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Oregon Housing and Community Services (OHCS)
Homeowner Assistance and Reconstruction Program (HARP)

Construction Standards and Expectations for Manufactured and Stick-Built Homes

Version 1.1 — October 18, 2024

Got Questions?
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housingsupport@reoregon.org
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Version History and Version Policy

The version history of this manual is tracked in the table below, with notes for each change. The dates of each publication are also tracked in the table.

After making non-substantial changes, such as minor wording and editing or clarification of existing policy that do not affect the interpretation or applicability of the policy, OHCS will publish a version of the document with a sequential number increase behind the primary version number such as 2.1, 2.2, etc.

Amendments made may go into effect on the date of the revision or may be applied retroactively. Whether a policy will be applied proactively or retroactively will be detailed in the version history below and/or within the relevant program sections.

Version Number	Date Revised	Key Revisions
1.0	01/31/2024	Initial Document Creation
1.1	10/18/2024	Revisions include additional guidance under hazard testing and clearance and construction standards for the home purchase pathway.

Acronyms

Acronym	Meaning
ACCA	Air Conditioning Contractors of America (quality standard)
ACM	Asbestos Containing Material
ADA	Americans with Disabilities Act
BCD	Building Codes Division
BFE	Base flood elevation
BMP	Best management practice
CCB	Construction Contractors Board
CDBG-DR	Community development block grant disaster recovery
CFM	Cubic feet per minute
CFR	Code of Federal Regulations
COP	Coefficient of performance
CPD	HUD Community Planning and Development
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
ERR	Environmental Review Record
FEMP	Federal Energy Management Program
GFCI	Ground fault circuit interrupter (safety device)
HARP	Homeowner Assistance and Reconstruction Program
HIZ	Home Ignition Zone
HSPF	Heating Season Performance Factor
HUD	Department of Housing and Urban Development
HVAC	Heating, ventilation, and air conditioning.
ICC	International Code Council
IRC	International Residential Code (for one- and two-family dwellings)
LEED	Leadership in Energy and Environmental Design (green building rating system)
LID	Low-impact development

Acronym	Meaning
MDF	Medium-density fiberboard
MEP	Mechanical, electrical, and plumbing
MERV	Minimum Efficiency Reporting Value
NEEM	Northwest Energy-Efficient Manufactured
NFPA	National Fire Protection Association
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OHCS	Oregon Housing and Community Services
ORDEQ	Oregon Depart of Environmental Quality
ORSC	Oregon Residential Specialty Code
SEER	Seasonal Energy Efficiency Ratio
UEF	Uniform energy factor
UIC	Underground injection control
VOC	Volatile organic compounds

Definitions

Definitions	Meaning
Contract Administrator	The grant administrator. This can be the subrecipient.
Contractor	The builder awarded the contract.
Green and Resilient Building Standard(s)	All new construction and reconstruction projects adhere to the Energy Star standards and the ICC-700 Certified Compliance Path for Single-Family Homes, Townhomes, and duplexes. Replacement manufactured housing units adhere to the Northwest Energy-Efficient Manufactured Housing Program standards.
Green Standard Certification	Official certification by an entity empowered to issue such certification for the Green Standard selected by the builder.
Habitable	A habitable dwelling unit is one that is structurally sound, weather tight and in good repair.
Homeowner	The person(s) to receive assistance through a program to repair, reconstruct or replace their damaged structure.
Housing and Urban Development Act of 1968, Section 3	Requires program administrators to ensure that training, employment, and other economic opportunities generated by HUD financial assistance shall be directed to the greatest extent feasible and consistent with existing federal, state, and local laws and regulations, to low- and very low-income persons. Recipients of Section 3-covered funding ensure compliance and the compliance of their contractors/subcontractors with the Section 3 requirements, as outlined in 24 CFR 135.32.
Manufactured home or Manufactured housing unit (MH)	Refers to manufactured homes more specifically, mobile homes.
Modular Home	Manufactured housing that is of modular construction will be treated as stick- or stick-built construction.
Noncombustible Material	Materials used and under the conditions anticipated will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat in accordance with ASTM E136.
Subrecipient	A unit of local government

Definitions	Meaning
Universal Design	Universal design is the concept of designing products, environments, and services that can be used by everyone, to the greatest extent possible, without the need for adaptation or specialized design. It aims to create inclusive spaces and experiences that are usable by people of all ages, abilities, and disabilities.
Visitability	As defined by Oregon Revised Statutes 456.510, Visitability requirements encourage the construction of homes and public spaces that are more accessible to people of all abilities, including those with disabilities and older adults.
Work Covered	All new and remodeled construction work called for in the “work write-up.”

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Introduction

1 Introduction

The purpose of the Oregon Housing and Community Services Homeowner Assistance and Reconstruction Program Construction Standards and Expectations for Manufactured and Stick-Built Homes (Standards) is to ensure that all single-family housing participants who receive new or rehabilitated construction housing through programs funded through Oregon Housing and Community Services (OHCS) live in housing that is decent, safe, and sanitary as defined in 49 CFR Part 24.2(a)(8). Furthermore, these Standards shall ensure that the investment of public and homeowner funds results in lengthening the term of affordability, promoting resilience.

All work carried out with the assistance of funds provided through OHCS shall be done in accordance with these Standards and U.S. Department of Housing and Urban Development (HUD) Housing Construction Specifications as they apply to single-family housing participants and, unless otherwise defined, shall meet or exceed industry and trade standards.

It is the program's goal and desire to deliver responsibly sourced and equitable housing to survivors of the 2020 Labor Day wildfires and straight-line winds. In this endeavor, we are providing construction standards that outline energy efficiency, environmental resiliency, and universal accessibility while meeting state, local, and federal requirements. Where possible and appropriate, the program will unify standards across construction modalities and program pathways. This will enable survivors to make transparent, informed, and empowered choices with the resources provided through the grant program.

Where code, law, ordinance, rule, regulation, or legitimate order of any public authority conflicts with installation, inspection, and testing requirements outlined in these Standards, the more stringent rule or requirement shall take precedence. This document is not meant to summarize all applicable codes or regulations and does not indicate that a project does not need to adhere to these requirements. It is expected that all projects shall adhere to codes and elements required to achieve plan review approval, permit issuance, and/or certificate of occupancy/completion.

1.1 Program Paths and Intent

ReOregon Homeowner Assistance and Reconstruction Program (HARP) is designed to serve participants who have yet to complete their recovery from the 2020 Labor Day wildfires and straight-line winds. This may include:

- Reconstruction of the destroyed or substantially damaged homes

- Rehabilitation or completion of the damaged home or replacement home or completion of reconstruction already in progress
- Replacement of destroyed or substantially damaged manufactured homes

Accessory dwelling units, structures commonly known as tiny homes or mother-in-law suites, shall be covered in another set of guidelines.

1.2 Pricing Considerations

Prices and costs associated with program activities are based on local vendors and labor rates as reported to the estimating platform. Costs ascribed to project elements are done so through the lens of cost-reasonableness to ensure that costs incurred are necessary and reasonable.

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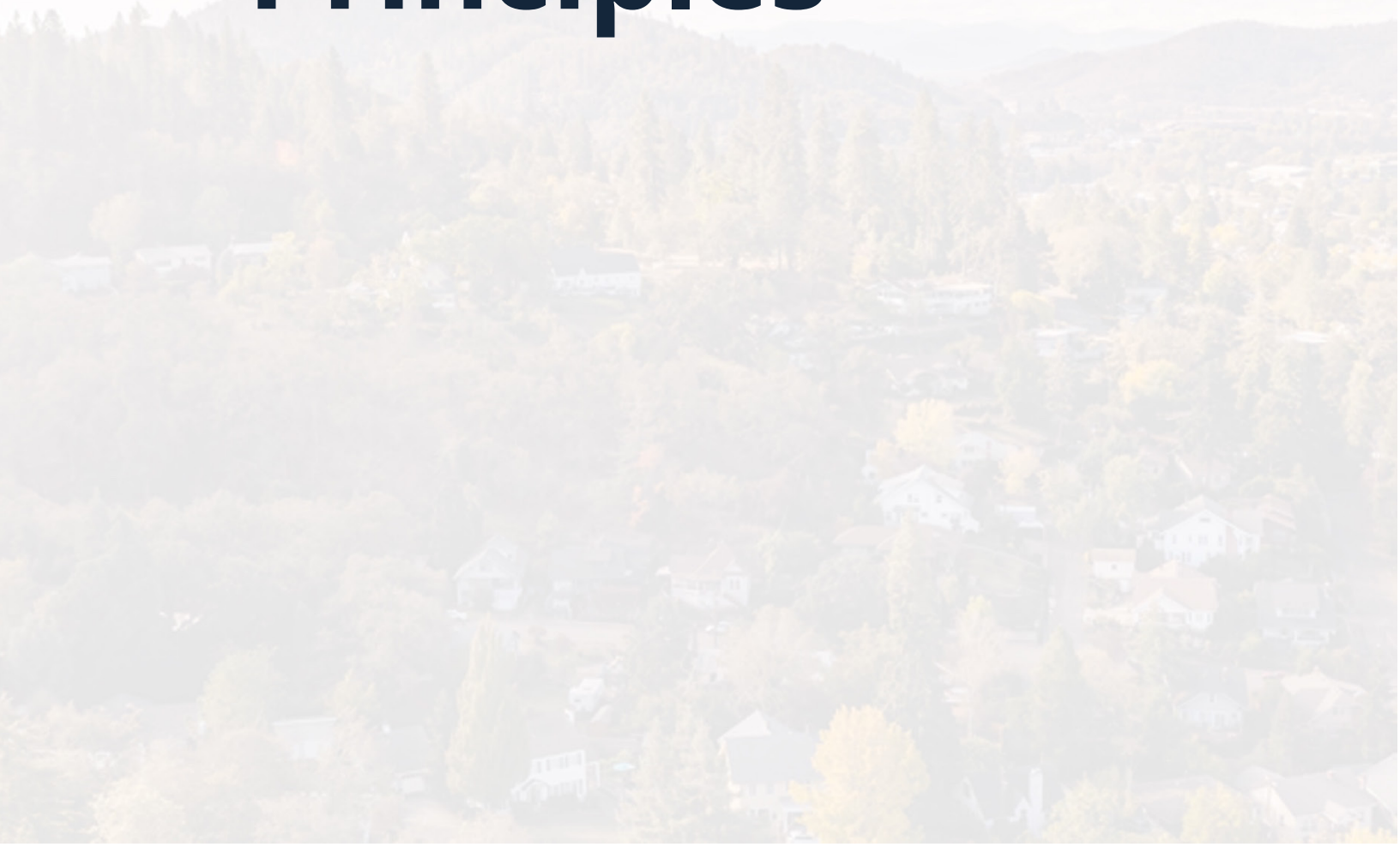
Design Guiding Principles



2 Design Guiding Principles

The designer, architect, or engineer should consider the following principles when designing the home and/or home site.

Considerations for Universal Design, Visitability, and Disability should be incorporated into the home's design.

The home design should consider grouping areas requiring specific services to reduce material and labor. For example, the primary bathroom and guest bathroom should share the same wetwall to reduce the installation labor and quantity of materials required.

2.1 Wildland-Urban Areas

For properties in the Wildland-Urban Interface with a risk classification of high or extreme, Oregon Senate Bill 762 requires actions to help mitigate the risk of wildfire through the adoption of defensible space and home hardening building codes. The Oregon State Fire Marshal is passing defensible space code requirements through a public process. The adoption of defensible space requirements occurred in December 2022, following the conclusion of the map validation and appeals period. These requirements did not take effect immediately. For more information, visit the Oregon State Fire Marshal's website.

The Building Codes Division (BCD) adopted home hardening building codes through a public process. These codes were adopted on Oct. 1, 2022, and became effective on April 1, 2023. More details can be found on the BCD website.

2.2 Environmental Concerns and Hazards

2.2.1 Wetlands

A site inspection will occur on each property. The construction advisor will be trained to conservatively identify common wetland indicators in the tax lot or work area, including standing or flowing water, drainage patterns, depressional low points, common wetland vegetation, saturated grounds, and others. The construction advisor will identify the work area boundaries for each project as either the full tax lot or a smaller subsection of the tax lot. The work area requiring clearance for wetland and waterway impacts includes all vehicle access routes, staging, and laydown areas. It also includes vegetation and tree removal areas, as well as demolition activities. This clearance applies to all elements of the construction project, including foundations, decks, utility connections and installations, and septic tank installations or removals. It also covers driveways, sidewalks, stormwater

facilities, ash and debris removal, and the removal of any other structures posing life safety issues.

The construction advisor will use their professional judgment on the site inspection form to indicate whether full avoidance of wetland indicators found within the work area is feasible for the project. The field inspection form with written observations and photographic evidence to support the presence or absence of waters or wetlands will be provided to the Tier 2 reviewer and appended to the Environmental Review Record (ERR).

Based on the findings of the construction advisor, referenced in the environmental site inspection that is performed during the initial site inspection, the contractor will use the architectural and engineering firm's design to:

- Implement and maintain erosion and sedimentation control measures sufficient to prevent erosion and deposition of sediment and eroded soil in on-site and off-site wetlands and waters
- Reduce soil compaction by minimizing project ground-disturbing activities in vegetated areas, including lawns

oregon.gov/dsl/WW/Pages/WetlandConservation.aspx

oregon.gov/dsl/WW/Pages/Permits.aspx

2.2.2 Section 106

Section 106 of the National Historic Preservation Act

If project construction uncovers significant archaeological deposits (such as Native American pottery, stone tools, bones, or human remains) the participant shall stop all work immediately near the discovery, take reasonable measures to avoid or minimize harm to the finds, and inform the program. All archeological findings will be secured and access to the sensitive area restricted. Work will stop in that area until the program has conferred with the State Historic Preservation Office and/or Native American Tribes and informed the participant the work can recommence.

2.2.3 Migratory Species

To the extent practical, site work and construction activities — primarily vegetation removal — will be avoided within the project area between March and August (migratory bird nesting season). If construction activities must occur during nesting season, a site survey must be undertaken by a qualified biologist to determine if active migratory bird nests are

present. If active migratory bird nests are identified and would be impacted by project activities, coordination with the U.S. Fish and Wildlife Service must occur before proceeding. This coordination will determine whether a permit under the Migratory Bird Treaty Act is required. Alternatively, other measures, such as an avoidance plan, may be implemented to address impacts to migratory birds or their active nests. The participant shall be notified of this action by the contractor so it can be placed into the ERR.

2.2.4 Geotechnical

Problems can arise during construction due to soil conditions, design changes, environmental factors, or human errors. An architectural and engineering firm will perform a geotechnical review. The scope of work and construction must adhere to local building code specifications for geotechnical reviews.

2.2.5 Oregon Scenic Waterways

While all Oregon Administrative Rules for state scenic waterways may be applicable, the considerations listed below may be the most encountered. These conditions apply to a project if it is within the designated boundary of an Oregon Scenic Waterway that is approximately 1/4 mile from either side of a designated river.

Projects that are subject to these considerations will need to exercise the Notification of Intent process through the Oregon Parks and Recreation Department. Specific requirements will vary with the specific waterway that is in proximity to a project. Local zoning and permitting restrictions may affect the specifications or construction plans because of additional local requirements.

Site-built projects on lands which can be seen from the waters within a scenic waterway shall:

- Be of such design and be constructed of such materials as to be unobtrusive and compatible with the scenic qualities of the area. For example, the following shall apply:
    - All structures shall be finished in muted tones appropriate to their natural surroundings.
    - No large areas, including roofs, shall be finished with white or bright colors or reflective materials.
    - No structures shall exceed 30 feet in height from natural grade on the side facing the river.

- All structures shall be so designed and constructed so that little or no soil is left exposed when construction is completed.
- All structures shall be located in such a way that topography and natural vegetation make them as inconspicuous as reasonably practicable and in no case obstructing the view from the river. The Oregon Parks and Recreation Commission may require that additional vegetative screening be established and maintained. In such an event, it shall be evergreen, wherever practicable, and compatible with natural growth in the area.

Manufactured and Modular Home projects on lands that can be seen from the waters within a scenic waterway shall:

- Not be established as dwellings, either permanent, seasonal, or temporary, within related adjacent lands unless they are entirely concealed from view from the waters within a scenic waterway by topography
- Except where homes are at least 20 feet wide, with exterior dimensions, less hitch, of 800 square feet, may be permitted under these rules subject to the same requirements and standards set forth in the previous section relating to criteria for review for structures and improvements that are visible from the waters within a scenic waterway
- Full skirting shall be installed which in design, color, and texture appears to be an integral part of the exterior of the structure

Where structures will remain (typically rehabilitation):

- Homeowners and users of existing structures and other improvements shall maintain them and their surroundings in a manner and condition in harmony with the environment, compatible with the objectives set forth in these rules and regulations for the classified river area in which they lie, and without substantially impairing the natural beauty of the scenic waterway. The existing color of such structures may be maintained.

2.2.6 Noise Quality/Attenuation

To ensure that construction activities minimize their impact on the surrounding environment and communities, noise quality and attenuation measures are critical. Effective noise management not only promotes a healthier and more pleasant environment but also helps in adhering to local regulations and standards. The following guidelines outline essential practices for controlling noise during project implementation. These measures focus on reducing noise at its source, ensuring compliance with local

ordinances, and integrating environmentally conscious methods for areas that experience high noise levels.

- Outfit all heavy equipment with operating mufflers.
- Comply with the applicable local noise ordinance.
- Use appropriate Green Building Standard methods to attenuate if the application site is in a high noise area.

2.2.7 Air Quality

Maintaining air quality during construction is essential to safeguard the health of workers, nearby communities, and the environment. Proper management of airborne pollutants such as dust and exhaust emissions helps minimize negative impacts on air quality while complying with regulatory requirements. The following practices outline effective strategies for controlling dust, reducing emissions, and addressing spills or contamination during construction activities. These measures not only ensure adherence to local and county regulations but also promote a cleaner, healthier worksite and surrounding area.

- Use water or chemical dust suppressants in exposed areas to control excessive dust.
- Cover the load compartments of trucks hauling dust-generating materials.
- Reduce vehicle speed in non-paved areas and keep paved areas clean.
- Retrofit older equipment with pollution controls.
- Establish and follow specified procedures for managing contaminated materials discovered or generated during construction.
- Employ spill mitigation measures immediately upon a fuel or other hazardous material spill. Minimize idling and ensure that all on-road vehicles and non-road construction equipment operating or visiting the project site comply with all applicable local and county regulations.

2.2.8 Soil Contamination

Properties within the fire-damaged area will require soil contamination clearance. The soil testing must result in passing levels of the below contaminants:

- Lead
- Arsenic
- Barium
- Cadmium

- Chromium
- Mercury
- Selenium
- Silver

If soil clearance cannot be met after three scrapes, the applicant will be referred to the Oregon Depart of Environmental Quality (ORDEQ) for a review and recommendations of further actions to resolve site contamination.

If site contamination cannot be resolved through ORDEQ-recommended actions, the site will be ineligible for HUD funding.

2.2.9 Stormwater Management

Stormwater design for projects must meet the stormwater design criteria as outlined in Appendix A the August 2024 HUD and National Marine Fisheries Service (NMFS) Programmatic Biological Opinion, to include stormwater reduction design, stormwater treatment design, flow control design, and conveyance design. The stormwater design requirements do not apply to manufactured homes on leased land (no site control) in a manufactured home park.

Stormwater Reduction Design. Site-specific low-impact development (LID) design elements to limit the generation of stormwater and reduce the quantity of stormwater discharged from a site during storm events include:

- Minimize impervious areas including:
  - Shared parking spaces
  - Pavement widths
  - Front setbacks
  - Shared driveways
  - Building footprint
  - Foundations
  - Roadway cross-sections
  - New pavement
- Limit ground disturbance
  - Construction sequencing
  - Soil conservation with the best drainage
  - Cluster development

  - Tree and shrub protection
- Landscape and hardscape areas
  - Restored and amended soils
  - Tree and shrub planting
  - De-pave existing pavement (such that it becomes a pervious area)
  - Contained planters (over impervious areas)
  - Vegetated roof
  - Porous pavement/asphalt or pavers
  - Rock storage galleries
  - Infiltration rain garden
  - Infiltration swale
  - Lined/unlined stormwater planters
  - Soakage trench (some forms of underground injection control [UIC] may count as LID)
  - Drywell (some forms of UIC may count as LID)
  - Downspout disconnection and dispersal to upland soils and vegetation

Stormwater Treatment Design. Specific best management practices (BMPs) to improve the water quality of discharged stormwater by filtration through soils and vegetation, infiltration, settling, and adhesion. Manufactured stormwater treatment technologies can be utilized where project constraints would prevent LID approaches or where the use of a manufactured treatment technology would achieve greater conservation value. Examples of LID treatment practices include:

- Infiltration rain garden
- Infiltration swale
- Unlined/lined stormwater planter
- Water quality conveyance swales
- Vegetated filter strips
- Lined rain garden
- Dispersal to upland soils and vegetation

Flow Control (Water Quantity) Design. Specific BMPs to retain, detain, or infiltrate stormwater on-site. The goal of flow control BMPs is to contain stormwater on-site for infiltration, reuse, or later discharge. Stormwater generated in excess of what can be infiltrated or reused is managed on-site to be discharged over a longer duration to reduce adverse hydromodification to receiving waters. Both LID BMPs and manufactured flow

control technologies can be utilized to meet flow control design goals. LID flow control BMPs include many of the elements of Stormwater Reduction Design and Stormwater Treatment Design. Manufactured flow control systems may include:

- Detention and retention basins (ponds)
- Outflow control structures (weirs, orifices, or similar)
- Below ground storage (pipes, tanks, rock galleries, or similar)

Conveyance Design. Specific approaches for transporting stormwater on- or off-site to a discharge location. Points of discharge can include receiving waters, municipal stormwater systems, municipal combined wastewater and stormwater systems, or similar. Conveyance systems are typically comprised of engineered materials, such as pipe (metal, concrete, ABS, or similar), culverts, curbs and gutters, and ditches. Conveyance design should conform with local jurisdiction requirements for capacity and appropriate materials.

The architectural and engineering firm will develop the stormwater design for each project and submit it to NMFS for a consistency review as outlined in the OHCS HARP Standard Operating Procedure for NMFS Review and Coordination. The stormwater design should limit ground disturbance to the greatest extent possible. Stormwater design that involves ground disturbance more than 2 feet below the ground surface will trigger a cultural survey and State Historic Preservation Office consultation and for this reason is to be avoided.

The contractor will construct/implement the approved stormwater design and provide documentation and reporting to OHCS upon the project completion. If the design cannot be implemented as approved (e.g., requires modification because of site constraints and cost), this shall be documented for reporting to OHCS. OHCS will report to NMFS. The Project Completion Report should include all information necessary to document that the project was constructed as approved by NMFS. The Project Completion Report shall include such materials as final plans/as-built drawings, photos of installed facilities, and explanations on any deviations from designs submitted for review.

Construction Restrictions and Requirements. The following restrictions and requirements apply to all projects:

- All exterior lighting shall be positioned and/or directed to prevent illumination onto/over aquatic resources.
- New landscape plantings are of native species approved by the local jurisdiction (no invasive species shall be permitted).
- Sprinkler or irrigation systems direct spray away from pollution-generating impervious surfaces (e.g., roads, parking areas, driveways).

- Access and staging areas are located at least 150 feet away from any aquatic resources.
- Construction source materials and material source sites have been assessed as part of the proposed action.
- All construction activities comply with state and local erosion and sediment control BMPs.
- BMPs will be implemented to prevent debris, trash, chemicals, and discarded materials from entering aquatic resources.
- An existing roof structure will not be replaced with hot tar roofing methods, torch down roofing methods, treated wood, copper, or galvanized metal. Galvanized flashing, gutters, or fasteners may be used as part of a roofing system if coated or painted to prevent exposure to precipitation.
- Existing siding will not be replaced with galvanized sheeting.
- All new or replaced heating, ventilation, and air conditioning (HVAC) systems (or similar mechanical systems) constructed of galvanized metal must be painted or physically covered to prevent exposure to precipitation.
- All waste materials must be disposed of at an approved disposal site (landfill or hazardous waste facility).

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Contractor Hazards Responsibilities

3 Contractor Hazards Responsibilities

3.1 Hazardous Materials

All activities must comply with federal, state, and local laws and regulations regarding asbestos, including the following, if applicable:

- National Emission Standard for Asbestos, standard for demolition and renovation, 40 CFR Part 61.145
- National Emission Standard for Asbestos, standard for waste disposal for manufacturing, fabricating, demolition, and spraying operations, 40 CFR Part 61.150

Contractors must comply with all laws and regulations concerning the proper handling, removal, and disposal of hazardous materials (e.g. asbestos, lead-based paint) or household waste (e.g., construction and demolition debris, pesticides/herbicides, electrical appliances).

All activities must comply with applicable federal, state, and local laws and regulations regarding lead-based paint, including but not limited to HUD's lead-based paint regulations in 24 CFR Part 35, Subparts B, H, and J and these Standards.

Project replacement, rehabilitation, and new construction shall apply appropriate materials and construction techniques to prevent radon gas contamination, where warranted and practicable (epa.gov/radon/radon-resources-builders-and-contractors).

Comply with all laws, regulations, and industry standards applicable to aboveground and underground storage tanks.

Storage tanks installed below the base flood elevation must be watertight and anchored to resist floatation and lateral movement during a storm surge or other flood.

Construction activities on parcels with aboveground storage tanks between 125 and 1,000 gallons will require compliance with National Fire Protection Association (NFPA) 58 and associated set-back distances.

3.2 Radon

If a structure exists during the program inspections, a radon assessment will be conducted by the program's construction advisor. If there is no structure present during the program inspections, the contractor will be required to perform a radon test during construction.

If the home tests higher than 4 piC/L, the contractor will be required to install a radon reduction system during construction. The contractor will need to provide documentation to the program of radon clearance at the end of construction.

3.3 Lead-Based Paint and Asbestos

The contractor is prohibited from disturbing any previously unidentified hazardous materials discovered during construction and/or demolition. Hazardous material treatment and removal must follow all applicable state and federal regulatory requirements. The contractor must make the program aware of any suspected hazardous materials that may have been uncovered during construction.

All projects must comply with the lead-based paint requirements of 24 CFR Part 35, Subparts A, B, J, K, and R.

As all rehabilitation activities performed through the program are funded with federal assistance, clearance examination is required for all structures not determined to be free of lead-based paint (24 CFR Part 35.1340). After all lead-based paint hazard abatement, the participant and/or contractor must engage a firm to provide a clearance examination. A copy of the lead hazard reduction or abatement report and a clearance letter or abatement report must be provided to the program.

No additional work should occur within and no entry should be made into the area for which clearance is requested until the clearance inspection occurs and clearance is achieved. Should the clearance inspection show that the hazards have not been sufficiently removed, or that the participant and/or contractor caused the clearance examination to fail, the program may not fund subsequent clearance examinations.

The participant/contractor must coordinate with their clearance inspector to ensure that the clearance examination is performed in a timely fashion as close to the completion of the activities as reasonably possible.

3.3.1 Asbestos

The program will have projects reviewed by a properly licensed and accredited entity for the presence of asbestos if the structure was constructed before 2004. If testing indicates that components contain friable asbestos, the program scope of work will include the findings. If asbestos-containing material is present, it must be properly removed and disposed of by an ORDEQ-licensed asbestos abatement contractor. If non-friable (not easily crumbled) asbestos-containing materials are identified, they can be removed by any Construction Contractors Board (CCB) licensed contractor. The CCB contractor must submit

a nonfriable notification form to ORDEQ and follow all work practices, packaging, and disposal requirements.

Remediation activities, abatement activities, and/or clearance testing and reporting must be performed by a properly credentialed professional who holds all the necessary and applicable certifications and licenses as required by the local and state jurisdiction. The contractor provides clearance testing results and reports after the work is completed.

3.3.2 Lead-Based Paint Requirements

HARP will enforce the requirements mandated under HUD Lead Safe Housing Rule, 24 CFR Part 35, Subparts B, D, H, M, and R.

3.3.2.1 Lead

The U.S. Environmental Protection Agency's (EPA) Lead Renovation, Repair, and Painting Rule (RRP Rule) requires that firms performing renovation, repair, or painting projects that disturb lead-based paint in homes, childcare facilities, and preschools built before 1978 be certified by the EPA (or an EPA-authorized state) or certified renovators trained by approved EPA training providers and follow lead-safe work practices.

3.3.2.2 Paint Removal

If project properties built before 1978 involve disturbing painted surfaces or cleaning up lead-contaminated dust or soil, use certified renovation or lead abatement contractors and workers using lead-safe work practices and clearance examinations consistent with the more stringent EPA RRP rule and HUD's Lead Safe Housing Rule. See HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (2012 Edition)."

Prohibited paint removal methods:

- Open flame burning or torching
- Heat guns operating above 1,100 degrees Fahrenheit
- Machine sanding or grinding without a HEPA vacuum exhaust tool
- Uncontained hydro-blasting or high-pressure wash
- Abrasive blasting or sandblasting without a HEPA vacuum exhaust tool

Avoid using the following methods:

- Methylene chloride chemical paint removers
- Dry scraping (except for limited areas)

Do not inspect painted surfaces if:

- The unit was built on Jan. 1, 1978, or after.
- There are no children under six years currently or expected to occupy the unit.
- The unit has zero bedrooms.
- The unit is for the elderly or handicapped with no children under six years expected to be on the lease.
- The unit is certified free from lead-based paint by a certified lead-based paint inspector.

This requirement applies to all painted surfaces (building components) within the unit. Do not include tenant belongings. Surfaces to receive a visual assessment for deteriorated paint include walls, floors, ceilings, built-in cabinets (sink bases), baseboards, doors, door frames, windows systems (including mullions, sills, or frames), and any other painted building component within the unit. Deteriorated paint includes any painted surface that is peeling, chipping, chalking, cracking, damaged, or otherwise separated from the substrate.

All deteriorated paint surfaces more than 2 square feet in any one interior room or space, or more than 10% of the total surface area of an interior type of component with a small surface area (e.g., windowsills, baseboards, and trim), must be stabilized (corrected) in accordance with all safe work practice requirements. Clearance is required. If the deteriorated painted surface is less than 2 square feet or less than 10% of the component, only stabilization is required (not clearance testing). Stabilization means the removal of deteriorated paint, repair of the substrate, and application of a new protective coating or paint. Lead-Based Paint Owner Certification is required following stabilization activities, except for minimal level repairs.

Remediation activities, abatement activities, and/or clearance testing and reporting must be performed by a properly credentialed professional who holds all necessary and applicable certifications and licenses as required by the local and state jurisdiction.

The contractor is required to provide evidence of clearance after the work is completed.

3.4 Lead-Based Paint Clearance

IMPORTANT: Contractors must follow HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing," Chapter 15: Clearance when completing lead-based paint clearance for HARP. Contractors should specifically note the following sections of Chapter 15: Clearance:

- How To Do It section (Pages 15-4 through 15-6)
  - HARP must disclose to participants the scope and results of lead hazard control work, including clearance examination results, under federal law. If the housing is receiving federal assistance, participants must be notified within 15 days of receipt by HARP of the scope and results of lead hazard control work, including the results of clearance examinations, in accordance with the HUD Lead Safe Housing Rule.
- Introduction, Regulations Pertaining to Clearance, and Purpose and Scope of Clearance sections (Pages 15-7 through 15-9)
  - Clearance testing and reporting must be performed by a properly credentialed professional who holds all necessary and applicable certifications and licenses as required by the local and state jurisdiction.
  - The contractor to the program must provide evidence of clearance.
  - A voluntary consensus standard, ASTM E2271, Standard Practice for Clearance Examinations Following Lead Hazard Reduction Activities in Dwellings, and in Other Child Occupied Facilities may also be used for determining whether a clearance area passes or fails a clearance examination. (astm.org/Standards/E2271.htm) The version of the standard as of the publication of these Guidelines is ASTM E2271-05a(2012)e1; the ASTM website should be checked to see if a subsequent edition or standard is current at the time the ASTM standard is being considered for use as part of the clearance process for a job).
- Paint Removal and Repainting, Building Component Removal and Replacement, Enclosures, Encapsulants, Soil Treatments, and Interim Controls sections (Pages 15-37 through 15-38)
- Dust Sampling Results, Recleaning and Resampling, and Composite Clearance Sampling sections (Pages 15-39 through 15-40)
- Determining Specified Hazard Control Work was Done section (Page 15-36)

3.5 Mold Inspection and Remediation

Inspect the interior and exterior of the building for evidence of moisture problems. Document the extent and location of the problems and implement the proposed repairs according to the moisture section of the EPA “Healthy Indoor Environment Protocols for Home Energy Upgrades.”

When a mold infestation is determined to be present by the program, the causes of mold should be corrected by the contractor. In cases of deferred maintenance, HARP will do the minimum required to prevent a recurrence of mold.

Remediation activities, abatement activities, and/or clearance testing and reporting must be performed by a properly credentialed professional who holds all necessary and applicable certifications and licenses as required by the local and state jurisdiction. The contractor is required to provide evidence of clearance at the conclusion of work.

3.6 Confirming Completed Specified Hazard Control Work

The vendor contracted to conduct the hazard control work will submit a clearance report to the contractor. This report will be attached to the Notice of Lead Hazard Reduction form cover sheet, which is filled out by the contractor or their certified remediation partner. Once this is complete, it will be submitted to the construction team for review. After review, the construction advisor will email the report to the participant and offer to review it with them.

RE Oregon
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General Requirements for All Projects

4 General Requirements for All Projects

The contents of this section are intended to apply for reconstruction, rehabilitation, and replacement projects, where practical. Additional project-specific requirements are noted in their respective sections.

The contractor shall understand that the work specified herein and shown in drawings shall be a finished and working job as agreed upon with the program and participant. All work shall comply with current federal, state, and local building codes/ordinances; Oregon program requirements; and HUD minimum property standards, located here: hud.gov/program_offices/housing/rmra/mps/mpshome.

Addenda and work order adjustments to drawings and specifications take precedence over the original construction documents. Should there be a conflict between any of the construction documents, the most stringent of the conflicting requirements will apply. The builder will consult with the program when conflicts arise.

The contractor secures and pays for all permits and files all required drawings, specifications, and certifications with the city and/or county agency having jurisdiction.

The contractor shall provide a Green Building Standard achievement for each house, evidenced by a completed checklist.

The contractor shall provide high-quality, durable, resilient, mold-resistant, energy-efficient, decent, safe, and sanitary housing that meets Green Building Standards and mitigates the impact from future disasters. Resilient measures may include elevating the first floor of the habitable area, breakaway ground floor walls, reinforced roofs, storm shutters, etc. Rental units will also follow safe, decent, and sanitary requirements in the impacted areas identified in the HUD-approved Action Plan.

Nothing contained within this document shall supersede any specific local, state, or federal requirements where those requirements are more stringent than the requirements specified herein. If there is a conflict between the requirements, the stricter or more demanding requirement should be followed.

Material standards shall conform to HUD requirements or as specified by program plans, whichever is greater.

Reference codes and requirements that are applicable but not limited to:

- Oregon Energy Efficiency Specialty Code
  - oregon.gov/bcd/codes-stand/Documents/2021oeesc.pdf

- Oregon Residential Specialty Code
  - oregon.gov/bcd/codes-stand/Pages/residential-structures.aspx
- The Americans with Disabilities Act (ADA)
  - ada.gov/law-and-regs/
- Oregon Visitability Requirements
  - oregon.public.law/statutes/ors_456.510
- National Manufactured Housing Construction and Safety Standards act of 1974
  - ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280
  - ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282
- Oregon Manufactured Dwelling Installation Specialty Code
  - oregon.gov/bcd/codes-stand/Documents/md-2010omdisc-codebook.pdf
- Northwest Energy-Efficient Manufactured (NEEM) Housing Program
  - neemhomes.com/program-info
- 2 CFR Part 200
- 24 CFR Part 570
- 24 CFR Part 58
- 24 CFR Part 35
- 24 CFR Part 75
- 40 CFR Subpart M

4.1 Section 3 Requirements

If the project cost exceeds $200,000, Section 3 requirements shall apply.

Section 3 of the Housing and Urban Development Act of 1968, as amended, requires that training, employment, and other economic opportunities generated by certain HUD financial assistance shall be directed, to the greatest extent feasible, and consistent with existing federal, state, and local laws and regulations, to low- and very low-income persons. The contractor will make every effort to ensure recipients of Section 3-covered funding achieve compliance and the compliance of their contractors/subcontractors with the Section 3 requirements, as outlined in 24 CFR Part 135.32. See the HARP Contractor Manual for specifics on required Section 3 reporting.

4.2 Contractor Expectations

The designated contractor or vendor shall be responsible for procuring all applicable building and project permits, including any testing, investigation, or clearance necessary to achieve project completion.

The contractor shall provide all necessary services, labor, materials, and equipment, including mobilization, required to complete the project. The contractor will also provide maintenance and delivery of portable toilets.

The contractor is responsible for security of the site and storage of materials from weather, theft, vandalism, and the like. The program is not responsible for any expenses or costs incurred resulting from the above events.

4.3 Green and Resilient Building Standards

HUD requires that new housing construction, reconstruction, or substantially rehabilitated housing comply with one of the following Green Standards:

- ENERGY STAR (certified homes or multifamily high-rise)
- Enterprise Green Communities
- EPA Indoor Air Plus (Energy Star a prerequisite)
- Leadership in Energy and Environmental Design (new construction, homes, midrise, existing buildings operations and maintenance, or neighborhood development)
- ICC–700 National Green Building Standard.
- EPA Indoor AirPLUS
- Equivalent or higher Oregon energy efficiency standards
- Any other equivalent comprehensive green building standard program acceptable to HUD

Additionally, all such covered construction must achieve a minimum energy efficiency standard, such as:

- ENERGY STAR (certified homes or multifamily high-rise)
- Department of Energy Zero Energy Ready Home
- EarthCraft House, EarthCraft Multifamily
- Passive House Institute Passive Building or EnerPHit certification from the Passive House Institute US, International Passive House Association

- GreenPoint Rated New Home, GreenPoint Rated Existing Home (Whole House or Whole Building label)
- Earth Advantage New Homes
- Any equivalent energy efficiency standard acceptable to HUD

HARP endeavors to build to the Energy Star standard and the ICC-700 National Green Building Standard Certified Compliance Path for Single-Family Homes, Townhomes, and Duplexes as verified by program staff.

- Energy Star:
  - energystar.gov/partner_resources/residential_new/homes_prog_reqs/national_page
- ICC-700:
  - nahb.org/blog/2020/04/2020-National-Green-Building-Standard-Now-Available

A completed program checklist and supporting documentation are submitted as proof of compliance. These Standards also apply to rehabilitation projects within the HUD definition of substantial rehabilitation.

Additionally, the implementation of Green Building Standards will apply to the greatest extent feasible for construction projects completed, underway, or under contract before the date that assistance is approved for the project. For specific required equipment or materials for which an ENERGY STAR-labeled, WaterSense-labeled, or Federal Energy Management Program (FEMP)-designated product does not exist, the requirement to use such products does not apply.

Rehabilitation work must follow, to the greatest extent feasible, the HUD Community Planning and Development (CPD) Green Building Retrofit Checklist.

- hud.gov/sites/dfiles/CPD/documents/CPD-Green-Building-Retrofit-Checklist.pdf

When older or obsolete products are replaced as part of the rehabilitation work, rehabilitation is required to use ENERGY STAR-labeled, WaterSense-labeled, or FEMP-designated products and appliances.

4.4 General Material Guidelines

The manufacturer's instructions and guidelines for installation or use shall be followed, including application techniques, fastener requirements, etc.

All materials used shall be new and of good quality. The builder shall provide products that comply with the construction agreement and/or contract rider, which are undamaged and

unless noted, new at the time of installation. All work shall be done with skilled workers and accomplished with care.

The contractor shall provide samples to the homeowner for selection for all materials as cited in the individual specifications and provide reasonable time for the homeowner to make selections.

Framing members should be crowned to avoid dips or humps in the finished element.

Upon completion of construction, and before final inspection, the contractor will:

- Remove all construction debris from the site.
- Clean and mop all floors.
- Clean all new and existing paint from other finished surfaces including windows and mirrors.
- Leave all newly installed items in operating condition.
- Light gas water heater, stove/oven, and gas heater pilots, if applicable.
- Start all other electrical and mechanical systems.
- Put all hardware in operating condition.
- Schedule a meeting with the homeowner to furnish equipment manuals, warranty documents, and home operational and maintenance instructions as needed.

The discovery of defective elements made known to the contractor before or during the construction process shall be brought to the immediate attention of the contract administrator in writing. When repairs are made, the repairs shall reasonably match the surrounding materials in original design and dimension as approved by the contract administrator.

4.5 Site

The lot or defined site shall be free of debris, garbage, or other accumulations of site-stored items that create the possibility of infestations. The site shall be generally level, well-drained, and accessible.

Tree, tree limb, and/or brush trimming within 10 feet of the building footprint must be removed. If the home is being reconstructed in a location substantially different than that of the original structure, the contractor will remove and/or trim trees and/or brush up to 2 feet in diameter such that the home can be constructed.

Floodplain

Homes within the floodplain being reconstructed, replaced, or substantially improved (rehabilitated), must meet the program elevation requirement. Elevation, if required, must be included within the scope of work for these projects. Homes rehabilitated within the floodplain that were subject to elevation requirements and which are not compliant may not be eligible for program assistance.

The elevation requirements are as follows and are described with the HARP Policy Manual:

- Elevated structures may need to meet federal accessibility standards.
- If the home is located within the 100-year floodplain (the Special Flood Hazard Area), the home must be elevated to the greater of 3 feet above base flood elevation (BFE) or the elevation level required by the local jurisdiction.
    - **Possible exception**: If an applicant has already initiated reconstruction before application, the home is located within the 100-year floodplain, and the home is elevated 2 feet above BFE, the program may not require the applicant to elevate to 3 feet. All homes within the 100-year floodplain must be elevated at least 2 feet above the base flood elevation to be eligible for any program assistance, per HUD requirements.

  If the home is located within the 500-year floodplain, the home must be elevated to the greater of either 3 feet above BFE of the 100-year floodplain or the elevation level required by the local jurisdiction.
    - **Possible exception**: If an applicant has already initiated reconstruction within the 500-year floodplain and the home is not elevated, the program may not require the applicant to elevate to the program elevation standard.

Elevations less than or equal to 3 feet above the lowest adjacent grade as determined by the elevation certificate is included in the Reconstruction Multiplier. Should reconstruction require elevation over 3 feet above the lowest adjacent grade, the program will allow for an additional amount above the applicable maximum award amount.

Note: Dirt fill as an elevation method is not eligible. Exceptions may be granted on a case-by-case basis.

Slabs on grade foundations, unless already installed, are not allowable. Exceptions may be granted on a case-by-case basis. For relocation where the participant has the option to find a replacement home, the following considerations are made:

- Where the home is not within a designated flood zone, a preexisting slab foundation may be allowable. If it is within a designated flood zone, the home must be minimum of 2 feet above the 100-year base flood elevation.

Elevations less than or equal to 3 feet above the lowest adjacent grade as determined by the elevation certificate is included in the Reconstruction Multiplier allowance. Should a Reconstruction project require elevation over 3 feet above the lowest adjacent grade, the program will allow for an additional amount above the applicable maximum award amount.

Flood Hazard Area

Areas determined by the floodplain administrator to be prone to flooding and not subject to high-velocity wave action shall be designated flood hazard areas.

Flood hazard areas are delineated as subject to wave heights between 1.5 feet (457 mm) and 3 feet (914 mm) or otherwise determined by the jurisdiction and designated Coastal Zones and subject to the requirements.

Unless the floodplain administrator determines more stringent requirements, elevations must adhere to the 3 feet program standard.

Stormwater Runoff Design Criteria

The National Oceanic and Atmospheric Administration's (NOAA) NMFS is responsible for the stewardship of the nation's living marine resources and their habitats. As part of this mission, NMFS manages stormwater runoff to protect aquatic ecosystems. Stormwater runoff flows off impervious surfaces, such as roads, parking lots, and rooftops, during rain or snow events. This runoff can carry pollutants, such as sediment, nutrients, and chemicals, into waterways and harm fish and other aquatic life.

Projects that increase the volume of runoff must include the approach to contain the runoff within the scope of work.

Sidewalks and Driveways

Sidewalks, driveways, and parking pads shall be provided as required by federal (the Fair Housing Act, Section 504, ADA), state, or local jurisdiction and as follows:

- A handicap-accessible route shall be provided from the street to one entrance door of the house.
- Sidewalks shall consist of 3- to 4-foot-wide concrete with a specified finish from the home’s front entrance (front porch) connecting to the driveway or concrete ADA parking pad.

- If a driveway or parking pad is required, a 9-foot-wide concrete driveway with a specified finish from the street to the garage or the parking pad will be provided. The length of the driveway is 20 feet minimum (except if less is required from the house to street access). More than 20 feet is determined on a case-by-case basis.
- When not in a municipality (or determined by commonality in the existing neighborhood), an all-weather surface (e.g., decomposed granite, shells, crushed limestone, etc.) that forms a hard-packed surface for an automobile to drive on may be used as feeder access for a vehicle to travel from the main road to a concrete driveway, parking pad, or suitably sized concrete exit pad that will allow a person with a disability to exit and enter their vehicle and have access to a 36-inch-wide route that meets ADA standards for slope and leads to a 36-inch-wide entry door on the home.
- All walkways and decks shall be continuous and usable, free from tripping hazards or other defects.
- Walkways that include two or more steps or decks over 30-inches high shall include railing installed per building code.

Grading

Where the site allows, the finish grade at the house foundation shall provide positive drainage away from the structure and start a minimum of 6 inches below the finish floor at the slab on grade or a minimum of 6 inches below the pier footings for the elevated floor. Grading below the elevated floor slab shall provide positive drainage away from the house footprint and prevent pooling under the house.

Hazardous Conditions

Hazardous and substandard conditions shall include any condition that threatens the health and or safety of the occupants. Substandard conditions include any condition that threatens, defeats, or will lead to the lack of functional viability of a single feature of a home.

These conditions may include:

- Accumulated debris, waste, or garbage in enclosed areas such as storage buildings or yard areas
- Deteriorated and/or irreparable outbuildings, sheds, wells, privies, or other structures that are no longer in use or are made unusable by their condition
- Holes, ditches, exposed meter boxes, or other conditions that create a tripping hazard, excluding drainage ditches that are part of a designed drainage system

- Rodents, insects, or other infestation; pre-emptive measurements should be taken as necessary, such as soil treatment (termite control) and removal of nearby overgrown vegetation (vermin) to address such issues
- Standing water or depressions that hold water during wet weather, leaking water supply, percolating, or leaking sewage
- Exposed pipes, railings, or other installations that create trip hazards
- Damaged, missing, or deteriorated walkways, steps, and decks that create tripping hazards or are otherwise unsafe
- Stairways or steps with two steps or more and without a functional rail
- Removing tree limbs within 2 feet of the roof or sides of the house
- Tripping hazards in primary walkways or decks caused by upheaval, broken or damaged wood or concrete, or other conditions that create a hazard
- Any condition not mentioned that meets the definition of a hazardous or substandard condition shall be repaired and/or rehabilitated to meet industry standards
- Soil contaminated with the eight metals regulated by the EPA under the Resource Conservation and Recovery Act

4.6 Exterior Framing, Finishes, and Requirements

The exterior shall adhere to the following requirements:

Garages and Carports

Garage floor surfaces shall be of approved noncombustible material. The floor area for parking automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway. If provided, automatic garage door openers shall be listed and labeled in accordance with UL 325. Carports shall be open on no fewer than two sides. Carport floor surfaces shall be of approved noncombustible material. The floor area for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

Exception: Asphalt surfaces shall be permitted at ground level in carports.

For buildings located in flood hazard areas as determined by the floodplain administrator, garage floors shall be one of the following:

- Elevated to or above the design flood elevation as determined in accordance with Section R322.

- Located below the design flood elevation provided that the floors are at or above grade on no fewer than one side; used solely for parking, building access, or storage; meet the requirements of Section R322; and are otherwise constructed in accordance with this code

Framing and Sheathing

Exterior wall assembly will be framed in 2-feet-by-6-feet plywood or OSB sheathing to meet code requirements, with continuous rigid insulation per Energy Star to reduce or eliminate thermal bridging.

All exterior corners shall be constructed to allow access for the installation of ≥ R6 insulation that extends to the exterior wall sheathing.

Wall intersections where impacting the conditioned envelope shall use ladder blocking, full-length 2-feet-by-6-feet or 1-foot-by-6-feet furring behind the first partition stud.

The underfloor area of elevated structures shall be enclosed to grade in accordance with the requirements of Oregon Residential Specialty Code (ORSC) and shall be protected by noncombustible or ignition-resistant material.

Decks and Entry Structures

Decks or covered porches, which are included in the building footprint, must meet and maintain the following requirements:

- Deck walking surfaces must be constructed with noncombustible materials.
  - Must have no vegetation. Noncombustible ground cover or bare earth is permitted.
  - Must have nothing stored underneath
- Additionally, for decks or porches 4 feet or less above the ground (when measured nominally from the walking surface to the ground at the location where this distance is maximum), the underdeck area must be enclosed to reduce the accumulation of debris using one of the following methods:
  - Install noncombustible, corrosion-resistant mesh material with openings not to exceed 1/8 inch around the outer edge of the deck from the walking surface to the ground to prevent ember intrusion. If material (e.g., lattice) is installed over the mesh, it needs to be noncombustible.
  - Fully enclosed with a noncombustible wall covering/cladding. For decks with an additional structure (e.g., a pergola or gazebo), that additional structure must be constructed of noncombustible materials and shall not have a solid cover (noncombustible slats that cover no more than 10% of the total surface area

where a roof cover would be acceptable) and be free from any vegetation and curtains/drapes/screens.

- Detached decks must meet the same requirements as attached decks.
    - Home Ignition Zone (HIZ): The first 5 feet around the home. The HIZ is one of the most critical aspects of wildfire mitigation at the parcel level and includes the space from the edge of the exterior walls to 5 feet from the building footprint. When decks and/or covered porches are present, the HIZ must extend around them.
- The HIZ must meet and maintain monthly all the following conditions:
    - Ground cover must be noncombustible and maintained free of debris (noncombustible hardscapes such as gravel or paving stones is recommended).
    - No vegetation (trees, shrubs, bushes, plants, grass, weeds, etc.) should exist within or overhang the HIZ. Any overhanging limbs or branches from nearby trees and bushes must be trimmed back to be outside the HIZ.

Roof and Roofing Materials

Roofing materials shall be specified in the scope of work or plans and, depending upon the material type, shall adhere to:

- **Asphalt Shingle:** Roofing shall be asphalt shingle of the Class A type, with the unit cost reasonableness being based on asphalt shingles. Roofing shall be rated for the applicable wind zone as required by ORSC. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D7158 and the required classification.
- **Metal Roof Panels:** Metal roof panel roof coverings shall be applied to solid or spaced sheathing, except where the roof covering is specifically designed to be applied to spaced supports. Metal-sheet roof covering systems that incorporate supporting structural members shall be designed and secured to the supports in accordance with ORSC.

Low-slope roofing styles using asphalt shingles are generally prohibited. Low slope is defined as a roof where the slope is less than or equal to 3 inches up for every 12 inches out (3/12).

Underlayment shall be installed as per code or manufacturer instructions and ORSC, including ice and water shields installed in all valleys and on all roof surfaces to a point not less than 2 feet inside the exterior wall line of the building.

Ice and water shield on the entirety of the roof deck if the roof slope is less than 3/12.

Gutters and Downspouts

When included within scope, gutters and downspouts must be made of noncombustible material. Gutters and downspouts must be provided with a means to prevent the accumulation of leaves and debris in the gutter.

HARP will allow the inclusion of gutters and downspouts into the scope of work if:

- Gutters are present on the home and were damaged due to the 2020 Labor Day Disasters
- Gutters are present on the home and were not damaged but are impeding completion of other scope of work items that are directly in relation to the gutters, a detach and reset will be allowed
- The roof of the home is being replaced and the eave will be less than 1 foot from the surface of the exterior wall, gutters will be added to the home to prevent water run-off from damaging the foundation. In these instances, and when there are only rafter tails, fascia, and soffit will be included in the scope of work

Vents

Ventilation openings for enclosed attics, gable ends, ridge ends, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations, crawl spaces, under eaves and cornices, and any other opening intended to permit ventilation, either in a horizontal or vertical surface, must meet the following requirements:

All vents must resist the intrusion of embers and flames by meeting one of the following requirements:

Performance: Corrosion-resistant vents conforming with the following ASTM E2886 test requirements:

- No flaming ignition of the cotton material during the Ember Intrusion Test

- No flaming ignition during the Integrity Test portion of the Flame Intrusion Test
- The temperature of the unexposed side of the vent does not exceed 662 degrees Fahrenheit.

Prescriptive: Vents must be made of noncombustible material and covered with noncombustible, corrosion-resistant mesh with openings not to exceed 1/8 inch.

- Exceptions:
  - Dryer vents should not have mesh and must have a louver or flap.
  - Plumbing vents are excluded from these requirements.

Radon

Radon mitigation measures shall be included in all projects as per program policy.

Cladding

Exterior walls must have a minimum of 6 vertical inches measured from the ground (at grade) and shall be made of noncombustible material or ignition-resistant material. Recommended materials include fiber cement siding, cementitious siding, or other program-approved noncombustible materials. Vinyl siding or wood products are not allowed. All trim components must be noncombustible material or ignition-resistant material.

Exterior wall surfaces shall be free from chipping, cracking, or peeling paint. All such loose paint shall be completely removed and bare wood surfaces primed. All primed surfaces shall be properly painted. Siding shall be smooth and free from gaps, cracks, rot, termite damage, holes, and other areas of damage. All gaps, seams, and laps shall be sealed.

Buildings not designated as historic by the Housing Recovery Office environmental review may have the siding replaced with fiber cement siding.

Doors

Exterior doors shall have a width of at least 36 inches and should be unobstructed.

Exterior doors facing toward the front of the home shall include storm doors unless they are protected from solar radiation through other means such as a recessed doorway.

No fewer than two egress doors shall be provided for each unit.

For manufactured home parks with their own exterior door requirements, an exception to HARP requirements may be allowed.

Exterior doors with a glass pane shall be minimum laminated multi-pane units. Tempered glass should be used for single panes. The exterior surface or cladding of the exterior doors shall be constructed with noncombustible materials.

Windows

Windows shall be minimum laminated multi-pane units or, if single pane, tempered glass. Windows shall be rated to comply with the requirements of ORSC R327. Window style shall be double-hung, single-hung, or slider, with fixed panel windows allowable at non-egress locations.

Hallways with a length greater than 8 feet and with no natural light or openings (door, window, etc.) shall have a window that is a minimum of 4 square feet.

Insulation and Weatherization/Air Sealing

Insulation shall be:

Area	R-Value – Manufactured Home	R-Value – Stick-Built
Floor	R-33 (combined belly and joist)	R-30
Wall	R-21	R-21
Attic	R-49	R-49

Air and Moisture Sealing

Where the following standards differ from the Green Standards, the Green Standards shall take precedence.

Exterior joints around window and door frames; between wall cavities and window or door frames; between walls and foundation; between walls and roof; between wall panels; at penetrations or utility services through walls, floors, and roofs; and all other openings in the exterior envelope shall be adequately sealed as per Energy Star guidelines. Use high-quality, durable, and long-lasting caulk, and/or sealants for optimal performance.

- **Windows:**
  - All windows shall be properly sealed with elastic putty or gasket material providing a tight seal.
  - Ensure that the weatherstripping is not worn, cracked, or missing around the window sash and frame.

  - Fill any gaps between the window frame and the surrounding wall with appropriate caulking. Use an elastomeric sealant like silicone or polyurethane for lasting flexibility.
  - Apply weatherstripping between sashes to windows with double-hung sashes to prevent air infiltration.
  - Install storm windows on the exterior to provide an additional layer of air sealing and insulation.
- **Doors:**
  - Ensure that the weatherstripping is not worn, cracked, or missing and has a tight seal with the door jamb.
  - Adjust the door sweep at the bottom to seal the gap between the door and the threshold and ensure that the threshold is high enough to create a proper seal when the door is closed.
  - Fill any gaps around the door frame and threshold with caulking for improved air sealing.
- **Penetrations:**
  - Use caulk or foam sealant to close any gaps around pipes, wires, and other penetrations through walls or ceilings.
  - Seal all holes, open seams, or other incursions that result in air leaks.
- **Miscellaneous:**
  - Use high-quality, durable, and long-lasting caulk and/or sealants for optimal performance.
  - Rod stock backup shall be flexible, closed cell, expanded round polyethylene rodding one to one-third times the joint width in diameter conforming to federal specifications HH-F-341, Type 1, Class A, and B.
  - Clean all surfaces dirt, grease, loose material, and foreign matter before applying sealants. Apply primers and sealants in strict accordance with the manufacturer's printed instructions. All sealants in exposed or visible locations are to be smoothed as recommended by the sealant manufacturer.
  - Complete sealant installation before the final coat of paint is applied.
  - Use Dupont Tyvek©, HomeWrap©, or ThermaWrap© building wrap or similar weather-resistant barriers on all exterior walls (ensure compliance with chosen Green Standard).

4.7 Interior Finishes and Requirements

General

All hardware, electrical trim components, plumbing trim components, and mechanical trim components shall be of uniform color and/or finish. For example, door handles should be brushed nickel to agree with the brushed nickel hinges; white electrical switches shall match white cover plates.

All rooms, except kitchens, baths, hallways, storage rooms, and porches, shall have a minimum width of 8 feet. Porches may not exceed 100 square feet (regardless of plan) without approval. Units where the porch exceeds the maximum may be reviewed for approval by the agency.

Basements, habitable attics, and every sleeping room shall have no fewer than one operable emergency escape and rescue opening. Where basements contain one or more sleeping room, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way or to a yard or court that opens to a public way.

Where possible, interior hallways shall have passive lighting installed to provide visibility during power outages.

Flooring

All subfloors shall be solid and continuous, without liberal movement or bounce, and free from rot and deterioration. All flooring shall be sealed and/or tight at the edges, free from tripping hazards, and with a minimum of seams spaced at logical locations such as doorways and matched to the existing floor.

Common rooms and wet rooms, such as the living, kitchen, bathroom(s), laundry, or mud room, shall have water-resistant sheet goods, vinyl, vinyl plank, or similar which meet HUD material standards and are UV resistant. Carpet and padding which meets HUD material standards are allowable in sleeping areas as an alternative.

Provide standard 1-inch sloped vinyl transition strip or reducer between all dissimilar flooring materials (bull-nosed style and any that has an abrupt change of level are not allowable).

Flooring materials for different living areas:

- Living room: Water-resistant sheet goods or vinyl
- Dining room: Water-resistant sheet goods or vinyl

- Kitchen: Water-resistant sheet goods or vinyl
- Bedrooms: Carpet or water-resistant sheet goods or vinyl
- Closets: Carpet or water-resistant sheet goods or vinyl
- Bathrooms: Water-resistant sheet goods or vinyl
- Utility: Water-resistant sheet goods or vinyl

Wall, Trim, and Paint Finish

Wall finishes shall be a minimum 1/2-inch drywall with Level 3 finish and knock-down or orange-peel texture. Finish paint shall include one coat of primer and two coats of finish color. Bathrooms shall have a minimum satin paint finish. All other rooms shall have a minimum eggshell finish. Paint must be applied as per manufacturer specifications. Where trim is painted, caulking shall be applied at all trim joints and returns as well as along the edge abutting the surface.

Trim and Doors

Interior passage doors will have a clear opening width of at least 32 inches.

Doors shall open towards the nearest perpendicular wall with clear access to light switch(es). Exterior doors shall open to the interior; outswing doors are not allowable.

Pocket doors in locations other than closets, if required, shall have locking mechanisms installed.

Pull-down attic access doors are to be trimmed with door casing. The attic access door and casing are to be painted.

Mitered corners are allowable with no visible gaps. Butt joints and returns shall be mitered.

Finished trim elements should be tight and without defects. Miter joints that do not lap each other satisfactorily, corners that are not tight, material blowouts from improperly shot nails, etc., will not be approved.

Interior doors shall be minimum hollow core Colonist, Craftsman, or other panel style door finish. Flush panel doors are not allowable.

Casing shall be minimum 2 1/4-inch primed material with detail. Sanitary casing is not allowable. Casing that is 1-inch-by-4-inch is allowable provided there are no visible defects or knots once finish paint is applied. Medium-density fiberboard (MDF) is not allowable.

The baseboard shall be a minimum of 3 1/4-inch finger-joint primed material with detail. Sanitary baseboards are not allowable. Baseboard that is 1-inch-by-4-inch is allowable

provided there are no visible defects or knots once finish paint is applied. MDF is not allowable.

Windows shall be finished with drywall returns, stool, and apron.

Kitchen

General

Minimum dimensions shall be 12-feet-by-12-feet or 148 square feet total.

All kitchens shall have adequate food storage facilities including at least 3 linear feet of counter area for food preparation and adequate cabinet space.

All kitchens shall have a working refrigerator/freezer, stove with oven, dishwasher, and hood vent with microwave or hood vent and countertop microwave only when the stove is installed in an island.

The cabinet and/or countertop fabricator/installer and contractor shall be responsible for all required appliance “cut-outs” taken from the manufacturer's installation instructions and templates.

Cabinets

Cabinets shall have factory-grade finish, paint, or stain. Particle board or MDF are not allowable for cabinet boxes and frames. Hinges shall be soft-close and adjustable. A cabinet over the refrigerator is required. Cabinets shall be attached to each other with appropriate-length screws and fastened to the wall as per the manufacturer’s recommendation. Toe kick in matching finish is required at all base cabinets unless the design is such that a toe kick is not required. End panels in matching finish shall be added to unfinished end cabinets. Additional costs for custom built-in cabinets will not be compensated for by the program. The countertop shall be caulked to the wall. Pulls and handles are required and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

Countertops

The countertops shall be laminate with a 4-inch laminate splash. The laminate ends shall be covered with matching finish. The mitered corners shall be joined using a manufacturer-approved joining method and hardware. The sink cut out needs to be waterproofed around the perimeter top, edge, and bottom. The contractor shall provide the homeowner with preselected color samples for color selection.

Fixtures

Fixtures shall be installed as per manufacturer instructions with all finishes matching.

- **Sink**: Shall have two equal-sized compartments, 22-inch-by-33-inch, 6-inch-deep minimum, stainless-steel finish
- **Garbage Disposal:** Shell be 1/2-horsepower continuous feed unless septic design prohibits macerated food waste
- **Faucet:** Shall be single handle, WaterSense-compliant, metal-bodied faucet with sprayer, solid brass or durable metal alloy for strength and long-lasting performance
- **Dishwasher:** Shall be installed in line with cabinetry; have a minimum of three wash cycles (heavy, normal, and light), four wash levels, cool and hot air dry, water heater, and Energy Star rating.
- **Microwave Hood Vent/Hood Vent and Microwave:** Shall, at a minimum, be ducted to the exterior, 1,000 watts, 200 cubic feet per minute (CFM), 1.6 cubic feet, EnergyStar rated, and installed above the range. A separate hood vent and microwave are allowable if the stove is in the island.
- **Refrigerator:** Shall be a minimum of 18 cubic feet, have a top freezer, and be EnergyStar rated. Doors shall be adjusted to open away from the main kitchen area.
- **Electric Range:** Shall be free-standing and installed in line with cabinetry, containing four burners, porcelain top, knob controls, digital clock, oven timer, hot surface indicator lights, and self-cleaning oven

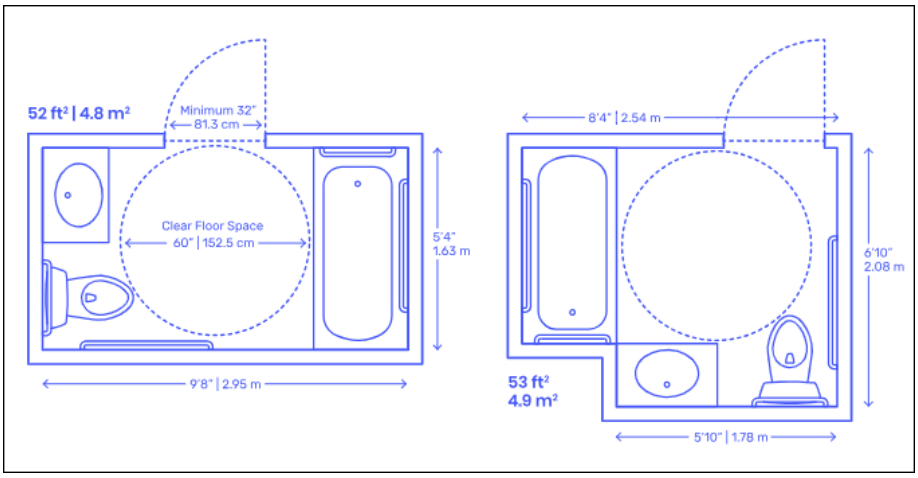
Bathroom

When a plan includes two or more bathrooms, provide a primary bathroom and a primary closet in the primary bedroom.

- Primary Bathroom:
  - Minimum dimensions shall be 12-feet-by-12-feet.
- Secondary Bathroom(s):
  - Minimum dimensions shall be large enough to accommodate the vanity, toilet, and tub/shower unit as scoped.

One commonly accessible bathroom area will be large and open, providing wheelchair-radius access to the toilet, bath/shower, sink, and linen hooks.

- Example:



Cabinets

Cabinets shall have factory-grade finish, paint, or stain. Particle board or MDF is not allowable for cabinet boxes and frames. Hinges shall be soft-close and adjustable. Cabinets shall be attached to each other with appropriate length screws and fastened to the wall as per the manufacturer's recommendation. A toe kick in matching finish is required at all base cabinets unless the design is such that a toe kick is not required. End panels in matching finish shall be added to unfinished end cabinets. Additional costs for custom built-in cabinets will not be compensated for by the program. Pulls and handles are required and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

- Primary Bathroom Vanity: 36-inch wide
- Secondary Bathroom Vanity: 36-inch wide

Countertops

Countertops shall be single-piece solid polymer material with an integral bowl and splash. Splash shall also be included where the side of the countertop abuts the wall. The countertop shall be caulked to wall. The contractor will provide homeowner with preselected color samples for color selection.

Fixtures and Functions

- **Toilet:** Shall be comfort height or ADA height with elongated bowl, WaterSense-compliant, and soft close toilet seat. Fabric or cushioned toilet seats are not allowable. Toilet flush handle finish shall match door and cabinet hardware finish.

- **Sink Faucet:** Shall be WaterSense-compliant, metal-bodied, single-handle lever type, in a finish to match adjacent hardware, and solid brass or durable metal alloy construction for strength and long-lasting performance
- **Tub/Shower Fixtures:** Shall be WaterSense-compliant, metal bodied, single-handle lever type, detachable hand sprayer/shower wand, and in a finish to match adjacent hardware
- **Tub/Shower Unit:** Shall be single or multi-panel with joints sealed as per manufacturer specifications. Panels shall be installed to framing. Shower panels adhered to drywall or wallboard are not allowable. Insulation must be installed behind the unit if on the exterior wall.
    - **ADA Requirements (if applicable):** A roll-in shower may be selected by a participant. It shall include a bench seat, grab bars, and adjustable shower head/wand.
- **Grab Bars:** If installed, shall be in a finish to match adjacent hardware and mounted to additional framing elements in wall. If grab bars are not contained within the scope of work, framing elements shall be added before drywall to accommodate future grab bar installation.
    - Grab bars shall be installed as per ADA design standards.
- **Heater Vent Light:** Vented to exterior, XXXCFM, XXXBTU, with humidistat switch for vent

Accessories

- Two 18-inch-long towel bars
- Single roll toilet tissue holder
- Wall-mounted medicine cabinet style mirror centered on sink faucet or, if vanity is greater than 36 inches wide, a wall-mounted mirror with medicine cabinet mounted to side wall is allowable. The mirror shall not be smaller than 6 inches less than the vanity width. Installation height shall be no higher than 40 inches from the floor to the bottom and no less than 74 inches from the floor to the top.

Living and Sleeping Areas

Bedrooms

- Primary Bedroom:
    - The minimum dimensions shall be 12-feet-by-12-feet or 148 square feet total, with one wall a minimum of 10 feet long.
    - A minimum 5-feet-wide by 2-feet-deep closet is required in each bedroom.

    - The closet shall include a shelf and closet rod which shall span the length of closet wall. The shelf is to be installed at 80–84-inch height from the floor and the rod installed at 80–82-inch height from the floor.
    - A minimum of two windows is required.
- Secondary Bedroom(s):
    - The minimum dimensions shall be 10-feet-by-10-feet or 100 square feet total, with one wall a minimum of 8 feet long.
    - A minimum 5-feet wide by 2-feet deep closet is required in each bedroom.
        - The closet shall include a shelf and closet rod which shall span the length of closet wall. The shelf is to be installed at 80–84-inch height from the floor and the rod installed at 80–82-inch height from the floor.

Hallway(s)

- Minimum of one window required when the hallway is adjacent to the exterior wall and longer than 5 feet. Not required to be operable or egress.

Living Room

- Minimum dimensions shall be 175 square feet with one wall being a minimum of 12 feet long.
- Coaxial cable to be run from within 5 feet of an exterior service entry to non-windowed longest wall or wall designed/designated as media location, terminated in single gang junction box with cover plate.

Dining Area

- Minimum dimensions shall be 175 square feet, provided this does not include square footage from the adjacent room. Example: open concept living, dining, and kitchen, where the minimum square footage of one area does not detract from the minimum square footage of the adjacent.

Laundry

Provide hookup and venting for the electric clothes washer and dryer as shown on the plans. The dryer exhaust vent connection shall be to the exterior. Appliances shall match in finish and/or color.

- The washer shall be, at minimum, EnergyStar rated, with 3.8 cubic feet of capacity, and three-cycle.
- The dryer shall be, at minimum, EnergyStar rated, 6 cubic feet of capacity, three-cycle, and vented to the exterior.

Laundry rooms shall be sized such that the side-by-side washer and dryer and heat pump water heater fit within area with the required amount of clearance space.

The laundry room shall contain one wall cabinet and include a shelf and closet rod. The shelf shall be installed at 80–84-inch height from the floor and rod installed at 80–82-inch height from the floor.

4.8 Paint and Coatings

Before commencing work, the contractor shall make certain that the surface to be covered is in proper condition to receive the finish specified.

All interior and exterior spaces are to be primed and painted as scheduled. The interior painting will be a total of three paint colors: one wall color, one ceiling color, and one trim color. Exterior selections will consist of a wall color, trim color, and one accent color.

If required for environmental reasons, exterior paint color must conform to requirements.

Ceilings shall be flat white, off-white, or wall paint color.

All paints, coatings, and finishes are to be applied in strict accordance with manufacturer's directions and carry a manufacturer's warranty.

Interior coatings shall be low/no volatile organic compounds (VOC).

Exterior Paint Standard:

- Fiber Cement/Cementitious Materials
  - Prime: One coat on all surfaces at 4 mils wet; 1.4 mils dry
    - Primer is not necessary on paint-ready fiber cement.
  - Finish: Two coats at 4 mils wet; 1.5 mils dry per coat; satin finish
- Metals
  - Prime: One coat at 7 mils wet
  - Finish: Two coats at 9 mils wet; 3 mils dry per coat; satin finish

Note: Projects located near State Scenic Waterways will need additional considerations regarding colors and reflectivity, vegetation, and structure height.

Interior Paint Standard:

- Gypsum Wallboard
  - Primer: One coat at 4 mils wet; 1.4 mils dry

    - Finish: Two coats at 4.2 mils wet; 1.6 mils dry per coat; eggshell finish
- Wood
    - Primer: One coat at 4 mils wet; 1.4 mils dry
    - Finish: Two coats at 4 mils wet; 1.4 mils dry per coat; semigloss finish
- Interior Doors and Trim
    - See wood finish above; semigloss finish
- Metal
    - Primer: One coat at 7 mils wet; 3 mils dry
    - Finish: Two coats at 9 mils wet; 3 mils dry per coat

4.9 Mechanical, Plumbing, and Electrical

Mechanical

The heating, ventilation, and air conditioning (HVAC) system will be an Energy Star certified heat pump that meets the following conditions:

- Air Source Heat Pump: 10 Heating Season Performance Factor (HSPF), 16 Seasonal Energy Efficiency Ratio (SEER) cooling or 8.5 HSPF, 15 SEER2 or
- Ground-Source Heat Pump: Coefficient of performance (COP) of 3.5 or Energy Star rated

Supplementary electric resistance heat elements shall be included to meet the heating load. An elevated exterior condenser pad shall be installed per municipal height requirements or to the finished floor level. A drain pan shall be installed at the air handler with a float valve and overflow piped to the exterior. Thermostats shall meet Energy Star smart thermostat criteria. A minimum of eight Minimum Efficiency Reporting Value (MERV) filters shall be installed.

Heating and cooling equipment and appliances shall be sized in accordance with ORSC or manufacturer's recommendation. Equipment and appliances installed outdoors shall be listed and labeled for outdoor installation with supports and foundations that shall prevent excessive vibration, settlement, or movement of the equipment as per ORSC or manufacturer's recommendation.

In flood hazard areas as determined by the floodplain administrator, heating and cooling equipment and appliances shall be located or installed in accordance with ORSC.

Heating and cooling equipment and appliances shall be located with respect to building construction and other equipment and appliances to permit maintenance, servicing, and

replacement. Clearances should be maintained to permit cleaning of heating and cooling surfaces; replacement of filters, blowers, motors, controls, and vent connections; lubrication of moving parts; and adjustments.

HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.

Plumbing

A PEX plumbing system shall be installed, complete with a minimum of two outside freeze-proof spigots. A 40-gallon Energy Star heat pump water heater shall be installed with a drain pan piped to the exterior. All visible stub-outs shall be copper and appropriately mounted to fixed blocking. The electric heat pump water heater shall have a minimum 3.45 uniform energy factor (UEF). It will be preferably installed in the laundry area with a louvered door or ducted using approved pipe and adapters to allow for the required air exchange.

All exposed plumbing shall be freeze-protected or insulated to a minimum R-value of 3.5.

Electrical

A ground fault circuit interrupter (GFCI)-type receptacle shall be installed adjacent to the sink in each bathroom.

Every habitable room shall have a minimum of one receptacle per wall.

Switches shall be illuminated with rocker style switches.

Light fixtures in rooms with more than one point of entry shall be switched with three-way switches within reach of the point of entry.

Rooms more than 150 square feet shall contain multiple light fixtures.

Required Trim Out and Finishes

- **Exterior Entry Door:**
  - Independent switches for exterior entry light(s), exterior flood light(s), and interior room light
  - A minimum of one lighting fixture for each entry or exit door, with two at the principal entry
  - A minimum of two switchable double-bulb exterior flood lights with motion sensing capabilities installed on opposing corners with lights, when on, illuminating all four sides
  - Exterior receptacles installed, at a minimum, adjacent to the exterior doors

- **Primary Bedroom:**
  - Ceiling fan with light, minimum 52-inches wide, LED dome light. Fan and light shall be wired for independent switches. The bedroom light fixture shall be controlled from the entry door and the bedside area.
  - The receptacles including include one USB-C port and one USB-A port installed at typical height below the light switch located at bedside
- **Closets:**
  - Flush mount LED dome light with switch
- **Hallway(s):**
  - IC-rated recessed LED light. A three-way switch is required when the hallway is longer than 8 feet.
  - Hallways 5 feet or longer shall have a minimum of one receptacle.
- **Kitchen:**
  - IC-rated recessed LED light over kitchen sink with switch nearby
  - Minimum of four switched IC-rated recessed LED lights situated equidistant over work areas
- **Living Room:**
  - Ceiling fan with light, minimum 52-inches wide, LED dome light. Fan and light shall be wired for independent switches.
- **Dining Room:**
  - One fan-box installed at room center point, wired for future fixture use, with switch leg terminating at recessed light switch junction box
  - Minimum of four switched IC-rated recessed LED lights situated equidistant over work areas
- **Laundry Room:**
  - Switched 4-foot ceiling mount LED or fluorescent light fixture
- **Staircase:**
  - As per code

Smoke and Carbon Monoxide Alarms

Per NFPA 72, smoke alarms must be hardwired or use 10-year non-rechargeable, non-replaceable primary batteries, sealed, tamper-resistant, contain silencing means, and provide notification for persons with hearing loss. Combination smoke and carbon monoxide alarms shall be permitted to be used in lieu of smoke alarms provided they are listed in accordance with UL 268 and UL 2075.

Smoke alarms shall receive their primary power from the building wiring. Where more than one smoke alarm is required to be installed within an individual dwelling unit, the alarm devices shall be interconnected in such a manner that the activation of one alarm will activate all the alarms in the individual dwelling unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception: Hardwired interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in the removal of interior walls or ceiling finishes exposing the structure.

4.10 Solar Ready

Homes shall be constructed to be solar-ready and allow the installation of additional solar components with minimal need to include design retrofits.

Roof and Attic Considerations

Design roof areas for solar placement. Arrays need to be placed on large roof faces in an aesthetic, orderly fashion for efficiency. Stay away from dormers, vents, gables, and other obstructions.

- Roofs with steeper pitches will produce the most energy throughout the year
- A flashed/waterproofed solar-specific junction box is mounted to the predetermined position on the roof
- Metal shingle roofs may require additional racking supports
- If the home has a vaulted ceiling, with no attic, additional measures are required to ensure cables are routed internally
- Place mechanical obstructions (vents, skylights, chimneys, satellite dishes, plumbing stacks, etc.) away from the solar area, when possible
- If obstructions must be placed on the same face as the predetermined solar array face, then the obstructions need to be grouped near the crest, eave, or edge, allowing for maximum unobstructed space for the solar panel array

Planning

If known, the following should be taken into consideration when planning:

- Tree cover
- Direction of the sun in accordance with the largest facing roof
  - South-facing will optimize potential.
  - East-west is also applicable but will result in a slight efficiency loss.
- Percentage per day/month/year of cloud or smoke cover

Installation

When roughing-in the home, hide any extra cabling by installing the wiring behind the walls, along with electrical wiring.

- Install 1.5-inch conduit from the attic, throughout the home to the point where the predetermined battery system will be located.
- Install 1.5-inch conduit from battery system location to the electric panel.
- Install wiring from the junction box, through the conduit, and to the predetermined battery system location. (Wiring size and type will vary, depending on size and type of paneling installed)
- Install wiring from battery system location to the electric panel. (Wiring size and type will vary, depending on size and type of paneling installed)

Electrical Panels Considerations

It is best practice to increase the electrical panel busbar size, relative to the main breaker rating. There should be a small area near the electrical panel dedicated to providing space for a potential need for a string inverter, if required.

4.11 Miscellaneous

Emergency Escape and Rescue Opening Required

Basements, habitable attics, and every sleeping room shall not have fewer than one operable emergency escape and rescue opening. Reference ORSC for additional and applicable standards. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools, or special knowledge. Window opening control devices on windows serving as a required emergency escape and rescue opening shall comply with ASTM F2090.

Emergency escape and rescue openings shall adhere to ORSC. Where a window is provided as the emergency escape and rescue opening, it shall have a maximum sill height of 44 inches from the finished floor to the bottom of the clear opening. Where the sill height is below grade, it shall be provided with a window well in accordance ORSC.

Exception: The ladder or steps required by Section R310.2.3.1 shall be permitted to encroach not more than 6 inches (152 mm) into the required dimensions of the window well.

Window wells with a vertical depth greater than 44 inches (1118 mm) shall be equipped with a permanently affixed ladder or steps usable with the window in the fully open position.

Area wells shall be designed for proper drainage in accordance with the 2023 ORSC.

Refer to ORSC for additional requirements.

4.12 Warranty

The program requires that warranties be provided by the contractor/vendor for:

- New construction
  - One-year fit and finish warranty period
  - Three-year mechanical, electrical, and plumbing (MEP) warranty period
  - 10-year structural warranty period.
- Rehabilitation for components addressed as part of the program scope
  - One-year fit and finish warranty period
  - Two-year MEP warranty period
  - Two-year structural warranty period
- Manufactured home replacement
  - One-year fit and finish warranty period
  - Two-year MEP warranty period
  - Two-year structural warranty period

Contractor/vendor warranty shall include all materials and labor to repair any defects or leaks that develop and repair or make good any damage caused by leaks and roof repairs for the specified period from the date of substantial completion.

All warranty claims are between the homeowner and the contractor. The program does not provide warranty services. The contractor should present warranty documents to the participant which detail the length and method of claim request.

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Modular Homes

5 Modular Homes

For this program, modular homes are considered stick-built homes. Sections of the home are built off-site and assembled on-site. This can dramatically increase project efficiency. All modular homes will comply with the standards contained within Section 8 Reconstruction Projects (Stick-Built).

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Rehabilitation

6 Rehabilitation and Repair Projects

The condition of the structure at the time of the program assessment will dictate whether the project may continue as a rehabilitation or if it must follow the reconstruction pathway as dictated by applicable policy. The participant is eligible only for reconstruction or replacement, even if the cost of rehabilitation to return the property to program standards exceeds the amount stipulated in the HARP Policy Manual.

Repairs shall not make the building less conforming with the provisions of applicable code than the building was before the repair was undertaken. Repairs for the purposes of building maintenance shall comply with IRC Section R105.2.2. Such repairs shall not include the cutting away of any wall, partition, or portion thereof; the removal or cutting of any structural beam or load-bearing support; the removal or change of any required means of egress; or the rearrangement of parts of a structure affecting the egress requirements. Ordinary repairs shall not include addition to, alteration of, replacement or relocation of any gas, piping, or mechanical work.

Where it becomes necessary to repair all or a portion of a legally existing building that has been damaged by, including but not limited to fire, wind, flood, earthquake, or other similar damage, and where prior to the damage the legally existing building did not contain unsafe conditions, the building may be reconstructed in substantially the same manner as it existed. The following requirements from the currently effective code shall be included in the rehabilitation, where practicable:

- Repaired structural elements in accordance with the design criteria and loading requirements of Chapter 3 of 2023 ORSC or to the maximum extent practical as approved by the building official
- Smoke alarms in accordance with IRC Section R314
- Carbon monoxide alarms in accordance with IRC Section R315
- Guards and fall protection in accordance with IRC Section R312
- Hazardous glazing locations in accordance with IRC Section R308
- Emergency escape and rescue openings in accordance with IRC Section R310
- Table N1101.2, to the maximum extent practical
- Floodplain construction requirements, where applicable, determined by the floodplain administrator

Additionally, if a component is being substantially repaired or replaced, it should be repaired or replaced in the manner specified within Section 4 General Requirements for All Projects. When older or obsolete products are replaced as part of the rehabilitation work,

rehabilitation is required to use ENERGY STAR-labeled, WaterSense-labeled, or FEMP-designated products and appliances.

Rehabilitation work must follow, to the greatest extent feasible, the HUD CPD Green Building Retrofit Checklist.

- hud.gov/sites/dfiles/CPD/documents/CPD-Green-Building-Retrofit-Checklist.pdf

Such repairs for the purposes of correcting damage are not required to meet other current code requirements for new construction. Where unsafe conditions existed prior to the damage occurring, the building may be reconstructed in accordance with this section, provided that the unsafe conditions are corrected, as determined by the building official.

In damaged areas of the home, siding and trim will be intact and weatherproof. Buildings designated as historic will have existing wood siding repaired in-kind. New exterior wood will blend with existing and be spot-primed and top-coated in a lead-safe manner. Buildings not designated as historic by the HUD Housing Recovery Office environmental review may have siding replaced with fiber cement siding to match the existing configuration.

As a rule, the program seeks to minimize the disturbance of asbestos containing material (ACM) to the extent that it is reasonably practicable to achieve minimum program standards. If siding can be repaired without disturbing the underlying ACM, then that is the preferred method.

If the siding contains asbestos and repairs are defined as substantial, replace all siding. When non-asbestos siding must be patched and asbestos siding is underneath, the asbestos siding may not need to be removed if it is not being disturbed.

Stucco siding will be patched where damaged. Material may be tinted or painted to match as closely as possible. Brick siding will be patched with brick matched as closely as possible to existing. The standard replacement of siding will be fiber cement siding or approved equal.

The homeowner will have a choice of color for exterior cladding if completely replaced. If partial repair, cladding finish shall match the existing color.

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Reconstruction Projects (Stick-Built)

7 Reconstruction Projects (Stick-Built)

All single-family rehabilitation and reconstruction carried out with the assistance of funds provided through community development block grant disaster recovery (CDBG-DR) funding shall be carried out in accordance with these Standards and construction specifications as they relate to single-family housing and, unless otherwise defined, shall meet or exceed industry and trade standards.

HUD housing must be decent, safe, sanitary and in good repair. Owners of housing described in 24 CFR Part 5.701(a), mortgagors of housing described in 24 CFR Part 5.701(b), and public housing authorities and other entities approved by HUD owning housing described in 24 CFR Part 5.701(c), must maintain such housing in a manner that meets the physical condition standards set forth in this section in order to be considered decent, safe, sanitary, and in good repair. These Standards address the major areas of HUD housing: the site, the building exterior, the building systems, the dwelling units, the common areas, and health and safety considerations.

Construction standards for new housing units must conform to the requirements specified in the current adopted codes:

- Oregon Energy Efficiency Specialty Code
  - oregon.gov/bcd/codes-stand/Documents/2021oeesc.pdf
- Oregon Residential Specialty Code
  - oregon.gov/bcd/codes-stand/Pages/residential-structures.aspx

If relevant codes and/or standards are updated prior to this document, the most recently adopted codes and/or standards shall apply.

7.1 Floor Plan

The floor plan shall include living/dining/kitchen with open floor plans expressed in square footage (gross square footage including all framed walls, excluding exterior masonry lug; attached garages not included). For floor plans with the same indicated room counts, the excess square footage for the larger floor plans will be applied to common areas (living, dining, kitchen, etc.).

HARP Floorplan	Square Footage	Bedrooms	Full Bathrooms	Lowest Square Footage Threshold
1	1,000	2	2	0
2	1,100	2	2	1,050
3	1,200	2	2	1,150
4	1,300	3	2	1,250
5	1,400	3	2	1,350
6	1,500	3	2	1,450
7	1,600	4	2	1,550
8	1,700	4	2	1,650
9	1,800	4	2	1,750
10	1,900	5	3	1,850
11	2,000	5	3	1,950

7.2 Foundation and Framing

Exterior footings shall be placed not less than 12 inches (305 mm) below the finished grade on undisturbed ground surface unless otherwise specified within ORSC. The top surface of any foundation elements shall be level and uniform in finish/appearance.

Seismic Provisions

Buildings in Seismic Design Categories C, D0, D1, and D2 shall be constructed in accordance with 2023 ORSC R301.2.2.

The value of SDS determined in accordance with Section 1613.2 of the ORSC is permitted to be used to set the seismic design category in accordance with Table R301.2.2.1.1.

Buildings located in Seismic Design Category E in accordance with Figure R301.2.2.1 are permitted to be reclassified as being in Seismic Design Category D2 provided that one of the following is done, as referenced in 2023 ORSC R3012.2.1.2.

Primary seismic zones which are identified below must be verified prior to design. The below is for general reference only.

County	Burn Scar Seismic Zone(s)	Other Seismic Zone(s)
Clackamas	D0	D1, C
Douglas	D0	D2, D1, C
Jackson	D0	D1, C
Klamath	D1, D0	D2, C
Lane	D0, C	D1
Lincoln	D2	E
Linn	D0, C	D1
Marion	D0, C	D1

Snow Loads

Wood-framed construction; cold-formed, steel-framed construction and masonry; concrete construction; and structural insulated panel construction in regions with ground snow loads of 70 pounds per square foot (3.35 kPa) or less shall be in accordance with ORSC Chapters 5, 6, and 8. Buildings in regions with ground snow loads greater than 70 pounds per square foot (3.35 kPa) shall be designed in accordance with accepted engineering practice.

Site-specific ground snow loads shall be those set forth in the online lookup tool at Snowload.seao.org/lookup.html. Where the site elevation is higher than the modeled elevation reported by the online lookup tool, the reported ground snow load values shall be adjusted as per code prescribed method. The minimum ground snow load, for prescriptive design is 36 pounds per square foot (1.724 kN/m2). The minimum roof snow load for engineered design is 25 pounds per square foot (1.197 kN/m2).

Wind Design

Buildings and portions thereof shall be constructed in accordance with the wind provisions of the ORSC using the basic design wind speed, V, in Table R301.2(1). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section, referenced in ORSC R301.2.1, shall apply.
A continuous load path shall be provided to transmit the applicable uplift forces in Section R802.11.1 from the roof assembly to the foundation.

Foundations

Geotechnical evaluations are likely required for the purpose of foundation design.

The provisions of this section shall control the design and construction of the foundation and foundation spaces for buildings. In addition to the provisions of this chapter, the design and construction of foundations in flood hazard areas as determined by the floodplain administrator shall meet the provisions of Section R322.

Foundation construction shall be capable of accommodating all loads in accordance with Section R301 and of transmitting the resulting loads to the supporting soil. Fill soils that support footings and foundations shall be designed, installed, and tested in accordance with accepted engineering practice.

Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from the foundation walls. The grade shall fall not less than 6 inches (152 mm) within the first 10 feet (3048 mm). All drainage plans shall conform to NMFS requirements.

Exception

Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), drains, swales, or other means shall be provided and shall be constructed to ensure drainage away from the structure. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped not less than 2% away from the building.

Where data indicate expansive soils, compressible soils, shifting soils, or other questionable soil characteristics may be present, the building official shall determine whether to require a soil test to determine the soil's characteristics at a particular location. This test shall be done by an approved agency using an approved method.

7.3 Electrical

Electrical

Units shall have a minimum of 200-amp electrical system/service and distribution that shall meet municipality requirements and plan specifications.

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Replacement Projects (Manufactured Housing)

8 Replacement Projects (Manufactured Housing)

Construction standards for new manufactured housing units are set by the National Manufactured Housing Construction and Safety Standards Act of 1974 (HUD Code Standards 3280 and 3282), and the Oregon Manufactured Dwelling Installation Specialty Code. Additionally, manufactured dwellings must conform to the Northwest Energy-Efficient Manufactured Housing Program standards.

- National Manufactured Housing Construction and Safety Standards Act of 1974
  - ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280
  - ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282
- Oregon Manufactured Dwelling Installation Specialty Code
  - oregon.gov/bcd/codes-stand/Documents/md-2010omdisc-codebook.pdf
- Northwest Energy-Efficient Manufactured Housing Program
  - neemhomes.com/program-info

If relevant codes and/or standards are updated prior to this document, the most recently adopted codes and/or standards shall apply.

All manufactured housing shall be constructed to NEEM 1.1 or better.

Manufactured housing units (MHUs) or mobile homes are eligible for rehabilitation at the discretion of the program. However, the MHU to be rehabilitated must not exceed the thresholds stipulated within the program policy and must return the home to a habitable state.

Minimum Manufactured Housing Standards: Construction standards for new MHUs are set by the agencies and programs stipulated above. Where a conflict among the standards exists, the more stringent requirement shall be adhered to.

- All manufactured housing shall be installed on a permanent foundation.
- All manufactured homes will be tied down through the installation of approved tie-downs adequate to meet state requirements.
- All road transport accessories such as wheels, trucks, and hitching devices shall be removed to make the installation permanent.

Hazards and Substandard Conditions: Hazardous conditions shall include any condition that threatens the health and or safety of the occupants. Substandard conditions include

any condition that threatens, defeats, or will lead to the lack of functional viability of a single feature of a home. These conditions shall include:

- A manufactured home that is not permanently situated on a permanent foundation.
- A manufactured home that is not adequately tied down or affixed by an approved tie-down system.
- A manufactured home that has not had its wheels, truck, and hitch removed.
- Any other condition not mentioned that meets the definition of a hazardous or substandard condition shall be repaired and/or rehabilitated to meet industry standards.

8.1 Foundation and Framing

Manufactured home foundations shall be designed by a licensed engineer or other party permitted to design foundations on contiguous footing supporting the entirety of the structural and load-bearing walls. Material and dimensions shall meet structural engineering specifications suitable for the specific soil and seismic conditions of the site. Piers shall be constructed from concrete masonry unit block as designed by the foundation engineer. Areas between footing elements are to be compacted gravel with an appropriate moisture barrier. Perimeter skirting is to be masonry block.

Anchors

Anchors shall be designed and installed to transfer the anchoring loads to the foundation element and shall be designed to Seismic Design Category D2 as described within the Oregon Manufactured Dwelling Installation Specialty Code.

Manufactured ground anchors shall be listed and installed in accordance with the terms of their listing and the anchor manufacturer's instructions and shall conform to applicable code. Ground anchor manufacturer's installation instructions shall include the amount of preload required and load capacity. These instructions shall include tensioning adjustments where needed to prevent damage to the manufactured home, particularly damage that can be caused by frost heave. Each ground anchor shall be marked with the manufacturer's identification and listed model identification number, which shall be visible after installation.

Anchoring Equipment

Anchoring equipment, where permanently installed, shall be capable of resisting all loads as specified within the applicable provisions. Where the stabilizing system is designed by an engineer or architect licensed by the state to practice, such alternative designs shall include anchoring equipment capable of withstanding a load equal to 1.5 times the calculated load.

Anchoring equipment shall be listed and labeled as capable of meeting the requirements of these provisions. Anchors, as specified in this code, shall be attached to the main frame of the manufactured home by an approved connector plate that conforms to the applicable code. Other anchoring devices or methods meeting the requirements of these provisions shall be subject to the evaluation and approval of the building official and program construction staff.

- Anchoring systems shall be so installed as to be permanent.
- Anchoring equipment shall be so designed as to prevent self-disconnection with no hook ends used.
- All anchoring equipment, tension devices, and ties shall resist deterioration as required by this code.
- Tensioning devices, such as turnbuckles or yoke-type fasteners, shall be ended with clevis or welded eyes.

Ties, Materials, and Installation

Approved seismic anchors, steel strapping, cable, chain, or other approved materials shall be used for ties. Ties shall be fastened to anchors and drawn tight with turnbuckles or other adjustable tensioning devices or devices supplied with the ground anchor. Ties shall connect the anchor and the main structural frame. Ties shall not connect to steel outrigger beams that fasten to and intersect the main structural frame unless specifically stated in the manufacturer's installation instructions. Connection of cable ties to main frame members shall be code-prescribed closed-eye bolts affixed to the frame member in an approved manner. Cable ends shall be secured with no fewer than two U-bolt cable clamps with the “U” portion of the clamp installed on the short (dead) end of the cable to ensure strength equal to that required by applicable provisions.

Wood floor support systems shall be fixed to perimeter foundation walls in accordance with provisions of this code. The minimum number of ties required per side shall be sufficient to resist the loads stated in the applicable code. Ties shall be as evenly spaced as prescribed along the length of the manufactured home. Where continuous straps are provided as vertical ties, such ties shall be positioned at rafters and studs. Where a vertical and diagonal tie are located at the same place, such ties are connected to a single anchor that can carry both loads. Vertical ties that are not continuous over the top of the manufactured home shall be attached to the main frame.

8.2 Electrical

Electrical

Single-wide units shall have a minimum of 150-amp electrical system/service and distribution that shall meet municipality requirements and plan specifications.

Double-wide units shall have a minimum of 200-amp electrical system/service and distribution that shall meet municipality requirements and plan specifications.

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Home Purchase Project Requirements

9 Home Purchase Project Requirements

The participant must understand, before purchasing their next home, that the home must meet HARP standards and requirements to receive assistance. A formal HARP inspection must be conducted to confirm eligibility for the program.

Any prospective home or site for a manufactured home must be located in Oregon and cannot be located inside of a designated airport boundary, flood zone, or floodplain (check FEMA's website, fema.gov/flood-maps).

Before buying a stick-built or manufactured home, it is important to make sure it is in good shape and meets basic standards for safe and comfortable living. Below are the key utilities and structural features a home must have to qualify for assistance from HARP.

- Structure
  - The home must be built in 2017 or later.
- Working utilities
  - Electricity that powers lights and appliances safely
  - Running water (both hot and cold)
  - At least one working bathroom
- Functioning doors, windows, and cabinets
  - Doors and windows that open and close easily
  - Cabinets and appliances that work properly
- Working kitchen
  - A working sink, stove, oven, and countertop
- Bedrooms
  - The number of bedrooms should match family needs. For example, a family of four should have around three bedrooms.
- Bathrooms
  - At least one working bathroom with a toilet, sink, and shower or tub
- Operable windows in each bedroom
  - Windows that open and can be used as an escape route in an emergency
- Heating and cooling systems
  - A heating system for winter and a cooling system if needed for summer

- Structural safety
  - The house should be strong with no serious cracks in the foundation, no rot, and a roof that is in good condition.
  - It should be free of hazards like exposed wires or broken stairs.
  - It should have smoke detectors in hallways and sleeping areas and carbon dioxide detectors if the home has gas utilities connected.
- Roof condition
  - The roof should not have leaks or missing shingles.
- No deteriorated paint or elements
  - The home should not have peeling paint or rotting wood.
- Specific to manufactured homes
  - Must be permanently attached to a foundation. All temporary parts, like wheels and hitches, must be removed.

If the prospective home is located within the wildfire burn area, the home must have the following fire-resistant measures:

- **Fire-Resistant Roofing**: The roof should be made of fire-resistant materials like metal, tile, or special fire-rated shingles.
- **Siding:** The exterior siding should be made of fire-resistant materials such as fiber cement or Hardie siding.
- **Windows and Doors:** Windows should have double-paned glass for added protection, and doors should be made from noncombustible or fire-rated materials.
- **Decks and Porches:** Any decks or porches should also be made from fire-resistant materials. Avoid wood decks in burn areas unless treated for fire resistance.
- **Vents:** Vents in the attic or crawl space should be covered with a fine metal mesh to keep embers from getting inside.
- **Trim and Fascia:** The trim around windows, doors, and eaves (fascia) should be fire-resistant, using materials like metal or fiber cement.
- **Gutters:** Gutters should be made of metal and kept clear from leaves and debris to prevent fire from spreading to the roof.

9.1 Manufactured Home

Any manufactured home purchased must have a manufactured date of 2017 or later. All manufactured homes must be installed permanently to the foundation and any temporary items removed. It must be tied down during installation with state-approved tie-downs. All accessories used during transport, such as wheels, trucks, and hitching devices, must be removed to ensure the installation is permanent.

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ICC-700 Certified Compliance Path for Single-Family Homes, Townhomes, and Duplexes

10 ICC-700 Certified Compliance Path for Single-Family Homes, Townhomes, and Duplexes

10.1 Green Building Practices

The following items are noted in Section 12 of the 2020 National Green Building Standard. The adopting entity shall be permitted to substitute one or more practices with alternatives that achieve the overall intent of this standard. The determination of intent and equivalency is in the purview of the adopting entity. Additionally, many of these items exist within the preceding standards.

10.1.1 Lot Development

1201.1 Floodplain. Construction shall not occur in a floodplain or construction shall be elevated above the floodplain.

1201.2 Lot slope. Finished grade at all sides of a building shall be sloped to provide a minimum of 6 in. (152 mm) of fall within 10 ft. (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 in. (152 mm) of fall within 10 ft. (3048 mm), the final grade shall be sloped away from the edge of the building at a minimum slope of 2%.

1201.3 Soil preparation for new plants. Soil shall be tilled, or new soil shall be added down 6 inches for new plants and 12 inches for new trees. Soil shall be amended with organic matter, such as mulch or compost, as needed. Long-acting sources of nutrients shall be added if the soil is deficient. Alternately, the landscaping plan shall incorporate the jurisdictional Department of Transportation (DOT) specifications (or equal) for soil preparation and amendment for landscape planning. Other approved sources such as University or County agricultural extension services shall be permitted.

1201.4 Regionally appropriate vegetation. When an Agency that has jurisdiction has developed a specification for planting, including non-invasive vegetation that is native or appropriate for local growing conditions, vegetation from that specification is selected for the landscaping plan, and that landscaping is installed.

1201.5 Protection of natural resources. Any trees or other natural resources that do not conflict with the home construction or finished grading and drainage of the lot and adjacent lots shall be properly protected during construction and all controls shall be

removed following construction. The landscape plan shall contain details for the protection and instructions for incorporating the trees/areas into the final landscape plan.

10.1.2 Resource Efficiency (Durability)

1202.1 Capillary break. A capillary break and vapor retarder shall be installed at concrete slabs in accordance with IRC Sections R506.2.2 and R506.2.3.

1202.2 Foundation drainage. Where required by the IRC for habitable and usable spaces below grade, exterior drain tile shall be installed.

1202.3 Dampproof walls. Dampproof walls shall be provided below finished grade.

1202.4 Sealed crawlspace. 6-mil polyethylene sheeting, or other Class I vapor retarder shall be installed in accordance with § 408.3 or IRC Section 506.

1202.5 Dry Insulation. Insulation in cavities shall be dry in accordance with the manufacturer's instructions before enclosing (e.g., with drywall).

1202.6 Water-resistive barrier. A water-resistive barrier and/or drainage plane system shall be installed in accordance with IRC requirements behind exterior veneer and/or siding.

1202.7 Flashing. Flashing shall be provided as follows to minimize water entry into wall and roof assemblies and direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details shall be provided in the construction documents and in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.

Flashing shall be installed at the following locations, as applicable:

1. Around exterior fenestrations, skylights, and doors
2. At roof valleys
3. At building-to-deck, -balcony, -porch, and -stair intersections
4. At roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets
5. At ends of and under masonry, wood, or metal copings and sills
6. Above projecting wood trim
7. At built-in roof gutters
8. Drip edge shall be installed at eave and rake edges

9. Window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711 or liquid applied flashing complying with AAMA 714 and installed in accordance with flashing fenestration or manufacturer's installation instructions.
10. Pan flashing is installed at sills of all exterior windows and doors.
11. Seamless, preformed kickout flashing, or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing, including but not limited to, kickout and step flashing is commensurate with the anticipated service life of the roofing material.
12. Through-wall flashing is installed at transitions between wall cladding materials, or wall construction types

1202.8 Tile backing materials. Tile backing materials installed under tiled surfaces in wet areas shall be in accordance with ASTM C1178, C1278, C1288, or C1325. Tiles shall not be installed over paper-faced drywall in wet areas.

1202.9 Ice and water shield. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed in accordance with the IRC at roof eaves of pitched roofs and shall extend a minimum of 24 in. (610 mm) inside the exterior wall line of the building.

1202.10 Architectural features. Horizontal ledgers shall be sloped away to provide gravity drainage as appropriate for the application.

1202.11 Visible suspect fungal growth. Building materials with visible suspect fungal growth shall not be installed or shall be addressed in accordance with industry-recognized guidelines such as ANSI/IICRC S520 Mold Remediation or EPA 402-K-01-001 Table 2: Mold Remediation Guidelines, prior to concealment and closing. Porous and semi-porous building materials should be stored in such a manner as to prevent excessive moisture content prior to installation or use. Relative humidity within the structure shall be controlled during construction to minimize the potential for microbial growth.

1202.12 Exterior doors. At least one entry at an exterior door assembly, including side lights (if any), is covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of 0.375 minimum is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix A, have either a storm door or a projection factor of 1.0 inches minimum, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).

a) Installing a porch roof or awning
b) Extending the roof overhang

c) Recessing the exterior door

d) Installing a storm door

1202.13 Roof overhangs. Roof overhangs, in accordance with Table 602.1.12, are provided over a minimum of 90% of exterior walls to protect the building envelope.

1202.14 Roof Water discharge. Each downspout shall discharge 5 ft. from building, onto impervious surfaces, into areas designed to infiltrate drainage into the ground, to water vegetation, or into a rain collection system.

10.1.3 Energy Efficiency

1203.1 Mandatory requirements. The building shall comply with § 1203.1 through § 1203.9 in addition to one of the following: § 1203.10 (Energy Performance Path); § 1203.11 through § 1203.14 (Energy Prescriptive Path); or § 1203.15 (ERI Target Path). Sampling shall not be permitted for this alternative compliance path.

1203.2 Adopting entity review. A review by the Adopting Entity or approved third party shall be conducted to verify design and compliance with these energy requirements.

1203.3 Duct testing. Ducts shall be pressure tested to determine air leakage by one of the following methods:

a) Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 in. w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test.

e) Post-construction test: Total leakage shall be measured with a pressure differential of 0.1 in. w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

Exceptions: 1) A duct air-leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope; 2) A duct air-leakage test shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems.

A written report of the test results shall be signed by the party conducting the test and provided to the Code Official.

1203.4 Radiant and hydronic space heating. Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., Air Conditioning

Contractors of America [ACCA] Manual J, AHRI I=B=R, ACCA 5 QI, or an accredited design professional's and manufacturer's recommendations).

1203.5 Building thermal envelope air sealing. The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped, or otherwise sealed with an air barrier material, suitable film, or solid material:

a) All joints, seams, and penetrations
f) Site-built windows, doors, and skylights
g) Openings between window and door assemblies and their respective jambs and framing
h) Utility penetrations
i) Dropped ceilings or chases adjacent to the thermal envelope
j) Knee walls
k) Walls and ceilings separating a garage from conditioned spaces
l) Behind tubs and showers on exterior walls
m) Common walls between dwelling units
n) Attic access openings
o) Rim joist junction
p) Other sources of infiltration

1203.6 Air sealing and insulation. Insulation shall be installed to Grade I. Grade II and Grade III insulation shall not be permitted. Building envelope air tightness and insulation installation shall be verified to be in accordance with the following.

A) Testing is conducted in accordance with ASTM E 779 using a blower door at a pressure of 1.04 psf (50 pa). Testing is conducted after rough-in and installation of penetrations in the building envelope, including but not limited to penetrations for utilities, electrical, plumbing, ventilation, and combustion appliances. Testing is to be conducted under the following conditions:

a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed.
q) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft, and flue dampers.
r) Interior doors are open.
s) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed.
t) Heating, cooling, and ventilation systems are turned off.

u) HVAC duct terminations are not sealed, and

v) Supply and return registers are not sealed.

B) Visual inspection. The air barrier and insulation items listed in Table 1203.6(B) shall be field verified by visual inspection.

Table 1203.6(B): Air Barrier and Insulation Installation

Component	Air Barrier Criteria	Insulation Installation Criteria
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop downstairs, or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of the exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by filling the cavity with a material with a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in

Component	Air Barrier Criteria	Insulation Installation Criteria
		substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or	

Component	Air Barrier Criteria	Insulation Installation Criteria
	unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be airtight and I-C rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be	

Component	Air Barrier Criteria	Insulation Installation Criteria
	installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

1203.7 High-efficacy lighting. A minimum of 90% of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent.

1203.8 Appliances. If installed, refrigerator, dishwasher, and/or washing machine shall be ENERGY STAR or equivalent.

1203.9 Clothes washers. Where installed, clothes washers rated with an IWF (integrated water factor), MEF (modified energy factor), or IMEF (integrated modified energy factor), shall be rated as follows:

1. Residential Clothes Washers: Front-loading, greater than 2.5 cu-ft maximum 3.2 IWF, minimum IMEF 2.76
2. Residential Clothes Washers: Top-loading, greater than 2.5 cu-ft maximum 4.3 IWF, minimum IMEF 2.06
3. Residential Clothes Washers: less than or equal to 2.5 cu-ft maximum 4.2 IWF, minimum IMEF 2.07

1203.10 Energy performance pathway.

1203.10.1 ICC IECC analysis. Energy efficiency features are implemented to achieve energy cost or source energy performance that exceeds the ICC IECC by 7.5%. A documented analysis using software in accordance with ICC IECC Section R405 is required.

1203.10.2 Energy performance analysis. Energy savings levels above the ICC IECC are determined through an analysis that includes improvements in building envelope, air infiltration, heating system efficiencies, cooling system efficiencies, duct sealing, water heating system efficiencies, lighting, and appliances.

1203.11 Energy prescriptive pathway.

1203.11.1 Building envelope. The building thermal envelope complies with § 1203.11.1.1 or § 1203.11.1.2. Exception: Section 1203.11.1.1 is not required for Tropical Climate Zone.

1203.11.1.1 Insulation and fenestration requirements. The building thermal envelope shall meet the requirements of Table 1203.11.1.1 and 1203.11.1.2.

1203.11.1.2 The total UA proposed and baseline calculations are documented where the total proposed building thermal envelope UA is less than or equal to the total baseline UA resulting from multiplying the U-factors in Table 1203.11.1.2 by the same assembly area as in the proposed building. REScheck is deemed to provide UA calculation documentation. SHGC requirements of Table 1203.11.1.1 shall be met.

Table 1203.11.1.1: Insulation and Fenestration Requirements by Component

Climate Zone	Fenestration[b] U-Factor	Skylight[b] U-Factor	Glazed Fenestration SHGC[b,e]	Ceiling R-Value[i]	Wood Frame Wall R-Value	Mass Wall R-Value[i]	Floor R-Value	Basement[c] Wall R-Value	Slab[d] R-Value & Depth	Crawlspace[c] Wall R-Value
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.32	0.55	0.25	38	20 OR 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.32	0.55	0.40	49	20 OR 13+5h	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.30	0.55	NR	49	20 OR 13+5[h]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.30	0.55	NR	49	20+5h OR 13+10[h]	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.30	0.55	NR	49	20+5h OR 13+10[h]	19/21	38[g]	15/19	10, 4 ft	15/19

NR = Not Required
For SI: 1 foot = 304.8 mm.

a) R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.

b) The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

c) 10/13 means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. 15/19 means - R15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. Alternatively, compliance with 15/19 shall be R -13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.

d) R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs. as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.

e) There are no SHGC requirements in the Marine Zone.

f) Basement wall insulation is not required in warm-humid locations as defined by ICC IECC Figure R301.1 and ICC IECC Table R301.1.

g) Alternatively, insulation should be sufficient to fill the framing cavity and provide not less than an R-value of R-19.

h) The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, “13+5” means R -13 cavity insulation plus R-5 continuous insulation.

i) Mass walls shall be in accordance with ICC IECC Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

Table 1203.11.1.2: Equivalent U-Factors[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawlspace Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.32	0.55	0.030	0.060	0.098	0.047	0.091[C]	0.136
4 except Marine	0.32	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.30	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	0.026	0.045	0.057	0.028	0.050	0.055

a) Non-fenestration U-factors shall be obtained from measurement, calculation, or an approved source.
b) Mass walls shall be in accordance with Section R402.2.5. Where more than half the insulation is on the interior, the mass wall U-factors shall not exceed 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.57 in Climate Zones 6 through 8.

1203.12 Space heating and cooling and water heating system efficiencies. The space heating and cooling and water heating systems are in accordance with Table 1203.12.

Table 1203.12: Space Heating and Cooling and Water Heating System Efficiencies

	Space Cooling System	Space Heating System - select 1 option from below				Water Heating System - select 1 option from below		
	AC	Gas Furnace	Gas Boiler	ASHP	GSHP or WSHP	Gas Tank WH	Gas Tankless WH	Elec Tank WH
Climate Zone	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. UEF Req.	Min. UEF Req.	Min. UEF Req.
1	15 SEER**	NR	85%	NR	Any	0.78	>.93	>.92
2	15 SEER**	NR	85%	NANR	Any	0.78	>.93	>.92
3	15 SEER**	92%	85%		Any	0.78	>.93	>.92
4	15 SEER**	92%	85%		Any	0.78	>.93	>.92
5	14 SEER	95%	85%		Any	0.78	>.93	>.92
6	14 SEER	95%	85%		Any	0.78	>.93	>.92
7	14 SEER	95%	85%		Any	0.78	>.93	>.92
8	14 SEER	95%	85%		Any	∀	>.93	>.92

>= 8.2 HSPF for single package
**zones 1-4 >=12.5 EER for split; >= EER for single package
NR = No requirement

1203.13 Duct leakage. The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be as follows:

1. Rough-in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 sq. ft. (9.29 m2) of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 sq. ft. (9.29 m2) of conditioned floor area.
2. Postconstruction test: Total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 sq. ft. (9.29 m2) of conditioned floor area.

1203.14 High-efficacy lighting. A minimum of 95% of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent.

1203.15 ERI target pathway.

1203.15.1 ERI target compliance. Energy efficiency features are implemented to achieve an ERI performance 8 points less than the EPA National ERI Target Procedure for ENERGY STAR Certified Homes version 3.0 as computed based on Step 1 of the EPA National ERI Target Procedure. Dwelling ratings shall be submitted to a quality control registry approved by the Adopting Entity for calculating points under this section.

10.1.4 Water Efficiency

1204.1 Lavatory faucets. Water-efficient lavatory faucets in bathrooms shall have a maximum flow rate of 1.5 gpm (5.68 L/min), tested at 60 psi (414 kPa) in accordance with ASME A112.18.1/CSA B125.1.

1204.2 Water closets. Water closets shall have an effective flush volume of 1.28 gallons or less and shall be in accordance with the performance criteria of the EPA WaterSense Specification for tank-type toilets.

1204.3 Irrigation systems. Where an irrigation system is installed, one of the following is met:

1. Drip irrigation is installed for all landscape beds and/or subsurface drip irrigation is installed for all turf grass areas.
2. Irrigation zones are organized by plant water needs.
3. The irrigation system(s) is controlled by a climate-based controller or soil moisture controller.
4. No irrigation is installed.

1204.4 Alternative Compliance Path. Water Rating Index (WRI) needs to achieve a level 70.

10.1.5 Indoor Environmental Quality

1205.1 Gas-fired fireplaces and direct heating equipment. Gas-fired fireplaces and direct heating equipment are listed and installed in accordance with the NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented outdoors.

1205.2 Solid fuel-burning fireplaces, inserts, stoves and heaters. Solid fuel-burning fireplaces, inserts, stoves, and heaters are code compliant and are in accordance with one or more of the following requirements:

1. Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.
2. Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified or Phase 2 Qualified.
3. Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).
4. Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified.
5. Masonry heaters are in accordance with the definitions in ASTM E1602 and IBC Section 2112.1.
6. Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.

1205.3 Garages.

a) Attached garage
    1. Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed; and
    2. A continuous air barrier is provided separating the garage space from the conditioned living spaces.
b) A carport is installed, the garage is detached from the building, or no garage is installed.

1205.4 Carpets. Wall-to-wall carpeting shall not be installed adjacent to

a) Water closets and bathing fixtures, and
b) Exterior doors.

1205.5 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm shall be provided in accordance with IRC Section R315 in any dwelling unit with a combustion fueled appliance or an attached garage with an opening that communicates with the dwelling unit.

1205.6 Interior architectural coatings. A minimum of 85% of the interior architectural coatings are in accordance with one or more of the following:

a) Low VOC as determined by EPA Method 24 (VOC content is below the detection limit for the method)
b) Green Seal GS-11
c) CARB Suggested Control Measure for Architectural Coatings (see Table 901.9.1).

1205.7 Local ventilation shall be in accordance with the following:

1. Bathrooms are vented outdoors. The minimum tested ventilation rate is 50 cfm (23.6 L/s) for intermittent operation or 20 cfm (9.4 L/s) for continuous operation in bathrooms. Exhaust fans are ENERGY STAR or equivalent.
2. Kitchen exhaust units and/or range hoods are ducted to the outdoors and have a minimum ventilation rate of 100 cfm (47.2 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation.
3. Bathroom and kitchen exhaust ventilation rates are tested to meet minimum ventilation rates or ducts are installed to meet the prescriptive requirements in IRC Table M1504.2.

1205.8 Whole Dwelling Ventilation. One of the following whole dwelling ventilation systems shall be implemented and shall be in accordance with the specifications of ASHRAE Standard 62.2-2010 Section 4. An explanation of the operation and importance of the ventilation system shall be included in the homeowner's manual.

1. Exhaust air ventilation system equipped with outdoor air ducts and intake(s) for ventilation air.
2. Exhaust air ventilation system equipped with outdoor air ducts and intake(s) for ventilation air and with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads.
3. Supply air ventilation system.

4. Supply air ventilation system equipped with automatic ventilation controls to limit ventilated air during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads.
5. Balanced air ventilation system with exhaust and supply fan(s) with supply intakes located in accordance with the manufacturer's guidelines not to introduce polluted air back into the building.
6. Heat-recovery ventilator.
7. Balanced air ventilation system with exhaust and supply fan(s) with automatic ventilation controls to limit ventilated air during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads, and with intakes located in accordance with the manufacturer's guidelines not to introduce polluted air back into the building.
8. Energy-recovery ventilator

1205.9 Radon control. Radon control measures are installed in accordance with 902.3 for Zone 1 as defined in Figure 9(1).

a) A passive radon system is installed, or
b) An active radon system is installed

1205.10 Kitchen exhaust. If a kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, make-up air shall be provided.

1205.11 MERV filters. Minimum 8 MERV filters shall be installed on central forced air systems and are accessible.

1205.12 HVAC system protection. One of the following HVAC system protection measures shall be performed.

a) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.
b) Prior to homeowner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed. In addition, the coils are inspected and cleaned, and the filter is replaced if necessary.

10.1.6 Homeowner Operation and Maintenance

1206.1 Homeowners Manual. A homeowner's manual shall be provided. The homeowner's manual shall include all items below:

1. A document indicating compliance with applicable requirements.
2. List of green building features (can include the National Green Building Standard checklist).
3. Product manufacturer's manuals or product data sheets for installed major equipment, fixtures, and appliances. If the product data sheet is in the building owner's manual, the manufacturer's manual may be attached to the appliance in lieu of inclusion in the building owner's manual.
4. Information on the importance and operation of the home's fresh air ventilation system.
5. Provide information on regionally appropriate vegetation from the local authority with jurisdiction.
6. A narrative detailing the importance of maintenance and operation of the green building features from the National Green Building Standard checklist in retaining the attributes of a green-built home.
7. When stormwater management measures are installed on the lot, include the information on the location, purpose, and upkeep of these measures.

1206.2 Training of initial homeowners. Initial homeowners shall be familiarized with the role of occupants in achieving green goals. Training is provided to the responsible parties regarding equipment operation and maintenance, control systems, and occupant roles. These include:

1. HVAC filters
2. Water heater settings
3. Whole-house ventilation systems
4. Operation of household equipment