmful to human and environmental health

Performance Requirement: Develop and implement a strategy to ensure and demonstrate that none of the materials used in the project contain any of the following chemicals:

- added formaldehydes
- halogenated flame retardants
- Chlorinated Polymers (e.g., PVC, PVDC, chloroprene, CPVC)
- Toxic heavy metals (e.g., Mercury, cadmium, arsenic)
- CFCs and HCFCs
- Phthalates (Orthophtalates)
- xylene
- tolulene
- Polychlorinated Biphenyls (PCBS)
- PFAs and PFCs

Please discuss with Program Manager before claiming this point. Project team must propose a strategy for tracking and documenting compliance. At a minimum, this should include a complete inventory of materials to be used in the project, with compliant examples, and clear documentation submittal requirements in the Project Specifications, and a comprehensive documentation tracking system, with QC checks of installed materials.

Points: 30 points

When Verified: Product inventory reviewed at completion of design; qualifying submittals log reviewed at completion of construction, with supporting documentation available on request

Cross-references: 4-23, 5-28

4-23: Use products with a Health Product Declaration (HPD)

Responsible Party: Architect, General Contractor

Intent: A Health Product Declaration (HPD) provides a standardized way of reporting the material contents of building products, and the health effects associated with these materials. The HPD Open Standard is a voluntary technical specification that reports product contents and associated health information. The HPD Open Standard was developed by manufacturers, architects, designers, specifiers, contractors, and scientists. HPDs enable manufacturers to disclose information ranging from meeting minimum requirements to full disclosure and transparency. The HPD Open Standard is managed by the HPD Collaborative (HPDC), a nonprofit member organization representing the Architecture/Engineering/Construction (AEC) industry.

Performance Requirement: Include HPDs as part of material selection criteria, then select and use products with HPDs on the project.

Points Breakdown: 1 point per product with a Health Product Declaration. Maximum 5 points.

When Verified: Review of product documentation and visually verified at final inspection.

Cross-reference: 1-24

Resources:

HPD Project Team Guide: https://www.hpd-collaborative.org/hpd-user-guide/

HPD Public Repository: https://www.hpd-collaborative.org/hpd-public-repository/

Moisture Control

OVERALL

4-24: Use Building Envelope Consultant during design

Responsible Party: Owner/Developer or Architect

Intent: To ensure that the envelope design controls rain water shedding, air flow, and vapor diffusion; which will decrease the chance of moisture related problems and improve air quality and building durability

Performance Requirement: Contract with a Building Envelope Consultant who provides, or conducts a thorough review of, envelope assemblies and design details that will effectively eliminate potential moisture problems related to the building envelope, and provides a report of findings

Points: 5 points

When Verified: Review of Building Envelop Consultant's report and check if any recommended design changes are incorporated into the final design

Cross-reference: 4-25

4-25: Envelope inspection at various stages of envelope installation by a qualified professional

Responsible Party: Owner, Architect, General Contractor

Intent: To ensure that envelope design features are properly installed and will actually control rain water absorption, air flow, and vapor diffusion; which will decrease the chance of moisture related problems and improve air quality and building durability

Performance Requirement: A qualified envelope consultant inspects construction elements that can impact the building envelope's ability to control and manage moisture intrusion. Qualifications include Building Envelope Commissioning Professional (BECxP) or equivalent, approved by Built Green program, and must not be an employee or sub-contractor of the General Contractor. Site inspection schedule must be determined in advance, based on envelope assembly details and sequencing, and must be coordinated appropriately during construction; reports must be submitted for each visit. Credit will not be earned if Owner or General Contractor chooses not to correct any substantive issues reported during these inspections

Points: 5 points

When Verified: Review of site visit reports and visual verification of recommended corrections and changes

Cross-reference: 4-24

4-26: Grade to drain away from buildings

Responsible Party: General Contractor

Intent: Minimize soil saturation, which improves site stability; and moisture intrusion into the building, which improves indoor air quality and building durability

Performance Requirement: Slope soil adjacent to the building for a 6-inch drop in the first 10 feet. At the foundation footing, install drain tile so water will flow down the drainboard and drain away from the building. Garage floor and driveways are sloped to drain out. Provide a combined length of at least two feet of extenders and splash blocks on downspouts.

Points: 1 point

When Verified: Visually verified at final inspection

ROOF

4-27: Provide 2:12 (9.5 degree) pitch sloped roof surface -for at least 50% of roof or 100%

Responsible Party: Architect

Intent: Decrease the change for potential moisture issues by using roof angles that shed water effectively.

Performance Requirement: Provide a 2:12 (9.5 degree) pitch roof for a minimum of 50% or 100% of roof area

Points Breakdown:

50% 6 points

100% 10 points

When Verified: Visually verify at final inspection

Cross-reference: 4-6

WALLS – ABOVE GRADE

4-28: Provide continuous air- and weather resistive barrier installed to manufacturer's requirements

Responsible Party: Architect, General Contractor

Intent: Protect the building envelope from exterior moisture intrusion, and uncontrolled air infiltration and exfiltration

Performance Requirement: Include air barrier continuity sheets and details in the construction documents, clearly showing which materials make up the continuous air and weather resistive barriers, and how continuity is maintained through all key transitions. Products used must be warranted by the manufacturer as suitable as an air barrier material, and manufacturers air-barrier installation requirements must be fully

implemented in construction, unless superseded by the project's envelope consultant of record.

Points: 3 points

When Verified: Continuity sheets reviewed at completion of design; installation visually verified during intermediate construction inspections

4-29: Use prefabricated, liquid applied, or self-adhering flashing at siding transitions and penetrations

Responsible Party: Architect, Envelope Consultant, General Contractor

Intent: Protect the building envelope from exterior moisture intrusion, and uncontrolled air infiltration and exfiltration

Performance Requirement: Specify and use a system of compatible prefabricated, liquid-applied and/or self-adhering flashing products to ensure continuity of the air- and weather resistive barriers, and water-shedding layer at all transitions, penetrations and openings in the building envelope

Points: 3 points

When Verified: Visually verified at intermediate construction and final inspections

Cross-references: 4-24, 4-25, 4-26, 4-37

4-30: Install rainscreen siding

Responsible Party: Architect, General Contractor

Intent: Protect the building envelope from exterior moisture intrusion, and enhance drying potential of exterior wall assembly

Performance Requirement: Provide a space between the water shedding layer (the cladding) and the weather resistive barrier to allow water that gets behind the cladding to drain down and out of the assembly, and allow air movement to enhance drying of sheathing, WRB and cladding. On taller buildings, this space should be interrupted/ventilated every two or three floors to prevent excessive stack effect behind the cladding, including a properly lapped weep control system at each ventilation level.

Points: 6 points

When Verified: Visually verified during intermediate construction or final inspections

Cross-references: 4-28, 4-29

4-31: In wood-framed structures, use low-toxic mold-inhibitor product

Responsible Party: General Contractor

Intent: Reduce the risk of mold growth in the structural wood framing and sheathing

Performance Requirement: Treat framing and sheathing with low-toxic product to inhibit mold growth. Lumber materials may be pre-treated or site-treated. Silver and borate are acceptable active agents. Other alternatives will need to be approved by the Program Manager

Points: 3 points

When Verified: Review of product documentation

BELOW GRADE

4-32: For slab on grade, use 10 mil polyethylene vapor barrier or equivalent performance, directly under slab

Responsible Party: General Contractor

Intent: Avoid moisture related problems by keeping water vapor and water in the ground and out of the slab; and provide sufficient drying of the water already in the slab

Performance Requirement: Use 10 mil polyethylene vapor barrier or equivalent performance, directly under slab. Depending on weather conditions during curing, it may be necessary to slow the drying rate of the exposed surface of the slab (by wetting out, use of burlap covering, etc.) to accommodate the slower curing of the lower surface. This will prevent cracking of the slab.

Points: 3 points

When Verified: Visually verified during early construction inspection or photo documented

Cross-reference: 4-33

4-33: Perform moisture test for any slab on grade prior to installing any finish to manufacturer's specifications

Responsible Party: General Contractor

Intent: Decrease potential for mold growth and installed floor failure from buckling or lifting

Performance Requirement: Follow the protocols in ASTM F1869-04 for the use of the calcium chloride test.

Points: 2 points

When Verified: Review results of calcium chloride test

Cross-references: 4-36, 4-38

4-34: Install mechanical ventilation system to control moisture in crawl space

Responsible Party: Mechanical Engineer, General Contractor

Intent: Keeping moisture and soil gasses away from and out of building, improving indoor air quality and building durability

Performance Requirement: Install mechanical ventilation system to improve moisture management in the crawl space or depressurization system below the vapor barrier membrane under the building

Points: 2 points

When Verified: Visually verified at final inspection

Cross-references: 4-36, 4-37

4-35: Install a rigid perforated footing drain at foundation perimeter, not connected to roof drain system

Responsible Party: Architect, Envelope Consultant, General Contractor

Intent: Divert rainwater away from foundation of building which will decrease chance of moisture issues

Performance Requirement: Install perforated footing drainage along the foundation perimeter and tie them into an appropriate drainage system at least 5’ from the building to help control moisture in the building. Check with your local jurisdiction. Use soils report to determine degree of backfill compaction plus minimum slope to achieve adequate drainage. Perforations point down to allow water to enter the drainpipe. Drain discharges by gravity (preferable) or mechanical means into the approved drainage system. Roof water drains should be kept separate and tight-lined until well clear of the foundation.

Points: 1 point

When Verified: Visually verified at early construction inspection or photo documented

Cross-reference: 4-40

4-36: Install moisture management system for below grade walls beyond code, i.e., drainage mat

Responsible Party: Architect, Envelope Consultant, General Contractor

Intent: Minimize the risk of moisture issues by improving drainage of water away from foundation assemblies

Performance Requirement: Fully waterproof the exterior of foundation and below grade walls, and install a dimpled drain mat from 6" above grade down to the footing to protect the waterproofing and facilitate free drainage of water down to the footing drain. Install at 100% of foundation and below grade walls for credit

Points: 3 points

When Verified: Visually verified at early construction inspection or photo documented

Cross-references: 4-6, 4-39

OPENINGS

4-37: Properly seal building openings and penetrations against moisture and air leaks

Responsible Party: General Contractor

Intent: Conserve energy by decreasing conditioned air loss and improve indoor air quality and durability by decreasing air-transported moisture

Performance Requirement: Take steps to ensure that proper sealing of building openings and penetrations is part of the quality management plan, that responsibility is clearly assigned to members of the GC team or sub-contractors, and that the standard of air-tightness is understood by all involved.

Points: 1 point

When Verified: Verify through questions to the construction team during intermediate construction inspections, and visual verification of air sealing work.

4-38: Install additional moisture control measures

Responsible Party: Architect, Envelope Consultant, General Contractor

Intent: Reduce risk of moisture-related negative indoor air quality and durability problems

Performance Requirement:

Back dams: Design and implement window, door installation details that include pre-fabricated, wet applied or self-adhered flashing that forms a back dam and end dams at the window sill, with a slope to drain water from the opening to the outside. Window is air sealed to the dam on the inside.

Sill pans: Design and implement window installation details that include wet applied or self-adhered flashing that extends up the sides of the rough opening from the sill pan, improving integration with the weather resistive barrier.

Thresholds: Specify and install weatherproof door threshold hardware to protect door thresholds from wind, water and snow intrusion.

Sheet metal head flashing must be properly lapped into the weather resistive barrier and protecting the joint between the head of the window and/or door and the wall.

Overhangs: At least 25% (by number of entries) of the building's entries have overhangs that are 18" or deeper

Points Breakdown:

Sill pans with back dams or slope at windows	5 points
Door pans with back dams at doors	3 points
Sill flashing extending up sides of windows	5 points
Threshold protection at doors	3 points
Metal head flashing at windows	1 point
Metal head flashing at doors	1 point
Min. 18" overhangs at entryways	1 point

When Verified: Measures typically verified during intermediate construction inspections

4-39: Provide hose testing or negative pressurization testing to pre-installed sample of each window type to test assembly for moisture control protection - ASTM E1105 or equal

Responsible Party: Architect, General Contractor

Intent: Quality assure the effectiveness of both the window installation details as installed, and the window frames themselves

Performance Requirement: Perform test on the first installed window of each type in the project. If intrusion occurs during test, perform root cause analysis, modify installation and

retest. When successful completion of the test, modify installation details for all future installations accordingly

Points: 3 points

When Verified: Review test report at time of final inspections

Cross-references: 4-32, 4-33, 4-42

Air Distribution and Filtration

4-40: No stud or joist cavities used for air conveyance

Responsible Party: Architect, Mechanical engineer

Intent: Protect quality of conditioning and ventilation air from dirt, dust, mold, moisture and other indoor air contaminants from the joist cavities, and ensure a more efficiently controlled distribution system

Performance Requirement: Use sheet metal or flex duct for all forced air distribution – supply, return, and exhaust

Points: 2 points

When Verified: Visually verified during intermediate construction inspections

4-41: Do not install electronic, metal mesh, horse hair, or non-pleated fiberglass filters

Responsible Party: Mechanical Engineer, HVAC sub-contractor

Intent: Use effective, high-efficiency filtration to remove smaller particles from the air handling system

Performance Requirement: Install high-efficiency pleated filters, for reliable passive performance and reliability with minimal maintenance

Points: 2 points

When Verified: Visually verify at final inspection

Cross-reference: 4-56

4-42: Make sure air intakes are placed to avoid intake from air pollutant sources (beyond code)

Responsible Party: Architect, Mechanical Engineer

Intent: Avoid introducing pollutants to indoor air environment

Performance Requirement: All outside air intakes are located with spacing at least 20% greater than required by applicable code for any given contaminant source. Take prevailing winds and other relevant environmental factors into account when determining spacing requirements

Points: 1 point

When Verified: Visually verified at final inspections

Cross-references: 4-53, 4-56

4-43: No parking within 40 feet of building air intakes

Responsible Party: Architect

Intent: Avoid introducing pollutants to indoor air environment

Performance Requirement: No parking is installed within at least 40 feet of intake vents, operable windows or doors. Where appropriate, install "No Parking or Idling" signage adjacent to air intakes.

Points: 1 point

When Verified: Visually verified at final inspection

Cross-references: 4-11, 4-42

4-44: Use effective media air filter, ensuring the HVAC system is designed for the static pressure drop of the filter: MERV 8 or MERV 12+

Responsible Party: Mechanical Engineer, Mechanical sub-contractor, Operations and Maintenance staff

Intent: Optimize HVAC performance while removing harmful particulates from supplied air

Performance Requirement: Specify high efficiency pleated media filters and design HVAC system to function optimally with the specified filter installed. Filter housings should be designed to deter the use of inappropriate filters, and access hatches should be marked with the correct filter type and size.

Points Breakdown:

Medium efficiency pleated (4"+ filter), MERV 8	2 points
High efficiency filter, MERV 12+	5 points

When Verified: Visually verified at final inspection

Cross-reference: 7-2

4-45: Install operable windows in all occupied spaces, minimum 4% of floor area

Responsible Party: Architect

Intent: To promote health with improved indoor air quality with cross-ventilation, daylighting and views

Performance Requirement: In all occupiable spaces in residential units and common areas (excluding corridors and stair wells), the area of window that is operable must be no less than 4% of floor area of that space. Where possible, operable windows should be placed on opposite or adjacent walls to facilitate cross-ventilation

Points: 2 points

When Verified: Review sizing calculations and visually verify at final inspection

4-46: Install CO_2 detectors in community rooms

Responsible Party: Mechanical Engineer, HVAC Sub-contractor, Property Management

Intent: Raise awareness of inadequate ventilation

Performance Requirement: Install wall-mounted CO_2 detectors with clear digital readouts. Place signage indicating that levels around 500 are ideal and above 800 ppm are undesirable. Consider a visual or audible warning for room occupants and/or building management at levels above 1,200 ppm

Points: 2 points

When Verified: Visually verify at final inspection

4-47: Demand controlled ventilation in all rooms designed for high occupancy

Responsible Party: Mechanical Engineer, HVAC Sub-contractor

Intent: Decrease energy use by minimizing unnecessary ventilation

Performance Requirement: Design and install CO_2-based, demand controlled ventilation in community rooms, and other spaces designed for high occupancy but with intermittent use

Points: 2 points

When Verified: Visually verify at final inspection

4-48: Utilize a balanced ventilation approach (supply + exhaust/return) in residential units

Responsible Party: Mechanical Engineer, HVAC Sub-contractor

Intent: Improve the effectiveness of in-unit ventilation systems

Performance Requirement: Design and install a ventilation system for 100% of residential units that provides balanced outside air supply and return, rather than an exhaust only system. System may serve individual units or be centralized. In either case, supply and return flows should be tested and balanced to be neutral or provide slight depressurization of the unit, and should be commissioned prior to occupancy

Points: 10 points

When Verified: Visually verify at final inspection and review Test & Balance report.

Cross-references: 3-26, 3-27

HVAC Equipment

4-49: Design to ensure accessibility of all system components

Responsible Party: Architect, Mechanical Engineer

Intent: Providing good indoor air quality by facilitating inspection, cleaning, maintenance and repair of systems

Performance Requirement: All installed systems should allow easy access to building management for all maintenance, repair and replacement tasks

Points: 1 point

When Verified: Visually verify at final inspection

4-50: Design to prevent standing water in ducted HVAC systems

Responsible Party: Mechanical Engineer, Mechanical Sub-contractor

Intent: Minimize HVAC system conditions that could negatively affect indoor air quality

Performance Requirement: Ensure all drain pans and condensate lines have adequate slope to ensure good drainage, and an air gap at pipe termination to allow inspection. Humidification and cooling coils must be installed to ensure water droplets do not collect on duct surfaces

Points: 1 point

When Verified: Visually verified during final inspections

4-51: Commission all spot ventilation fans in all units

Responsible Party: Owner, General Contractor

Intent: To ensure ventilation is programmed to meet code requirements

Performance Requirement: Fans must be properly sized for the static pressure conditions of the connected duct work, and controls must be programmed to meet or exceed code requirements. Control sequence and delivered flow rate must be tested and confirmed (at 90% or more of design flow) on all units prior to occupancy. This may be included in the scope of the Commissioning Professional or Built Green Verifier

Points: 3 points

When Verified: Air flow tested at final inspection

4-52: Use heating system controls that are free of mercury

Responsible Party: General Contractor

Intent: Eliminate the chance of mercury exposure to manufacturers, installers and end-users.

Performance Requirement: Install only mercury-free heating system controls

Points: 1 point

When Verified: Review of production documentation and visually verified at final inspection

4-53: Range exhaust hoods shall be ENERGY STAR or HVI certified and have a maximum flow rate no less than 100 and no more than 300 cfm

Responsible Party: General Contractor

Intent: Ensure effective removal of contaminants from cooking through installation of quiet, energy efficient, effective range hoods

Performance Requirement: All installed range hoods shall be Energy Star or HVI certified, with a maximum flow rate of no less than 100 cfm, and no more than 300 cfm, and must be directly vented to the exterior. Microwave/rangehood combos may be used if they can meet the same requirements as a stand-alone range hood. Flow rates will be tested and confirmed on a 15% sample of units, see Credit 4-58.

For buildings using a whole-building ERV distributed ventilation system that are designed to achieve a high level of building tightness (i.e., PHIUS certification) an exception may be

proposed if the units will lack adequate make-up air for the range hood to exhaust outside. The Built Green Program Manager must be contacted during the design phase to discuss the proposed design and ventilation strategy for an exception to be considered.

Points: 1 point

When Verified: Review of product documentation and verify with fan flow testing at final inspection

Cross-reference: 4-58

4-54: Install an automatic fan control with 20-minute delay timer, motion sensor, or humidistat for bath exhaust fans

Responsible Party: Mechanical Engineer, General Contractor

Intent: Reduce moisture buildup and possible mildew problems by using automatic controls for exhaust fans

Performance Requirement: All bathroom exhaust fans must activate automatically with each use (fan tied to light switch or motions sensor) and include a 20-minute delay timer (runtime after occupancy) or a humidistat that will maintain Relative Humidity below 60%

Points: 2 points

When Verified: Review of product documentation and visually verify at final inspection

Cross-references: 3-22, 6-23

4-55: Install quiet bath exhaust fan with smooth ducting, minimum 4 inch, with a fan sone rating of .3 or less at or above the design CFM

Responsible Party: Mechanical Engineer, General Contractor

Intent: Enhance occupant comfort and encourage use of bath exhaust fans

Performance Requirement: All bath exhaust fans must have a sone rating of 0.3 or less, when operating at the design flow rate. Ducts must be smooth, sheet metal or plastic, at least 4" diameter and no elbow for at least 12" from the fan box

Points: 2 points

When Verified: Duct type, size and layout visually verified at intermediate construction inspections. Review of fan product and documentation at final inspection

Cross-reference: 3-39

4-56: No sound insulation or other fibrous materials installed inside ducting

Responsible Party: Mechanical Engineer, General Contractor, HVAC Sub-contractor

Intent: To avoid restricting airflow, or introducing contaminants, including moisture, into supplied air

Performance Requirement: No sound insulation should be installed inside forced air duct work

Points: 1 point

When Verified: Visually verify or verbally confirm during intermediate construction inspections

4-57: Install sealed combustion heating and hot water equipment

Responsible Party: Mechanical Engineer, General Contractor

Intent: Limit combustion pollutants in occupied spaces

Performance Requirement: Specify and install only closed-combustion, direct vent space and hot water heating equipment inside the building envelope

Points: 3 points

When Verified: Review of product documentation and visually verified at final inspection

4-58: Compartmentalization testing of sampling of units

Responsible Party: Owner, General Contractor, Built Green Verifier

Intent: Confirm effectiveness of unit air sealing measures

Performance Requirement: Units must be blower door tested, using either a single-point or multi-point depressurization test in accordance with the RESNET blower door testing protocol or ASTM E-779 (but depressurization only). The unit must be tested in the normal operating condition (no taping of exhaust ducts other penetrations, except supply and exhaust registers of balanced, continuously operating whole-unit ventilation systems), but with ventilation and HVAC fans disabled.

Points Breakdown:

For units of 1200 sq. ft. or less

- ≤ 0.3 CFM50/sq. ft. 3 points
- ≤ 0.23 CFM50/sq. ft. 5 points

For units of more than 1200 sq. ft.

- ≤ 0.23 CFM50/sq. ft. 3 points
- ≤ 0.15 CFM50/sq. ft. 5 points

When Verified: Testing should be performed at the earliest feasible opportunity after the unit air barrier is complete. Sampling may be used if the Verifier has been approved for sampling in advance by the Built Green Program Manager. The sampling rate will be 1 in 7 or 15%, with units selected at random, based on the RESNET sampling protocol. To qualify the project for sampling, the Verifier must test 7 completed units (of varying sizes and conditions/locations) and get 7 consecutive passes at the lower performance threshold.

Cross-references: 3-12, 3-14, 4-53

Resources:

RESNET Sampling Protocol Guidance: https://www.resnet.us/wp-content/uploads/Adopted_RESNET_Guidlines_for_Multifamily_Ratings_8-29-14.pdf

Health and Indoor Air Quality

4-59: Install biodegradable carbon filter at sink

Responsible Party: Plumbing Engineer, Plumbing Sub-contractor

Intent: Improve quality of drinking water

Performance Requirement: Install a biodegradable, activated carbon filter at the kitchen sink, on a separate drinking water faucet

Points: 1 point

When Verified: Review of product documentation and visually verify at final inspection

4-60: Install showerhead filter in all units, include information in the tenant handbook

Responsible Party: Plumbing Engineer, Plumbing contractor

Intent: Protect occupants from absorbing chlorine through the skin during showering

Performance Requirement: Install showerhead filters in all units and common area showers. Provide information to tenants about the benefits of showerhead filters; with details of how to maintain them.

Points: 1 point

When Verified: Visually verify at final inspection.

4-61: Provide track-off mats, carpets, and/or shoe grates at principle entryways to building

Responsible Party: Architect, General Contractor

Intent: One of the single most important indoor air quality (IAQ) measures you can take is to minimize pollutants entering the house in the first place. Walk-off mats and grills decrease the number and volume of particles and pollutants brought into the living space by shoes. They also reduce wear and tear on flooring by removing damaging particles from shoes prior to entrance.

Performance Requirement: Install permanent track-off matts or slotted grates, at least 10 feet long, at all regularly used entryways to the building. Include instructions in the O&M manual regarding period emptying of grate collection areas.

Roll-out mats are acceptable only if they are provided under a contract that requires weekly cleaning and replacement. The width of the mat should equal that of the door it is used at. Minimum size for any mats used is 24-inch length, 36-inch width, 0.38-inch thick.

Installed carpet tiles are allowed as a walk-off material, provided instructions in the O&M manual cover cleaning and replacement. Enclosed vestibules with durable, commercial carpeting or carpet tiles also meet the intent of this credit.

Any units that have a direct entry from outside need a permanent grate installed or track off mat to be provided and maintained by building owner. The width of the mat should equal that of the door of the main outside entrance. Minimum size for any mats used is 48-inch length, 36-inch width, 0.38-inch thick.

Points: 3 points

When Verified: Visually verified at substantial completion

Cross-references: 1-23, 4-82

4-62: Provide a shoe removal and storage area at the entrance to each unit

Responsible Party: Architect

Intent: Some studies indicate that up to 80% of indoor pollutants are tracked into the home on shoes. Providing track-off mats, see Credit 4-61, and shoe racks encourages shoe removal, which can go a long way to reducing this source of indoor pollution. One important indoor air quality measures you can take is to minimize bringing pollutants into the house in the first place. The first line of defense is to remove shoes from the living space that can bring in pesticides, hydrocarbons, and pollen from outside.

There are a variety of ways to achieve this intent through design of the main entrances; examples include an exterior or interior vestibule, built-in seating and/or shelves, space-defining flooring materials or grade changes, or a closet next to the entrance.

Using design and material selection to define an entrance is a simple way to delineate the main home from the entrance and encourage the behavior of shoe removal. An example of this is installing stone, polished concrete or tile flooring at the main entryways and then install more resilient flooring materials for the rest of the home. Doing this also has an added benefit of reducing the wear and tear on interior flooring materials that are less resilient to tracked-in debris or moisture and more expensive to maintain.

Performance Requirement: Provide a built-in feature at units' entrances, where occupants and visitors can sit to remove their shoes, with storage space for at least two pairs of shoes per bedroom in the unit. Staging furniture or removable shoe-removal furniture is not appliable.

Points: 2 points

When Verified: Visually verify at substantial completion

Cross-reference: 4-61

4-63: Do not install gas-burning appliances inside unit or building

Responsible Party: General Contractor

Intent: Limit combustion exhaust pollutants in living space

Performance Requirement: No fixed combustion fuel burning infrastructure, equipment or appliances to be installed inside any units or building common areas. Non-fixed furniture and equipment may use combustion fuels if located outdoors (e.g., grills, fire pits, back-up generators). This is a requirement for all NZE buildings, see Credits 3-5. Not applicable for sites located in jurisdictions with code-required electrification or a fossil-fuel ban for new construction (excludes green building incentive program requirements). Direct-vent fireplaces are excluded from this credit.

Points: 10 points

When Verified: Visually verified at final inspection

Cross-references: 1-20, 3-30, 3-34, 3-38, 3-40

4-64: Install floor drain or catch basin with drain under washing machines (and condensing/heat pump dryers if applicable)

Responsible Party: General Contractor

Intent: Avoid moisture problems if washing machines overflow

Performance Requirement: Install a floor drain or catch basin with drain under all washing machines and condensing dryers

Points: 1 point

When Verified: Visually verified at final inspection

4-65: Use radon resistant construction using EPA standards (passive) or test for radon and install active system after building is complete

Responsible Party: General Contractor

Intent: Reduce risk of exposure to radon gas

Performance Requirement: For passive approach, use of all the techniques currently recommended by the EPA to prevent radon from entering the house (see Radon Resistant Construction Techniques). For testing approach, after substantial completion, perform a test for radon for a minimum of 48 hours (or the minimum required by the test manufacturer), using two similar, EPA-approved test kits in the same location, or hire a qualified radon test professional. If the averaged result between the two tests is higher than 2 pCi/L, install the inline fan to activate the radon mitigation system. NOTE: The EPA threshold for action is 4 pCi/L, but concentrations below this level may still pose a health risk. Built Green requires the lower threshold of 2 pCi/L to earn credit.

Points Breakdown:

Passive	1 point
Test and install radon extraction fan	2 points

When Verified: For passive approach, visually verified during construction inspections. For testing approach, review of test results and visually verify installed system.

Resources:

EPA's Radon-Resistant Construction Basics and Techniques:
https://www.epa.gov/radon/radon-resistant-construction-basics-and-techniques

Extra Credit for Indoor Air Quality

4-66: Extra credit for innovation in Indoor Air Quality, subject to approval by Built Green program mProgram anager

You may submit a health and indoor air quality strategy or system, not specifically called out in this Section, for consideration for an Extra Credit for Innovation. All extra credits are subject to approval by the Built Green program mProgram anager. If approved, add up to 10 points to your Section total.

Section Five: Materials Efficiency

Overall

5-1: Design and build for deconstruction concept - 50%, 75%, or 90%

Responsible Party: Architect, General Contractor

Intent: Deconstruction is the preferred alternative to traditional building demolition for removing existing structures. Deconstruction is a coordinated process of disassembling a building and salvaging materials. It increases material life, reduces environmental impact of landfills and harvesting new materials, and saves money in dumping fees. Designing for deconstruction draws on design, construction, and demolition to maximize reusability and durability of building components throughout their functional lifetime and end of life.

Design for disassembly goes beyond the concept of designing for deconstruction, which is primarily focused on harvesting and reusing individual materials. Instead, disassembly expands that focus to the reuse of the building and its system components. When designed for disassembly, an existing structure can be taken apart in sections, modules, or panels that can facilitate future changes, be relocated and rebuilt into the original structure again, or used to create a new structure altogether.

This strategy must be fully integrated during the design phase and communicated to all subcontractors and installers of system components. Using an Integrated Design Process (see credit 6-39) that involves all major subcontractors and introducing design for disassembly expectations in specifications or job contracts would facilitate the intent of this credit.

Spray foams considerations for designing for disassembly:

Large surface area applications of spray foam are highly detrimental to future deconstruction and material salvaging, reuse, and recycling. Spray foam application impedes the ability to deconstruct, separate, and salvage building components at the building's end of life and further contaminates the materials preventing them from being recycled. Limit use of spray foams to spot applications for minor air-sealing or use a non-spray foam alternative, see Credit 5-74.

Performance Requirement: Design and construct the building using components and fastening systems that facilitate disassembly and deconstruction, including modular components or framing, prefabricated structural elements, pre-cast panels, glue- and nail-free assemblies, mechanical connectors instead of glued or soldered joints, and centralized, accessible wiring and utilities, see Credit 5-31. Projects that include surface area applications of spray foam (excluding minor spot applications for air-sealing) are not eligible for this credit.

Project team must describe the systems that facilitate disassembly for reuse and demonstrate what percentage of total building they constitute, by cost, surface area, or other metric approved by the Built Green Program Manager. Information on these systems must be included in the As-Built documents, and owner's Kit. It is highly encouraged to document the areas and modular sections that can be disassembled as part of the project's photo record in the owner's Kit.

If there are existing dwellings on the building site that need to be removed, see Credits 5-10 through 5-14 for credits related to relocating existing structures for reuse and deconstruction and material salvaging.

Points Breakdown:

50% of building components and materials chosen for future disassembly	10 points
75% of building components and materials chosen for future disassembly	15 points
90% of building components and materials chosen for future disassembly	20 points

When Verified: Since this strategy must be fully integrated into the design and construction process, the plan and approach should be reviewed by the verifier in the design phase. As-built and Homeowner's Kit content should be visually verified at the time of final inspections.

Cross-references: 5-8, 5-10 through 5-14, 5-19, 5-31, 6-39

Resources:

Design for Disassembly in the Built Environment: a guide to closed-loop design and building: https://www.lifecyclebuilding.org/docs/DfDseattle.pdf

A Guide to Design for Disassembly: https://www.archdaily.com/943366/a-guide-to-design-for-disassembly

What Is Design for Disassembly?: https://www.c2ccertified.org/news/article/what-is-design-for-disassembly

Design for Disassembly and Deconstruction - Challenges and Opportunities: https://doi.org/10.1016/j.proeng.2015.08.485

"Design for Deconstruction", by Michael Pulaski, Christopher Hewitt, Michael Horman Ph.D. and Bradley Guy, 2003: https://www.aisc.org/globalassets/modern-steel/archives/2004/06/2004v06_deconstruction.pdf

Design for Deconstruction (EPA): https://www.epa.gov/sites/production/files/2015-11/documents/designfordeconstrmanual.pdf

5-2: Eliminate materials and systems that require finishes or finish materials on a minimum of 100 square feet in common areas

Responsible Party: Architect, General Contractor

Intent: To reduce the consumption of material resources and improve indoor air quality by choosing materials that do not require additional finishing.

Performance Requirement: In common areas, use structural materials, such as wall panels, drywall, floor decking, and ceiling assemblies that do not require additional hard (e.g., drywall, finish flooring), soft (e.g., carpet) or wet-applied (e.g., paint) finish materials.

Pre-finished materials do not apply to this credit.

Points Breakdown: 1 point per 100 sq. ft. of finish-free, exposed material. Maximum 5 points

When Verified: Visually verified at final inspection

JOBSITE OPERATIONS

5-3: Provide weather protection for stored and installed materials

Responsible Party: General Contractor

Intent: Minimize or eliminate absorptive stored and installed building materials from contamination and/or damage from exposure to moisture, dust, other pollutants, and construction activities. This practice will reduce wasted materials and save cost on replacement. Over the building's life, this will help maintain building durability and indoor air quality.

Performance Requirement: Protection of stored and installed materials should be planned as part of sequencing of materials before they arrive on site.

Measures taken should include:

- Storing materials in dry conditions indoors, under cover, and off the ground or floor;
- Consider "Just in time" delivery;
- If materials are exposed to moisture:
- Dry wood to 15% moisture or less prior to enclosing;
- Replace drywall and/or insulation;
- No smoking in the building during construction, or within 25 feet of an entrance;
- Apply high-VOC products in areas where absorptive materials have not been installed yet. Ventilate the area well during application;
- Plan for higher-impact weather events: check weather protection measures at the end of the week (covers, downspouts).

Points: 1 Point

When verified: Visually verified during intermediate construction inspections

5-4: Use suppliers who offer reusable or recyclable packaging with recyclable/ biodegradable fillers or plastic and Styrofoam free packaging

Responsible Party: Architect, General Contractor

Intent: Reduce or eliminate material wasted onsite that is not intended for installation with policies and practices. Material and product packaging makes up a substantial percentage of construction material waste. Keeping material out of the waste stream helps preserve landfill space and lower disposal fees. Construction product suppliers can realize these benefits by working with their supply chain and using various types of reusable, recyclable packaging. When possible, consider no packaging.

Not all packaging is created equal when it comes to their lifecycle impact and recyclability. Plastic and Styrofoam manufacturing are energy intensive and emit greenhouse gases and toxic air pollutants. Most recycling facilities cannot process common forms of plastic (e.g., shrink wrap, strapping ties, plastic foams) and Styrofoam packaging materials so most of it is sent to landfills. When materials are not incinerated, contributing to toxic air pollutants, they often end up in the natural environment. An estimated 8 million tons of plastic is dumped into the ocean every year. Minimizing, or better yet, eliminating use of these types of packaging would greatly reduce the damage they cause to our planet.

Performance Requirement: Identify areas to eliminate or reduce non-reusable, non-recyclable, plastic, and Styrofoam packaging in project's supply chains. Require subcontractors to adhere to reusable or recyclable packaging purchasing practices. Specify in the contract that the subcontractor will purchase and deliver products/materials in recycled or reusable packaging, entirely free of plastic and Styrofoam whenever feasible. Consider requiring the subcontractor to collect and recycle packaging materials after use. Use a phase-appropriate bin to collect plastic films, wraps and foams, and Styrofoam packaging materials for source-separated recycling, see Credit 5-17.

Use suppliers who:

- Use minimal packaging, providing materials in bulk packaging, on pallets, in blankets, etc.
- Offer takeback of packaging for their product for reuse or recycling
- Provide their product in easy-to-recycle packaging, such as cardboard, wood, or metal
- Offer "just in time" delivery to minimize the need for protective plastic wrapping and damage to materials during onsite storage
- Purchase materials and products that are not packaged in plastic or Styrofoam
- Certified as Plastic-Free or Single Use Plastic Elimination or Reduction (SUPER)

Points Breakdown: May be combined for a maximum of 3 points.

1 point: Reusable or recyclable packaging with recyclable or biodegradable fillers

2 points: Packaging is 100% plastic and Styrofoam free

When Verified: Verify packaging requirements in Construction Waste Management Plan at pre-construction, visually verify during intermediate construction inspections.

Cross-references: 5-5, 5-8, 5-9, 5-15, 5-17

Resources:

Packaging waste 101: the problem: https://supplychain.edf.org/resources/sustainability-101-packaging-waste-the-problem/

Single Use Plastic Elimination or Reduction (SUPER) Certification: https://www.super.ngo/

Plastic-free packaging materials library: https://aplasticplanet.com/resource-library/

REDUCE

5-5: Implement comprehensive construction waste reduction and management plan

Responsible Party: Contractor, subcontractors

Intent: Planning can reduce costs associated with wasted materials; mitigate the pollution and costs of trucking waste; and keep construction and demolition materials out of landfills

Performance Requirement: Provide draft and then revised version (as necessary) of a Comprehensive Construction Waste Reduction and Management Plan. The Plan requirements include:

- Identifying who is responsible for implementing the plan and what the objectives and metrics are
- Identifying waste materials generated by the project and ways to reduce waste through smart procurement choices and resource efficient practices
- Staging, storage and removal of waste materials to be reused, recycled or landfilled
- Engagement with all subcontractors to participate fully in the plan, with incentives and penalties
- Tracking and reporting to document all waste materials by type, disposal method and weight or volume

Points: 5 points

When Verified: Review plan during pre-construction and visually verify implementation of plan during intermediate construction and at final inspection.

Cross-references: 5-2 through 5-19

Resources:

Built Green Recycling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

King County C&D requirements:
https://your.kingcounty.gov/solidwaste/greenbuilding/construction-demolition.asp

King County Letter to Vendor sample:

https://your.kingcounty.gov/solidwaste/greenbuilding/documents/letter_to_vendor.pdf

5-6: Create detailed take-off and provide as cut list to framer

Responsible Party: Architect, General Contractor

Intent: Minimize lumber waste by ensuring dimensional lumber sizes are used for their intended purpose

Performance Requirement: Create a detailed lumber take-off from the plans as part of the lumber ordering process. Provide to framer as a cut list, to ensure long studs and joists are not cut short by mistake.

Points: 2 points

When Verified: Review documents at preconstruction, or at time of final inspection

5-7: Use central cutting area or cut packs

Responsible Party: General Contractor

Intent: Minimize lumber waste by ensuring dimensional lumber sizes are used for their intended purpose, and off-cuts are used to best advantage

Performance Requirement: Restrict all dimensional lumber cutting to a central area, and retain off-cuts nearby for reuse. Alternately, order dimensional lumber in pre-cut packages as much as possible.

Points: 2 points

When Verified: Visually verify cutting areas or pre-cut framing packages during intermediate construction inspections

5-8: Use prefabricated or modular construction elements

Responsible Party: Architect, General Contractor

Intent: Modular construction can cut net waste in half compared to conventional construction. Under optimized conditions, the fabrication facility can reduce errors and

accidental damage. Factory-based modular construction processes are also better suited for implementing lean production principles and other strategies to better control inventory.

Although the total amount of materials used for a modular project will be greater than an equivalent, conventionally constructed project (each module requires substantial, independent structure frame), from a lifecycle perspective, the reduction of material waste in the modular construction process more than offsets the increased use of structural materials. The robust structures of modular buildings support a longer lifecycle, so the energy and carbon cost of its construction can be amortized over a longer period of time.

Prefabrication allows for entire buildings or building elements to be constructed in a factory, where materials are close at hand, weather-protected, and optimized in a way that cannot be mimicked by site-built construction. Production is further accelerated by the lack of weather-related delays and greatly reduced onsite time. This process saves time and money, which can contribute to making homes more affordable.

Incorporating prefabricated and modular elements into a structure may also contribute to easier disassembly and reuse (see Credit 5-1) and reducing the total waste generated on site (see Credit 5-9).

Performance Requirement: Design and construct at least 80% of the building using prefabricated or modular components. Project team must describe the components and information on these systems must be included in the As-Built documents. If ICF, SIPs, CLT, or other factory-framed wall panels are used this credit may be combined with Credits 5-31 and 5-32.

Points: 5 points

When Verified: Since this strategy must be fully integrated into the design and construction process, the plan and approach should be reviewed by the verifier in the design phase. Implementation should be visually verified at intermediate construction site visits. As-built documents should be visually verified at the time of final inspections.

Cross-references: 5-1, 5-9, 5-31, 5-32, 7-2

Resources:

The Potential of Prefab: How Modular Construction Can Be Green: https://www.buildinggreen.com/feature/potential-prefab-how-modular-construction-can-be-green

Fannie Mae-Multifamily Modular Construction Toolkit:
https://multifamily.fanniemae.com/media/13576/display

Outside the Box: Modular Multi-Family Designs Are Turning Heads:
https://www.thinkwood.com/blog/outside-the-box-modular-multi-family-designs-are-turning-heads

Building Multifamily with Shipping Containers:
https://www.threesquaredinc.com/post/building-multifamily-with-shipping-containers

5 Innovative Multifamily Projects Showcase the Benefits of Building Better:
https://www.multifamilyexecutive.com/design-development/design/5-innovative-multifamily-projects-showcase-the-benefits-of-building-better_o

5-9: Reduce total waste generated on site

Responsible Party: Contractor, subcontractors

Intent: Reduce costs associated with wasted materials; mitigate the pollution and costs of trucking waste; and keep construction and demolition materials out of landfills

Performance Requirement: Using co-mingled waste and source-separation disposal, reduce total waste generated on site below national average for residential construction. Count landfilled material at 100% of weight. Material that are recycled at a facility from the Built Green Recycling Guidelines can be calculated using the facility's diversion rate during the time of construction. Count 50% of weight of recycled material. The denominator is the conditioned floor area of the project, including leasable commercial space, whether finished or not.

Formula: [Weight of landfilled material + (Weight of Recycled Material * (1 - diversion rate of facility)) + (Weight of recycled material * diversion rate of facility * 50%)] / Conditioned Square Footage

Points Breakdown:

- ≤4.2 lbs./sq. ft 5 points
- ≤3 lbs./sq. ft 10 points
- ≤2.0 lbs./sq. ft 15 points
- ≤1.5 lbs./sq. ft 20 points

When Verified: Review completed waste tracking log and recycling facility truck tags and receipts at time of final inspection

Cross-references: 5-4 through 5-14, 5-19

Resources:

Built Green Recycling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

Reuse

5-10: Use deconstruction to dismantle existing building and salvage materials for reuse

Responsible Party: Architect, General Contractor

Intent: This credit is designed to salvage valuable, reusable building materials from existing onsite buildings through deconstruction for reuse in other projects. Reuse includes selling, donating, or reusing the materials onsite or for other projects.

Salvageable materials include but are not limited to:

- Lighting and hardware
- Mantels
- Timbers and framing
- Tongue and groove paneling
- Flooring
- Trim and molding
- Shelving
- Sinks
- Bathtubs
- Built-in hutches
- Wrought iron railings
- Bricks
- Pavers
- Cabinets
- Tile
- Glass blocks
- Doors
- Countertops
- Mirrors and vanity cabinets
- Antique architectural elements

Also included (but consider energy and water efficiency trade-offs):

- Faucets and toilets
- Windows
- Appliances (less than 5 years old)

Note: prior to beginning any renovation or demolition work, an asbestos survey must be performed by an accredited AHERA Building Inspector. In addition, a completed Notice of Intent must be submitted before any asbestos removal, and all asbestos-containing materials must be removed by asbestos workers prior to demolition. See your local jurisdictions to learn more about asbestos rules.

Performance Requirement: Requires salvage assessment conducted by a salvage professional with final amount of salvageable materials described by type and total weight (credit 5-10). Use deconstruction to dismantle existing buildings prior to any demolition work and salvage reusable materials for reuse. Determine amount salvaged by comparing the total weight in the assessment with the amount actually salvaged by weight.

Points Breakdown:

Deconstruct existing buildings or structures	5 points
Deconstruct and salvage at least 20% of all salvageable materials by weight	8 points
Deconstruct and salvage 50% or more of all salvageable materials by weight	10 points

When Verified: Review salvage assessment and visually verified at intermediate inspections.

Cross-reference: 5-11

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

5-11: Engage a salvage professional to conduct a salvage assessment of buildings planned for removal

Responsible Party: General Contractor

Intent: Increase the reuse of high-value salvaged materials from the site. Reduce costs associated with wasted materials; mitigate the pollution and costs of trucking waste; and keep construction materials out of landfills.

Performance Requirement: Contract a licensed deconstruction and salvage professional to conduct a salvage assessment of buildings planned for removal. Their assessment report should include the amount of salvageable material described by type and total weight. Self-assessments are not applicable.

The deconstruction and salvage professional must meet at least one (1) of the following criteria:

1. An established salvage and reuse retail company
2. A licensed contractor specializing in deconstruction
3. A demolition company with knowledge and experience with local and current salvage retail markets

Points: 3 points

When Verified: Review salvage assessment prior to demolition or deconstruction.

Cross-reference: 5-10

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

5-12: Donate, sell, or give away reusable finish items, wood scraps, lumber and land clearing debris

Responsible Party: General Contractor

Intent: Optimize the utilization of building material resources

Performance Requirement: Include steps for this Action Item in the Construction Waste Management Plan, provide infrastructure and require all on-site personnel to participate.

Points: 1 point

When Verified: Visually verified at intermediate or final inspections, review CWM Plan

Cross-reference: 5-9

5-13: Reuse salvaged materials

Responsible Party: General Contractor

Intent: Reusing building materials provides wide-ranging environmental benefits including, reducing waste, avoiding disposal costs, preserving embodied energy, reducing pollution, and preserving natural resources and habitats.

Performance Requirement: Purchase materials from salvage and reuse operations, re-use materials from reuse marketplace, other jobsites, or use reclaimed items from demolition. Credit will be awarded to salvaged materials used for 33% of a building

component either in the shell, circulation, or in every unit. Only salvaged materials that are not already covered by other Material Efficiency credits may be counted here. Possible components are listed here.

- Interior doors
- Fixtures
- Interior wall coverings
- Siding
- Decking
- Trim
- Urban-harvested trees from land clearing
- Glass blocks
- Tile

Points: 1 point per material, Maximum 10 points

When Verified: Visually verify at final inspection, review receipt of purchase, etc.

Cross-references: 5-9 through 5-14

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

Sustainable Northwest Wood: https://www.snwwood.com/

Pioneer Millworks: https://pioneermillworks.com/

5-14: Reuse existing buildings onsite or relocate buildings for reuse

Responsible Party: Architect, General Contractor

Intent: Leaving buildings and materials intact and in place is the highest form of materials efficiency and low embodied carbon construction. Renovation and reuse projects typically save between 50 and 75 percent of the embodied carbon emissions compared to constructing a new building. This is especially true if the foundation and structure are preserved since most of the embodied carbon resides there.

Older homes and structures in our region can offer high-quality construction and materials that cannot be sourced in modern supply chains, especially when it comes to timber

products. Nickel Bros estimated that a 1,600-sq. ft. home represents over 80 tons of materials and about 70 trees worth of lumber (equivalent to the amount of what one person could recycle in 125 years). Homes that are reused, rather than demolished, help preserve landfill space and significantly reduce disposal fees. Older homes may also contain toxic elements that are safer for workers and the environment if they are undisturbed and left in place. When relocated onto a new foundation and retrofitted with some energy efficiency upgrades, a reused home can increase its lifespan another 100 years.

Existing homes and buildings can also be sold or donated and then relocated to offer more affordable housing options with a much lower carbon footprint.

Performance Requirement: Reuse existing building on or offsite (may be reused by the general contractor, owner, or outside party). Majority of original building (homes, carriage houses, or detached garages) must be reused in its original form to earn this credit. Existing building may be disassembled into modular sections to be reconstructed later, but full deconstruction and salvage for material reuse is not appliable (see Credits 5-9 and 5-10 for deconstruction). Reused home or building must be a part of the new construction project scope and project address, subdivisions where an existing house remains unchanged and independent on a subdivided lot are not applicable.

If building is reused or repurposed onsite as part of the new development, renovations of the reused building to improve energy performance to at least current code requirements must be included in the project's scope. The reused building may contribute to the project earning any other Section 5 Material Efficiency credits. Any construction and demolition waste generated by reuse of the building are required to be included in Construction and Demolition Materials Management calculations and planning. Section 2 Site and Water credits such as landscaping and occupant water reduction requirements must be applied to the reused building as well as the new building(s). Any buildings or housing units that have a separate address from the building seeking certification or can be sold independently, must certify under its own Built Green checklist.

Points: 15 points

When Verified: Reviewed at completion of design. Visually verified during intermediate construction and final inspections.

Cross-references: 5-9, Section 2, Section 5 Design and Material Selection and Embodied Carbon credits

Resources:

House Rescue: Examining the Carbon Accounting Benefits of Moving a House: https://youtu.be/rNDyUgPnkL8

The Parsonage - a Built Green 4-star certified project with historical preservation: https://www.schemataworkshop.com/theparsonage

Construction and Demolition Materials Management

5-15: Use a three bin waste separation system: one for landfill, one for comingle recycling, one for phase-appropriate source-separated recycling

Responsible Party: General Contractor

Intent: Recycle the greatest amount of construction and demolition "waste" materials as possible while retaining value and quality of the materials for recycling. By utilizing three bins for comingled recycling, waste, and source-separated recycling will result in cleaner, higher quality, and presorted materials for recycling facilities and ensure more materials are truly diverted from landfills.

Performance Requirement: Must demonstrate that an appropriately sized commingled C&D recycling container and a waste C&D container (for landfill) have been onsite for the duration of the construction project. A third, phase-appropriate, container should be utilized to facilitate source-separated recycling of specific materials, e.g., wood during framing, gypsum board during drywalling, and cardboard during finish installation. Verify by assessing C&D hauling receipts and construction progress photos.

Points: 5 points

When Verified: Review of waste management documentation and visually verified during intermediate construction.

Cross-references: 5-16, 5-17

Resources:

Construction and Demolition Debris Section of King County's "What Do I Do With....?" Database: https://info.kingcounty.gov/services/recycling-garbage/solid-waste/what-do-i-do-with/Materials?cat=17

Washington State regulations (WAC 173-345-040) require a separate collection container be provided for waste at jobsites that conduct recycling, https://apps.leg.wa.gov/WAC/default.aspx?cite=173-345-040

5-16: Send at least 90% of jobsite waste (by weight, excluding concrete, brick, and asphalt) to a commingled recycling facility with a minimum of 50% diversion rate

Responsible Party: General Contractor

Intent: Reduce pressure on virgin resources and decrease the volume of material disposed of in landfills.

Performance Requirement: Include all necessary steps in Construction Waste Management plan to recycle at least 90% of waste generated, provide suitable facilities for staging and removal of materials, and document throughout construction, see Credit 5-14. Arrange for your construction waste to be hauled to a qualified recycling facility with an approved facility diversion rate as listed in the Built Green Recycling Guidelines. These guidelines are updated twice a year (summer and winter). Please stay aware of latest facility diversion rates. Any use of a recycling facility not listed in the guidelines must be approved by the Built Green Program Manager prior to use.

Comingled recycling is encouraged to be combined with source-separated recycling waste management strategies.

Points Breakdown:

Use comingled waste facility with a 50% diversion rate	8 Points
Use comingled waste facility with a 75% diversion rate	12 Points
Use comingled waste facility with a 90% diversion rate	15 Points

When Verified: Verify by assessing C&D hauling receipts. Built Green Recycling Guidelines are updated twice a year (summer and winter) based on the SPU Facility Certification Program quarterly diversion reports. Always check the current guidelines and their effective dates.

Cross-references: 1-25, 1-35, 5-15, 5-17

Resources:

Built Green Recycling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

5-17: Bonus: Source separated recycling, 90% minimum rate for all material generated during construction

Responsible Party: General Contractor

Intent: Effective source separation supports the highest and best use of materials and cleaner feedstock for producing recycled materials because there is less contamination.

On average, about 25% of discarded construction materials is dimensional lumber and another 10% is waste from manufactured wood products. Wood scrap you can't reuse should be targeted for recycling. Clean wood scraps refer to unpainted and untreated materials. Depending on the final use of the material, the following may be considered unacceptable contaminants: paint, stain, pressure treatment, lamination, adhesives, and nails or other fasteners. Many of the region's wood recyclers also accept pallets as part of their wood waste stream. Check with wood recycler to identify any restrictions on the wood they accept.

Drywall generally comprises 11% by volume and 26% by weight of a residential home's waste stream or roughly one pound per square foot. Drywall is most often recycled as feedstock for recycled-content drywall, see Credit 5-51. If your drywall subcontractor handles his or her own waste, work with the subcontractor to develop a recycling program and obtain recycling receipts for project verification.

Paints may be taken to the household hazardous waste areas. Check with your solid waste collector to see if full cans of paint are acceptable.

Performance Requirement: Verify by assessing C&D hauling receipts to ensure that 90% of a specific material was recycled via source-separation. Utilize photo documentation and a spreadsheet to track and calculate source-separated recycled materials and their quantities. See resource section for list of source separation recycling service providers. Please contact the facility directly to confirm what they accept and any restrictions they may have on materials accepted. If a subcontractor handles their own waste, work with them to develop a recycling program and designated recycling facility for drop-off and obtain their facility receipts for project verification. May be combined with three-bin separation system and commingled recycling credits, see Credits 5-14 and 5-15.

Point Breakdown:

Recycle cardboard	1 point
Recycle metal scraps	2 points
Recycle clean scrap wood and broken pallets	5 points
Recycle plastic films, package wrap and pallet wrap	2 points
Recycle drywall	3 points
Recycle concrete/asphalt rubble, masonry materials, or porcelain	2 points

Recycle paint	1 point
Recycle asphalt roofing	4 points
Recycle Styrofoam	4 points
Recycle carpet padding and upholstery foam	2 points
Recycle glass	1 point
Recycle land clearing and yard waste, food waste, soil and sod	3 points
Recycle light blubs, electronics and batteries	2 points

When Verified: Review of waste management documentation and visually verified during intermediate construction.

Cross-references: 5-5, 5-15, 5-16

Resources:

Built Green Recycling Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

King County Salvage and Source-Separated Recyclers List:
https://www.seattle.gov/utilities/construction-resources/collection-and-disposal/construction-and-demolition/certified-facilities

5-18: Provide designated area in building where residents can give away reusable items for use by other residents

Responsible Party: Architect, Owner

Intent: Reduce pressure on virgin resources and decrease the volume of material disposed of in the landfill

Performance Requirement: Design a designated area in the building that can be utilized for residents to give away reusable items for use by other residents. Building owner will have clear signage and information provided to tenants for their use.

Points: 1 point

When Verified: Visually verified and reviewed at time of final inspections

DESIGN AND MATERIAL SELECTION

OVERALL

5-19: Use standard dimensions in design of structure

Responsible Party: Architect

Intent: Reduce waste of construction materials

Performance Requirement: Use two foot and four foot increments where possible in floor plans and framing layouts, and place door and window openings to avoid additional framing or additional cuts. Coordinate with subcontractors to optimize design to most common material dimensions.

Points: 1 point

When Verified: Review at completion of design phase

5-20: Design and install recycling stations on each floor, including a maintenance service plan

Responsible Party: Owner, architect, property manager

Intent: Improve resident participation in municipal recycling and reduce contamination of recyclables

Performance Requirement: Provide a recycling station on each floor of the building, with clear (preferably graphic or multi-lingual) signage that is consistent with the local municipality's recycling program. Include recycling station management/maintenance in property maintenance service plan, and educational materials in resident orientation packets

Points: 10 points

When Verified: Visually verified and reviewed at time of final inspections

5-21: Design and install food waste management system on each floor, including a maintenance service plan

Responsible Party: Owner, architect, property manager

Intent: Reduce the amount of compostable food waste in the solid waste stream. Over 20% of what we throw away in our garbage is compostable.

Performance Requirement:

Provide kitchen collection vessels in 100% of units, and a central collection area with appropriate signage that is maintained for cleanliness and odors. Include

management/maintenance measures in the property maintenance service plan, and communicate food waste composting requirements in the resident orientation and manual.

The majority of King and Snohomish Counties can now recycle food scraps, food soiled paper, and other compostable containers and materials in their curbside yard waste bin. Food waste recycling in multifamily facilities presents unique challenges and may not be easy to establish currently due to the nature of multifamily unit occupancy, or even because of the current culture regarding food waste collection. Therefore, good signage and communication with an easily accessible central collection area is paramount.

Points: 8 points

When Verified: Final verification

Resources:

Seattle Public Utilities site:
http://www.seattle.gov/util/ForBusinesses/SolidWaste/FoodYardBusinesses/BldgOwnersManagers/index.htm

City of Kirkland – great resource for multifamily:
http://www.kirklandwa.gov/depart/Public_Works/solidwaste/resources/multifamily-toolkit.htm

Snohomish County – Waste Management information:
http://wmnorthwest.com/ssnohomishcounty/yardwaste.html

5-22: Install materials with longer life cycles

Responsible Party: Owner, architect, general contractor

Intent: Reduce the future consumption of raw materials for the replacement of short service life building components

Performance Requirement: Install at least one major building component that has a life expectancy and warranty at least 30 years (roofing, siding, windows, cabinetry, counter tops, flooring). Include expectation and submittal requirements in specifications or contract documents

Points Breakdown: 1 point per significant material with 30+ year warranty. Maximum 3 points.

When Verified: Final Verification (include product warranty information)

5-23: Install locally/regionally produced materials

Responsible Party: Architect, general contractor

Intent: Reduce the carbon footprint of materials resulting from transportation from source to processing and to project site

Performance Requirement: Install materials (costing no less than 2% of the materials budget) that are both harvest/extracted, and processed/manufactured within 500 miles of the project site. Salvaged materials are applicable under this credit.

Points Breakdown: 1 point per compliant material up to 10 points

When Verified: Review at final verification (include product submittal with documentation of extraction, production, and manufacture)

5-24: Use building-salvaged lumber, minimum 200 board feet

Responsible Party: Architect

Intent: Reduce pressure on virgin timber resources. According to EPA statistics, a 2000-square-foot residential project generates 127 tons of demolition debris. Ten percent of this is recoverable framing lumber, which averages 6,000 board feet or 33 mature trees.

The most common commercially salvaged and reused building component is wood salvaged from beams in turn-of-the-century buildings or abandoned railroad trestles. Consequently, reclaimed wood is often available in species, coloration, and wood quality not found in today's new material markets. Some companies offer original hand-hewn beams for reuse in their present form. Most companies grade the wood depending on its grain, the number and type of knots, and the number of nail holes left over from its prior use. Others provide salvaged wood re-milled into flooring, millwork, or paneling, see cross-referenced credits below.

Engaging a salvage professional to identify salvageable materials in existing structures that are targeted for removal (see Credit 5-11) can provide valuable high-quality lumber that can reduce time, costs, and embodied carbon impacts associated with disposal, supply, and transportation.

Performance Requirement: Points are awarded for the quantity of building-salvaged lumber from an existing building onsite, deconstructed building, or commercially salvaged and reused building material sources. This does not apply to new wood from trees cut onsite or off-cuts produced onsite during framing. Finished wood products that

incorporate or are re-milled from salvaged lumber that are not already covered by other Material Efficiency credits may be counted here.

Points Breakdown: 1 point for every 200 board feet, 8 points maximum.

When Verified: Review of salvage assessment and deconstruction supplied materials, product documentation or receipt of sale, and visually verified at final inspection.

Cross-references: 5-29, 5-40, 5-66, 5-81, 5-91

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

Sustainable Northwest Wood: https://www.snwwood.com/

Pioneer Millworks: https://pioneermillworks.com/

5-25: Use rapidly renewable building materials and products made from plants harvested within a ten-year cycle or shorter

Responsible Party: Architect, General Contractor

Intent: To reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

There are many wall paneling options available, such as cork and bamboo, that are both renewable resources and natural materials. Cork is sustainable because the bark is harvested, and the tree is left to regenerate more bark. The bark is harvested on an eight-year cycle. Cork is durable, sound absorbing, and naturally moisture-, mold-, and rot-resistant. Bamboo is sustainable because it can be harvested on a six- to eight-year cycle. Bamboo is a very durable and dimensionally stable. Despite the long-distance transport of these products to the United States, the durability, hardness, short regeneration time and continued carbon-sequestering provide justification for specifying bamboo and cork products over more local alternatives. There are also indoor air quality advantages to using natural materials—they off-gas less due to using fewer or no chemicals during manufacture.

Paneling made from reclaimed agricultural fibers is plant-based and sustainable because it is harvested on an annual or semi-annual cycle. The straw that makes up strawboard for example can be harvested every 2–3 years. Strawboard can be a substitute for wood particleboard and medium-density fiberboard. Seek out products that have no added formaldehyde in the bonding agents and finishes.
Plant-based finishes refer to products made from rapidly renewable vegetable oils, citrus oils, waxes, and mineral oils. They often create a more natural-looking final product.

Performance Requirement: Install materials (costing no less than 2% of the materials budget) that are made from plants harvested within a ten-year cycle or shorter

Points Breakdown: 2 points per compliant material, up to 6 points

When Verified: Final Verification (include product submittal with documentation of extraction, production, and manufacture)

5-26: Use no endangered species or old growth wood

Responsible Party: Architect, General Contractor

Intent: Avoid the use of endangered wood species or old growth timber. Alternative wood products that provide similar performance and aesthetics to tropical hardwoods include thermally-modified, bio-based liquid impregnated wood siding and decking (e.g. Kebony, Shou Sugi Ban), see Credits 5-79 and 5-85.

Deconstructed buildings in our region are an ethical place to source old-growth wood materials that can add historical and aesthetic character to a building's interior design.

Performance Requirement: Use no species on the Convention on International Trade in Endangered Species (CITES) list (See Wood Database in References, below), or wood harvest from old growth forests (never previously harvested - check with supplier). Wood species on the list represents plant species determined to be endangered or threatened if international trade were left unrestricted or where international trade could threaten their survival. Ipe, also known as Iron Wood, is included in this credit.

Points: 3 points

When Verified: Verify documentation for any wood that appears to be tropical or old growth

Resources:

CITES: International Union for Conservation of Nature: IUCN Red List of Threatened Species
www.cites.org

Wood Database: www.wood-database.com/wood-articles/restricted-and-endangered-wood-species/

Also, International Union for Conservation of Nature (IUCN) Red List of Threatened Species: http://www.iucnredlist.org/

Thermally treated wood: https://www.buildwithrise.com/stories/thermally-treated-wood

Kebony wood modification process: https://us.kebony.com/technology/the-process/

Greenhome Solutions: https://www.ghsproducts.com/

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

Northwest Building Salvage Network: https://www.nbsnseattle.org/

5-27: Use no PVC, CPVC, or ABS piping for plumbing or sprinklers within the building envelope

Responsible Party: Architect, plumbing designer, plumbing subcontractor

Intent: Minimize the use of plastics containing high levels of toxic chemicals

Performance Requirement: Use no PVC, CPVC or ABS piping for plumbing or sprinkler within the building envelope. Give preference copper, PEX, cast iron, steel, and polypropylene pipe

Points: 3 points

When Verified: Visually verified during intermediate construction inspections

5-28: Use Red List Free, DECLARE, Living Product, or Cradle-to-Cradle labelled products

Responsible Party: Architect, General Contractor

Intent: Third-party certification standards establish criteria and verify manufacturer claims regarding the environmental, social, and economic benefits of their products. The following certifications represent industry-transforming standards of sourcing, manufacturing, and disposal transparency focused on a product's impacts over its entire life cycle.

Red List Free products and materials do not contain any of the chemicals identified by the Living Building Challenge Red List. The Red List represents the "worst in class" materials, chemicals, and elements known to pose serious risks to human health and the greater

ecosystem that are prevalent in the building products industry. Declare labels are one way of finding products that are Red List free.

Declare is a product ingredient transparency platform. Declare requires ingredient reporting to 100ppm for a minimum of 99%, by weight, of a product's ingredients. Look for products with Declare labels that are third-party verified and not listed on the Living Building Challenge Red List.

Living Products are healthy and free of toxins, socially responsible, respect the rights of workers, are net positive, and benefit both people and the environment. Based on the Living Building Challenge, products must demonstrate compliance in seven performance areas (petals); place, water, energy, health and happiness, materials, equity, and beauty.

Cradle-to-Cradle Certified products are sustainable products made for the circular economy. To receive certification, products are assessed for environmental and social performance across five critical sustainability categories: material health, material reuse, renewable energy and carbon management, water stewardship, and social fairness.

Performance Requirement: Use any product in any application that carries one of these labels or certifications to achieve this credit's intent. "Red List approved" is only accepted for this credit if it's listed on a Declare label, not as a stand-alone product claim.

Points: 1 point per product, maximum 3 points.

When Verified: Review of product documentation and visually verified at final inspection.

Resources:

Declare Label and Product Database: https://living-future.org/declare/declare-about/#declare-2-0

Living Products: https://living-future.org/lpc/basics/

Cradle-to-Cradle Product Registry: https://www.c2ccertified.org/products/registry

LBC Red List: https://living-future.org/declare/declare-about/red-list/

FRAMING

5-29: Use salvaged framing lumber in structural framing applications, 30% minimum

Responsible Party: General Contractor, Structural Engineer

Intent: Reduce pressure on virgin timber resources.

Performance Requirement: Use framing lumber from salvage and reuse operations, reused from other jobsites, or reclaimed in deconstruction/demolition. When reusing or repurposing lumber for structural purposes, check with your local building authority regarding grading requirements, strength restrictions or limits. Code may require some downgrading of structural capacity. In some cases, such as old heavy timbers, structural capacity may be increased.

Points Breakdown: 30% minimum with 1 point per 10% of structural framing, maximum of 10 points.

7 Points: at least 30% of structural framing is salvaged lumber

10 Points: 60% or more of structural framing is salvaged lumber

When Verified: Review of salvage assessment and deconstruction supplied materials, product documentation or receipt of sale. Visually verified during intermediate construction and final inspections.

Cross-references: 5-23, 5-24

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

Pioneer Millworks: https://pioneermillworks.com/

5-30: Use third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines; 50% minimum per application

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvested wood products.

Performance Requirement: Add third-party certified wood products in material specifications and supplier order requirements. Use wood that is third-party certified and sustainably harvested in accordance with the Tier 1 or Tier 2 requirements outlined in the Built Green Wood Certification Guidelines for at least 50% on the following framing applications:

- Dimensional lumber
- Sheathing
- Beams

See the Built Green Wood Certification Guidelines for the specific third-party certification labels accepted and their tier levels.

Points Breakdown: Points are applied to each framing application individually. Points from all three applications may be combined for a maximum of 15 points.

Dimensional lumber

2 points: Tier 2 certification

6 points: Tier 1 certification

Sheathing

3 points: Tier 2 certification

5 points: Tier 1 certification

Beams

3 points: Tier 2 certification

6 points: Tier 1 certification

When Verified: Review of product documentation and visually verified during intermediate construction and at final inspection.

Resources:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

Forest Stewardship Council: https://fsc.org/en

Sustainable Forest Initiative: https://www.forests.org/

Sustainable Northwest Wood: https://www.snwwood.com/

Pioneer Millworks: https://pioneermillworks.com/

5-31: Use factory-framed wall panels (panelized wall construction), e.g. SIPs, ICFs, CLT

Responsible Party: Architect, General Contractor

Intent: Prefabricated wall panels are built in a factory based on individual building plans. Since the panels are manufactured in a quality-controlled environment, they are stronger, more dimensionally accurate, more durable structures, and do not suffer from weather-related delays. They are built, labeled for assembly, and shipped to the job site. Builders follow assembly procedures defined by factory specifications.

Factory-framed wall panel systems offer significant savings in labor by combining framing, insulating, and sheathing. Less waste is produced because of the system's flexibility (the forms can be cut to any shape). Additionally, many systems have "studs" built in so there's something to nail or screw to, and sheetrock may be attached directly to the foam's interior surface. Exterior siding material, such as wood, vinyl, brick, or stucco, can be easily attached.

Using structural insulated panel (SIP) systems for wall, roof, and flooring applications instead of traditional stick framing can be an effective way to reduce the amount of wood used in a building. Panel systems have been in use for over 30 years and a variety of systems are available. The most common system includes a foam core sandwiched between oriented strand board (OSB) skins. Avoid structural insulated panels produced with ozone-depleting HCFCs. EPS (expanded polystyrene) does not contain HCFCs or other ozone-depleting chemicals. Non-ozone-depleting polyurethane is now available.

For homes located in wild land-urban interface zones and other areas increasingly prone to wildfires, ICF and SIP panel systems also provide exceptional fire protection over traditional stick-frame construction. The Concrete in ICF panels is one of the most resistant materials to heat and fire and can withstand intense heat for four or more hours. SIPs panels are less resistant to the heat, but the panels' solid core of EPS eliminates the chimney effect in the walls that occurs in stick-built structure; it will melt and self-extinguish rather than maintain a flame.

ICFs also represents an opportunity to use waste products like fly ash and wood waste in standard building material, which coincidentally offer superior performance. Fly ash waste from coal burning has been shown to improve the strength of concrete, see Credit 5-29.

In order to get optimum performance and waste reduction out of a panel system, first carefully evaluate your building plans to see if panels are appropriate. A complex shell design with lots of window or door openings can make it more difficult to use panels resourcefully. If you decide to use panels, make sure your framer understands how to work with them. Improper installation can negate the benefits. (The manufacturer should be able to provide some assistance when you start using these products.)

Performance Requirement: Use structural insulated panels for at least 80% of the exterior above grade walls, and/or 80% of the roof.

Point Breakdown:

At least 80% of above grade walls	4 points
At least 80% of the roof	4 points
At least 80% of the above grade walls and roof	8 points

When Verified: Visually verified during intermediate construction and final inspections.

Cross-references: 3-10, 5-1, 5-2, 5-8, 5-32

Resources:

Sustainable Building with SIPS: https://www.sips.org/green-building/green-building-with-sips

About SIPS: https://www.greenbuildingadvisor.com/green-basics/structural-insulated-panels

Mass Timber Design Manual: https://www.thinkwood.com/mass-timber

ICF Walls are Durable and Energy Efficient: https://www.greenbuildingadvisor.com/green-basics/insulated-concrete-forms

ICF Construction: Everything You Need To Know: https://www.buildwithrise.com/stories/mythbusting-icf-sustainable

Fireproof ICFs: https://www.icfmag.com/2008/08/fireproof-icfs/

5-32: Use ICFs with concrete using at least 20% supplementary cementitious materials (by weight)

Responsible Party: Architect, General Contractor

Intent: Reduce waste of dimensional lumber by using prefabricated wall systems. Reduce the embodied carbon footprint of the project by using non-portland cement and industry byproducts as supplementary cementitious materials (SCM).

Performance Requirement: For at least 75% of the exterior above grade walls, use insulated concrete forms made from concrete mixes composed of at least 20% non-portland cement SCM.

Points: 3 points

When Verified: Review of product documentation and verified at final inspection.

Cross-references: 3-10, 5-8, 5-31

Resources: Supplementary Cementitious Materials: https://www.nahb.org/-/media/NAHB/nahb-community/docs/councils/bsc/supplementary-cementitious-materials.pdf

5-33: Use advanced wall framing - 24-inch OC, with double top plate

Responsible Party: Architect, general contractor

Intent: Reduce the consumption of framing lumber by eliminating unnecessary framing for structural and infill purposes, through Optimum Value Engineering.

Performance Requirement: Use 24" on center framing for at least 50% of exterior and interior walls, based on linear feet of one-story wall, where structurally feasible. Double top plates or equivalent are allowed to remove the need to stack vertical framing members

Points: 5 points

When Verified: Visually verified during intermediate construction inspections

5-34: Use engineered structural products and use no 2xs larger than 2x8, and no 4xs larger than 4x8

Responsible Party: Architect, General Contractor

Intent: Reduce demand for dimensional lumber from large, mature trees by using engineered products that can be made from smaller trees with shorter harvesting cycles

Performance Requirement: Design for, and specify engineered products, such as open web trusses, I-joists, glue-lams and Laminated Veneer Lumber (LVL) for all structural joists and beams greater than 8" wide. Clearly communicate to lumber yard and framer that no dimensional lumber greater than 2x8 and 4x8 is to be used in the project

Points: 3 points

When Verified: Visually verified during intermediate construction inspections

5-35: Use finger-jointed framing material (e.g. studs)

Responsible Party: Architect, General Contractor

Intent: Reduce demand for dimensional lumber from larger trees by using engineered products that can be made from scrap wood and smaller trees with shorter harvesting cycles

Performance Requirement: Use finger-jointed studs for at least 50% of wood-framed walls, based on linear feet of one-story wall.

Points: 1 point

When Verified: Visually verified during intermediate construction inspections

Cross-references: 3-10, 3-14, 5-31

5-36: Use Cross Laminated Timber in place of steel or concrete beams or framing

Responsible Party: Architect, General Contractor

Intent: Reduce the embodied carbon of buildings by avoiding the use of materials with high energy inputs during production.

Cross-laminated timber (CLT) is a wood panel product made from gluing together layers of solid-sawn lumber, i.e., lumber cut from a single log. Each layer of boards is usually oriented perpendicular to adjacent layers and glued on the wide faces of each board, usually in a symmetric way so that the outer layers have the same orientation. CLT offers high strength and structural simplicity needed for cost-effective buildings, as well as a lighter environmental footprint than concrete or steel. It also provides numerous other benefits, including quicker installation, reduced waste, improved thermal performance, and design versatility.

Mass timber, composite wood, man-made wood, or manufactured board, includes a range of derivative wood products which are manufactured by binding or fixing the strands, particles, fibers, or veneers or boards of wood together with adhesives or other methods of fixation[1] to form composite material. Structurally, mass timber offers the kind of proven performance—including fire protection and seismic resistance—that allows its use in larger buildings. It also expands options for exposed wood structure in smaller projects.

Mass Timber/CLT has a high strength-to-weight ratio, which makes it good for protecting against seismic events and for use in load-bearing applications. Since mass timber panels are prefabricated and then assembled on site, buildings made from mass timber have much shorter project timelines and safer construction sites. Like traditional wood products, CLT products can offer very pleasing interior design aesthetics that require no additional surface finishes, see Credit 5-56.

Performance Requirement: Use Cross Laminated Timber (CLT) for at least 20% of the project's structural materials budget. CLT is made into structural panels that can be used for load-bearing walls and floors, among other uses.

Points: 3 points

When Verified: Visually verified during intermediate construction.

Cross-references: 5-8, 5-30, 5-31

Resources:

Mass Timber Design Manual: https://www.thinkwood.com/mass-timber

Wood Products Council: https://www.woodworks.org/

FOUNDATION

5-37: For all foundations, retaining and structural walls, use supplementary cementitious materials for 25-50% by weight of cementitious materials for all concrete (pavement excluded)

Responsible Party: General Contractor, Structural or Civil Engineer

Intent: Reduce the embodied carbon footprint of the project by using non-portland cement and industry byproducts as supplementary cementitious materials (SCM).

Performance Requirement: For at least 90% of the poured-in-place concrete in the project, use concrete mixes with at least 25% of cementitious content composed of non-portland cement SCM. Concrete pavements are excluded from this credit, see Credit 5-86

Points Breakdown:

25%, by weight, of concrete mix is supplementary cementitious materials	3 points
50%, by weight, of concrete mix is supplementary cementitious materials	6 points

When Verified: Review concrete mix documentation at time of final inspections.

Resources: Supplementary Cementitious Materials: https://www.nahb.org/-/media/NAHB/nahb-community/docs/councils/bsc/supplementary-cementitious-materials.pdf

5-38: Use recycled concrete, asphalt, or glass cullet for base or fill

Responsible Party: General Contractor

Intent: Optimize the use of material resources by repurposing waste/salvaged materials.

When using this technique, grind concrete, asphalt, or glass cullet properly to meet base or fill specification. When ground to specs, the materials compact nicely to form a stable base. Get a sample from the supplier for your excavator crew to approve. See your pavement supplier for recycled concrete and asphalt options. Reduce waste hauling and disposal fees by contracting a mobile concrete crusher that can crush concrete onsite to spec.

Performance Requirement: Use recycled concrete, asphalt, or glass cullet for at least 30% of base or fill aggregate in foundations or paved areas. Not to be used as fill in landscaped or stormwater infiltration areas.

Points: 2 points

When Verified: Visually verified during intermediate construction inspections, review documentation at final inspections.

SUB-FLOOR

5-39: Use recycled content sub-floor

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Use an engineered sub-floor or underlayment product, that is certified to have at least 20% total recycled content, for at least 50% of the framed floor in the project

Points: 1 point

When Verified: Visually verified during intermediate construction inspections, with review of documentation

FINISH FLOOR

5-40: Use salvaged flooring or flooring made from salvaged lumber

Responsible Party: Architect/ Interior Designer, General Contractor

Intent: Optimize the use of material resources by repurposing waste, preserving embodied energy, and reducing pressure on forest resources and habitats. Reuse flooring purchased from salvage and reuse operations, reused from other jobsites, or reclaimed in deconstruction. Salvaged wood flooring can add an attractive feature to a home a rich historical appeal. Many salvaged woods come from original old-growth timbers, have fewer knots, longer lengths or widths, and come from species no longer available. Quality and availability can vary widely but reusing wood flooring causes no new trees to be harvested.

Performance Requirement: Install salvaged flooring and/or flooring with a wear layer made from salvaged lumber (minimum 3mm wear layer). Credit will be awarded to salvaged flooring used for at least 33% of the flooring either in the circulation or in every unit. Points may be combined if both types of salvaged wood flooring are utilized in a project.

Points Breakdown:

5 points: salvaged flooring

2 points: flooring made with salvaged lumber wear layer

When Verified: Visually verify at final inspection. Review receipt of purchase, EPD, or product documentation.

Cross-references: 4-17, 5-88, 5-91

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

Greenhome Solutions: https://www.ghsproducts.com/

Sustainable Northwest Wood: https://www.snwwood.com/

Pioneer Millworks: https://pioneermillworks.com/

Craft flooring: https://craftfloor.com/

5-41: Use rapidly renewable flooring products with a ten-year harvest cycle or shorter (excluding carpet)

Responsible Party: Architect, General Contractor

Intent: Reduce the negative environmental impacts of manufacturing and disposing of materials with toxic components, by increasing demand for products with high recycled content

Performance Requirement: For at least 90% of the vinyl flooring used in the project, use a product that is certified to have at least 10% total recycled content.

Points: 2 points

When Verified: Visually verified during final inspections, with review of documentation

Cross-reference: 5-91

5-42: Install untreated natural fiber carpet (e.g. jute, sisal, wool)

Responsible Party: Architect/ Interior Designer, General Contractor

Intent: Today, 97% of all manufactured carpets consist of synthetic fibers, backing material, binders, and protective coatings. These synthetic components off-gas and some are known to be detrimental to health. Several companies make carpets with natural fibers, such as wool, cotton, sisal, and jute. Look for natural fiber carpets that use a jute and natural rubber backing to avoid noxious off-gassing from synthetic chemical treatments, glues, and synthetic backing materials.

Wool carpeting provides many benefits: it is soil and stain resistant, has long-term appearance retention, color retention and texture recovery, is flame-resistant, mildew resistant, and water repellant. Wool is hypoallergenic. Unlike synthetic carpets that attract and lock-in lint, pollen, and dirt particles, wool repels them for easy removal with a vacuum. It has been proven hygienically safe in medically sensitive areas. Wool does not promote the growth of dust mites or bacteria and significantly improves indoor air quality by rapidly absorbing the common pollutants formaldehyde, sulfur dioxide, and nitrogen oxides. Not only does wool neutralize these contaminants more quickly and completely than synthetic carpet fibers, but wool will also not re-emit them, even when heated. Wool carpet may continue purifying the air for up to 30 years. All these features lead to improved comfort, ease of maintenance, and less waste from replacement.

At the end of the carpet's life untreated natural fiber carpeting with natural backing materials and binders are biodegradable.

Performance Requirement: Install natural fiber floor coverings with no synthetic chemical treatments (including synthetic moth-proofing treatments) for at least 50% of non-hard surface floors in the project.

Points: 3 points

When Verified: Review product documentation and visually verify at final inspection.

Cross-references: 4-21, 5-91

5-43: If using vinyl flooring, use product with recycled content

Responsible Party: Architect, General Contractor

Intent: Reduce the negative environmental impacts of manufacturing and disposing of materials with toxic components, by increasing demand for products with high recycled content

Performance Requirement: For at least 90% of the vinyl flooring used in the project, use a product that is certified to have at least 10% total recycled content.

Points: 2 points

When Verified: Visually verified during final inspections, with review of documentation

Cross-references: 4-15, 4-18

5-44: No vinyl flooring

Responsible Party: Architect, General Contractor

Intent: Reduce the negative environmental and human health impacts of manufacturing, using and disposing of materials with toxic components, by using alternatives that are environmentally-preferable

Performance Requirement: Install no vinyl flooring in the project.

Points: 4 points

When Verified: Visually verified during final inspections, with review of documentation

5-45: Use recycled content carpet pad

Responsible Party: Interior Designer, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Use a carpet pad, that is certified to have at least 40% total recycled content, for at least 90% of the carpeted in the project (excluding carpet tile areas). Product also must not contain brominated flame retardants to earn this point.

Points: 1 point

When Verified: Visually verified during final inspections, with review of documentation

Cross-references: 4-19, 4-21

5-46: Use recycled content carpet

Responsible Party: Interior Designer, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Use carpet that is certified to have at least 40% total recycled content in the pile or the backing (or both), for at least 50% of the carpet in the project. Preference should be given to suppliers with "take-back" programs, which help to close the loop of manufacturer responsibility.

Points: 2 points

When Verified: Visually verified during final inspections, with review of documentation

Cross-references: 4-19, 4-21, 5-28

5-47: Use replaceable carpet tile for 50% of carpeted area or 100% of carpeted area (minimum of 50 sq. ft.)

Responsible Party: Interior Designer, General Contractor

Intent: Reduce unnecessary waste generated from the replacement of full widths of broadloom carpet, when limited areas are worn or stained

Performance Requirement: Install replaceable carpet tile in the project

Points Breakdown:

50% of carpeted area	2 points
100% of carpeted area	4 points

When Verified: Visually verified during final inspections

Cross-references: 4-21, 5-28

5-48: If using tile, use hard surface tile that is 40% recycled content

Responsible Party: Interior Designer, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Use hard-surface tile that is certified to have at least 40% total recycled content. Preference should be given to high levels of post-consumer recycled content.

Points: 5 points

When Verified: Visually verified during final inspections, with review of documentation

Cross-references: 4-15, 4-17

5-49: Use natural linoleum

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Linoleum is durable, low-maintenance flooring made from all-natural materials including linseed oil, pine resin, sawdust, cork dust, limestone, natural pigments, and jute backing. Unlike vinyl flooring, linoleum does not contain significant petroleum-based products, phthalates, or chlorinated chemicals. From a raw materials standpoint, linoleum is an outstanding product. It also contributes to healthy indoor air quality by inhibiting the growth of bacteria and dust mites and providing sound absorption. All of its ingredients are minimally processed, commonly available, rapidly renewable, and it is biodegradable at the end of life.

Linoleum comes in a wide range of colors, patterns, textures in sheet, tiles, or engineered click tiles that allow it to compliment any aesthetic style.

Performance Requirement: Use natural linoleum in place of synthetic resilient flooring products. Use a low-VOC adhesive if using sheet or tile linoleum to maximize indoor air quality.

Points: 5 point

When Verified: Visually verified during final inspections, with review of product documentation.

Cross-references: 4-15, 4-17, 4-20, 5-44, 5-91

5-50: Use flooring that is third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines; 50% minimum

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvested wood products.

Performance Requirement: Use flooring made from wood that is third-party certified sustainably harvested in accordance with Tier 1 or Tier 2 certification requirements (outlined in Built Green Wood Certification Guidelines) for at least 50% of the hard surface flooring in the project.

Points Breakdown:

Tier 1 certification 5 points

Tier 2 certification 4 points

When Verified: Review of product documentation and visually verified at final inspection.

Resources:

Built Green Wood Certification Guidelines: https://builtgreen.net/certification/#checklistandhandbook

Greenhome Solutions: https://www.ghsproducts.com/

Sustainable Northwest Wood: https://www.snwwood.com/

Pioneer Millworks: https://pioneermillworks.com/

Craft flooring: https://craftfloor.com/

5-51: Use spot repairable floor finish

Responsible Party: Interior Designer

Intent: Increase the service life of finish flooring, reducing waste and maintenance cost

Performance Requirement: For wood, cork and other natural surface flooring, use penetrating oil or wax finishes instead of polyurethane. Wear and tear in a penetrating finish can be spot repaired instead of skimming and refinishing the whole area.

Include clear instructions for floor finish maintenance and repair in the Operations & Maintenance Manual

Points: 1 point

When Verified: Visually verified at final inspections, with review of O&M manual

INTERIOR WALLS

5-52: Use drywall with a minimum of 95% recycled content synthetic gypsum or 30% if non-synthetic gypsum

Responsible Party: General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content. Gypsum board manufacturers employ various levels of recycled content (pre- and post-consumer) in the production of gypsum board through either the use of flue-gas desulfurization (FGD) (also known as synthetic) gypsum or post-consumer gypsum collected from construction and demolition projects used in new product board core and recycled paper for board facing. These higher recycled content boards are commonly available at most building material suppliers and are cost-competitive with conventional drywall. Non-synthetic recycled gypsum content industry standard is around 5%, therefore specifying a higher content product with your vendor is necessary. Some products are locally sourced/manufactured.

Performance Requirement: Use at least 30% of drywall with a minimum of 95% recycled content synthetic gypsum or 10% if non-synthetic gypsum.

Points: 2 point

When Verified: Review of product documentation and visually verified during intermediate construction.

Cross-reference: 5-17

5-53: Use natural interior wall finishes, e.g. lime paint, clay, wood

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on virgin materials and reduce embodied carbon emissions. Natural finishes include lime paints, milk paints, and clays with no plastics or acrylics and low levels of solvents and VOCs.

Lime paint is an interior or exterior finish that contains slaked lime, clay, marble dust, earth pigments, natural glue, and water. Lime paint can be applied to a variety of surfaces including wood, drywall, and masonry.

Milk paint is a durable, economical, matte finish made of milk protein, lime, and clay. Milk paint dries quickly without the solvents and VOCs of traditional paint.

Natural clay plaster is an interior, trowel-on finish that comes in a wide variety of colors and can be highly polished or heavily textured. It contains clay, marble dust, borax, and earth pigments. Clay plaster is mold resistant, hypoallergenic, and low-toxic.

When left exposed, cross-laminated timber (CLT) panels and beams provides a finished wood surface that can enhance an interior space with a warm natural aesthetic without the use of sealers or solvents, see Credits 5-2 and 5-36.

Performance Requirement: Use natural wall finishes on large interior surfaces (not trim, doors, etc.) of the project.

Points: 2 points

When Verified: Visually verified at final inspection, with product documentation review.

Cross-references: 4-15, 4-22, 5-2, 5-36

5-54: Use recycled or "reworked" paint and finishes on main surfaces or all surfaces

Responsible Party: Interior Designer, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Use recycled or reworked paints and coatings on large interior surfaces (not trim, doors, etc.) of the project

Points Breakdown:

Main interior surfaces	2 points
All interior surfaces	3 points

When Verified: Visually verified at final inspection, with product documentation review

5-55: If installing acoustical tiles or paneling, select a recycled content product

Responsible Party: Interior Designer, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Install acoustical tile that contains recycled content for at least 90% of the acoustical tile in the project, based on area.

Points: 1 point

When Verified: Visually verified at final inspection, with product documentation review

WINDOWS

5-56: Use all wood, composite, or fiberglass windows

Responsible Party: Architect, General Contractor

Intent: Reduce the environmental impact of vinyl during manufacture, use, and disposal by sourcing alternate materials with lower impact

Performance Requirement: Install all-wood, plastic composite (no vinyl), or fiberglass windows in at least 90% of window locations (storefront window systems excluded)

Points: 8 points

When Verified: Visually verified at final inspection

TRIM

5-57: Use trim that is third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines, 90% minimum

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvested wood products.

Performance Requirement: At least 90% of interior trim (by cost or linear footage) must be from certified sustainably harvested wood that meets the Tier 1 or Tier 2 requirements (outlined in Built Green Wood Certification Guidelines).

Points Breakdown:

Tier 1 certification	4 points
Tier 2 certification	2 points

When Verified: Review of product documentation and visually verified at final inspection.

Resources:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

5-58: Use finger-jointed or MDF trim with no added urea formaldehyde, 90% minimum

Responsible Party: Interior Designer, General Contractor

Performance Requirement: At least 90% of interior trim (by cost or linear footage) must be finger jointed, or MDF that is certified NAUF, NAF, ULEF, or CARB II compliant.

Points: 3 points

When Verified: Visually verified at final inspection, with product documentation review

Cross-reference: 4-16

5-59: Use wood veneers made of rapidly renewable product

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by using materials with short harvesting cycles (10 years or less).

Performance Requirement: At least 90% of interior trim (by cost or linear footage) must be made from a rapidly renewable products with no added urea formaldehyde, certified NAUF, NAF, ULEF, or CARB II compliant. Prioritize products that are certified sustainably harvested.

Points: 2 points

When Verified: Review of product documentation and visually verified at final inspection.

Cross-references: 4-16, 5-91

5-60: Use wood veneers that are third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines, 50% minimum

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvested wood products.

Performance Requirement: At least 90% of wood veneers (by cost or linear feet) must be from certified sustainably harvested wood that meets the Tier 1 or Tier 2 requirements (outlined in Built Green Wood Certification Guidelines).

Points Breakdown:

Tier 1 certification 4 points

Tier 2 certification 2 points

When Verified: Review of product documentation and visually verified at final inspection.

Resources:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

CABINETRY AND COUNTERS

Cabinets

5-61: Use salvaged cabinets

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Optimize the use of material resources by repurposing waste, preserving embodied energy, and reducing pressure on natural resources.

Salvaged kitchen cabinets can be restored and reused in the home or for storage cabinetry in garage or workshop. Period-specific cabinetry can also be restored to add a distinctive look for bathrooms. These materials/components are available from building salvage and architectural salvage operations.

Performance Requirement: For at least 75% of all cabinet casework use salvaged cabinets that were purchased from salvage and reuse operations, reused from other jobsites, or reclaimed in deconstruction.

Points: 2 points

When Verified: Review of salvage assessment and deconstruction supplied materials, product documentation or receipt of sale, and visually verified at final inspection.

Cross-reference: 5-91

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

5-62: Use salvaged hardware

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Optimize the use of material resources by repurposing waste, preserving embodied energy, and reducing pressure on natural resources.

Many salvaged hardware items provide a period-authentic look that could be incorporated into new homes. Consider handles, drawer pulls, cabinet hardware, drapery hardware, registers, hooks, and brackets.

Performance Requirement: For at least 50% of hardware use salvaged hardware that was purchased from salvage and reuse operations, reused from other jobsites, or reclaimed in demolition.

Points: 2 points

When Verified: Review of salvage assessment and deconstruction supplied materials, product documentation or receipt of sale, and visually verified at final inspection.

Cross-reference: 5-91

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

5-63: Use wood that is third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines, 50% minimum

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvested wood products.

Performance Requirement: At least 90% of cabinetry must be from certified sustainably harvested wood that meets the Tier 1 or Tier 2 requirements (outlined in Built Green Wood Certification Guidelines). This credit may be combined with Credit 5-65 if agricultural fiber is used for cabinet boxes in place of MDF.

Points Breakdown:

Tier 1 certification 4 points

Tier 2 certification 2 points

When Verified: Review of product documentation and visually verified at final inspection.

Resources:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

5-64: Use recycled-content cabinet casework for at least 75% of all casework

Responsible Party: Architect, general contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: At least 75% of cabinet case work in the project (based on cost or linear feet of cabinet) must be certified to contain recycled content

Points: 3 points

When Verified: Visually verified at final inspection, with product documentation review

5-65: Use cabinet casework and shelving made with agricultural fiber that is NAUF, NAF, or ULEF for at least 75% of all cabinetry

Responsible Party: Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by using non-wood alternatives with short harvesting cycles

Performance Requirement: At least 75% of installed cabinetry is made of engineered wood products that are certified NAUF, NAF or CARB II ULEF.

Points: 1 point

When Verified: Visually verified at final inspection, with product documentation review

Cross-reference: 4-16

Countertops

5-66: Use salvaged countertops: common areas (4pts) or in all units (6pts)

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Optimize the use of material resources by repurposing waste, preserving embodied energy, and reducing pressure on natural resources.

Performance Requirement: Use salvaged countertops or salvaged materials that were purchased from salvage and reuse operations, reused from other jobsites, or reclaimed in deconstruction in lobby/reception/common areas or in all units. Also applicable are countertops made from trees species that are removed to restore habitat (e.g., invasive juniper).

Points Breakdown:

In lobby/reception, common areas only	4 points
In all units	6 points

When Verified: Review of salvage assessment and deconstruction supplied materials, product documentation or receipt of sale, and visually verified at final inspection.

Cross-reference: 5-91

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

5-67: Use countertops that are third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvested wood products.

Performance Requirement: For all units install a countertop made from certified sustainably harvested wood that meets the Tier 1 or Tier 2 requirements (outlined in Built Green Wood Certification Guidelines).

Points Breakdown:

Tier 1 certification 4 points

Tier 2 certification 2 points

When Verified: Review of product documentation and visually verified at final inspection.

References:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

5-68: Use domestic stone or 90%+ quartz content in all units

Responsible Party: Architect/Interior Designer, General Contractor

Intent: Quartz countertops are made from industrial byproducts reduce pressure on virgin materials and ecosystems. Locally quarried stone reduces the impact of carbon dioxide emitted during the production and transportation of materials and construction to project site.

Performance Requirement: For all units install countertops made from either domestic stone or quartz (with at least 90% quartz content). The countertop underlayment installed with countertop must be either wheatboard, or no-added urea formaldehyde plywood or particle board (CARB II Compliance not accepted as substitute).

Points: 4 points

When Verified: Review of product documentation and visually verified at final inspection.

Cross-reference: 4-16

5-69: Use recycled-content material in lobby/reception areas or in all units

Responsible Party: Architect, general contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Install slab or tile countertops made from with recycled content or recycled paper products in lobby/reception/common areas or in all units. The countertop must be no-added urea formaldehyde (CARB II Compliance not accepted as substitute).

Points Breakdown:

In lobby/reception, common areas only	1 point
In all units	4 points

When Verified: Visually verified at final inspection, with review of product documentation

Cross-reference: 4-16

ROOF

5-70: Use recycled content roofing material

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Use a roofing material that is certified to contain recycled content for at least 75% of the roof area

Points: 2 points

When Verified: Visually verified at final inspection, with product documentation review

Cross-references: 2-24, 2-35

5-71: Use a modified bitumen built-up roof

Responsible Party: Architect, General Contractor

Intent: Optimize roof service life with durable, repairable materials

Performance Requirement: Specify and install modified bitumen built up roofing as the primary roofing system for the project.

Points: 2 points

When Verified: Product documentation reviewed and visually verified at intermediate or final site visit

5-72: Protect at least 90% of built-up and membrane roofing with ballast, pavers, or vegetated roof systems

Responsible Party: Owner, Architect, General Contractor

Intent: Increase service life of roof by protecting it from solar radiation and friction wear and tear.

Performance Requirement: At least 90% of low angle, built up or membrane roofing is covered with ballast, elevated pavers, of a vegetated roofing system

Points: 5 points

When Verified: Visually verified at final inspection

Cross-reference: 2-22

INSULATION

5-73: All cavity insulation to have a minimum of 40% post-consumer recycled content

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: All cavity-installed insulation must be certified to contain at least 40% post-consumer recycled content

Points: 4 points

When Verified: Visually verified at final inspection, with review of product documentation

Cross-references: 3-13, 4-15

5-74: Use environmentally friendly foam building products (CFC-, HFC-, HCFC-free)

Responsible Party: General Contractor

Intent: Reduce the use of products containing chemicals with high global warming potential, greenhouse gas emissions, and other atmospheric impacts associated with foam product manufacture by using products made with more benign blowing agents. Building an environmentally friendly home means eliminating the use of foam building materials that are manufactured using chlorofluorocarbons (CFCs) hydrochlorofluorocarbons (HCFCs), or hydrofluorocarbons (HFCs).

CFCs and HFCs are known to contribute significantly to ozone depletion and have a global warming potential (GWP) ranging thousands to tens of thousands of times higher than carbon dioxide (CO_2). HCFCs are less damaging than CFCs but are still considered high GWP gases and should also be avoided. Use of these high-GWP foams will further exasperate climate change by increasing a project's embodied carbon emissions during construction and end-of-life stage.

Also avoid products that include formaldehyde because indoor formaldehyde is recognized as a severe health hazard, causing reactions ranging from flu-like symptoms to death in individuals sensitized through exposure.

Alternative foams for insulation:

- *Beadboard* or *EPS* (expanded polystyrene) rigid foam insulation can be used for interior or below grade uses. However, it doesn't insulate as well (R-3.6 to R-4.4 per inch), but it is less damaging to the environment because pentane is used in its production rather than HCFC.
- *Polyurethane* insulation (e.g., polyisocyanurate) made with pentane instead of HCFCs as the blowing agent is now available. Unlike EPS, however, there are few outlets for polyurethane foam as a recycled product.
- *Blown-in cellulose* (100% recycled newspaper content) or *formaldehyde-free fiberglass*.
- *Soy-based foams*

Alternatives to spray foams for air sealing:

- *Interior-applied waterborne acrylic* sealants that are aerosolized and injected into a pressurized home (e.g., Aerobarrier)
- *Exterior-applied, liquid-applied* weatherproofing membranes (e.g., Enviro-Dri by Tremco)

Spray foams considerations for deconstruction and salvage at end of life:

Large surface area applications of spray foam are highly detrimental to future deconstruction, material salvaging, and recycling due to the spray foam impeding deconstruction and salvaging building components and contaminating materials for reuse or recycling.

Performance Requirement: All rigid foam insulation and spray foam used in the building must be documented to use no CFC-, HFC-, or HCFC blowing agents during manufacture or installation

Points: 5 points

Cross-references: 4-15, 4-22, 5-1

Resources:

Chlorofluorocarbons (CFCs) and hydrofluorocarbons (HFCs): https://www.pca.state.mn.us/air/chlorofluorocarbons-cfcs-and-hydrofluorocarbons-hfcs

Choosing Insulation for Carbon Value: https://www.swinter.com/party-walls/choosing-insulation-for-carbon-value-why-more-is-not-always-better-part-1/

AeroBarrier: https://aeroseal.com/aerobarrier/

Enviro-Dri by Tremco: https://www.tremcosealants.com/markets/residential/weather-resistive-barrier-systems/enviro-dri/enviro-dri/

EXTERIOR WALLS

5-75: Use recycled content sheathing (OSB does not apply)

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Install sheathing that is certified to contain recycled content (OSB does not apply)

Points: 2 points

When Verified: Visually verified during intermediate construction inspections, with review of product documentation

5-76: Use exterior cladding with reclaimed or recycled material on at least 20% of solid wall surface

Responsible Party: Architect, general contractor

Intent: Reduce pressure on virgin materials, by increasing demand for products with high recycled content

Performance Requirement: Select and install exterior cladding which is reclaimed or has recycled content on at least 20% of the area of opaque, above-grade walls

Points: 3 points

When Verified: Visually verified at final inspection, with review of product documentation

5-77: No vinyl siding or exterior trim

Responsible Party: Architect, General Contractor

Intent: Reduce the environmental impact of vinyl during manufacture, use, and disposal by sourcing alternate materials with lower impact

Performance Requirement: Use no vinyl siding/cladding or exterior trim products in the project

Points: 4 points

When Verified: Visually verified during final inspections

5-78: Use 50-year siding product (minimum 20% of solid wall surface)

Responsible Party: Architect, General Contractor

Intent: Reduce the future consumption of raw materials for the replacement of short service life building components

Performance Requirement: Use a siding/cladding product with a 50-year service life (based on warranty/manufacturers documentation) on at least 20% of the opaque, above-grade walls of the project

Points: 3 points

When Verified: Visually verified at final inspection, with documentation review

5-79: Use thermally-modified, bio-based liquid impregnated wood siding that does not require wood sealer

Responsible Party: Architect, General Contractor

Intent: Thermally-modified wood products, increasingly common in the marketplace, are a natural, non-toxic alternative to chemically treated or sensitive rainforest wood products. Unlike pressure-treated lumber, thermally modified wood is essentially "cooked" in oxygen-free ovens which changes its cellular and molecular makeup by removing all organic compounds from its cells. The wood no longer absorbs water, reducing its ability to expand or contract, a leading cause of rot in outdoor uses. The lack of moisture content in the wood also means that the wood's cellulose will no longer act as a "food source" for fungi or insects. The processes also eliminate the need for sealers or paints for preservation. Thermally modified wood products can be guaranteed for up to 25 years.

There are three types of thermally-modified wood products accepted for this credit: thermally-modified with no additives, bio-based liquid impregnated thermally-modified wood, and Shou Sugi Ban (i.e., wood charring).

Kebony wood products use a thermal-modification process that impregnates traditional FSC-certified pine lumber with a bio-based (furfuryl alcohol) liquid that further increases its

dimensional stability. The impregnated lumber is then heat-cured and dried, creating a polymer that fuses with the wood on a cellular level and increases the cell's thickness by 50%. The result is lumber products that are similar in dimensional stability, hardness, and rot and pest resistance to rarer and environmentally-sensitive tropical woods (e.g., ipe, cumaru, garapa). The modification process utilizes rapidly renewing pine trees from sustainably-managed forests and increases the lifespan of the wood in exterior applications to over 30 years without the need for sealers or paints. This product can be used for siding and decking applications.

Shou Sugi Ban is an antient Japanese exterior siding technique that preserves wood by charring it with fire. The process involves charring the wood, cooling it, cleaning it, and finishing it with a natural oil. The charred wood becomes more moisture, rot, pest, and fire resistant, with an expected lifespan of 80 years. Traditionally red cedar was used, but the technique can be applied to many other wood species.

Performance Requirement: Use a thermally-modified wood product on at least 20% of the solid wall surface without applying a wood sealer (natural oil prefinishes are ok). Preference should be given to products that are certified under a Tier 1 certification as described in the Built Green Wood Certification Guidelines.

Points: 4 points

When Verified: Review of product documentation and visually verified at final inspection.

Cross-references: 5-2, 5-22, 5-78, 5-80

Resources:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

Thermally treated wood: https://www.buildwithrise.com/stories/thermally-treated-wood

Shou Sugi Ban: https://shousugiban.com/

Kebony wood modification process: https://us.kebony.com/technology/the-process/

Greenhome Solutions: https://www.ghsproducts.com/

Pioneer Millworks: https://pioneermillworks.com/

5-80: Wood siding that is third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines; at least 20% of solid wall surface

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvest wood products

Performance Requirement: Use wood siding that is third-party certified sustainably harvested wood that meets the Tier 1 (5 pts) or Tier 2 (3 pts) requirements (outlined in Table 5-1) on at least 20% of solid wall surface

Points Breakdown:

Tier 1 certification	5 points
Tier 2 certification	3 points

When Verified: Visually verified at final inspection, with product documentation review

References:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

5-81: Use salvaged siding

Responsible Party: Architect, General Contractor

Intent: Optimize the use of material resources by repurposing waste, preserving embodied energy, and reducing pressure on forest resources and habitats. Reuse siding purchased from salvage and reuse operations, reused from other jobsites, or reclaimed in deconstruction. Salvaged wood siding and siding made from salvaged lumber can add an attractive feature or historical appeal to a home. Many salvaged woods come from original old-growth timbers, have fewer knots, longer lengths or widths, and represent species no longer available. Quality and availability can vary widely but reusing wood flooring causes no new trees to be harvested.

Only reuse siding in good condition. Be aware of building envelope considerations when selecting any siding product/material. Be sure to install a drainable house wrap under exterior siding to promote wall drainage.

Performance Requirement: Use salvaged siding or siding made from salvaged lumber for at least 20% of the exterior surfacing.

Points: 4 points

When Verified: Visually verify at final inspection and review receipt of purchase, product documentation, etc.

Cross-reference: 5-91

Resources:

Northwest Building Salvage Network: https://www.nbsnseattle.org/

Habitat for humanity Restores: https://www.habitat.org/restores

Washington Materials Marketplace: https://washington.materialsmarketplace.org/

RE-USE Consulting: https://reuseconsulting.com/home-page

Greenhome Solutions: https://www.ghsproducts.com/

Sustainable Northwest Wood: https://www.snwwood.com/

Pioneer Millworks: https://pioneermillworks.com/

OTHER EXTERIOR

5-82: Use lumber that is third-party certified, sustainably harvested wood that meets Tier 1 or Tier 2 of the Built Green Wood Certification Guidelines (excluding siding)

Responsible Party: Architect, General Contractor

Intent: Reduce pressure on forest resources by increasing demand for sustainably managed and harvest wood products

Performance Requirement: Use lumber that is third-party certified sustainably harvested wood that meets the Tier 1 or Tier 2 requirements (outlined elsewhere in the Handbook) for decking and porches

Points Breakdown:

Tier 1 certification 3 points

Tier 2 certification 2 points

When Verified: Visually verified at final inspection, with product documentation review

Cross-references: 5-26, 5-84

References:

Built Green Wood Certification Guidelines:
https://builtgreen.net/certification/#checklistandhandbook

5-83: Use 95% recycled-content plastic or wood/bamboo polymer lumber for decks and porches

Responsible Party: Architect, Landscape Architect, General Contractor

Intent: Reduce pressure on forest resources and virgin materials by increasing demand for products with high recycled content. Prioritize composite products that are FSC or SFI certified.

Performance Requirement: Use composite lumber made from 95% recycled content plastic and certified sustainably harvested wood/bamboo for decks and porches. Composite decking containing PVC are not applicable.

Points: 1 point

When Verified: Review of product documentation and visually verified at final inspection.

Cross-references: 5-2, 5-26

5-84: If lumber is used, use no pressure treated lumber

Responsible Party: Architect, Landscape Architect, General Contractor

Intent: Minimize the use of toxic chemicals that may impact soil and surface water ecosystems

Performance Requirement: When including wood on the exterior of the building or in the landscape, do not specify or install pressure treated lumber. Instead, use naturally rot resistant materials.

Points: 5 points

When Verified: Product documentation reviewed and visually verified at final site visit

Cross-reference: 5-26

5-85: Use thermally-modified lumber that does not require wood sealer for decking and exterior millwork (excludes siding)

Responsible Party: Architect, General Contractor

Intent: Thermally-modified wood products, increasingly common in the marketplace, are a natural, non-toxic alternative to chemically treated or sensitive rainforest wood products. Unlike pressure-treated lumber, thermally modified wood is essentially "cooked" in oxygen-free ovens which changes its cellular and molecular makeup by removing all organic compounds from its cells. The wood no longer absorbs water, reducing its ability to expand or contract, a leading cause of rot in outdoor uses. The lack of moisture content in the wood also means that the wood's cellulose will no longer act as a "food source" for fungi or insects. The processes also eliminate the need for sealers or paints for preservation. Thermally modified wood products can be guaranteed for up to 25 years.

There are three types of thermally-modified wood products accepted for this credit: thermally-modified with no additives, bio-based liquid impregnated thermally-modified wood, and Shou Sugi Ban (i.e., wood charring).

Kebony wood products use a thermal-modification process that impregnates traditional FSC-certified pine lumber with a bio-based (furfuryl alcohol) liquid that further increases its dimensional stability. The impregnated lumber is then heat-cured and dried, creating a polymer that fuses with the wood on a cellular level and increases the cell's thickness by 50%. The result is lumber products that are similar in dimensional stability, hardness, and rot and pest resistance to rarer and environmentally-sensitive tropical woods (e.g., ipe, cumaru, garapa). The modification process utilizes rapidly renewing pine trees from sustainably-managed forests and increases the lifespan of the wood in exterior applications to over 30 years without the need for sealers or paints. This product can be used for siding and decking applications.

Performance Requirement: Use a thermally-modified lumber for decking and/or exterior millwork without applying a wood sealer. Preference should be given to products that are certified under a Tier 1 certification as described in the Built Green Wood Certification Guidelines. Siding is excluded from this credit, see Credit 5-79.

Points: 4 points

When Verified: Review of product documentation and visually verified at final inspection.

Cross-references: 5-2, 5-82, 5-84

Resources: Built Green Wood Certification Guidelines: https://builtgreen.net/certification/#checklistandhandbook

Thermally treated wood: https://www.buildwithrise.com/stories/thermally-treated-wood

Kebony wood modification process: https://us.kebony.com/technology/the-process/

Greenhome Solutions: https://www.ghsproducts.com/

5-86: For all concrete pavements, use supplementary cementitious materials for 25-50% by weight of cementitious materials for all concrete; 25% and 50%

Responsible Party: General Contractor, Structural or Civil Engineer

Intent: Reduce the embodied carbon footprint of the project by using non-portland cement and industry byproducts as supplementary cementitious materials.

Performance Requirement: For at least 90% of the poured-in-place concrete pavements in the project use concrete mixes with at least 25% of cementitious content from non-portland cement supplementary cementitious materials. Concrete foundations and retaining walls are excluded from this credit, please see Credit 5-37.

Points Breakdown:

25%, by weight, of concrete mix is supplementary cementitious materials	3 points
50%, by weight, of concrete mix is supplementary cementitious materials	6 points

When Verified: Review concrete mix documentation at time of final inspections.

Resources: Supplementary Cementitious Materials: https://www.nahb.org/-/media/NAHB/nahb-community/docs/councils/bsc/supplementary-cementitious-materials.pdf

BENCHMARKING

5-87: Commit to annual tracking of building trash using ENERGY STAR Portfolio Manager and to sharing with Built Green

Responsible Party: Owner

Intent: Improve understanding of solid waste management performance in Built Green certified buildings

Performance Requirement: Include building solid waste tracking and reporting in property management service plan. Established ESPM account, “Share Building” with Built Green program account and include agreement to track solid waste for a minimum of two years in project verification binder

Points: 5 points

When Verified: Final verification

Resources:

Getting Started With Waste Benchmarking: https://www.energystar.gov/buildings/owners_and_managers/existing_buildings/use_portfolio_manager/track_waste_materials

EMBODIED CARBON

5-88: Use materials with Environmental Product Declaration (EPD)

Responsible Party: Architect, General Contractor

Intent: The intent of Environmental Product Declarations (EPD) is to increase transparency around the environmental performance or impact of any product or material over its entire lifecycle. To create an EPD, a manufacturer must conduct a lifecycle assessment of their product following ISO standards and have the assessment third-party verified. EPDs allow architects, engineers, and designers to compare materials and products to select the option that supports the most sustainable result and lowers embodied carbon. An EPD is not a claim of environmental superiority for a specific product or material. Some local jurisdictions, like Seattle, are now requiring the use of EPDs on all projects receiving green building incentives.

Performance Requirement: Specify and select materials and products that have EPDs. EPD must be third-party verified and valid at the time of specification and purchase.

Points: 1 point per EPD. Maximum of 10 points.

When Verified: Reviewed at completion of design. Visually verified at final inspection.

Cross-reference: 1-24

Resources:

Simple guide to Environmental Product Declarations: https://www.oneclicklca.com/simple-epd-guide/

Model LCA Specifications: https://www.buildingtransparency.org/en/ec3-resources/ec3-downloads/

5-89: Request product-specific EPDs from vendors or manufacturers for materials that do not have one (1 pt per letter sent). See handbook for sample letter. (Builder is limited to claiming one letter per product across multiple units and checklists)

Responsible Party: Architect, General Contractor

Intent: Creating EPDs is a voluntary act by the manufacturer, and while many manufacturers have chosen to disclose the environmental impacts of their products, many still have not taken the step. One reason is that they don't see a business case for incurring the cost of creating an EPD. The lack of EPDs in the construction industry creates gaps in our understanding of the environmental impact of the products and materials used for Built Green projects, increases the difficulty of comparing similar products, and hinders the accurate calculation of embodied carbon emissions of a project. Our Built Green architects and builders can leverage their purchasing power to communicate the benefits of and need for transparency concerning a product's lifecycle to manufacturers and distributors so they can quantify the economic benefit of providing the EPD.

Performance Requirement: Prior to sending a letter, contact the sales representative or manufacturer to confirm they do not have an EPD available for the specific material or product. If using the Building Transparency letter template, please include a mention of Built Green where it says "LEED." Builder is limited to claiming one letter per product. Non-transferable or repeatable across multiple projects for the same product.

Points: 1 point per letter. Maximum 5 points.

When Verified: Design

Resources: EPD Request Letter templates: https://www.buildingtransparency.org/en/ec3-resources/ec3-downloads/

5-90: Calculate the embodied carbon of the new building OR calculate an embodied carbon baseline and show at least a 10% reduction

Responsible Party: Architect, General Contractor, and Verifier

Intent: Embodied carbon is the sum of all the greenhouse gas emissions (mostly carbon dioxide) resulting from the mining, harvesting, processing, manufacturing, transporting, and installation of building materials. Current building codes and Built Green energy efficiency credits reduce operational carbon emissions, but do not typically address the impacts of embodied carbon from the materials and products used in new homes. Looking at total greenhouse gas emissions from new buildings to be built over the next ten years—the critical period for action on the climate emergency—Architecture 2030 estimates that 74% will come from embodied emissions. So, lowering embodied carbon emissions is even more urgent than lowering operating emissions.

As building operations become more efficient, these embodied impacts related to producing building materials become increasingly significant.

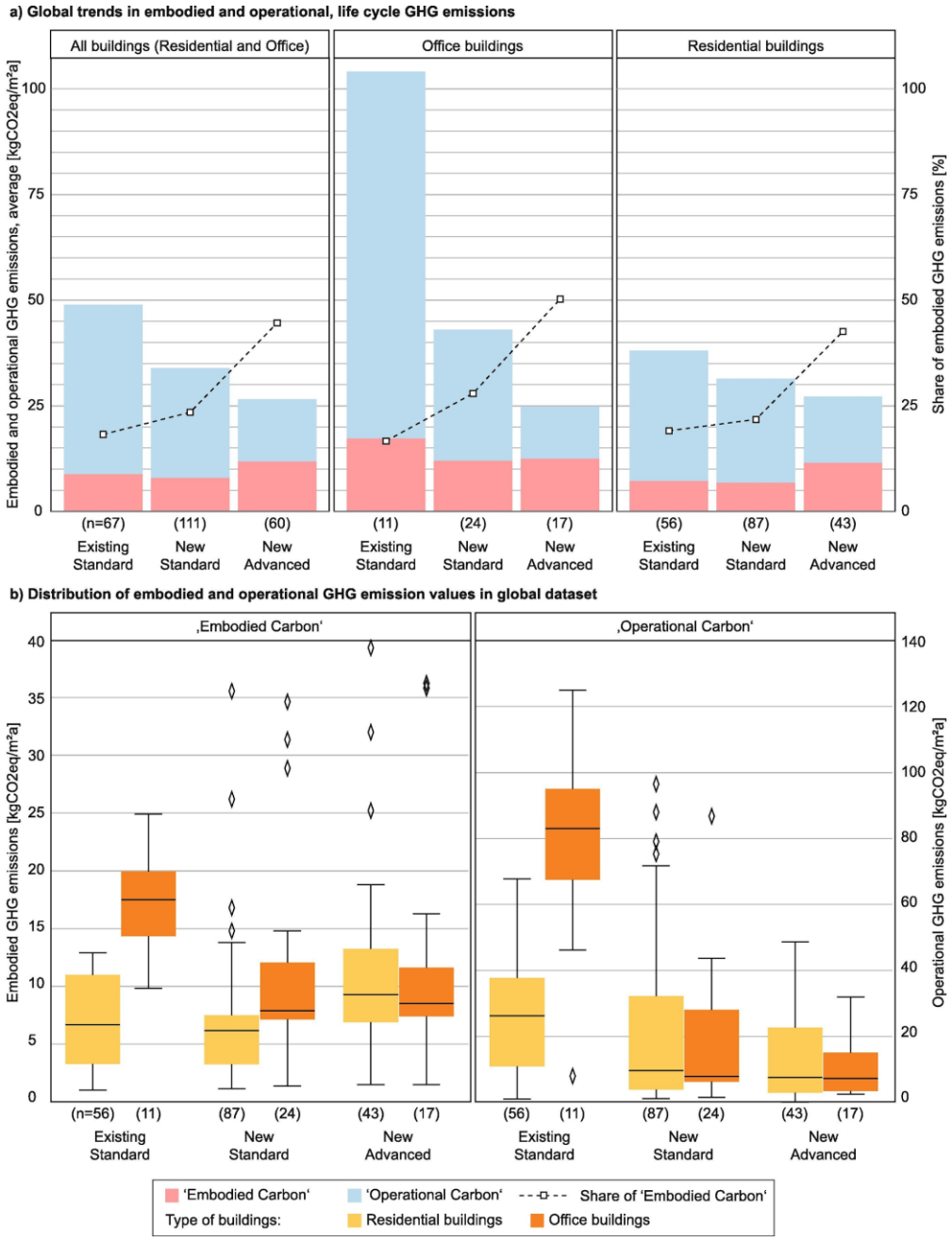


Fig. Global trends in buildings' life cycle GHG emissions (a), and distribution of GHG emission values (b) for residential and office buildings by energy performance class. Source: https://doi.org/10.1016/j.apenergy.2019.114107

Rock et al. (2020) found that, "there has been a global escalation of the contribution of embodied greenhouse gas (GHG) emissions in both residential and office buildings – from ~20% to ~50% in new advanced buildings, surpassing 90% in extreme cases. This relative increase in embodied GHG emissions is mainly because operational GHG emissions have dropped in the transition from existing buildings to buildings with new and advanced standards… buildings with newly advanced standards show a substantially higher share of embodied GHG emissions, which means that most of the GHG emissions saved through

energy efficiency measures have been lost or even outweighed through extra emissions from building materials and technical systems."

Just having net-zero homes and buildings will not save us from the worst of the climate change forecasts, as studies have shown that over the next 20 years embodied carbon emissions will outweigh the operating emissions from buildings. As the saying goes, if you do not measure it, how do you hope to improve it?

Performance Requirement: The embodied carbon emissions of the project shall be calculated using one of the approved LCA modeling tools below. Calculations should list the estimated carbon impact of each of the final construction materials and processes associated with the foundation, structure, enclosure, and interior of the project. All projects should use a standard 50-year lifespan when calculating embodied carbon for consistency and to ensure buildings with longer lifespans are not penalized for the carbon impacts of replacing materials over time. If an existing building is being reused on site, you will also use the Carbon Avoided Retrofit Estimator (CARE) to report how much carbon was avoided by retrofitting that structure for reuse onsite, see Resources below.

For materials where there are no EPDs or product data in the LCA tool's database you have the following two options:

1. Find a similar product (ingredients and manufacturing location) to use in the model as a stand-in and call out each material that was substituted in the overall assessment. Must meet ISO 21930:2017 standards for comparability. Please see EPD comparability video by the Carbon leadership Forum in Resources.
2. List excluded materials in the comments of the overall assessment with an explanation of why they are not included.

Preliminary embodied carbon should be calculated based upon the design and utilized to make design decisions resulting in the selection of lower embodied carbon materials, products, and mechanical systems. When construction has been completed, all materials and products and their quantities should be verified and updated as needed to calculate the final embodied carbon emissions.

Approved LCA modeling tools:

- Embodied Carbon Construction Calculator (EC3)
- BEAM Calculator
- Tally
- Athena Impact Estimator
- One-Click LCA

Points Breakdown:

20 points: calculate the embodied carbon of the building

30 points: create an embodied carbon baseline and show an embodied carbon reduction of at least 10%.

When Verified: Reviewed at completion of design. Visually verified at final inspection.

Cross-references: 1-36, 5-88, 5-89, 5-91

Resources:

Embodied GHG emissions of buildings – The hidden challenge for effective climate change mitigation: https://doi.org/10.1016/j.apenergy.2019.114107

The Urgency of Embodied Carbon and What You Can Do about It: https://www.buildinggreen.com/feature/urgency-embodied-carbon-and-what-you-can-do-about-it

Carbon Leadership Forum: https://carbonleadershipforum.org/

Architecture 2030: https://architecture2030.org/new-buildings-embodied/

Embodied Carbon Tools: Assessing the Options: https://www.buildinggreen.com/news-analysis/embodied-carbon-tools-assessing-options

BEAM Calculator: https://www.buildersforclimateaction.org/beam-calculator.html

CARE Calculator: https://carbonleadershipforum.org/care-estimator/

Embodied Carbon in Construction Calculator (EC3): https://www.buildingtransparency.org/en/

Carbon Leadership Forum resources and EC3 tool videos: https://carbonleadershipforum.org/resource-library/

Carbon Leadership Forum- EPD Comparability for EC3 tool: https://youtu.be/GgrifjsOE1Q

ULI Embodied Carbon in Building Materials for Real Estate: https://americas.uli.org/research/centers-initiatives/greenprint-center/greenprint-resources-2/best-practices-in-sustainable-real-estate/embodied-carbon-in-building-materials-for-real-estate/

Builders for Climate Action: https://www.buildersforclimateaction.org/

5-91: Use a minimum of 15% of project's material budget on carbon-neutral, carbon-negative, or climate-positive materials

Responsible Party: Architect, General Contractor

Intent: Carbon-neutral materials release net-zero carbon emissions into the atmosphere over their life cycle. Carbon-negative or climate-positive materials go beyond net-zero carbon and create an environmental benefit by sequestering or removing additional carbon dioxide from the atmosphere.

Examples of applicable products

- Salvaged and reused building materials
- Natural linoleum
- Sheep wool carpet and insulation
- Cork flooring, wall paneling, insulation
- Sustainably grown and harvested bamboo
- Locally harvested, third-party certified sustainably harvested wood products
- Vegetated roof systems
- Hemp insulation or hempcrete
- Earthen materials
- Algae or mycelium-based building materials
- Strawbale walls
- Net Zero Carbon concrete

Materials from this category that are not already represented in the Material section credits may be eligible for Material Efficiency Innovation credits, see Credit 5-93.

Performance Requirement: Use carbon-neutral, carbon-negative, or climate-positive materials costing no less than 15% of the materials budget. For vegetated roof systems you must comply with performance requirements for minimum size in Credit 2-22. May be combined with other Material Efficiency credits.

Points: 10 points.

When Verified: Reviewed at completion of design. Visually verified at final inspection.

Resources:

Carbon smart materials palette: https://materialspalette.org/

2030 Palette: http://www.2030palette.org/

The New Carbon Architecture-Building to Cool the Climate, Bruce King (2017): https://www.ecobuildnetwork.org/

Carbon Storing Materials (2021): https://carbonleadershipforum.org/carbon-storing-materials/

Transformative Carbon-Storing Materials (2021): https://carbonleadershipforum.org/transformative-materials/

Greenhome Solutions: https://www.ghsproducts.com/

Habitat for Humanity ReStores: https://www.habitat.org/restores

Northwest Building Salvage Network: https://www.nbsnseattle.org/

5-92: Purchase a one-time carbon offset to account for carbon footprint of materials, minimum of 50% of project footprint

Responsible Party: Owner, General Contractor

Intent: Reduce the impact of the carbon dioxide emitted during the production and transportation of your materials, and construction of your project. There are a number of organizations that can help you calculate your carbon footprint – the amount of carbon the project will produce during construction– and then direct you to credible, high-quality offsets. Examples of offset programs include an industry switching to cleaner fuel sources, the capturing of carbon emissions with landfills or dairy farms, and reforestation projects.

Performance Requirement: To earn credit, the project must use a credible carbon footprint calculator and offset at least 50% of the project's footprint, using certified offsets. Green-e is an approved source.

Points: 15 points

When Verified: Verify offset calculation and purchase agreement at time of final inspection

Resources: Green-e: www.Green-e.org

Extra Credit for Materials Efficiency

5-93: Extra credit / innovation for Materials Efficiency

You may submit a materials efficiency strategy or system, not specifically called out in this Section, for consideration for an Extra Credit for Innovation. All extra credits are subject to approval by the Program Director. If approved, add up to 10 points to your Section total.

Section Six: Equity and Social Justice

Creating Spaces of Belonging

When people feel like they belong to a community, they feel like they're at home. Building a home has always been more than a construction project on a plot of land. It's the creation

of a place of physical and psychological safety where hopes and dreams can flourish, a place to make connections with others, raise families and grow old, a place to call home. It's the foundation for building community.

All of us must work together to create spaces of belonging. It begins with imagining what could be and encompasses all phases of development, from site selection, to design, to construction, to homeownership. For some, this may be a new business approach offering new concepts, additional revenue streams, reduction in employee turnover costs, and opportunities for growth. Getting it right requires understanding the surrounding community and prospective homeowners, and a willingness to learn about and confront the obstacles that keep homeownership or skilled trades careers out of reach for many community members.

Despite the myriad benefits of owning a home, many community members don't have access to homeownership. Many also lack living-wage jobs that would make homeownership more attainable. In order to overcome these disparities, an equitable, just, and inclusive approach is required, one that opens the door to homeownership as well as living-wage jobs in the building trades.

That's where equity comes in. The organization Americans for the Arts states, "equity embodies the values, policies, and practices that ensure that all people—including but not limited to those who have been historically underrepresented based on race/ethnicity, age, disability, sexual orientation, gender, gender identity, socioeconomic status, geography, citizenship status, or religion—are represented…"

As we commit to working for equity and inclusion in housing and the building trades, we must value the voices, experiences, cultures, knowledge, and multi-dimensionality of all people, including community members impacted by discrimination, bias, and systemic barriers. Understanding their perspectives is essential to removing these barriers. Creating these spaces of belonging and centering equity in turn provides economic and growth opportunities, reduction in turnover costs and increased applicant labor pool for builders to capitalize on.

The following section is intended to support architects, builders, and developers in their efforts to promote equity and inclusion, one home at a time. This work will require a common language. Adopting the following terms and definitions is the first step.

Equity: A system of fairness. Equity is the full and equal access to opportunities, power, and resources so that all people achieve their full potential and thrive. Equity is an ardent journey toward wellbeing as defined by those most negatively affected. [1]

Social Justice: This includes all aspects of justice—legal, political, economic, and environmental—and requires the fair distribution of and access to public goods, institutional resources, and life opportunities for all people. [1]

Underserved Communities: Community groups, such as Black, Indigenous, people of color, LGBTQ+ members, people with disabilities, immigrants and refugees, and others who have consistently and historically been impacted by inadequate services and limited access to opportunity (limited access to quality schools, safe neighborhoods, reliable transportation, or higher-paying jobs) in comparison to dominant culture community members.

Marginalized Populations or Communities: Groups and communities that experience discrimination and exclusion (social, political, and economic), because of unequal power relationships across social, political, economic, and cultural dimensions.

BIPOC – Black, Indigenous, and People of Color: Black commonly refers to people of African or Afro-Caribbean ancestry, often the descendants of people who were enslaved.

Indigenous refers to groups native to the Americas who were here before European colonization. This includes Native Americans, as well as Indigenous peoples from the Americas who later immigrated to the U.S.

People of color (POC) is an umbrella term to refer to non-white individuals who often face discrimination. Non-white people include those who have Asian, Middle Eastern, Indian, and Pacific Island heritage, among others.

CBS News has also reported on the BIPOC acronym recently, saying, “People are using the term to acknowledge that not all people of color face equal levels of injustice. They say BIPOC is significant in recognizing that Black and Indigenous people are severely impacted by systemic racial injustices.”

Structural Inequality: Structural inequality occurs when the fabric of organizations, institutions, governments, or social networks contains an embedded bias which provides advantages for some members and marginalizes or produces disadvantages for other members. This can involve property rights, status, or unequal access to health care, housing, education, and other physical or financial resources or opportunities. Structural

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[1] *King County Equity and Social Justice Strategic Plan: https://www.kingcounty.gov/~/media/elected/executive/equity-social-justice/documents/201609-ESJ-SP-FULL.ashx?la=en*

inequality is believed to be an embedded part of the culture of the United States due to the history of slavery and the subsequent suppression of equal civil rights of BIPOC individuals.

Environmental Racism: Environmental racism refers to the institutional rules, regulations, policies, or government and/or corporate decisions that deliberately target certain communities for locally undesirable land uses and lax enforcement of zoning and environmental laws, resulting in communities being disproportionately exposed to toxic and hazardous waste based upon race.

Environmental Justice: A movement centered on creating legislation and policies to directly address environmentally racist policies and institutional decision-making processes to improve and maintain clean and heathy communities, typically in BIPOC and lower income communities who live and work closest to pollution sources.

Creating Brave Spaces: Brave spaces are intentional environments and settings that facilitate the courageous, uncomfortable, and honest exploration of social categorizations such as physical ability, race, ethnicity, class, and gender identity and the privilege or marginalization that is extended to individuals based on these categorizations. Brave spaces are created and maintained by a transparent commitment to practices that allow difference and celebrate new forms of action and strategy. [2]

Culturally Enriched Communities: Culturally Enriched Communities recognize the potential that lies within each individual and therefore include spaces that support diverse ways of living and being in the world. Culturally Enriched Communities allow for the creation of municipalities that can contribute to the prosperity and wellbeing of all people. Their creation relies on planners, policy leaders, housing developers, and others who feel an obligation to understand those they are working with and are interested in the lives of others.

The Beloved Community: Martin Luther King's Beloved Community is a global vision in which all people can share in the wealth of the earth. In the Beloved Community, poverty, hunger, and homelessness will not be tolerated because international standards of human decency will not allow it. Racism and all forms of discrimination, bigotry, and prejudice will be replaced by an all-inclusive spirit of sisterhood and brotherhood.

Resources:

Yes, There's a Difference Between 'BIPOC' and 'POC' — Here's Why It Matters:
https://www.healthline.com/health/bipoc-meaning#learn-more

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[2] *Salzburg Statement on Confronting Power and Privilege for Inclusive, Equitable and Healthy Communities: https://www.salzburgglobal.org/news/statements/article/confronting-power-and-privilege-for-inclusive-equitable-and-healthy-communities*

ULI-Towards Culturally Enriched Communities: https://metrocouncil.org/Handbook/PlanIt/Files/Workshop-Housing-ULI-MN.aspx

Culturally Enriched Communities Design: https://www.cec-design.com/

Martin Luther King's Beloved Community: https://thekingcenter.org/#the-beloved-community

Economic Justice Project: http://economicjusticeproject.org/

Centering Health Equity Framework: https://www.centeringequity.org/

Salzburg Statement on Confronting Power and Privilege for Inclusive, Equitable and Healthy Communities: https://www.salzburgglobal.org/news/statements/article/confronting-power-and-privilege-for-inclusive-equitable-and-healthy-communities

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

Project Team

6-1: Emphasize use of Built Green® member subcontractors, vendors, service providers, and real estate agents that are committed to equity and inclusion.

Responsible Party: Developer, General Contractor

Intent: Cultivate relationships among the green building community to ensure alignment of Built Green principles, expertise, and experience of green practices to support the Built Green movement. Emphasize members that have an Equity and Social Justice vision, mission, and values statement publicly shared on their website.

Performance Requirement: Document all Built Green members hired or retained during design, construction, and marketing phases. If feasible, include their public commitment to Equity and Social Justice. The professional or company must be a current Built Green member at the time of contracting with them. Project Builder and Built Green Verifier are not applicable.

Points Breakdown: 1 point for each Built Green member. Maximum of 5 points.

Cross-reference: 6-4

Resources: Built Green Member Search: https://builtgreen.net/find-a-member

6-2: Expand stakeholder involvement to create diverse teams to guide equitable development and culturally enriched spaces while expanding interest and capacity-building among priority populations, consultants, and in-house staff.

Responsible Party: Architect, Developer, General Contractor

Intent: In addition to creating teams to advance Built Green efforts, builders/developers should cultivate a diverse, multicultural team to offer new and different perspectives on a project. Having a more diverse team is a win-win proposition, adding new dimensions to the team while also creating employment opportunities for people historically excluded from the building trades. A team can include diverse staff, consultants, and other construction trade members as well as potential homeowners, community-based equitable development organizations, and community members with a vested interest in their neighborhood—all who offer different perspectives and types of expertise.

Imagine building in a historically Black neighborhood. What site and building elements can honor those roots or address systemic disadvantages such as food insecurity or health disparities? How is belonging best conveyed in the built environment? By connecting with local community-based organizations, Black community members and artists, the builder may learn of and incorporate important design elements otherwise missed.

See an example of community stakeholder engagement in Credit 6-40.

Performance Requirement: Build a diverse team representing multiple viewpoints and perspectives. Find opportunities to work together on current projects and, more importantly, new projects where design and construction decisions can be made in advance. If augmenting your team with community members or prospective homeowners, use the project to build a lasting relationship that will continue beyond the immediate work.

Document what steps were taken to build a diverse team, what perspectives were added to the team, and how a more inclusive team approach benefitted the design and/or construction of the project.

Points Breakdown:

5 points: A diverse and inclusive design team (architect, designers, engineers etc.) or construction team.

10 points: Entire design and construction teams are inclusive of diverse team members.

15 points: A diverse team representing both design and construction teams, plus community members or homeowners.

When Verified: Design and construction phase

Cross-references: 6-39, 6-40, 6-42

Resources:

Why You Need Diversity on Your Team and 8 Ways to Build It: https://www.entrepreneur.com/article/338663

How to Build Diverse Teams at Work: https://www.achievers.com/blog/diverse-teams-at-work/

The Business Case for Diversity and Inclusion in the Construction Industry: https://www.agc.org/sites/default/files/Files/Advocacy/AGC%20Report%20on%20Biz%20Case%20for%20D%26I%20FINAL.pdf

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-3: Offer equity-focused trainings and workshops to staff, subcontractors, and other building partners.

Responsible Party: Developer, General Contractor

Intent: "No matter where you live in the United States, no matter who you are, race has been relevant to your life." — Winona Guo, cofounder of CHOOSE and author of "Tell Me Who You Are"

Take time to broaden and deepen your understanding of race and racism, the importance of belonging, and our individual and collective role in building communities of belonging. In order to address racial, ethnic, and other disparities, we must understand the challenges and possible solutions.

We are all better off when we grow together. Offering trainings and workshops to staff and other team members sends the message that equity is a valued principle in your business and that each team member is responsible for advancing equity. Staff-wide trainings provide a foundation and common language for subsequent discussions and action steps.

Performance Requirement: There are many types of trainings, workshops, and seminars that advance race and social justice awareness. Investigate the type of training most appropriate to your business and consider inviting team members, subcontractors, and other building partners to participate—learning together fosters collective action.

Submit the sign-in sheet from the training that documents the date, duration, type of training, third-party training provider, number of attendees, and their employer. Requires at least 100% of project builder's direct reports to attend at least one training over one calendar year. Trainings may be applied to multiple checklists/projects submitted over the course of a calendar year.

Points: 5 points

When Verified: Design and/or construction phase

Resources:

Equity Matters offers trainings, assessments, skill-building, and other services: https://www.equitymattersnw.com/services-1

ANEW's RISE Up (Respect, Inclusion, Safety and Equity in the Construction Trades) offers trainings geared to the construction trades: https://img1.wsimg.com/blobby/go/d66c1945-9e3c-45ab-a825-4f236211ff16/ANEW_RISEUp_Technical%20Assistance%20Form.pdf

Race Forward's Racial Justice Trainings: https://www.raceforward.org/trainings?utm_term=Building%20Racial%20Equity%20trainings&utm_campaign=Doubling%20Down%3A%20Upcoming%20Virtual%20Building%20Racial%20Equity%20Trainings&utm_content=email&utm_source=Act-On+Software&utm_medium=email

Trainings offered by: Education for Racial Equity: https://www.educationforracialequity.com/

6-4: Develop a racial equity vision, mission, and values statement and prominently display and share with staff, building partners, clients, and general public.

Responsible Party: Architect, Developer, General Contractor

Intent: Just like in other areas of business and building, if we don't write it down it can't be that important. Imagine building a home without a contract, architectural plans, specifications, or basic construction principles to guide the process. If it's not written down and stated publicly, how would you be able to hold vendors, subcontractors, and your direct reports accountable for their actions and deliverables on a project? Having an Equity and Social Justice (ESJ) vision, mission, and values statement—in addition to existing vision, mission, and values statement—makes clear to all (including team members) that the business is committed to dismantling the barriers to employment and homeownership and achieving equity for all. Publicly displaying these values holds everyone in an organization

accountable to the values codified in these statements. The following definitions and examples may be useful:

A **vision statement** succinctly states what the business would like to achieve, in this case, designing and building spaces where all people belong. A good vision statement should be short, simple, specific to your business, and leave nothing open to interpretation.

A **mission statement** sets forth what the business will do to achieve its vision. It is a statement describing the organization's specific role in creating spaces of belonging, removing racial and other barriers, and promoting equity in housing.

Values are principles the business is committed to observing and following. The values are embedded in all aspects of the business, both its internal operations and its community-facing endeavors. A set of values are unique to a business—you get to choose which values resonate with your business and represent your best practices. Race Forward, a national organization working to advance racial justice offers the following core values:

- **People of Color:** We value the voices, experiences, cultures, knowledge, and multi-dimensionality of people of color.
- **Justice:** We value fairness, the best foundation for unity among all people.
- **Transformation:** We value the ability of individuals and systems to change in ways that make racial justice possible. We recognize the importance of struggle in fueling transformation.
- **Bridging:** We value the insights, relationships, and holistic understandings that are deepened when divergent paths come together.
- **Expression:** We value voicing and sharing our viewpoints with integrity even when difficult, unpopular, or risky.
- **Adaptability:** We value relevance and resourcefulness in the face of changing social, economic, political, and ideological environments.
- **Delight:** We value making space for laughter, beauty, and joy in the work of social change.

Performance Requirement: Provide a screenshot of your company website or marketing materials that prominently display your ESJ vision, mission statement, and core values. Information must be publicly available on the organization's website. Prominently displayed refers to the intent of transparency and that information is easily located for the public to find, it is not required to be on the homepage. Burying the information in subpages on a website or on a page that is not intuitive to locate does not meet the intent of this credit.

Points: 5 points

Resources:

Partnership for a Healthy Durham, examples of racial equity mission statements: https://healthydurham.org/cms/wp-content/uploads/2018/10/Racial-Equity-mission-statement-1.pdf

Race Forward, Vision, Mission and Core Values: https://www.raceforward.org/about

Racial Equity Tools: https://www.racialequitytools.org/

6-5: Develop an annual racial equity workplan to focus internal and external equity efforts

Responsible Party: Architect, Developer, General Contractor

Intent: No organization can achieve all its goals and objectives in a single year. If you don't develop and implement a realistic workplan, accounting for all the daily pressures and tasks, it's unlikely you'll find time for equity work unless you plan accordingly.

The purpose of the annual ESJ workplan is to identify equity action steps that will impact your entire business. With your team, set aside time to develop a workplan that will prioritize the year's equity activities. For example, your team may identify action steps such as:

- Creating a more diverse staff, team, subcontractor, and vendor pool, etc.
- Examining your pay structure to ensure that all members are paid fairly and equitably (staff conducting similar work are paid consistent to skill and tenure).
- Working with a design team that intentionally focuses on building elements demonstrating cultural awareness, community/neighborhood stories, other community concepts.
- Providing information to prospective buyers about pathways to homeownership.
- Engaging local community organization (design phase, housing opportunities, etc.).
- Using your social media platforms to inform others of your equity efforts, share your ESJ mission, etc.
- Partnering with job training organizations to provide meaningful apprenticeship opportunities to youth of color and other underserved populations.
- Taking advantage of low-income, affordable, and attainable home construction opportunities.
- Looking for and contracting with Just-labelled vendors, subcontractors, and others.

The workplan, akin to a project management tool, should identify and document the specific equity tasks you intend to accomplish, the timeframe for action steps, responsible parties, any necessary resources, and anticipated date of completion. Be realistic and allow sufficient time to complete each identified action step—it's better to successfully complete

fewer tasks than to take on too many and fail. Many of the actions of this workplan will also earn you additional project-specific ESJ Section 6 credits.

Performance Requirement: Document and manage the workplan by including its calendar year, action items, timeframe, and any other critical information (e.g., Gantt chart). Must be reviewed and updated annually for the duration of the project. If using this plan over multiple projects/checklists it should document progress or completion of items with each resubmission.

Points: 5 points

Cross-references: 6-9, 6-10, 6-11, 6-40, 6-42

Resources:

How to Write an Action Plan: https://creately.com/blog/diagrams/how-to-write-an-action-plan/

Racial Equity Tools: https://www.racialequitytools.org/

How to Make a Gantt Chart in Excel: https://youtu.be/un8j6QqpYa0

Guide to Developing a Strategic Diversity, Equity and Inclusion Plan: https://www.shrm.org/resourcesandtools/tools-and-samples/hr-forms/pages/guide-to-developing-a-strategic-diversity-equity-and-inclusion-plan.aspx

Centering Health Equity Framework worksheets: https://www.centeringequity.org/v0-beta-frameworks

Salzburg Statement on Confronting Power and Privilege for Inclusive, Equitable and Healthy Communities: https://www.salzburgglobal.org/news/statements/article/confronting-power-and-privilege-for-inclusive-equitable-and-healthy-communities

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-6: Use Just-labelled, or certified B-Corporations or SEED firms.

Responsible Party: Architect, Developer, General Contractor

Intent: The Just program was created by the International Living Futures Institute to help organizations optimize policies that improve social equity and enhance employee

engagement. It is a voluntary disclosure tool for organizations, providing a transparency platform to disclose an organization's operations, including how they treat their employees and where they make financial and community investments.

Just labeling is a transparency label that allows building teams to identify and choose other businesses with a similar social equity commitment with which to work, partner, and engage.

Certified B Corporations (B-Corp) are leaders in the global movement for an inclusive, equitable, and regenerative economy.

Certified SEED firms are principle-based organizations dedicated to building and supporting a culture of civic responsibility and engagement in the built environment and the public realm. Certified SEED consulting firms advise clients through the SEED Evaluator process (see Credit 6-7), adding layers of value to projects, from building community support in pre-design through systematic documentation of results in post-occupancy, as required by most funding sources.

Performance Requirement: Use a Just-labelled, or certified B-Corp or SEED firm as part of the contracted project team. Just labels, B-Corp or SEED certifications must be active and unexpired at time of hire/contracting to qualify.

Points Breakdown: 1 point per firm. Maximum of 3 points.

Resources:

International Living Future Institute, Just Program: https://living-future.org/just/

Certified B Corporations: https://bcorporation.net/

Seed Network: https://seednetwork.org/consulting-firms/

Overall Design

6-7: Certify the social, economic, and environmental outcomes through SEED Certification

Responsible Party: Owner/Developer, Architect, General Contractor, Verifier

Intent: Improve reporting and measuring of social and economic outcomes with third-party certification from SEED Network

Performance Requirement: Provide SEED certification documentation from SEED Network.

Points: 15 points

When Verified: Document review at time of project completion. Evidence of certification in progress may be accepted in lieu of final certificate.

Resources:

SEED Evaluator: https://seednetwork.org/seed-evaluator/

6-8: Project includes at least 10% affordable, work-force or attainable housing units

Responsible Party: Developer, General Contractor

Intent: More community members can become homeowners if affordable housing and additional ownership pathways are offered. As the Aspen Institute has noted, "An ugly and central aspect of the history of public policy in housing is its purposeful, race-based exclusion and marginalization of many people, particularly Native American and black populations." Policies impacting BIPOC communities included redlining, certain zoning practices, placement of public housing, and the disparate allocation of infrastructure dollars, all leading to impoverished, underserved neighborhoods.

> *Affordable Housing:* Building affordable housing opens the door to community members whose social-economic status blocks traditional avenues toward homeownership. Housing is considered affordable to a household if rent or mortgage costs no more than 30% of the household's income. Household income is shown as a percentage of the Area Median Income (AMI) and is typically limited to 60% AMI. Builders and developers may find that local cities and counties provide incentives for affordable housing construction.
>
> *Workforce Housing:* Workforce housing is defined as housing affordable to households earning between 60% and 120% of AMI. Workforce housing targets middle-income workers and includes professions such as police officers, firefighters, teachers, health care workers, retail clerks, etc.
>
> *Attainable Housing:* Endeavors to create market-rate housing that is accessible to a wider range of prospective homeowners. The industry definition of attainable, for-sale housing is unsubsidized, profitable housing developments that meet the needs of those with incomes between 80% and 120% AMI. The price points for attainable housing vary by metro area depending on the AMI, with FHA Loan Limits typically hovering around 115% AMI.

Performance Requirement: Work with financial institutions, nonprofit organizations, and local governmental agencies to identify subsidized and unsubsidized housing development opportunities and participate by developing or constructing one of these housing projects.

Document the local AMI and unit sale price for each unit that is achieving this credit. In the verifier's cover letter identify the below-market-priced unit addresses. The minimum number of below-market units required is 10% of all units or one unit, whichever is greater. Should the local jurisdiction or incentive program require a project to provide more below-market units than Built Green requires for this credit, the builder needs to comply with those requirements.

Points Breakdown:

15 points: Building and selling/leasing of at least 10% workforce or attainable housing units.

25 points: Building and selling/leasing of at least 10% affordable housing units.

When Verified: Completion

Resources:

RCLCO, Attainable Housing: Challenges, Perceptions and Solutions: https://www.rclco.com/publication/attainable-housing-challenges-perceptions-and-solutions/

Strong Towns, Want to Make Housing More Affordable? Start by designing neighborhoods, not just buildings: https://www.strongtowns.org/journal/2020/6/11/affordable-housing

The Aspen Institute: Strong Foundations: Financial Security Starts With Affordable, Stable Housing: https://mbaks.app.box.com/s/q84ry2cx1mbyhusncyga4bjpmkumee00

Poor Households Spend Nearly Four Times as Much on Utilities as Well-Off Ones: https://earther.gizmodo.com/poor-households-spend-nearly-four-times-as-much-on-util-1845010294

6-9: Develop a project-specific ESJ plan clearly indicating equity objectives and actions; identifying priority actions.

Responsible Party: Architect, Developer, General Contractor

Intent: Every project is an opportunity to further the goals of building green and creating spaces of belonging for all people, particularly historically underserved communities. A

project-specific ESJ plan is one tool to document the different equity objectives and action steps appropriate to a specific project, particularly the priority elements (those with the highest impact and most important to the project to achieve). In addition to listing, tracking, and managing equity activities, a plan helps a team stay focused, and provides a guidepost so project decisions align with goals and objectives, meet project deadlines, and hold everyone accountable.

Project timelines and available resources can be ever-changing, and even standard project objectives can be difficult to achieve by required completion deadlines. If you don't develop and implement a realistic workplan, accounting for all the daily pressures and tasks, it's unlikely you'll find time for equity work unless you plan accordingly. Be pragmatic and allow sufficient time to complete each identified action step—it's better to successfully complete fewer tasks than to take on too many and fail.

Examples of possible equity objectives and their associated action steps/ESJ credits:

- Diversifying the design team
    - Action step: Credit 6-2: Expand stakeholder involvement to create diverse teams to guide equitable development and culturally enriched spaces while expanding interest and capacity-building among priority populations, consultants, and in-house staff
- Provide women and minority-owned business development and growth opportunities
    - Action step: Credit 6-43: Use suppliers, vendors, or subcontractors that are certified WMBE or MBE firms
- Engaging the community to establish a positive relationship and address critical needs
    - Action step: Credit 6-40: Engage with local community groups to assess community needs to inform the project-specific ESJ plan
- Provide affordable and/or attainable housing
    - Action step: Credit 6-8: Project includes at least 10% attainable housing units
- Adopting universal design elements or including cultural design elements
    - Action step: Credit 6-14: Stepless front entry
    - Action step: Credit 6-23: Bedroom, bathroom, kitchen, and laundry appliances on main floor, requires a stepless entry

Many of these ESJ objectives connect with Section 6 ESJ credits that can be used to guide implementable actions to achieve the objectives and earn points towards meeting star level requirements.

1. What equity objectives could be addressed by this project?

2. Highlight (bold) priority equity objectives that could be implemented
    a. Priority elements: those with the highest possible impact and most important for the project to achieve.
3. What objectives are the project committed to implement on this project?
    a. For each equity objective provide the specific action steps that will achieve its intent (including as much specific details as possible), ESJ credits related to these actions, responsible party accountable for implementation, and anticipated completion timeline/project phase.
4. If there are priority elements identified, but not selected for implementation, describe reasons why it was not selected.

Performance requirement is not determined by ability to implement or achieve all equity objectives committed to in the plan (project still must meet star level requirements).

Points: 5 points

When Verified: Design

Cross-references: 6-5, 6-10, and 6-11

Resources:

Section 6 Equity and Social Justice credits 6-1 through 6-53

How to Develop a Diversity, Equity, and Inclusion Initiative: https://www.shrm.org/resourcesandtools/tools-and-samples/how-to-guides/pages/how-to-develop-a-diversity-and-inclusion-initiative.aspx

Centering Health Equity Framework worksheets: https://www.centeringequity.org/v0-beta-frameworks

Salzburg Statement on Confronting Power and Privilege for Inclusive, Equitable and Healthy Communities: https://www.salzburgglobal.org/news/statements/article/confronting-power-and-privilege-for-inclusive-equitable-and-healthy-communities

6-10: Implement priority elements of project's ESJ plan; implement all elements or calculate local economic and equity impact of implemented actions

Responsible Party: Architect, Developer, General Contractor

Intent: A project-specific ESJ plan is only as valuable as the elements and actions that are implemented. While our goal may be to accomplish all elements in an ESJ Plan, there may be situations where an element, for one reason or another, cannot be realized. The best

way of ensuring completion of an ESJ plan is to continuously monitor implementation efforts.

Performance Requirement: Use a Gantt chart or other project management software to track project-specific ESJ plan elements and action items and document whether each element listed was implemented and completed. For any element not implemented, include a short explanation as to why the team was unable to complete it.

Points Breakdown:

7 points: implementing all priority elements.

12 points: implementing all elements; OR implementing any number of elements and calculating the local economic and equity impact (LM3) of those actions.

When Verified: Completion

Cross-references: 6-9, 6-11

Resources:

Calculate your local economic and equity impact- Local Multiplier (LM3): https://www.nefconsulting.com/our-services/evaluation-impact-assessment/local-multiplier-3/

How to Make a Gantt chart in Excel: https://youtu.be/un8j6QqpYa0

6-11: Conduct internal review of ESJ plan implementation

Responsible Party: Architect, Developer, General Contractor

Intent: Conducting an internal review of your project-specific or organizational ESJ plan efforts will provide valuable insights and information for future projects. Were you able to implement all identified action steps? Did the equity action steps meet your expectations? Did they benefit the project? If not, why? What action step did you not include that might have been a valuable addition?

A Practice Example: Action Step – In year 20XX, we will seek to diversify by 20% (remember: goals should be measurable) our sub-contractor pool to include women, BIPOC, and members of LGBTQ communities. A team member is identified who will be responsible for the implementation of the action steps. We will identify potential subcontractor vendors and take time to meet and discuss possible business opportunities. We will track our use of subcontractors and on a quarterly basis, we will evaluate progress towards our goal of diversifying our subcontractor pool. On a quarterly basis, we will make adjustments (such

as increasing recruitment efforts, reviewing the composition of building teams, obtaining feedback from diverse subcontractors, and reporting findings to our internal team) to ensure we meet our annual goal. If best efforts were not successful, we will reevaluate, seek external advice, and implement alternative or additional strategies if necessary.

Performance Requirement: Document the findings of the internal review with the ultimate goal of creating a menu of effective equity elements; use the findings to evaluate the efficacy of implementation and strategies associated with the equity elements chosen for the particular project.

Points: 2 points

When Verified: Completion

Cross-references: 6-5, 6-9, 6-10

Resources: 6 Steps to Measure Your Diversity, Equity & Inclusion Initiatives: https://everfi.com/blog/workplace-training/measuring-your-dei-initiatives/

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-12: Site, design, and construct to counter known disparities identified through engagement with community stakeholders

Responsible Party: Developer, General Contractor, Architect, Verifier

Intent: The Center for American Progress reports, "While Native Americans have long been the primary target of government-sponsored land redistribution, other communities of color—especially Black communities—have experienced and continue to experience displacement as well. For Black communities in urban areas, public policies have often been enacted under the guise of creating new public spaces, combating urban blight, or bolstering economic development. But over time, these policies have stripped Black communities of the wealth and financial stability found in property ownership and affordable rental housing."

To make matters worse, Forbes magazine reports that, "according to listing site Zillow, Covid-19-spurred job losses are disproportionately impacting Latino, Asian and Black workers, who make up the majority of the workforce in the hospitality, tourism and service industries, which have borne the largest economic brunt of the pandemic so far." Moreover, compounding the impact of job losses is the fact that people of color shoulder higher housing costs as a portion of their incomes, while earning less than whites.

In general, during times of economic downturns, Black, Indigenous, Latin, and Hispanic communities suffer disproportionately. According to the Urban Institute, history has shown that once the economy rebounds, the racial gaps in income, home equity, and wealth do not shrink.

Examples of known disparities in communities of color and underserved populations:

- Food deserts and food insecurity
- Displacement
- Lack of affordable housing
- Housing segregation
- Lack of affordable, accessible transportation
- Poorly maintained infrastructure, lack of resilient systems
- Higher proportion of income spent on utilities
- Poor indoor and outdoor air quality
- Higher exposure to environmental pollutants or hazards
- Higher instances of asthma, obesity, diabetes, and other health issues
- Lack of tree canopy or access to green space/nature
- Higher than average commute times for necessities (food, health services, and employment)

So how do we confront or address these and other disparities that continue to burden BIPOC individuals and families? A first step is to engage community stakeholders to learn more about the challenges they face and possible remedies or solutions.

Community engagement serves multiple purposes, including gaining vital information about site, design, and construction elements as well as other concerns, such as the impact of gentrification, the construction of non-affordable homes, and the loss of small businesses that have played a key role in the community.

By learning from a community's feedback and concerns, the builder/developer has the opportunity to eliminate or mitigate inequities or other harms associated with development. Furthermore, building a positive working relationship with the community they are building in can provide benefits to the developer during the design and construction phases, e.g., increased public support at public design review boards. For example, imagine a 100-unit development in a historically Black neighborhood. By engaging community stakeholders, the developer/builder may learn about concerns over air pollution from being located under the airport's take-off pathways. The project team could then incorporate upgraded air filtering, enhanced air sealing techniques, and additional soundproofing thereby protecting residents and lowering their risk for respiratory health issues and noise pollution.

Performance Requirement: Document the actions taken to counter at least three known disparities and the outcomes of each action item.

Points: 15 points

When Verified: Verify the stakeholder engagement during design/pre-construction meetings. Visually verify as-built strategies that are implemented during intermediate inspections. Review documentation of the process and actions at project completion.

Cross-references: 6-2, 6-39, 6-40, 6-42

Resources:

Seattle Central Area Neighborhood Design Guidelines: https://www.seattle.gov/opcd/ongoing-initiatives/central-area-neighborhood-design-guidelines

23rd Avenue Action Plan: https://www.seattle.gov/Documents/Departments/OPCD/OngoingInitiatives/23rdAvenueActionPlan/23rdAvenueActionPlanStrategies.pdf

23rd and Jackson Community blog: https://23jackson.com/community/

Who Gets to Future? Race, Representation, and Design Methods in Africatown: https://dl.acm.org/doi/pdf/10.1145/3290605.3300791

Liberty Bank Building Case Study (IAQ materials): https://homefree.healthybuilding.net/projects/4/case-study

Changes in the Central District Affect the African-American Community: https://seattlemag.com/article/changes-central-district-affect-african-american-community

Racial Disparities in Home Appreciation: https://www.americanprogress.org/issues/economy/reports/2019/07/15/469838/racial-disparities-home-appreciation/

Racial Inequities in Housing Fact Sheet: https://www.opportunityhome.org/resources/racial-equity-housing/

Centering Equity in the Sustainable Building Sector: https://naacp.org/climate-justice-resources/centering-equity-sustainable-building-sector/

This Project Is Trying To Reverse Gentrification by Bringing People Back to Seattle's Central District: https://www.seattletimes.com/seattle-news/politics/this-project-is-trying-to-bring-reverse-gentrification-by-bringing-people-back-to-seattles-central-district/

Environmental Health Disparities in Housing: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222490/

Rethink Resilience for the Era of COVID-19 and Climate Change: https://nextcity.org/daily/entry/rethink-resilience-for-the-era-of-covid-19-and-climate-change

About Climate Safe Neighborhoods: https://groundworkusa.org/focus-areas/climate-safe-neighborhoods/about/

Missing Middle Housing: https://missingmiddlehousing.com/

Tacoma's Missing Middle Housing: Planning for Access, Affordability, and Mobility: https://www.theurbanist.org/2021/01/22/tacomas-missing-middle-housing-planning-for-access-affordability-and-mobility

6-13: Submit a code innovation case study on this project and be selected by the Building Innovations Database

Responsible Party: Developer, General Contractor, Verifier

Intent: Share your innovative practices and outcomes with others in the building trades to help those who are embarking on a similar path and increase positive impacts of Built Green homes. Case studies can cover any topic represented in the Built Green checklist.

Performance Requirement: Submit a case study to www.buildinginnovations.org and have it selected for publishing by the Building Innovations Database.

Points: 1 point

When Verified: When submission and selection has occurred

Resources: Submit a case study here: http://www.buildinginnovations.org/for-builders/

UNIVERSAL DESIGN

NC State University's Center for Universal Design defines universal design as, "an approach to design that incorporates products as well as building features and elements which, to the greatest extent possible, can be used by everyone. While accessible or adaptable

design requirements are specified by codes or standards for only some buildings and are aimed at benefiting only some people (those with mobility limitations), the universal design concept targets all people of all ages, sizes, and abilities and is applied to all buildings."

Universal design goes beyond the traditional idea of accessibility and may be used to address a variety of abilities, mobilities, and impairments, such as:

- Chemical and respiratory sensitivities
- Sound and auditory sensitivities and impairments
- Mobility impairments
- Visual impairments
- Neurodivergent disorders or neurological impairments
- Height impairments

To truly create spaces of belonging we must design and build spaces that are universally accessible to and inclusive of a broad range of human abilities and life stages. Universal and inclusive design can be leveraged to address barriers faced by people with disabilities, older people, children, and other populations that are typically overlooked in the design process to reduce stigma and provide benefits for all users.

Eight Goals of Universal Design (© Steinfeld and Maisel, 2012)

- Body Fit: Accommodating a wide range of body sizes and abilities.
- Comfort: Keeping demands within desirable limits of body function and perception.
- Awareness: Ensuring that critical information for use is easily perceived.
- Understanding: Making methods of operation and use intuitive, clear, and unambiguous.
- Wellness: Contributing to health promotion, avoidance of disease, and protection from hazards.
- Social Integration: Treating all groups with dignity and respect.
- Personalization: Incorporating opportunities for choice and the expression of individual preferences.
- Cultural Appropriateness: Respecting and reinforcing cultural values, and the social and environmental contexts of any design project.

Resources:

What is Universal Design: http://idea.ap.buffalo.edu/about/universal-design/

8 Goals of Universal Design: http://idea.ap.buffalo.edu/wp-content/uploads/sites/110/2019/10/UDGoals_DigitalDistribution.pdf

Universal Design Training and Resources: http://universaldesign.com/

Americans Need Home Design That Welcomes Everyone: https://www.architecturaldigest.com/story/universal-design-living-laboratory

Universal Design in Housing: https://projects.ncsu.edu/ncsu/design/cud/pubs_p/docs/UDinHousing.pdf

Rethinking Universal Design in Multifamily Projects: https://elearning.nahb.org/products/rethinking-universal-design-in-multifamily-projects#tab-product_tab_overview

The Weekly show: Universal design in multifamily housing, reimagining urban spaces, back to campus trends: https://www.bdcnetwork.com/weekly-show-universal-design-multifamily-housing-reimagining-urban-spaces-back-campus-trends

Universal Design Features Give These Micro-Apartments Extra Versatility: https://www.multifamilyexecutive.com/design-development/design/universal-design-features-give-these-micro-apartments-extra-versatility_s

DESIGNED FOR INCLUSIVITY

6-14: Stepless front entry, Stepless other entry; max threshold height of 1/2"

Responsible Party: Architect

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Foster healthier lifestyles by extending the years that residents remain active, busy, socializing with family and friends, and enjoying building amenities and outdoor spaces. Design smarter and more functional outdoor spaces that better accommodate different abilities and mobilities.

Performance Requirement: Photo documentation of stepless entrances. Maximum threshold heights of one-half inch are allowed for stepless entries.

Points Breakdown: 2 points - Stepless front entry. 1 point - Stepless other entries. Maximum 3 points.

When Verified: Visually verify during design and at final inspection.

6-15: Hard-surface stepless grade changes to allow access to essential maintenance areas (e.g., garbage cans, shared laundry)

Responsible Party: Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Foster healthier lifestyles by extending the years that residents remain active, busy, and socializing with family and friends enjoying building amenities and outdoor spaces. Design smarter and more functional buildings that better accommodate different abilities and mobilities.

Performance Requirement: A stepless pathway from all units to access essential maintenance locations (e.g., garbage cans and common laundry facilities) must be provided. Elevators and waste shoots may be included to provide access to maintenance locations.

Points: 1 point

When Verified: Visually verify during design and at final inspection.

6-16: Install exterior accessible hard-surface gathering area (requires stepless grade changes to access area)

Responsible Party: Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Foster healthier lifestyles by extending the years that residents remain active, busy, and socializing with family and friends enjoying building amenities and outdoor spaces. Design smarter and more functional outdoor spaces that better accommodate different abilities and mobilities.

Performance Requirement: Photo documentation of exterior gathering area with site finished grading and pavement. Must be combined with credit 6-15, Hard-surface stepless grade changes to allow access to essential maintenance areas. May not be combined with credit 6-16.

Points: 1 point

Cross-references: 6-14, 6-15

When Verified: Visually verify during design and at final inspection.

6-17: Provide community common areas accessible to all building occupants

Responsible Party: Architect, Landscape Designer

Intent: Provide opportunity to develop a sense of community and security; and reduce transportation to other sites by providing for social interaction on site. Improves value and marketability (i.e., economic sustainability) as your units will be considered by a broader population.

Performance Requirement: Set aside a minimum of 1,000 square feet for common areas, made accessible to all occupants by using universal design standards. All common areas and shared building amenities must be designed to be universally accessible. May not be combined with 6-17.

Points: 3 points

When Verified: Visually verify during design and at final inspection.

6-18: Provide accessible guest bathroom near common areas for those with mobility impairments

Responsible Party: Architect, General Contractor

Intent Promotes equity and social sustainability by providing inclusive spaces for a broader range of people. Design smarter and more functional outdoor spaces that better accommodate different abilities and mobilities.

Performance Requirement: Provide an accessible bathroom near common areas for those with mobility impairments that can be used by occupants and their guests.

Points: 2 points

Cross-reference: 6-16

When Verified: Visually verified at final inspection

6-19: Install cabinets with removable or slide-away lower doors for roll-up access to kitchen sink, upper cabinets that lower to counter top height for access, etc.

Responsible Party: Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Design smarter and more functional buildings that better accommodate different abilities and mobilities. Improves value and marketability (i.e., economic sustainability) as your units will be considered by a broader population.

Performance Requirement: Customized cabinetry with special features such as upper cabinets that lower to counter level accessible to a wheelchair user or person of short stature or sink-base doors that slide away with no cabinet bottom shelf, allowing rollup access to the kitchen sink.

Points Breakdown: 1 point per fixture. 3 points maximum.

When Verified: Visually verified at final inspection

6-20: Install in-unit fire and CO alarms that include visual alarm features

Responsible Party: Architect, General Contractor, Electrical Engineer

Intent: Research shows that people who are deaf or have hearing loss will not be awakened from a deep sleep by an audible smoke alarm. It is critical that deaf and hard of hearing individuals have a visual smoke alarm in their homes. Using alarms with strobe lights increases the likelihood that a hearing-impaired person will be able to quickly respond and escape unharmed.

Performance Requirement: Per unit alarms should be hardwired with battery back-up and include LED strobe lights. Minimum required locations for visual alarms include the kitchen and inside of each separate sleeping areas.

Points: 1 point

When Verified: Review alarm product documentation and visually verified at final inspection

6-21: Minimum door width 2'-10" for all rooms requiring entry (small closets excepted)

Responsible Party: Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Design smarter and more functional buildings that better accommodate different abilities and mobilities. Improves value and marketability (i.e., economic sustainability) as your units will be considered by a broader population.

Performance Requirement: Rooms not requiring entry by occupants are exempted from this requirement. Rooms requiring entry means any room that a person would need to enter in order to use the room. Only small, shallow closets where reach-in access is the normal use of the room and special equipment rooms for furnaces or similar equipment normally accessible to only qualified technicians would be exempted from this requirement.

Points: 3 points

When Verified: Visually verified at final inspection

6-22: Install touchless or motion sensor plumbing fixtures

Responsible Party: Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Design smarter and more functional buildings that better

accommodate different abilities and mobilities. Improves value and marketability (i.e., economic sustainability) as your units will be considered by a broader population.

Performance Requirement: Requires that the rooms have been sized according to manufacturer's data to ensure that a residential elevator will fit in the designated space. Requires a concrete slab with a drain at the bottom. Requires 38" rough-opening door framing width and door openings lined up from floor to floor.

Points Breakdown:

3 points: Stacking closets engineered to receive a future elevator

5 points: Adequate electrical circuits are provided in attic

When Verified: Visually verified at final inspection

6-23: Install smart technology (e.g. electronic blinds, programmed environmental controls, etc.)

Responsible Party: Architect, General Contractor, Electrical Engineer

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Design smarter and more functional buildings that better accommodate different abilities and mobilities. Improves value and marketability (i.e., economic sustainability) as your units will be considered by a broader population and create a better user experience.

Smart technologies are not only helpful for increasing building efficiency and performance (e.g., adaptable thermostats), but can also increase comfort for those with mobility impairments or neurodivergent disorders that can benefit from automation.

Examples of Smart technology:

- Smart outlets and lighting
- Adaptable/ learning thermostats
- Electronic blinds
- Self-shading windows
- Video intercom
- Keyless entry system
- Virtual community hub for occupants

Performance Requirement: Per unit install Smart technology that increases usability, accessibility, and efficiency of building features and systems.

Points: 1 point per fixture. 3 points maximum.

When Verified: Visually verified at final inspection

6-24: Design to ensure accessibility of all building features that provide essential occupant services (requires stepless entry)

Responsible Party: Developer, Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Design smarter and more functional buildings that better accommodate different abilities and mobilities.

Building features that provide essential services to occupants include the following:

- Indoor air quality controls
- Plumbing fixtures
- Electrical switches
- Entryways, hallways, walkways, and doors
- Kitchen and Laundry appliances
- Parking (if provided)
- Alarms (building and in-unit)

See further examples of checklists and strategies to achieve this in the resources at the beginning of this subsection and in credit resources below.

Performance Requirement: All building features that provide essential services are to be designed or made accessible to all occupants by using universal design standards. This credit does not require all building features be universally accessible to all abilities and mobilities, but features must be designed to, the greatest extent possible, be used by everyone (e.g., chemical or respiratory sensitivities, hearing, vision, mobility impaired or neurodivergent). Requires at least one stepless entry to the building (Credit 6-14), preferably the main entrance or one near parking or transit access areas. Credits 6-14 through 6-23 provide means of earning this credit but may not be combined with this credit. May be combined with Credit 6-24.

Points: 10 points

Cross-references: 6-14, 6-16, 6-20 through 6-24

When Verified: Visually verify during design and at final inspection.

Resources:

NW Universal Design Council Home Checklist: https://www.environmentsforall.org/home-checklist/

Disability Apartments: Looks and Features You Might Find: https://www.apartmentguide.com/blog/disability-apartments-looks-features/

CA Universal Design Model Ordinance: https://www.hcd.ca.gov/building-standards/state-housing-law/universal-design.shtml

6-25: Minimum 10% of units are Accessible Dwelling Units (requires stepless entry)

Responsible Party: Developer, Architect, General Contractor

Intent: Promotes equity and social sustainability by providing inclusive spaces and homes for a broader range of people. Design smarter and more functional buildings that better accommodate different abilities and mobilities.

Accessible dwelling units are defined as,

See further examples of checklists and strategies to achieve this in the resources at the beginning of this subsection and in credit resources below.

Performance Requirement: Minimum of 10% of units (not less than one) are designed to be accessible dwelling units through universal design standards. Units will be located in areas of the building that will provide similar access to views, natural light, amenities, and building services as other tenants who do not have impairments. This credit does not require all units to cater to all abilities or mobilities but may include a variety of designs that cater to different abilities or mobilities (e.g., chemical or respiratory sensitivities, hearing, vision, mobility impaired or neurodivergent). If less than 100% of the units are accessible it may be combined with any other Universal Design credits. Requires at least one stepless entry to the building (Credit 6-14), preferably the main entrance or one near parking or transit access areas.

Points:

10% or more are accessible dwelling units	10 points
50% or more are accessible dwelling units	15 points
All units are accessible dwelling units	20 points

Cross-references: 6-13, 6-14, 6-16, 6-20 through 6-24

When Verified: Visually verify during design and at final inspection.

Resources:

NW Universal Design Council Home Checklist: https://www.environmentsforall.org/home-checklist/

Disability Apartments: Looks and Features You Might Find: https://www.apartmentguide.com/blog/disability-apartments-looks-features/

CA Universal Design Model Ordinance: https://www.hcd.ca.gov/building-standards/state-housing-law/universal-design.shtml

COMMUNITY CONNECTIVITY

We all benefit from living in walkable, pedestrian-oriented, mixed-use communities centered around high-quality transportation systems. We benefit from a cleaner environment, more active lives, and less dependence on cars for transportation.

6-26: Create a Transit-Oriented Development

Responsible Party: Developer, Architect

Intent: Reduce environmental and social impact of single-occupant vehicle use by locating housing in close proximity to transit stops and providing residents with amenities that support multi-modal transportation solutions, including walkability. Note that jurisdictions may provide additional support to TOD projects that work collaboratively to include transit oriented affordable housing opportunities (particularly at 30% to 60% AMI), and honor diversity principles.

Performance Requirement: Development must be located in a high-capacity transit area, within a ½ mile walk (with sidewalks and/or bike lanes) of existing or planned (within 5 years of project completion) Light Rail, Rapid Ride, Swift, other Bus Rapid Transit, Sounder or Sound Transit Express Bus station or a key node for multiple transportation nodes.

Project must be built to the maximum density allowed in the zone, provide no more parking than the minimum published parking requirement, and must provide secure bicycle storage for at least 25% of residents.

Points: 15 points

When Verified: Review location in design. Visually verify amenities at final inspection

Resources: Enterprise Transit Oriented Development Initiative: http://www.enterprisecommunity.org/solutions-and-innovation/equitable-transit-oriented-development

National Resources & Technical Assistance for Transit-oriented Development: https://todresources.org/

6-27: Build on a lot that is within 1/2 mile of at least six essential services, (e.g., grocery store, post office, place of worship, community center, daycare center, bank, school, restaurant, medical/dental office, laundromat/dry cleaner, etc)

Responsible Party: Developer

Intent: Walkable neighborhoods increase accessibility of necessary services to those who have limited access to transportation. Higher walkability in neighborhoods is associated with decreased rates of obesity and diabetes, improved air quality, and decreased noise pollution. Increased foot traffic can support local businesses and neighborhood economies and increase property values. Walk Score, a service that measures the walkability of addresses, has shown that for each point of a home's walkability, its value typically increases by $500 to $3,000.

Examples:

- Grocery store (excluding convenience or quickie-mart style stores)
- Post office
- Place of worship
- Community center
- Daycare center
- Bank
- School
- Restaurant
- Medical/dental office
- Laundromat/dry cleaner
- Transit Station (Facility with several routes or modes of transit)

Points: 3 points

When Verified: Review location in design. Visually verify amenities at final inspection

Resources: Walk Score: https://www.walkscore.com/

6-28: Build within ¼ mile of a transit stop or Park and Ride (not combinable with 6-25)

Responsible Party: Developer

Intent: Reduce the environmental impacts of single occupancy vehicles

Performance Requirement: Project boundary must be ¼ mile from an existing transit stop or Park and Ride location. May not be combined with Credit 6-26.

Points: 4 points

When Verified: At any time after project site is confirmed. Planned stops will be accepted with documentation that they will be operational within 12 months of project completion

6-29: Create a mixed-use building

Responsible Party: Developer, Architect

Intent: The goal of a "mixed-use" development is to discourage automobile use, to focus foot traffic around the housing community, and to provide infrastructure for services and employment adjacent to housing. Mixed–use, for this credit, is defined as commercial and residential development with at least three stories.

Performance Requirement: Building must be at least three occupiable stories above grade, with at least 30% of at-grade space designed to accommodate retail or commercial occupancies, either immediately, or in the future.

Points: 10 points

When Verified: Verify with plan review during design, and visually verify at final inspection

6-30: Provide subsidized bus passes (25% or 50% subsidized)

Responsible Party: Owner, Property Management

Intent: Encourage use of public transportation to reduce environmental impact of single occupancy vehicles

Performance Requirement: Create subsidy policy, publicize to tenants, and include as a selectable option at lease-signing.

Points Breakdown:

25% of cost of pass subsidized by building owner	3 points
50% or higher of cost of pass subsidized by building owner	6 points

When Verified: Review of policy and promotional materials at occupancy

6-31: Provide bicycle lockers or bicycle storage beyond code

Responsible Party: Architect, General Contractor

Intent: Encourage use of buses to reduce the environmental impact of low occupancy automobile use.

Performance Requirement: Where bus stops are located within or near the project property, provide or work with the local jurisdiction to ensure provision of appropriately sized shelters for people waiting to ride the bus.

Points: 2 points

When Verified: Visually verified at final inspection

6-32: Provide bike service station available to tenants

Responsible Party: Developer

Intent: Riding a bicycle 10km each way to work each day will save about $1,700 per year in transport costs. Also, bicycle parking is usually free, easily accessible, and more convenient than car parking. Benefits of riding a bike in your community means fewer cars which can lead to a safer road environment. Children can take advantage of slower and less dangerous traffic to ride bicycles as well. With community benefits also comes environmental benefits. Bicycle riding uses minimal fossil fuels and is a pollution-free mode of transport. Bikes reduce the need to build, service, and dispose of cars and conserves roadway and residential space, thereby providing opportunities for less concrete and more plant life in urban areas.

Performance Requirement: Provide space in the building for occupants to service and wash their bikes prior to storage. Service amenities must include air pumps, bike stands and a wash station.

Points: 2 Points

When Verified: Visually verified at final inspection.

Cross-references: 6-27, 6-31

Resources:

Bicycle kitchens give cyclists their very own amenity space:
https://www.bdcnetwork.com/bicycle-kitchens-give-cyclists-their-very-own-amenity-space

Guide On Bike Rooms For Tips On Maximizing Bicycle Storage In Apartment Buildings:
https://www.theparkcatalog.com/blog/guide-bike-rooms-bicycle-storage-apartment-buildings/

6-33: Provide bus shelters

Responsible Party: Developer, Architect, General Contractor

Intent: Reduce the environmental impacts of single occupancy vehicles.

Performance Requirement: Install a bus shelter at an established bus stop that is located on-site, either public mass transit or privately-owned mass transit option. If the stop is a public transit stop, you will need to contact the local public transit authority to discuss possible design requirements.

Points: 3 Points

When Verified: Visually verified at final inspection.

6-34: Provide dedicated parking spots for carpool or car-share vehicles

Responsible Party: Architect, General Contractor

Intent: Promote carpooling and car-sharing to reduce the environmental impact of single occupancy vehicles

Performance Requirement: Install signage for dedicated parking spots for carpool or carshare vehicles.

Points Breakdown:

One stall above code	6 points
Two stalls above code	8 points
Three stalls above code	10 points
Four or more stalls above code	12 points

When Verified: Visually verified at final inspection

6-35: Provide a link to community trails

Responsible Party: Architect, Landscape Designer, General Contractor

Intent: Encourage non-motorized transportation and provide connection to surrounding services and natural environments

Performance Requirement: Install one or more universally accessible connections from the project site to surrounding community trails

Points: 2 points

When Verified: Visually verified at final inspection

6-36: Provide EV charging station

Responsible Party: Developer, Architect, Electrical Designer

Intent: Electrical vehicles are rapidly becoming a significant portion of new vehicle purchases. By installing vehicle charging stations in multifamily buildings, we reduce the barriers to electric vehicle ownership among apartment- and condominium-dwellers, and increase the marketability of Built Green properties to electric vehicle owners.

Performance Requirement: Install one or more Level II vehicle charging outlets in the building parking areas. Outlet can be a free or pay station charger. Credit given based on the number of vehicles that can be charged simultaneously.

Points Breakdown: Maximum 20 points

First vehicle charging station	5 points
Each additional vehicle charging station	3 points

When Verified: Visually verified at final inspection

6-37: Provide community garden space for community interactions

Responsible Party: Developer, Architect, Landscape Architect, General Contractor

Intent: Community garden spaces provide numerous benefits, including decreasing food insecurity by increasing access for fresh produce that maybe unavailable in some underserved communities, providing space for community members to interact and nurture something together, and overall beautification of a building.

When space is at a premium roofs garden provide decorative and productive landscape design and stormwater management. Consider pairing it with roof top rainwater collection to supplement irrigation of the garden. For low-rise buildings locate the raised beds along city sidewalks and in public easements as a welcoming and productive landscape design, utilizing space that cannot otherwise be developed.

When designing raised bed boxes consider a design that will allow the most people with the widest range of abilities to use them (ask yourself, can people of different heights use the boxes comfortably if standing? Could someone sitting in a chair use them?). The beds should not impede access to the home for those with limited mobility (do not block street-to-sidewalk access). Construct raised beds using salvaged materials from deconstruction of the original structure for additional materials credits.

Performance Requirement:

Points:

Community garden beds	1 point
Garden beds with a roof-top greenhouse	2 points

When Verified: Visually verified during design and at final inspection

Cross-references: 2-22, 2-48

Resources:

Community Gardens as Amenities:
https://www.multifamilybiz.com/blogs/211/community_gardens_as_amenities

Growing Food and Gardening in Mixed-Use, Multi-Unit Residential Developments:
https://www.victoria.ca/assets/Departments/Parks~Rec~Culture/Parks/Documents/Growing~in~the~City/Growing%20Food%20and%20Gardening%20Final_e.pdf

6-38: Design to promote and encourage pedestrian-friendly and safe neighborhoods

Responsible Party: Architect or Landscape Architect

Intent: There are many ways to create more pedestrian friendly and safe neighborhoods. The following are examples of design elements eligible for points toward this credit:

- People-oriented/human-centered architecture and scale
- Accessibility for bicycles (at least 1 access point with no steps or curbs)
- Special bike storage designed into building OR separate storage outside
- Edible landscaping in front yard/in planting strip/or vegetable garden planter boxes
- Street trees planted in courtesy strip
- Wide walkable sidewalks with no obstructions
- Public spaces designed for people to gather and interact

Points Breakdown: 1 point per measure. 5 points maximum.

Cross-references: 2-25, 6-31, 6-37

When Verified: Visually verified during design and at final inspection

Resources:

Design Like You Care: 10 of the Best People-Oriented Designs: https://land8.com/design-like-you-care-10-of-the-best-people-oriented-designs/

STAKEHOLDER ENGAGEMENT

6-40: Use Integrated Design Process

Responsible Party: Project Team – Developer/Owner, Architect, General Contractor, Engineers, Landscaper, Deconstructer, Subcontractors, Verifier

Intent: Conduct an eco-charrette with the homeowner before the project begins, using the checklist to determine Built Green features to be included in the building. Goal setting and commitment to a green approach to the project can help ensure successful implementation of green strategies and actions. Review this checklist with all parties (e.g., developer/owner, designer, engineer, general contractor, landscape professional) at an early stage in the design process. An integrated approach can help identify innovative solutions and ensure that team members are not working at cross purposes.

A knowledgeable team is established, and team member roles are identified with respect to lot design, preparation, and development. A written mission statement that includes the project's goals and objectives is developed.

One of the earliest challenges for a builder in developing a green lot is assembling an effective team to help them implement best green practices throughout the process. Examples of possible team members include staff, site superintendents, utilities, excavators, landscape architects, wildlife biologists, ecologists, and arborists.

Those involved in the development phase must understand what the mission of the site is, what it means to be a green lot, and why green practices should be followed. Once the green intent of the developer is communicated to the development team, the builder should work with the team throughout the development process to identify and delegate responsibilities of team members, as well as facilitate coordination between the members to achieve best green practices.

Performance Requirement: Incorporate Built Green early in the design by conducting an eco-charrette with the developer, owner, and design team to determine Built Green features to be included in the home. Identify team member roles and how they relate to various phases of green lot design, prep, and development. Create a mission statement that includes the project's goals and objectives.

Points: 5 points

Cross-references: 6-2, 6-40

When Verified: Verified during design and preconstruction meetings and intermediate construction site inspections.

Resources:

Integrated Design for Green Homes: https://www.greenbuildingadvisor.com/green-basics/integrated-design

Roadmap For The Integrated Design Process: http://www.greenspacencr.org/events/IDProadmap.pdf

6-40: Engage with local community groups to assess community needs to inform the project-specific ESJ plan, Built Green checklist and project goals, or developer's overall equity workplan

Responsible Party: Developer, Architect, General Contractor

Intent: Community engagement pays dividends in multiple ways. While it may seem like a task outside the scope of work, it is well worth the effort. It is first and foremost about relationship building. The developer is actively seeking to establish a relationship with a new community organization, a new neighborhood, or community members. Often, community engagement is tied to a specific project, but the process can blossom into

workforce development opportunities, neighborhood support, new friendships, and often, a greater awareness of the diverse world in which we live.

According to PolicyLink, "Transformative engagement can be the difference between a successful initiative and one that falls well short of its potential." One benefit of engagement is "legitimacy and increased support for plans and projects."

Engaging with the community can take many forms. Here, the credit is related to conducting a project-specific community needs assessment, or seeking feedback on a ESJ plan or, on a larger scale, a developer's portfolio of projects. A note of caution: Asking community organizations and/or community members to donate their time and energy without some recognition of their investment will not help future relationship building or engagement. Remember, you are seeking out their involvement. Ask the community-based organization what you can do in exchange for their effort. Similarly, think of ways to recognize and compensate community members for their time. A hosting organization may be able to assist you in that regard.

Community engagement example:

For the 23rd + Jefferson Apartments, Seattle city planners, community members, the developer, Vulcan Real Estate, and its project team developed a strong working relationship during the development process that benefited all parties. Through the community engagement process the complex ended up including 532 housing units, of those 107 units were committed to be attainable housing units, a grocer, retail space, and 12,000 sq.ft. of green space. Runberg Architecture Group and the project team conducted over 100 meetings with community stakeholders to get input and feedback on the design and amenities provided by the development. These meetings were a variety of sizes and formats to offer accessibility and allow for different voices to be heard. For larger community meetings they used a call-and-response approach to design, starting with blank pages, rather than coming to the community with preconceived and predetermined options for them to review. They would use an educational approach to explain why somethings were done or not and what issues could be addressed by the project. Feedback from the community meetings were taken from each meeting, addressed by the design team, and brought back to the community to progress the designs. This process built strong support within the community which led to compelling community support demonstrated at design review board meetings and smoothing the design review process. This saved time and money on redesigns and provided a positive experience and feature for the community. From these meetings the following actions were taken on the project:

- A goal of 15% of the total subcontract value to be used to employ Women and Minority Business Enterprises (WMBE) (see Credit 6-42)
- Set a priority to hire local workers and businesses (see Credits 6-43 and 6-45)

- Worked with partners ANEW and Seattle Vocational Institute to offer an apprenticeship training program (see Credit 6-43 and 6-49)
- Paid homage to local heritage by incorporating culturally relevant architectural elements and commissioning local artists to create display art (see Credit 6-40)
- Environmentally sustainable, stormwater management, and indoor air quality construction practices achieved through third-party certifications (see Credit 2-4)
- Micro retail spaces to provide affordable spaces for local businesses
- 12,000 sq. ft. of open space plaza that provides a valuable community amenity and functional connection point for pedestrians through the neighborhood (see Credit 6-37)
- Nearly 20% of the housing units were work-force or attainable housing units (see Credit 6-7)

If this project had certified under Built Green's 2021 Multifamily New Construction checklist these actions could've earned the project a minimum of 51 points in Equity and Social Justice credits.

Performance Requirement: Document the type of community engagement, the group(s) engaged, and the outcome of the engagement activities. Documentation should be a memo on company letterhead describing the engagement activity, date of event, community group(s) involved, summary of the event activities, and the outcomes and actionable items that came from the event.

Points: 8 points

When Verified: Design phase

Cross-references: 6-5, 6-9, 6-10, 6-11, 6-42

Resources:

Community engagement toolkit for planning:
https://dilgpprd.blob.core.windows.net/general/Communityengagementtoolkit.pdf

The Sustainable Communities Initiative:
https://www.policylink.org/sites/default/files/COMMUNITYENGAGEMENTGUIDE_LY_FINAL%20%281%29.pdf

Big Idea: Let Community Engagement Surprise You:
https://www.enterprisecommunity.org/blog/big-idea-let-community-engagement-surprise-you

Communities of Opportunity: https://www.coopartnerships.org/work

A Guide to Engaging the Community in Your Project: https://www.artscapediy.org/guide/a-guide-to-engaging-the-community-in-your-project/

23rd + Jackson Apartments Community Blog: https://23jackson.com/community/

6-41: Engage community to directly contribute to design element onsite

Responsible Party: Developer, Architect, General Contractor

Intent: Build relationship and promote community ownership of the project being added to the neighborhood.

Performance Requirement: Through community stakeholder engagement, partner or contract with local community members, artists, or design professionals. Use that relationship to inform the building's architectural aesthetic (e.g., facades, shapes, materials, colors, patterns, decorations, etc) or add at least one large art installation or 3 smaller art installations.

Points: 5 points

When Verified: Verified during design and visually verified at final inspections.

6-42: Conduct post-occupancy evaluation with community stakeholders to evaluate the process and outcomes of their involvement of the project

Responsible Party: Developer, Architect, General Contractor

Intent: Conducting a post-occupancy evaluation related to the review of your project-specific or organizational ESJ plan efforts will provide valuable insights and information for future projects. Were you able to implement all identified credits and action steps? Did the equity action steps meet your expectations? How did the community benefit from the project and their involvement in its development? Did the interaction and experience develop a deeper relationship or understanding of the community and its stakeholders? If not, why? What action step did you not include that might have been a valuable addition?

Performance Requirement: Post-occupancy evaluation shall involve feedback from the project team, the community stakeholders involved and tenants (if available). Document the findings of the evaluation. Use the findings to evaluate the efficacy of the project team's stakeholder engagement implementation and strategies, the strength of the relationship that was created, and the benefits to the project team and the community. These finding shall inform stakeholder engagement procedures and strategies on the next project.

Points: 5 points

When Verified: Visually verified at completion.

Cross-reference: 6-40

Pro-Equity Sourcing

6-43: Use suppliers, vendors, or subcontractors that are WMBE or MBE firms

Responsible Party: Developer, General Contractor

Intent: Women and People of Color face an uphill battle in traditionally white-male-dominated industries, and WMBE and MBE businesses face a wide range of difficulties and challenges. These include facing biases and prejudices regarding their ability to complete a job and overcoming false views regarding their sophistication and capabilities. Such companies often have limited access to vital business, information networks, and capital. The misperception that small, BIPOC- and women-owned subcontractors are too risky to work with due to their size, limited resources, and portfolio is one of the main barriers to their growth and success. Although many of these companies have exactly what it takes to be successful, they aren't given the chance to compete for contracts. Shifting away from the practice of using "go-to" companies and into intentional efforts to build capacity, diversity, and inclusion in the building industry could lead to new ideas, new approaches, and accomplishments that benefit everyone.

> *WMBE:* Women and Minority-Owned Businesses: small business state-certified or self-identified firms at least 51% owned by women and/or minorities.
>
> *MBE:* Minority-Owned Business: small business state-certified or self-identified firms at least 51% owned by minorities.

Performance Requirement: Firm must have valid state or federal WMBE or MBE certification at time of contracting or purchase to qualify for this credit.

Points Breakdown: 1 point per firm. Maximum of 10 points.

When Verified: Construction phase

Resources:

One Woman on What It's Like to Run a Construction Company: https://repeller.com/olay-female-construction-company-interview/

A Key Challenge for Minority-Owned Subcontractors? Misperceptions: https://www.messer.com/news-and-insight/a-key-challenge-for-minority-owned-subcontractors-misperceptions/

Washington State Office of Minority & Women's Business Enterprises Directory: https://omwbe.wa.gov/directory-certified-firms

Supplier Diversity Best Practices: https://omwbe.wa.gov/state-supplier-diversity-reporting/supplier-diversity-best-practices

MBAKS Professional Women in Building (PWB) Council: https://www.mbaks.com/membership/councils-and-committees/professional-women-in-building-council

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-44: Hire temporary employees or apprentices through Weld Works or ANEW (or equivalent mission-driven employment program); minimum 25% of temporary work hours

Responsible Party: General Contractor

Intent: Weld Works is a division of Weld Seattle, whose mission is to equip system-impacted individuals with housing, employment, and resources conducive to recovery and successful reintegration. *System-impacted* refers to a person who is legally, economically, or familially-affected in a negative way by his or her incarceration or the incarceration of a close relative. System-impacted also includes people who have been arrested and/or convicted without incarceration. Weld Works is an innovative staffing organization effectively serving the construction, manufacturing, and retail industries.

Apprenticeship & Nontraditional Employment for Women (ANEW) is dedicated to improving access and advancement of women in non-traditional career pathways such as construction and manufacturing. ANEW focuses on equity and inclusion in the construction industry for both women and people of color by offering pre-apprentice training and apprenticeship opportunities placement programs.

For projects outside of Weld Works' or ANEW's operational territories, similar non-profit, mission-driven organizations exist that focus on employment and training of marginalized populations. Look for an organization that can provide the appropriate labor type for your project and a program that provides participants with case management, mentoring, and/or retention services.

Performance Requirement: Hire temporary workers or apprentices from a program such as Weld Works or ANEW (or equivalent mission-driven employment program). Provide proof of the agreement with the organization and the number of hours the employee(s) were employed. This can apply for any category of temporary labor on a project (e.g., site cleanup, deconstruction, demolition, administrative, skilled or unskilled labor, etc.). May

extend to first tier subcontractors and their direct hires. This credit is project-site-specific and non-transferable to other projects/checklists.

Points Breakdown:

At least 25% of temporary labor hours	5 points
At least 50% of temporary labor hours	8 points
75% or more of temporary labor hours	12 points
100% of temporary labor hours	15 points

Resources:

Weld Works: https://weldworks.org/hire-us/

Apprenticeship & Nontraditional Employment for Women (ANEW) programs: https://anewaop.org/programs/

United Way of King County Organizations focused on employment and job training: https://volunteer.uwkc.org/agency/index/?q=&cat_id=22106&distance=&zip=&name=&partners=&county=&s=1

Washington State Department of Social and Health Services- Community Based Organizations: https://www.dshs.wa.gov/esa/community-partnership-program/community-based-organizations-cbos-alphabet

6-45: Permanently hire employees from Weld Works or ANEW (or equivalent mission-driven employment program) used during demolition or construction

Responsible Party: General Contractor

Intent: Offer a space of belonging within your business by permanently hiring Weld Works temporary or ANEW apprentices that were utilized during demolition and construction. Your business will gain a new staff person who will bring new ideas and skills to your team and you will benefit from retaining trained employees. The employee will benefit from a stable living wage, and the community organization will benefit from positive outcomes for their participants and a stronger relationship with the industry.

Performance Requirement: Permanently hire workers from programs such as Weld Works or ANEW (or equivalent mission-driven employment program). Provide proof of a hiring agreement with Weld Works, ANEW (or similar organization), removing any confidential personal identification numbers, residential address and wage information. This credit is project site-specific and non-transferable to other projects/checklists.

Points: 2 points

Cross-reference: 6-44

6-46: Hire workers and apprentices who reside in one of the 43 Priority Hire ZIP codes (or equivalent economically distressed Washington ZIP codes); minimum 25% of work hours

Responsible Party: Builder/Developer

Intent: Due to institutionalized racism and sexism, women and minorities have continued to be excluded from the construction trades. Economically distressed ZIP codes represent communities that are home to the most disenfranchised peoples, and people of color are disproportionately represented in those areas. Intentionally hiring from these low-income and underserved communities is a good step to ensure that economically distressed residents can begin to benefit from Washington's booming construction industry. By prioritizing these communities, we offer their residents an opportunity to grab that first rung on the economic ladder with living-wage careers.

King County has 43 Priority Hire ZIP codes that are considered *economically distressed* due to having high concentration of the following three criteria:

- People living under 200% below the Federal Poverty Level (FPL)
- High unemployment
- People without a college degree

For projects located at least 20 miles outside of King County, please search for your local city or county jurisdiction's list of economically distressed ZIP codes, or locate local ZIP codes listed as Mid-tier, At-Risk, or Distressed on the Economic Innovation Group's Distressed Communities Index.

Performance Requirement: Provide a report that documents permanent employee's name, residential ZIP code, labor classification, job title, and number of hours worked on the project. Do not disclose employee's address, wages, or other confidential personal identification information. This can apply for any category of labor on a project (e.g., site cleanup, deconstruction, demolition, administrative, skilled or unskilled labor, etc.). May extend to first tier subcontractors and their direct hires. This credit is project-site-specific and nontransferable to other projects/checklists. May be combined with credit 6-44 and 6-45.

Points Breakdown:

At least 25% of labor hours	5 points
At least 50% of labor hours	8 points
75% or more of labor hours	10 points

Cross-references: 6-36 and 6-37

Resources:

Priority Hire in the City of Seattle and King County: https://www.seattle.gov/Documents/Departments/FAS/PurchasingAndContracting/Labor/Zip_Codes.pdf

City of Tacoma Economically Distressed ZIP codes: https://cms.cityoftacoma.org/CBCFiles/CommunityWorkforceAgreementTaskForce/Meeting%201/Economically%20Distressed%20ZIP%20Codes%20Chart.pdf

Economic Innovation Group's Distressed Communities Index: https://eig.org/dci/interactive-map?path=state/WA

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

Advance Economic Justice

6-47: Offer abandoned properties for Housing to Welds Seattle Employees (or equivalent organization) prior to demolition

Responsible Party: Builder

Intent: Weld Seattle, a nonprofit organization, serves formerly incarcerated and system-impacted individuals by offering housing and job placement in construction trades. *System-impacted* refers to a person who is legally, economically, or familially-affected in a negative way by his or her incarceration or the incarceration of a close relative. System-impacted also includes people who have been arrested and/or convicted without incarceration.

According to Weld Seattle, 77% of former prisoners are rearrested within 5 years. However, Weld Seattle's program, which includes employment pathways, clean and sober housing, and community re-engagement, has resulted in a less than 4% rearrest rate for Weld Seattle members. By partnering with builders and developers, Weld Seattle receives vacant properties which serve as temporary housing for its members. The developer/builder benefits because the Weld program maintains the property and prevents these otherwise unoccupied spaces from becoming magnets for squatters and crime.

Performance Requirement: Offer and provide the vacant property scheduled for demolition to Weld Seattle (or similar mission-driven organization) to serve in the organization's temporary housing program. Provide proof of the agreement with WELD or

similar organization. This credit is project-site-specific and non-transferable to other projects/checklists.

Points: 8 points

When Verified: Pre-demolition

Resources: Weld Seattle: https://www.weldseattle.org/housing

6-48: Offer mentorship program to employees, interns, and apprentices

Responsible Party: Builder/Developer

Intent: Mentoring employees, interns, and apprentices can mean the difference between continued employment or a higher-than-average turnover rate. Moreover, according to the Association for Talent Development, "Unlike other tactics companies have used to improve diversity, mentoring is proven to make a difference. One 2016 study in the American Sociological Review found that mentoring, in comparison to other corporate tactics (such as mandatory diversity training, grievance systems or job tests), increased BIPOC representation among managers in the workplace anywhere from 9 to 24%." When we mentor staff, particularly underrepresented staff members, their likelihood of advancing to higher levels increases as does the value of their contribution to the company.

Performance Requirement: Create and implement a mentorship program and include underrepresented staff members, interns, and apprentices; must be maintained for the duration of the project. Provide a memo that describes the program, benchmarks used to determine success, and outcomes. This program does not need to be project-specific, but if it is reused across multiple projects/checklists it should be updated each time to reflect progress and outcomes.

Points: 3 points

Cross-references: 6-3, 6-4, 6-5, 6-49, 6-50

Resources:

Building Mentorship Programs for People of Color:
https://rvcseattle.org/2018/03/21/building-mentorship-programs-people-color/

4 Ways Mentoring Can Empower Your Diversity and Inclusion Initiatives:
https://www.td.org/insights/4-ways-mentoring-can-empower-your-diversity-and-inclusion-initiatives

The 7 Benefits of a Structured Workplace Mentorship Program: https://www.gqrgm.com/7-benefits-structured-workplace-mentoring-program/
https://wabuildingtrades.org/community/apprenticeship-programs/

Construction and Trades Apprenticeship information:
http://www.futuresnw.org/apprenticeships

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-49: Participate in recruitment or career development events in underserved communities

Responsible Party: Builder

Intent: The goal is to broaden recruitment and hiring functions to more fully include people of color and other underrepresented communities impacted by bias and discrimination. By participating in organized recruitment efforts or career development events, individuals seeking employment in the construction trades will have an opportunity to meet potential employers while builders are able to meet their workforce needs and diversify their teams.

Career development events may include:

- Youth mentorship programs
- Participation in a WorkSource or community organization's career fair
- A recruitment or career development workshop targeting underserved community residents organized by your business.
- Job site tours and educational activities with local architecture, engineering, or construction students

Performance Requirement: Participate in at least one recruitment or career development event designed to reach an underserved community per calendar year throughout the duration of the project. Also accepted: voluntary participation and mentorship activities through partnerships with youth-focused organizations that focus on enrolling youth, POC, and women into pre-apprenticeship programs or helping them pursue careers in architecture, construction, or engineering. This may be reused across multiple projects/checklists per calendar year.

Points: 1 point

Cross-references: 6-5, 6-48, 6-50

Resources:

ACE Mentorship Program: https://www.acementor.org/

WorkSource career fairs: https://secure.esd.wa.gov/home/WorkSourceWA/Employer/Account

MBAKS workforce development: https://www.mbaks.com/workforce-development

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-50: Offer job training, job assistance, or job retention programs to underserved community members

Responsible Party: Builder

Intent: Creating a diverse, equitable, and inclusive organization often starts with offering job opportunities to individuals who have faced racial and other forms of discrimination. Low-barrier job entry, job training, and retention programs are effective and economical ways to provide pathways to living-wage jobs. At the same time, the builder may benefit by expanding his/her team and achieving a more diverse workforce.

Performance Requirement: Develop or partner with a local organization or academic program to offer a job training, job assistance, and/or job retention program for underserved community members. Program must be maintained for the duration of the project. Document the type of program and the individual(s) served, including length of time and relevant outcome (such as, the trainee found employment in the construction field, individual hired by builder, program led to retention of employee or employee promotion). This may be reused across multiple projects/checklists.

Points: 1 point

When Verified: Construction phase

Cross-references: 6-44, 6-46, 6-48, 6-49

Resources:

ANEW Apprenticeship Programs**:** https://anewaop.org/programs/

Youth Build: https://youthcare.org/homeless-youth-services/employment/youthbuild/

MBAKS workforce development: https://www.mbaks.com/workforce-development

Sawhorse Revolution: https://sawhorserevolution.org/

DOE's Better Building Residential Handbooks: Contractor Engagement & Workforce Development: https://rpsc.energy.gov/handbooks?f%5B0%5D=program_component%3A6

6-51: Partner with organizations and/or financial institutions to create pathways to investment and homeownership, especially for individuals and families facing the most pressing disparities

Responsible Party: Developer/Builder

Intent: In 2020, Citibank acknowledged persistent housing disparities impacting people of color. "Homeownership is a key way to build wealth and equity, and safe, affordable housing is an important platform for financial stability. However, Black homeownership is at its lowest level since the 1960s. In addition, rental housing in many urban areas across the country is scarce and too expensive. Compounding this crisis is the near-absence of minority-owned real estate developers in the affordable housing industry." As a result, Citi and other institutions are working to identify new funding streams dedicated to confronting racial disparities. Specifically, Citi promises to "expand access to its mortgage products and services among minority borrowers in low- and moderate-income neighborhoods and provide $200 million of equity and preferential financing through Citi Community Capital to affordable and workforce housing projects by minority developers who either are the sole equity owners or are in a joint venture with meaningful equity participation. Some of this funding will also be invested in minority developers to increase their capacity and allow them to compete for larger affordable housing projects."

Citi is not alone in their commitment to closing the racial wealth gap and housing disparities. Builders and developers can benefit by obtaining funding to build affordable/attainable housing and by helping individuals and families find pathways to investment and homeownership opportunities like the one described below.

Practice Example: A community-based organization based in South Seattle, El Centro de la Raza, offers a Home Purchase program including workshops and one-on-one consulting to community members. Their website states: "As a HUD-approved housing counseling agency, ECDLR's Home Purchase Program is designed for potential homebuyers. We evaluate your current financial and credit capacity to determine your mortgage readiness. Workshops are also available to inform participants of the homebuying process (finding lenders and real estate agents, budgeting, and different loan products)." This program has been effective in assisting community members in fulfilling their dream of homeownership. Partnering with an organization like El Centro de la Raza could offer valuable information to prospective homeowners and possible new business to the builder/developer.

Performance Requirement: Document the partnership effort leading to creating or expanding pathways to investment or homeownership. Specifically, document the builder or developer's role in the process.

Points: 8 points

Resources:

Announcing the Release of the Housing Pathways Proposal - Coming Home: Providing a Pathway to Housing for All: https://prosperitynow.org/blog/announcing-release-housing-pathways-proposal-coming-home-providing-pathway-housing-all

A Financial Institution's Action Plan for Racial Equity: https://www.citigroup.com/citi/racial-equity/

Building for Tomorrow: Innovative Infrastructure Solutions**:** https://www.nahb.org/-/media/NAHB/advocacy/docs/industry-issues/land-use-101/infrastructure/building-for-tomorrow-innovative-infrastructure-solutions.pdf

Habitat for Humanity Seattle-King County: https://www.habitatskc.org/

Green Choice and Affordable Loan programs from Olympia Federal Savings: https://www.olyfed.com/personal/home-loans/

Study: How Diverse is the Real Estate Investing Community?: https://www.millionacres.com/research/real-estate-investor-diversity/

6-52: Annually provide pro bono or substantially reduced rate services, resources, or trainings to nonprofit or historically marginalized community organizations

Responsible Party: Builder/Developer

Intent: Providing free or substantially reduced services or materials and/or supporting local organizations, particularly those that serve people of color and other marginalized groups, is a great way of demonstrating your commitment to community and for serving others in need. Set aside time to provide construction services to a local community organization. MBAKS organizes 2–3 community stewardship events each year, such as our annual Rampathon and Painting a Better Tomorrow. Organizations like United Way King County's Day of Caring or Rebuilding Together organize events where volunteers are dispatched to community organizations in need of remodeling or construction services (such as new paint, new playground, etc.). Similarly, Habitat for Humanity seeks volunteers and material suppliers to help build houses for individuals and families who are unable to purchase a home without assistance. Alternatively, you could also offer a training or DIY

clinic at a community-based organization related to homeowner education, water and energy conservation, or indoor air quality.

Performance Requirement: Document services provided with date, description of services, and the organization that you worked with. May be resubmitted for multiple project checklists in a given calendar year.

Points: 5 points

When Verified: Upon completion of service.

Resources:

Habitat for Humanity: https://www.habitatskc.org/

United Way Day of Caring: https://www.uwkc.org/events/day-of-caring/

MBAKS Community Stewardship: https://www.mbaks.com/community

Rebuilding Together Seattle: http://www.rtseattle.org/

Sawhorse Revolution: https://sawhorserevolution.org/

6-53: Use alternative development and ownership models (e.g., land trust, co-ownership) to create additional pathways to homeownership

Responsible Party: Builder/Developer

Intent: Traditional paths to homeownership are not sufficient and prevent too many community members from owning their own home. Alternatives to development, alternative ownership models, and alternative financing create additional pathways to address this problem.

Performance Requirement: Work with organizations and financial institutions promoting innovative alternative development opportunities and/or different ownership models.

Points: Earn 8 points for use of alternative development or ownership model leading to homeownership.

When Verified: Upon completion of project.

Cross-reference: 6-8

Resources:

Community Land Trusts and Stable Affordable Housing: https://www.huduser.gov/portal/pdredge/pdr-edge-featd-article-110419.html

Shared Equity Models of Ownership: https://nhc.org/policy-guide/shared-equity-homeownership-the-basics/shared-equity-models-of-ownership/

Extra Credit for Equity and Social Justice

6-54: Extra credit for innovation in Equity and Social Justice, subject to approval by Built Green Program Manager

You may submit a materials efficiency strategy or system, not specifically called out in this Section, for consideration for an Extra Credit for Innovation. All extra credits are subject to approval by the Program Director. If approved, add up to 10 points to your Section total.

SECTION SEVEN: OPERATION, MAINTENANCE & TENANT EDUCATION

7-1: Provide educational materials designed for the public that highlight the green building features and their performance that are included in the project

Responsible Party: Owner or General Contractor

Intent: Increase market awareness, interest, and the value of green building by educating the public about green building strategies, benefits, and the specific approaches in your project.

Performance Requirement: Create signage on the jobsite, signage for a model unit, brochures for tours or passersby, or a webpage to educate the public about your project. At a minimum, the materials must highlight the features and benefits from at least two Built Green Action Items per each of the following sections (a minimum of 12 features and associated benefits):

- Site Protection
- Water Conservation
- Energy Improvement
- Health and Indoor Air Quality
- Materials Efficiency
- Equity and Social Justice

Points: 7 points

When Verified: Visually verified during construction or at the time of final inspection

Cross-references: 7-9 through 15

Resources:

DOE's Better Buildings Residential Resources: Marketing & Outreach – Communicate Impacts: https://rpsc.energy.gov/handbooks/marketing-outreach-communicate-impacts#edit-group-description

DOE's Better Buildings Residential Resources: Training Toolkit: https://www.energy.gov/eere/better-buildings-residential-network/downloads/better-buildings-training-toolkit

DOE's Better Buildings Residential Resources: Community-Based Social Marketing Toolkit: https://www.energy.gov/eere/better-buildings-residential-network/downloads/community-based-social-marketing-toolkit

EPA WaterSense: Start Saving: https://www.epa.gov/watersense/start-saving

PSE Energy Saving Tips for Your Home: https://www.pse.com/en/rebates/energy-saving-tips

EPA Learn about Indoor Air Quality Resources: https://www.epa.gov/indoor-air-quality-iaq/learn-about-indoor-air-quality

7-2: Prepare an environmentally friendly operations and maintenance plan for common area facilities

Responsible Party: Owner or General Contractor

Intent: Protect your investment by empowering staff to take ownership of long-term durability, efficiency, and health through best O&M practices.

Performance Requirement: The maintenance plan should include, at a minimum:

- Product Manuals and clear operating instructions for:
- Common area HVAC equipment and controls
- Central water heating (if applicable)
- Common area plumbing and water heating
- Common area lighting
- Exterior lighting
- Building exterior components
- Monthly and annual maintenance checklists for all common area systems and equipment, the building envelope (foundation, walls, roof) including rainwater management, and exterior lighting
- A plan that states how each staff member will be introduced to the materials

Points: 5 points

When Verified: Visually verified during construction or at the time of final inspection

Cross-reference: 7-7

7-3: Prepare an environmentally friendly landscape operations and maintenance plan

Responsible Party: Owner, General Contractor, or Landscape Professional

Intent: Keep your residents, your landscaping, and your building healthy and resource efficient through ongoing landscape O&M best practices.

Performance Requirement: At a minimum, your landscape operations and maintenance plan needs to include the following:

- Integrated Pest Management (IPM) strategies that list regular tasks to minimize the use of chemicals and mitigate pest risk
- Weekly, monthly, and annual checklists
- List of chemicals or types of products that should not be used or purchased by onsite staff or contracted service providers
- Monthly and annual checklists that include all of the following as applicable to your property:
- Erosion Control
- Hardscapes
- Stormwater management system
- Irrigation system
- Tipsheet for all staff that indicates:
- Materials and equipment storage requirements
- Best practices to reduce emissions from site maintenance equipment
- Considerations when contracting service providers

Points: 5 points

When Verified: Visually verified during construction or at the time of final inspection

Cross-references: Section 2

Resources:

Healthy landscape guidelines for property owners, designers, and contractors: http://www.seattle.gov/utilities/protecting-our-environment/sustainability-tips/landscaping/for-professionals/maintenance-plans

7-4: Develop and provide a building-wide food waste disposal strategy

Responsible Party: Owner

Intent: Whether your municipality requires food waste to be managed or not, providing the infrastructure and encouragement for your residents will keep valuable nutrients in our local ecosystem and reduce the waste sent to landfills.

Performance Requirement: Provide all of the following:

- Central food waste receptacle easily accessible by all residents.
- Regular, scheduled pick-up for food waste and compostables that is frequent enough to accommodate food waste from all residents.
- Signage at the receptacle that clearly indicates in picture form what can and cannot be composted.
- Information to all residents at move in where to take food waste and what is accepted and prohibited.
- Optional, but recommended: Provide each resident with a kitchen compost bin and a start-up kit with compostable bags.

Points: 6 points

When Verified: Visually verified at the time of final inspection

Cross-reference: 5-21

Resources: Seattle Municipal Code sections 21.36.082 and 21.36.083 require that residents and businesses do not put food scraps, compostable paper, yard waste, and recyclables in their garbage.

SPU- Help Residents Recycle and Compost: http://www.seattle.gov/utilities/your-services/collection-and-disposal/multi-family-properties/for-managers-and-owners/help-residents

King County Food Too Good To Waste: https://kingcounty.gov/depts/dnrp/solid-waste/programs/waste-prevention/food-too-good-to-waste.aspx

EPA Food Too Good To Waste: https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit

7-5: Require tenants to sign an energy consumption data release form (if separately metered)

Responsible Party: Owner or Property Manager

Intent: "You can't manage what you don't measure" and this holds true for all resources in your building. By monitoring resource use, you can trouble shoot problems more quickly and help you and your residents save money.

Performance Requirement: Include in the lease language a utility release as a default. Include an opt-out field for residents who do not want to sign the release.

Points: 7 points

When Verified: Visually verified at the time of final inspection

Cross-reference: 3-45

Resources: Check with your utility provider to determine if they have a template or online form to share with residents

7-6: Require tenants to sign a water consumption data release form (if separately metered)

Responsible Party: Owner or Property Manager

Intent: "You can't manage what you don't measure" and this holds true for all resources in your building. By monitoring resource use, you can trouble shoot problems more quickly and help you and your residents save money.

Performance Requirement: Include in the lease language a utility release as a default. Include an opt-out field for residents who do not want to sign the release.

Points: 5 points

When Verified: Visually verified at the time of final inspection

Cross-reference: 2-63

Resources: Check with your utility provider to determine if they have a template or online form to share with residents.

7-7: Conduct training sessions for maintenance staff and/or residents

Responsible Party: Owner or Property Manager

Intent: Extend the value of your investment by providing training sessions that describe building components, ongoing operations and maintenance (O&M) needs and staff or resident expectations.

Performance Requirement: Create and implement a plan that includes the following:

- Learning objectives for the participants
- Agenda with topics covered and delivery format+
- Associated training materials or references
- Sign-in sheet*

+Training sessions for staff should be at least 2 hours and cover all of the topics listed in 6-2 and 6-3. Resident training should cover all benefits and operating instructions of the key features within their unit.

*Plan should include a target attendance of at least 75% of staff or 100% of residents (during move-in walks or combined with other events) within 3 months of move-in

Points: 7 points

When Verified: Visually verified at the time of final inspection

Cross-references: For Staff: 7-2, 7-3

For residents: 7-9 through 7-15

Resources:

DOE's Better Buildings Residential Resources: Training Toolkit: https://www.energy.gov/eere/better-buildings-residential-network/downloads/better-buildings-training-toolkit

7-8: Give individual feedback to all tenants about their energy consumption in comparison to others and/or building average

Responsible Party: Owner, Property Manager, or Utility (if applicable)

Intent: Engaging and educating residents about their relative energy use is a powerful way to grab their attention in order to find approaches to save money and energy.

Performance Requirement: Create a reporting plan, or contract with a service provider, to communicate unit-level energy consumption to all residents.

The reporting plan must include quarterly reports for all residents with a comparison of their energy use to the appropriate building averages.

Points: 5 points

When Verified: Visually verified at the time of final inspection

Cross-reference: 7-5

Resources: Check with your utility to determine if they provide this service or can help connect you to someone that can.

HUD Exchange Multifamily Utility Benchmarking Toolkit: https://www.hudexchange.info/programs/utility-benchmarking/toolkit/

Provide tenants with materials including information on:

7-9: Where to dispose of food waste (compost)

Responsible Party: Owner or Property Manager

Intent: Encourage better composting rates by educating residents about what goes where.

Performance Requirement: Provide all residents with information that clearly indicates what can and cannot be put in the food waste bin, where the food waste bin is located, and suggestions for minimizing food waste.

Points: 1point

When Verified: Visually verified at the time of final inspection

Cross-reference: 5-21

Resources: Check with the local waste collection utility to determine if they provide this service or can help connect you to someone that can.

SPU- Help Residents Recycle and Compost: http://www.seattle.gov/utilities/your-services/collection-and-disposal/multi-family-properties/for-managers-and-owners/help-residents

King County Food Too Good To Waste: https://kingcounty.gov/depts/dnrp/solid-waste/programs/waste-prevention/food-too-good-to-waste.aspx

EPA Food Too Good To Waste: https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit

7-10: Where to dispose of recyclables

Responsible Party: Owner or Property Manager

Intent: Encourage better recycling rates by educating residents about what goes where.

Performance Requirement: Provide all residents with information that clearly indicates what can and cannot be recycled, where to take all recyclables, what to do if the recycling containers are full, and suggestions for minimizing total waste (including recyclables and landfill-bound materials).

Points: 1 point

When Verified: Visually verified at the time of final inspection

Cross-references: 5-18, 5-20

Resources: Check with the local waste collection utility to determine if they provide this service or can provide you with flyers or guides.

SPU- Help Residents Recycle and Compost: http://www.seattle.gov/utilities/your-services/collection-and-disposal/multi-family-properties/for-managers-and-owners/help-residents

7-11: General practices to conserve water and energy

Responsible Party: Owner or Property Manager

Intent: Help residents save money and minimize the environmental impact of your building by providing explicit ways residents can save water and energy.

Performance Requirement: Provide all residents with specific actions they can take to save energy and water within their units.

Points: 1 point

When Verified: Visually verified at the time of final inspection

Resources:

Energy Efficiency: ENERGY STAR, Department of Energy (DOE) Energy Saver's

Water Efficiency: WaterSense 2.0

7-12: Transportation options and resources

Responsible Party: Owner or Property Manager

Intent: Buildings use significant amounts of energy and contribute substantially to greenhouse gas emissions. In addition, occupant transportation choices to and from buildings contribute significantly to health and environmental outcomes. Carpooling, riding public transit, biking, or walking can greatly reduce per person emissions.

Performance Requirement: Include within a resident manual OR as a poster in the entry/lobby, or within a move-in packet: information that informs residents about nearby transportation options, such as:

- Public transit (nearby bus and train stops, related apps, where to purchase fare / tickets, etc.)

- Bicycle resources (storage options, repair stations or nearby repair shops, bike route maps, bike sharing programs, etc.)
- Car sharing programs
- Walking maps

Points: 1 point

When Verified: Visually verified at the time of final inspection

Cross-references: 6-26 through 6-36

Resources:

- Metro's Trip Planner, Sound Transit's Trip Planner, Community Transit, Everett Transit
- One Bus Away app - shows real-time information about bus schedules in Seattle
- Depending on your project's location, include links to services such as car2go, ReachNow, Zipcar, and bike sharing programs.

7-13: EVs, their benefits, and where to charge them

Responsible Party: Owner or Property Manager

Intent: Support the use of electric vehicles to reduce direct fossil fuel consumption and the associated carbon emissions.

Performance Requirement: Provide all residents with information about electric vehicles (EVs), the benefits of EVs, and where to charge them.

Points: 3 points

When Verified: Visually verified at the time of final inspection

Cross-reference: 6-36

Resources:

Seattle – Why drive an EV: http://www.seattle.gov/city-light/residential-services/home-energy-solutions/electric-vehicles

7-14: Green features and benefits of the buildings

Responsible Party: Owner or Property Manager

Intent: Educate and empower residents to know and optimize the benefits of the valuable investments you've made to protect health, efficiency, durability, and the environment.

Performance Requirement: Provide all residents with information about the green features on the site and within the building. At a minimum, list at least two features from each of the following Built Green Sections along with the associated benefits and any O&M expectations for each feature:

- Site Protection
- Water Conservation
- Energy Improvement
- Health and Indoor Air Quality
- Materials Efficiency
- Equity and social Justice

Points: 2 points

When Verified: Visually verified at the time of final inspection

Cross-reference: 7-1

Resources: See resources in Credit 7-1. Utilize your Built Green checklist and the intent subsections of credits to create this tip sheet for residents. If you are pursuing Credit 7-1, you can utilize the same list, but will need to add the ongoing O&M expectations associated with each feature.

7-15: Maintenance checklists for their unit

Responsible Party: Owner or Property Manager

Intent: Encourage residents to take responsibility for ongoing easy-to-implement maintenance tasks that will save hassle, work orders, and long-term equipment and maintenance costs.

Performance Requirement: Provide all residents with a tip sheet that, at a minimum, includes: monthly activities (such as cleaning dishwasher filter, cleaning kitchen exhaust filter, inspecting all plumbing fixtures for leaks, confirming exhaust and whole house fan operation, etc.)

Points: 3 points

When Verified: Visually verified at the time of final inspection

Cross-references: 7-1, 7-7

Resources: Consider sending email reminders with a maintenance checklist on the first of the month or the date that rent is due.

Extra Credit for Operations, Maintenance and Tenant Education

7-16: Extra credit for innovation in Operation, Maintenance and Tenant Education, subject to approval by Built Green Program Manager

You may submit a strategy that includes homeowner education, not specifically called out in this Section, for consideration for an Extra Credit for Innovation. All extra credit is subject to approval by the Program Manager. If approved, add up to 5 points to your Section 7 total.

Section Eight: Built Green Brand Promotion

8-1: Verifier provides case study write-up highlighting project's green features and performance with professional project photos for use on Built Green's blog (requires minimum of 450 points to be earned, project provides affordable housing, or is innovative). Requires preapproval and subject to discretion of the Built Green Program Manager.

Responsible Party: Verifier

Intent: Recognize Built Green builders and projects that demonstrate environmental and social equity leadership in the residential building industry. Share project examples and best practices throughout the Built Green community.

Performance Requirement: Requires prior approval from Built Green Program Manager. To propose a project to be featured by Built Green, send an email to Built Green detailing the preliminary point count, location, project type, and interesting features or story. See below for selection criteria* (must meet at least one criterion to be considered):

1. Scores at least 450 points on the checklist and performs beyond minimum requirements
2. A Net Zero Energy, all electric home
3. A multifamily or remodel project
4. Located outside of Seattle, or in an area where Built Green is less represented
5. Has innovative or underutilized features that should be promoted
6. Has a unique story to tell
7. Design aesthetic is unique, eye-catching, and captivating
8. Project provides a teaching/educational opportunity

**Selection criteria subject to Built Green's discretion*

Points: 2 points

When Verified: After final inspection. Submit case study proposal to Built Green Program Manager prior to submittal of verification packet.

Resources:

Built Green Case Studies: https://builtgreen.net/blog-home

8-2: Posted a Built Green yard sign during construction

Responsible Party: Developer, General Contractor or Realtor

Intent: Increase consumer awareness of Built Green by increasing visibility of program benefits and projects being built in their communities, thereby building brand recognition value for Built Green members and homeowners.

Performance Requirement:

- Photo of sign that includes Built Green logo onsite either during construction or during sales process.
- Educational signage posted inside the home during home tours that highlight Built Green certification and Built Green features to potential buyers.
- Include the *targeted* Built Green certification star-level in the description or photos of the MLS listing. A project may not claim any star level certification unless the certificate has been issued by Built Green.

Points: 1 Point per action. Maximum of 3 points.

When Verified: Visually verified during intermediate construction and final inspections.

Resources:

Built Green Logo files available by logging into your Built Green Builder portal: builtgreen.net/

Built Green Marketing Materials: https://builtgreen.net/resources/#builders

8-3: Built Green logo or hyperlink prominently listed on Builder's or project's website

Responsible Party: Developer, General Contractor

Intent: Increase consumer awareness of Built Green by increasing visibility of program benefits and Built Green builders in their communities, thereby building brand recognition value for Built Green members and homeowners.

Performance Requirement: Built Green logo or Built Green Member logo and program description (including benefits to homebuyers) displayed in an easily found location on the builder's website.

Points: 1 Point

When Verified: Visually verified during intermediate construction and final inspections.

Resources:

Built Green Logo files available by logging into your Built Green Builder portal: builtgreen.net

Built Green Marketing Materials: https://builtgreen.net/resources/#builders

8-4: Extra credit for innovation in Built Green Brand Promotion

You may submit a marketing strategy that includes promoting the Built Green logo or brand, not specifically called out in this section, for consideration for an extra credit for Innovation. All extra credits are subject to approval by the Program Manager. If approved, add up to 5 points to your Section 8 total.