



Single-family Housing Rehabilitation Standards

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Colorado Department of Local Affairs
Division of Housing
1313 Sherman Street, Room 500
Denver, Colorado 80203
(303) 864-7810
<http://dola.colorado.gov/doh>

Pat Coyle, Director

Single-Family Housing Rehabilitation Standards

Description:

The Division of Housing (DOH) has created this Single Family Owner Occupied Housing Rehabilitation Standards (Rehab Standards) to uniformly provide for safe, decent, durable, high-performing and affordable homes. They apply to homes rehabilitated under DOH-funded Single Family Owner Occupied Housing Rehabilitation programs (SFOO Rehab).

These standards are designed to be used with one- to four-unit dwellings of three stories or less. Many of the standards might apply to multifamily properties, but multifamily properties are generally subject to more stringent life-safety code and other code requirements, and often have more complex requirements for egress, fire ratings, common areas, parking and mechanical systems, among other differences.

These standards describe the minimum requirements in a variety of ways including:

- Remaining useful life, especially of major systems such as the structure, roof, cladding, weatherproofing (windows, doors, siding, gutters, etc.), plumbing, electrical, heating, ventilation, and air conditioning. **These major systems must have a remaining useful life of at least five years upon completion of a rehabilitation project, whether or not they are part of the rehab scope of work.**
- Minimum requirements for the materials and methods used. **All construction materials and methods must be in compliance with locally adopted building codes.** If there are no local codes, then they must comply with State Code (the National Electrical Code, 2011 Edition, as may be amended by the Colorado Electrical Board; and the Colorado Plumbing Code) as well as the International Existing Building Code of the ICC (IEBC).
- The requirements of regulatory agencies such as the local government's Building, Housing and Zoning Codes; the Environmental Protection Agency (EPA); federal, state and local Historic Preservation requirements. **These Rehabilitation Standards are not meant to substitute for a thorough understanding of all of the regulations that may apply to your projects.**
- The requirements of funders such as HUD (CDBG, HOME, NSP) or local governments, including the Environmental Review process.

In order to access further and more detailed information, hyperlinks to useful web sites are included in this document. They can serve as a valuable resource.

Establishing Scope of Work Priorities:

For all homes served by the Rehabilitation Program, health & safety standards represent the highest priority work to be completed first, especially if they are life threatening. DOH encourages SFOO Rehab Agencies to address life threatening projects as Emergency Repairs so they can be corrected as soon as possible; even if a larger rehab project is called for (the rest of

the work can be completed as a regular rehab project). **Any and all life threatening health & safety deficiencies must be corrected in every rehabilitation project, regardless of funding source.**

Another top priority for the scope of work is any major building system that does not have a useful life of at least five years. Major systems include the structure, roof, cladding, weatherproofing (windows, doors, siding, gutters, etc.), plumbing, electrical, heating, ventilation, and air conditioning, and are identified by the symbol “[MAJOR SYSTEM]”. **All major systems must have a remaining useful life of at least five years upon completion of a rehabilitation project, whether or not they are part of the rehab scope of work.**

The next priority for inclusion in the scope of work is any violation of locally adopted building code, housing code, zoning ordinance, &/or disaster mitigation standards. It is important for SFOO Rehab Agencies to be knowledgeable about their local codes, and to communicate freely with local code officials if their code requirements are unclear. If there are no locally adopted building codes, then SFOO Rehab Agencies must follow State Code (the National Electrical Code, 2011 Edition, as may be amended by the Electrical Board; and the Colorado Plumbing Code) as well as the International Existing Building Code of the ICC (IEBC).

Most building codes, including the International Existing Building Code of the ICC (IEBC), allow for building components that were constructed in compliance with the building code that was in effect at the time, and that do not pose a health or safety threat, to remain as is. Generally, they do not need to be improved to meet current code unless they are a threat to health or safety. The same applies to these Rehab Standards – if a building component is not a threat to health or safety, and if it complies with the building code that was in effect when it was built, then the SFOO Rehab Agency does not need to bring it into compliance with these standards.

SFOO Rehab Agencies and their clients may choose to make improvements to the accessibility of the home, based on the homeowners’ needs.

SFOO Rehab Agencies and their clients may also choose to implement “Green Standards,” identified by this symbol - [GREEN STANDARD]. These standards accomplish one or more of the following:

- Conserve water
- Conserve energy
- Provide the resident with a healthier living environment
- Reduce impact on the natural environment
- Create a more sustainable product lifetime

Some elements of the “Health & Safety” section are also labeled [GREEN STANDARD]. They must be treated as Health & Safety items.

Source Documents:

The standards in this document were adapted from a template used by Livable Housing, Inc., a consulting and training firm, and were based on a number of similar documents used in various housing rehabilitation programs. The standards with the label **[GREEN STANDARD]** were added with the assistance of Enterprise Community Partners and intended to be used for including “green rehab” improvements that follow accepted national green building standards such as LEED and the Green Communities Criteria.

Applicable Laws and Regulations

These Rehabilitation Standards are not meant to substitute for a thorough understanding of all of the regulations that may apply to your projects.

The following statutory and regulatory requirements are applicable to projects funded with federal funds:

- HUD – HOME or CDBG regulations (depending on the funding source used)
- NEPA Environmental Review
- Local Code: Current locally adopted Building, Housing and Zoning Codes, including any local Disaster Mitigation Standards
- If no local Building Code: State Code (the National Electrical Code, 2011 Edition, as may be amended by the Electrical Board; and the Colorado Plumbing Code) as well as the International Existing Building Code of the ICC (IEBC)
- Federal Code: For programs funded with HOME funds after January 24, 2014, HUD will adapt the Uniform Physical Condition Standards (UPCS) inspection protocol for housing rehabilitation.
- Environmental Protection Agency (EPA) regulations.
- EPA regulations for the Resource Conservation and Recovery Act (RCRA), dealing with hazardous materials.
- If the building is over 50 years old, then the Colorado State Historic Preservation Office (SHPO) requirements as well as any federal or local Historic Preservation requirements.
- Life Safety Code – NFPA 101 as published by the National Fire Protection Association.

The following are additional guidelines and codes, which may apply:

- Energy: Any locally adopted energy code, such as the 2009 (or newer) International Energy Conservation Code (IECC).
- Accessibility: ANSI standards for accessibility by disabled residents
- HAZMAT: HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing
- Model Building Codes such as the CABO 1-4 Unit Dwelling Code

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1) Health & Safety

Contaminants [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
N/A	
Replacement Standard	Minimum Life 5 years
<p>All materials installed will meet the following standards to minimize the presence of Volatile Organic Compounds (VOC) and Formaldehyde:</p> <ul style="list-style-type: none"> • All paints and primers should meet the most recent Green Seal G-11 Environmental Standard. http://www.greenseal.org/Home.aspx • All particleboard components will meet ANSI A208.1 for formaldehyde emission limits, or all exposed particleboard edges will be sealed with a low-VOC sealant or have a factory-applied, low-VOC sealant prior to installation. All MDF edges will meet ANSI A208.2 for formaldehyde emission limits, or all exposed MDF edges will be sealed with a low-VOC sealant or have a factory-applied, low-VOC sealant prior to installation. 	

Lead Based Paint (LBP) [GREEN STANDARD]	
Repair Standard (“Interim Controls”)	Minimum Life 5 years
<p>For all houses constructed prior to 1978, follow HUD LBP Guidelines including testing for LBP and Lead-safe work practices. Only EPA-certified Renovation, Repair & Painting (RRP) contractors may perform the work. See: http://www.hud.gov/offices/lead/lbp/hudguidelines/</p>	
Replacement Standard (“Abatement”)	Minimum Life 20 yrs.
<p>When Interim Control is impractical, the most affordable solution for abatement of the component will be chosen. For example, walls containing LBP may be covered with drywall or gutted and replaced with drywall. Trim and other wood or metal components containing LBP may be removed and replaced with similar materials.</p> <p>Follow HUD LBP Guidelines including Lead-safe work practices, and only use EPA-certified abatement contractors to perform the work. See: http://www.hud.gov/offices/lead/lbp/hudguidelines/</p>	

Asbestos [GREEN STANDARD]	
Repair Standard	Minimum Life N/A
<p>As asbestos inspection by a certified asbestos building inspector is required in Colorado if the trigger level of suspect materials to be disturbed is exceeded. An exemption is possible only if it can be shown that the building was constructed after October 12, 1988 and either no asbestos containing material (ACM) was specified in any construction document for the building OR no ACMs were used in the building.</p> <p>For more information & repair requirements, see the Colorado Dept. of Public Health & Environment's Asbestos website at: http://www.colorado.gov/cs/Satellite/CDPHE-AP/CBON/1251594599613</p>	
Replacement Standard	Minimum Life N/A
<p>Abatement of friable asbestos-containing materials in Colorado must be performed by a General Abatement Contractor, certified by the Colorado Dept. of Public Health & Environment's Air Pollution Control Division.</p> <p>For more information & abatement requirements, see the Colorado Dept. of Public Health & Environment's Asbestos website at: http://www.colorado.gov/cs/Satellite/CDPHE-AP/CBON/1251594599613</p>	

Radon [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
<p>All housing in this program will be subject to a "Short Term" Radon Test. If the result is a reading of 4 pCi/L or higher, then perform a follow-up "Short Term" test and average the results. If the average is above 4 pCi/L, remediation will be required.</p> <p>Radon test kits may be purchased from your local home improvement store. Be sure the kit says "certified by the National Radon Proficiency Program." Individuals can also get coupons for mail-order test kits on the Colorado Dept. of Public Health & Environment's website: http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251617274212</p> <p>As a time-saving measure, Rehab Agencies may ask applicants to purchase the test kit themselves and to perform the test before their application is approved.</p>	
Replacement Standard	Minimum Life 20 years
<p>If, as a result of the testing above, there is a presence of Radon at or above the 4 pCi/L level,</p>	

remediation will be undertaken per the EPA guidance in their Consumer’s Guide to Radon Reduction: [Http://www.epa.gov/radon/pubs/consguid.html](http://www.epa.gov/radon/pubs/consguid.html).

If the home’s water comes from a private well, the water should also be tested. Water testing is available from the [Colorado Department of Public Health and Environment's Laboratory Services Division](#).

Mold [GREEN STANDARD]	
Repair Standard	Minimum Life N/A
Any presence of mold is unacceptable and must be addressed per the National Center for Healthy Housing protocol “Creating a Healthy Home.” All carpeting, drywall or other gypsum-based wall coverings or any other non-structural components with mold present will be removed and replaced.	
Replacement Standard	Minimum Life N/A
U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control and Prevention (CDC) recommend that trained mold remediation professionals do the mold clean up if mold growth covers more than 100 square feet, or a 10 foot by 10 foot area.	
All carpeting, drywall or other gypsum-based wall coverings or any other non-structural components with mold present will be removed and replaced. The National Center for Healthy Housing protocol “Creating a Healthy Home” will be followed for remediation of structural components: http://www.nchh.org/Portals/0/Contents/FloodCleanupGuide_screen .pdf	

Fire Safety - Egress	
Repair Standard	Minimum Life N/A
N/A	
Replacement Standard	Minimum Life 5 years
Egress windows are required in all new sleeping and living areas unless other secondary means of escape requirements are met, in accordance with local building codes or the IEBC. No bedrooms shall be created in attics or basements unless Life Safety Code (NFPA 101) egress requirements are met.	

Fire and CO Alarms [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
Existing fire and smoke, carbon monoxide and security systems that meet local code (or the IEBC) will be repaired to operating condition.	
Replacement Standard	Minimum Life 5 years
Smoke detectors are required on each dwelling floor and in all bedrooms. They may be either hard-wired or battery operated, in accordance with Colorado Statute.	
Colorado law also requires that carbon monoxide alarms be installed near the bedrooms of every home that is heated with fossil fuel, has a fuel-fired appliance, has a fireplace, or has an attached garage.	

2) Site

Grading [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
All grading adjacent to the building and for a distance of at least 10 feet away from the building will slope away from the structure at a pitch of at least 1 inch per foot. All bare earth within three feet of the foundation will be planted with low-water landscaping. Bare earth more than three feet from the foundation may be reseeded with grass or planted with low-water landscaping. For more information, see Denver Water’s website at: http://www.denverwater.org/Conservation/Xeriscape/	
Replacement Standard	N/A
N/A	

Outbuildings	
Repair Standard	Minimum Life 5 years
Unsafe and blighted structures, including outbuildings, may be removed if it is not financially feasible to complete the repairs required to make them structurally sound, leak-free, with any health or safety hazards stabilized. Detached garages should have operable and lockable doors and windows.	

Replacement Standard	N/A
No outbuilding replacement is permitted in this program.	

Fencing	
Repair Standard	Minimum Life 3 years
Repair to fencing on property lines is allowed. Replacing sections in kind is also permissible if the budget permits.	
Replacement Standard	Minimum Life 5 years
Wholesale replacement of deteriorated fencing is discouraged and should only be undertaken if the budget permits.	

Paving And Walks	
Repair Standard	Minimum Life 5 years
Essential paving, such as front sidewalks and driveways with minor defects, will be repaired to match. Tripping hazards greater than 3/4" must be addressed. Non-essential, highly deteriorated paving, such as sidewalks that are unnecessary, will be removed and appropriately landscaped.	
Replacement Standard	Minimum Life 5 years
Un-repairable essential walks and driveways will be replaced with permeable paving if financially feasible [GREEN STANDARD] , or with concrete per local codes (or IEBC). Handicapped-accessible ramps are an eligible expense.	

Trees and Shrubbery	
Repair Standard	Minimum Life 5 years
Trees that are dead, dying, or hazardous may be removed or trimmed, if that removes the hazard. Removal will include cutting close to the ground, and should also include grinding of the stump to 12 inches below the finished grade, installation of topsoil and re-seeding.	
Replacement Standard [GREEN STANDARD]	Minimum Life 5 years
Replacement trees and shrubs are permitted if economically feasible and must be selected from the State Extension Service list of local, drought-resistant and non-invasive plant materials. In placement of trees, attention should be paid to shading the house to reduce air conditioning costs. Also, trees should be located a sufficient distance from foundations, sidewalls, walkways, driveways, patios and sidewalks in order to avoid future damage from root growth, branches brushing against the structure, and fire. Setbacks from structures should typically exceed half of the canopy diameter of a full-grown example of the species.	

Lawn [GREEN STANDARD]	
Repair Standard	Minimum Life 1 year
Bare section of lawn may be reseeded with drought-resistant grasses or plantings. For more information, see Denver Water’s website at: http://www.denverwater.org/Conservation/Xeriscape/	
Replacement Standard	Minimum Life 5 years
Wholesale replacement of lawn grasses is not allowed. Over-seeding is permitted with drought-resistant varieties. If lawn grasses do not exist at property, drought-resistant sod can be used for renovation if existing vegetation is removed and the underlying soil is tilled or core cultivated (aerified).	

3) Exterior Building Surfaces

NOTE: Any exterior work on a building that is historic must follow the Colorado State Historic Preservation Office guidelines & any applicable local or federal regulations on historic properties.

Exterior Cladding [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 10 years
Siding and trim will be intact and weatherproof. All exterior wood components will have a	

minimum of one continuous coat of paint, and no exterior painted surface will have any deteriorated paint. Buildings designated as historic will have existing siding repaired to blend with existing and will be spot-primed and top-coated in a lead-safe manner.

Replacement Standard

Minimum Life 10 years

Buildings may have siding replaced with wood, vinyl or cementitious siding to match the existing configuration. New wood components will be FSC certified: <http://www.fsc.org/>.

Exterior Porches

Repair Standard

Minimum Life 5 years

Deteriorated concrete porches will be repaired when possible. Unsafe wood porch components will be repaired to conform closely to historically accurate porches in the neighborhood. Porch repairs will be structurally sound, with smooth and even decking surfaces. Deteriorated wood structural components will be replaced with preservative-treated wood.

Replacement Standard

Minimum Life 10 years

New porches on historic buildings will conform closely to historically accurate porches in the neighborhood. Decks and railings on non-historic porches will be replaced in accordance with local codes (or IEBC). Replaced wood structural components will be preservative-treated.

Exterior Railings

Repair Standard

Minimum Life 5 years

Existing handrails and railings will be structurally sound and meet local codes (or IEBC). Guard rails are required on any accessible area, including stairs, with a walking surface over 30" above the adjacent ground level. Structurally sound railings may be repaired if it is possible to maintain the existing style. On historic structures, railing repairs will be historically sensitive.

Replacement Standard

Minimum Life 10 years

Handrails will be present on one side of all interior and exterior steps or stairways with more than two risers and around porches or platforms over 30" above the adjacent ground level, and will meet local codes (or IEBC). Handrails and guard rails will conform to the style of similar components in the neighborhood. On historic structures new railings will be historically sensitive.

Exterior Steps and Decks	
Repair Standard	Minimum Life 5 years
Steps, stairways, and porch decks will be structurally sound, reasonably level, with smooth and even surfaces. Repairs will match existing materials.	
Replacement Standard	Minimum Life 10 years
In non-historic structures wood decking may be replaced with 5/4" X 6" preservative-treated material and new steps will be constructed from nominal 2" preservative-treated wood. On historic structures new wood decking will be structurally sound and historically sensitive	

Exterior House Numbers and Mailboxes	
Repair & Replacement Standard	Minimum Life 5 years
All houses should have 4" house numbers clearly displayed near the front door and a standard size mailbox placed in accordance with local Post Office requirements.	

4) Foundations & Structure

Firewalls [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Firewalls (between separate dwelling units and between a home and its attached garage) will be maintained without cracks and plaster deterioration and covered with 5/8" type X gypsum, glued and screwed to structure.	
Replacement Standard	Minimum Life 5 years
When frame walls and floors adjoining other dwellings or attached garages are gutted, new wall finish installations will conform to local codes (or IEBC) for fire ratings.	

Foundations [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Foundations will be repaired to be sound, reasonably level, and free from movement.	
Replacement Standard	Minimum Life 25 years

Foundation replacements are generally beyond the scope of the program. If the cost of renovation exceeds the home's value, the homeowner should consider complete replacement of the entire home.

Structural Walls [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Structural framing and masonry will be free from visible deterioration, rot, or serious termite damage, and be adequately sized for current loads. Prior to rehab, all sagging floor joists or rafters will be visually inspected, and significant structural damage and its cause will be corrected.	
Replacement Standard	Minimum Life 15 years
New structural walls will be minimum 2" x 4", 16" OC. All exterior walls that are part of the building envelope (the air barrier and thermal barrier separating the conditioned space from the non-conditioned space) will be insulated to meet local codes (or IEBC).	

Additions [MAJOR SYSTEM]	
Repair Standard	Minimum Life N/A
N/A	
Replacement Standard	Minimum Life 60 years
New additions are acceptable only when – for marketing and livability reasons – it is necessary to add additional bedroom space. Stamped plans must be submitted to the City Building Official for review and approval prior to bidding. All standards for Exterior Building Surfaces, Roofing, Windows and Doors, Insulation and Ventilation, Plumbing, Electrical, HVAC apply.	

5) Windows and Doors

Interior Doors	
Repair Standard	Minimum Life 5 years
Baths and occupied bedrooms will have operating doors and lock sets.	
Replacement Standard	Minimum Life 5 years

Hollow-core, pressed-wood product consistent with the style of existing doors including a bedroom lock set may be installed.

Exterior Doors [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Exterior doors will be solid, weather-stripped and will operate smoothly. They will include a peep sight, a dead bolt, and an entrance lock set.	
Replacement Standard	Minimum Life 5 years
Replacement doors at the front of historic buildings will be historically sensitive. Steel, insulated doors may be installed at entrances not visible from the front street and on the front of the property for buildings that are not historic. Dead bolt locks will be installed on all exterior doors and keyed to match. All new doors will be weather-stripped to be air tight.	

Windows [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
All windows will operate, remain in an open position when placed there, lock when closed and the open section will be covered with a screen.	
Replacement Standard	Minimum Life 10 years
Windows that are not repairable may be replaced and will meet the ENERGY STAR standard for this geographic region. For more information: http://www.energystar.gov/index.cfm?c=windows_doors.pr_anat_window Windows on key façades of historically sensitive properties will be wood of the style original to the building. New windows on other properties may be vinyl and double-glazed.	

Basement Windows & Ventilation [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Ideally, two basement windows on opposite sides of the building would be operable for ventilation, in good working order, and lockable.	
Replacement Standard	Minimum Life 10 years
Basement windows may be replaced with glass block, so long as a minimum of two glass block	

windows on opposite sides of the building have operable and lockable center vents. If the basement is used as a sleeping or living area, please refer to Section 1 for Fire Safety – Egress requirements.

6) Roofing

Flat and Low-Slope Roofing [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Built-up roofing that is leak-free will be re-coated and flashing and accessories repaired if their minimum life is questionable.	
Replacement Standard	Minimum Life 15 years
The most cost-effective roof will be installed to the manufacturer’s specifications and in accordance with local codes (or IEBC).	

Pitched Roofs [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Missing and leaking shingles and flashing will be repaired on otherwise functional roofs. Slate, metal and tile roofs will be repaired when possible. Antennae will be removed and replaced if needed.	
Replacement Standard	Minimum Life 20 years
The most cost-effective roof will be installed to the manufacturer’s specifications and in accordance with local codes (or IEBC).	

Gutters and Downspouts [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
Gutters and downspouts must be in good repair, leak free and collect storm water from all lower roof edges. Concrete splash blocks will be installed to move water away from the foundation. The system must move all storm water away from the building and prevent water from entering the structure. In addition to positive drainage away from the building, outlets will be a minimum of 3 feet away from the foundation whenever there is a history of water problems.	

Replacement Standard	Minimum Life 5 years
Gutters and downspouts will be installed and collect storm water from all lower roof edges. Concrete splash blocks will be installed to move water away from the foundation. The system must move all storm water away from the building and prevent water from entering the structure. In addition to positive drainage away from the building, outlets will be a minimum of 3 feet away from the foundation whenever there is a history of water problems.	

7) Insulation and Ventilation

Infiltration [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
Any home receiving energy-efficiency improvements will be tested with a Blower Door and existing air sealing will be repaired to attain a maximum 0.35 Air Changes per Hour at 50 Pascal pressure (0.35 ACH50).	
Replacement Standard	Minimum Life 5 years
All homes or units will be air sealed to meet the minimum Blower Door test requirements of 0.35 Air Changes per Hour at 50 Pascal pressure (0.35 ACH50).	

Insulation [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
If added to a home, insulation must be installed per the manufacturer's instructions, with an R-value that conforms to local building codes (or IEBC)	
Replacement Standard	Minimum Life 20 years
The envelopes of all homes will have a continuous air barrier and a continuous thermal barrier that is in contact with the air barrier. All exterior surfaces opened in the course of renovation shall be insulated to meet local code (or IEBC). The ENERGY STAR Thermal Bypass Inspection Checklist should be completed for each home, found at:: http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Thermal_Bypass_Inspection_Checklist.pdf	

Whole House Ventilation [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
All homes must meet the ventilation code that was in effect at the time of their construction.	
Replacement Standard	Minimum Life 10 years
Any home receiving energy-efficiency improvements including blower door testing and related air sealing measures shall meet the most recent ASHRAE standard by using one bathroom fan continuously operating at a verified CFM rate sufficient to meet the ASHRAE standard and creating ≤ 0.3 Sones of fan noise. The fan will also have a ≥ 80 CFM boost function switched one of three ways: (1) by a switch at the bathroom entrance with an adjustable time-delay function that runs the fan for an additional period after the switch is turned off, or (2) by a motion detector with an adjustable time-delay function that runs the fan for an additional period after the motion detector ceases to see motion, or (3) by a humidistat. For more information, from the Weatherization Program: http://www.waptac.org/WAP-Standardized-Curricula/ASHRAE-62002E2.aspx	

Bath Ventilation [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
All homes must meet the local building code (or IEBC) for bath ventilation that was in effect at the time of their construction.	
Replacement Standard	Minimum Life 10 years
One bathroom should have a bath fan that meets the Whole House Ventilation requirement, described above. Any additional bathrooms must be mechanically vented to the ≥ 80 CFM standard with the time-delay switching described above.	

Kitchen Ventilation [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
All homes must meet the local building code (or IEBC) for kitchen ventilation that was in effect at the time of their construction. They should have functional mechanical ventilation operating at a minimum 150 CFM.	
Replacement Standard	Minimum Life 10 years
All kitchens must have functional mechanical ventilation operating at a minimum 150 CFM. Any new ventilation system must meet current local code requirements (or IEBC).	

Roof Ventilation [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
All homes must meet the local building code (or IEBC) for roof ventilation that was in effect at the time of their construction.	
Replacement Standard	Minimum Life 10 years
All new roofing systems must meet current local code requirements (or IEBC) for ventilation.	

8 - Interior Standards

Interior Walls and Ceilings	
Repair Standard	Minimum Life 3 years
Holes, cracks and deteriorated and un-keyed plaster will be repaired to match the surrounding surfaces. All visual surfaces will be stabilized to minimize lead paint hazards using premium vinyl acrylic paint.	
Replacement Standard	Minimum Life 10 years
When necessary plaster will be replaced by ½" gypsum board. Fire-rated assemblies will be specified on a project-by-project basis as required by local codes (or IEBC).	

Flooring	
Repair Standard	Minimum Life 5 years
Bathroom, kitchen and other water-susceptible floor areas will be covered with water-resistant flooring that is free from tears or tripping hazards.	
[GREEN STANDARD] Damaged wood floor will be repaired. When existing deteriorated carpet is installed over hardwood floors, the hardwood may be refinished whenever practical, taking into account the relative cost of replacing carpet and the needs of the residents.	
Replacement Standard	Minimum Life 10 years
Baths will receive resilient sheet goods over plywood underlayment, and kitchens will receive resilient sheet goods or tile over plywood underlayment.	
[GREEN STANDARD] Whenever practical, rooms other than kitchens and baths with existing wood	

flooring will be maintained as wood floors and refinished when appropriate. Rooms other than kitchens or baths without usable wood floors may be finished with carpet and associated products that are Carpet and Rug Institute’s Green Label certified. For more information: <http://www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label.cfm>

New basement slabs shall be installed to local codes (or IEBC).

Closets	
Repair Standard	Minimum Life 5 years
Existing closets will be maintained in good repair and have a shelf and clothes rod.	
Replacement Standard	Minimum Life 10 years
New closets may be created if there is a significant lack of storage space and the budget permits. New closets will have a minimum depth of 2 feet and include a shelf and clothes rod.	

Kitchen Cabinets and Countertop [GREEN STANDARD]	
Repair Standard	Minimum Life 3 years
Kitchens will have countertop and storage space adequate for the preparation and storage of food. Existing cabinets with hardwood doors and face frames may be repaired if in good condition. All cabinets will be sound and cleanable.	
Replacement Standard	Minimum Life 10 years
Kitchens will have countertop and storage space adequate for the preparation and storage of food. Replacement cabinets will have hardwood doors and face frames. Dishwashers are allowed – if the client does not want a dishwasher, then space and plumbing for a future dishwasher installation may be installed.	

Kitchen Appliances	
Repair Standard	Minimum Life 5 years
All units will have a working and cleanable range. If there is an existing dishwasher in working and cleanable condition, it may be repaired.	

Replacement Standard	Minimum Life 15 years
All redesigned kitchens will have ENERGY STAR-labeled appliances where possible. New cooking ranges should be electric, wherever possible.	

9) Electric

Note: If there is no local building code, then all electrical work must comply with the State Code (the National Electrical Code, 2011 Edition, as may be amended by the Colorado Electrical Board).

Ground Fault Interrupter Circuits [MAJOR SYSTEM]	
Repair Standard	N/A
N/A	
Replacement Standard	Minimum Life 5 years
Non-functioning GFCIs will be replaced. Non-GFCI Kitchen counter, bath and laundry receptacles within 6' of a sink will be replaced with a GFCI-protected receptacle or protected by a GFCI device.	

Passage Lighting	
Repair Standard	Minimum Life 7 years
All halls, stairs and rooms necessary to cross to other rooms and stairways must be well lit. All lights and switches in hallways, stairs and other passages will be operable and safe.	
[GREEN STANDARD] Existing fixtures with incandescent lamp fittings will have CFL replacement lamps installed.	
Replacement Standard	Minimum Life 10 years
All halls, stairs and rooms necessary to cross to other rooms and stairways must be well lit. Attics, basements and crawl spaces must have utility fixtures. All new light fixtures will be ENERGY STAR labeled.	

Kitchen Electric Distribution [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Existing receptacles, fixtures and switches will be safe and grounded. Receptacles within 6' of a sink will be GFCI-protected.	
Replacement Standard	Minimum Life 5 years
Permanently installed or proposed stoves, refrigerators, freezers, dishwashers and disposals, washers and dryers will have separate circuits sized to meet local codes (or State Electrical code).	

Interior Electric Distribution [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Exposed knob and tube will be replaced. Every room will have a minimum of two duplex receptacles, placed on separate walls and one light fixture or receptacle switched at each room entrance. Where the source wiring circuit is accessible (e.g.. first floor above basements, in gutted rooms, etc.), receptacles will be grounded. All switch, receptacle, and junction boxes will have appropriate cover plates. Wiring will be free from hazard, and all circuits will be properly protected at the panel. Floor receptacles will be removed and a metal cover plate installed. Exposed conduit is allowed. Bedrooms receptacles will be protected by an Arc Fault breaker. There must be one electrical receptacle at the service panel.	
Replacement Standard	Minimum Life 7 years
If a room's wall finishes are removed, it will be rewired to the latest version of local codes (or State Electrical Code).	

Service and Panel [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Distribution panels will have a main disconnect, at least 10 circuit-breaker-protected circuits, a 100-amp minimum capacity and be adequate to safely supply existing and proposed devices. If a working central air conditioning system is present, the minimum service will be 150 amp.	
Replacement Standard	Minimum Life 10 years
Electrical service with a main disconnect panel shall be installed according to local code (or State Electrical Code).	

10) Plumbing

Note: If there is no local building code, then all plumbing work must comply with the Colorado Plumbing Code.

Drain, Waste, Vent Lines [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Waste and vent lines must function without losing the trap seal.	
Replacement Standard	Minimum Life 10 years
If walls are removed exposing vent and waste lines those lines will be reworked to the current mechanical code.	

Plumbing Fixtures	
Repair Standard	Minimum Life 3 years
All fixtures and faucets will have working, drip-free components.	
Replacement Standard	Minimum Life 15 years
Replace fixtures with single lever, metal faucets and shower diverters with 15-year, drip-free warranties. Sinks should be replaced with stainless steel sinks, and new tub surrounds should be of fiberglass.	
[GREEN STANDARD] Toilets with greater than a 1.6 GPF rating may be replaced with a 1.3 GPF model. Faucets and shower diverters should have a maximum 2.0 GPM flow.	

Plumbing Minimum Equipment [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Existing equipment will be repaired to ensure a 5-year minimum life.	
Replacement Standard	Minimum Life 10 years
Every dwelling unit will have a minimum of one single bowl sink with hot and cold running water in the kitchen and at least one bathroom containing a vanity with a sink, and a shower/tub unit, both with hot and cold running water, and a toilet.	
[GREEN STANDARD] Redesigned kitchens should include an ENERGY STAR-labeled dishwasher, or space and plumbing for a future installation.	

Water Heaters [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Each housing unit will have a working water heater, preferably less than 3 years old with a minimum capacity of 40 gallons if it is gas-fired. Water heaters may be repaired if it is clear that a repair will make it operable and extend its life by at least 5 years.	
Replacement Standard	Minimum Life 10 years
All units will have a minimum 40-gallon, gas-fired water heater with a 10-year warranty installed to the mechanical code. Electric water heaters may be installed if it is not possible to install a gas unit safely.	
[GREEN STANDARD] High efficiency power-vented or sealed combustion tankless models are allowed.	

Water Supply [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
The main shut off valve must be operable and completely stop the flow of water to the house. If there is no existing shut-off valve, then one may be installed. All fixtures must be leak-free and deliver sufficient cold water and, where applicable, hot water.	
Replacement Standard	Minimum Life 10 years
The main shut off valve must be operable and completely stop the flow of water to the house, and should be replaced if it does not. Lead and galvanized pipe that is part of the water service or the distribution system will be replaced with copper, PEX or other plastic approved for distribution of domestic water. All fixtures will have brass shut off valves. One freeze-protected exterior hose bib is allowed.	

11) HVAC

Air Conditioning [MAJOR SYSTEM] [GREEN STANDARD]	
Repair Standard	Minimum Life 5 years
Non-functioning, non-repairable air conditioners and evaporative coolers will be removed and drained of all CFCs. Existing air conditioners and evaporative coolers will be inspected, serviced and refurbished to operate safely, or they may be replaced.	

Replacement Standard	Minimum Life 10 years
New HVAC systems may include air conditioning (≥ 13 SEER) or evaporative cooling, if the local climate and building practices call for it.	

Chimney [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Unused chimneys will be removed to below the roof line wherever roofing is replaced. Unsound chimneys will be repaired or removed. Chimneys used for combustion ventilation should be relined.	
Replacement Standard	Minimum Life 10 years
The creation of new flues is not recommended in this program - the use of high efficiency closed combustion appliances is recommended to avoid the need for new flues. Replacement furnace flues, when required, will be metal double- or triple-walled as recommended by the furnace manufacturer.	

Distribution System [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
Duct work and radiator piping will be well supported, insulated in unconditioned space and adequate to maintain a comfortable temperature in all habitable and essential rooms.	
[GREEN STANDARD] All duct work in unconditioned space should be insulated to R-7, sealed at all seams with mastic (not tape) and pressure tested to eliminate leakage.	
Replacement Standard	Minimum Life 25 years
All duct work in unconditioned space will be insulated to R-7, sealed at all seams with mastic (not tape), pressure tested to eliminate leakage and run in concealed space.	

Heating [MAJOR SYSTEM]	
Repair Standard	Minimum Life 5 years
<p>Workable existing heating systems will be inspected and serviced to operate in a safe manner.</p> <p>[GREEN STANDARD] Resistance electric heating systems may be removed and replaced with systems as described below, unless the home has a very low heating load to super-insulation, solar gain or a mild climate.</p>	
Replacement Standard	Minimum Life 25 years
<p>Gas-fired heating plants will be rated at $\geq 92\%$ AFUE or better, to the extent possible. Oil-fired furnaces will be rated at $> 83\%$ AFUE or better. Oil-fired boilers will be rated at $> 85\%$ AFUE or better. Heat pumps will be rated at ≥ 15 SEER. Setback thermostats may be installed. When electric resistance heating systems are replaced, soffits for ductwork and/or new distribution pipes for hot water heating systems will be provided. Up to 4 lineal feet of resistance electric heating strips per 1000 square feet of floor area may be retained or installed in areas that are not cost effective to heat via ductwork or hot water distribution systems.</p>	