

# **VHCB HOME Program Rehabilitation Standards**

## **I. PURPOSE OF STANDARDS**

- A. These standards are designed to outline the requirements for building rehabilitation for all VHCB HOME funded multifamily housing projects. These standards are applicable to all VHCB HOME funded rehabilitation projects. These standards, though a requirement specifically to the development entity in direct receipt of VHCB HOME funding, are written to provide guidance to all relevant members of a project development team.
- B. The goal of the VHCB HOME program is to provide functional, safe, affordable and durable housing that meets the needs of the tenants and communities in which the housing is located. Ensuring that property rehabilitation puts each building in the best possible position to meet this goal over its extended life, and at a minimum that all health and safety deficiencies are addressed, is the purpose of these standards.
- C. If a project is out of compliance with these standards, the specific portion of the project which does not comply shall be brought to the attention of the VHCB staff, stating the reasons for non-compliance, and a determination will be made as to whether an exception to the standards shall be granted.
- D. Note: At the time of publication and adoption of these standards, the adopted codes referenced are believed to be those in force. As standards and codes change and are put into effect by the governing authorities having jurisdiction, the new standards and codes will apply in lieu of those referenced.

## **II. QUALITY OF WORK**

- A. Quality of Work: Grantees and developers shall ensure that all rehabilitation work is completed in a thorough and workmanlike manner in accordance with industry practice and contractually agreed upon plans and specifications as well as subsequent mutually agreed upon change orders during the construction process. Grantees and Developers will employ best practice industry standards relating to quality assurance to verify all work completed.
- B. Project Design Professionals
  - 1. Project will be designed by licensed professionals per Section 7 of the Vermont Fire & Building Code.
  - 2. The project developer will formally contract with licensed architectural and engineering design professionals to provide appropriate professional services for each project. It is the responsibility of each licensed professional to assure that the scope of work is done in accordance with the generally accepted practices in the their discipline, as well as designing the project to be in full conformance with all the applicable Federal, State and local codes. (See Section III below.)
  - 3. In addition the architect or engineer will provide contract specifications which stipulate quality standards, materials choices and installation methods & standards. Such specifications may reference other appropriate standards set by different trades associations, testing agencies, such as ASTM, Underwriters Laboratory (U/L), Tile Council of America, Gypsum National Roofing Contractors Association (NRCA) Architectural Woodwork Institute, SMACNA, ASTM, AFME, etc.
- C. By meeting the various code requirements as a minimum standard, together with the other standards herein or in attendant VHCB policies – each building rehabilitation project is assured to be brought up to an accepted level of rehabilitation.
- D. Warranties shall be required per the standard construction contracts on all materials, equipment and workmanship.

## **III. CODE COMPLIANCE**

- A. All work shall comply with all applicable Vermont State and local codes. Key currently updated Vermont State Codes are located at <https://firesafety.vermont.gov/buildingcode>. Applicable state codes include but are not limited to:
  - 1. Vermont Fire Building Safety Code
  - 2. NFPA 1 – Fire Code
  - 3. NFPA 101 – Life Safety Code
  - 4. ICC – International Building Code
  - 5. Vermont Electrical Safety Rules
  - 6. Vermont Plumbing Rules
  - 7. Vermont Elevator Safety Rules
  - 8. Vermont Access Rules (ADA)
  - 9. Vermont Rental Housing Health Code

- B. Please note that the VHCB HOME grantee must demonstrate compliance with all state and local codes through project affiliation with professional design team drawing certifications (e.g. architectural design stamp) and/or other approved method such as state inspector certification.
- C. A Code Review Analysis will be produced by the project's design professionals itemizing the applicable codes for each area of discipline.
- D. These standards are designed to exceed the Uniform Physical Condition Standards (UPCS) and ensure that upon completion the HOME assisted project and units will be decent, safe, sanitary, and in good repair as described in 24 CFR 5.703.

**IV. SCOPE OF WORK DETERMINATION**

- A. In developing scopes of work grantees and developers will work with VHCB to ensure that all requirements under these provisions are satisfied and that the proposed scope of work meets the goals of Part I above. VHCB approves all scopes of work in accordance with VHCB standard practice as outlined in VHCB Policy & Procedures for Project Underwriting and VHCB Standard Loan/Grant Conditions.

**V. EXPECTED USEFUL LIFE / REHABILITATION SCOPE & CAPITAL PLANNING:**

- A. In developing scopes of work on housing rehabilitation projects VHCB HOME grantees and developers will consider the remaining expected useful life of all building components with regard to building long term sustainability and performance. Specifically, each building component with a remaining expected useful life of less than 20 years shall be considered for replacement, repair or otherwise updated. The durability of the project shall be at minimum equal to the "HOME Period of Affordability".
- B. Once a scope of work has been developed by grantee and their development team, the grantee must also develop a Capital Plan in compliance with VHCB policy on Capital Needs Assessments. Whether or not a particular building component has been replaced, repaired or otherwise updated as part of the rehabilitation scope of work, all building components and major systems must demonstrate adequate capital line item funding to be viable for at least 20 years. [As an example: Kitchen cabinets with a remaining useful life of 8 years may be permitted to be left in place and not included in rehabilitation scope. However, adequate funding shall be demonstrated in building capital plan to replace those cabinets in year 8 of the post rehabilitation capital plan.]
- C. Grantees and their development teams should ensure that all building components are analyzed as part of a comprehensive effort to balance rehabilitation scope and capital planning in a way which maximizes as much as possible long term building performance within the parameters of both development and projected operational funding available.

**VI. ENERGY EFFICIENCY:**

- A. All VHCB HOME funded projects shall be subject to the VHCB "Policy on Energy Efficiency and Water Conservation in Multifamily Residential Properties". Contained within this policy are the VHCB & VHFA "Multifamily Energy Design Standards". As outlined in those standards all projects will either achieve the target energy efficiency objectives of the standard or present VHCB with an operational case for project sustainability pursuant to the financial structure of the project.
- B. In both the design and implementation of project rehabilitation scopes of work particular emphasis should be made to maximize the effectiveness of the energy efficiency related work scopes.

**VII. BIDDING AND PROJECT MANAGEMENT:**

- A. All projects will be bid in accordance with the VHCB procurement policy which applies to all VHCB HOME funded projects. Grantees and developers will submit a project management plan with their application which will outline how the project will be managed (e.g. General Contractor (GC) bid project, Construction Management (CM) project or other project management plan). Any changes to project management operational structure which substantially varies from the plan provided to VHCB at the time the HOME funding is awarded requires the prior notification to VHCB HOME staff.

**VIII. PROJECT ARCHITECTURAL REHABILITATION DESIGN STANDARDS**

- A. BUILDING OCCUPANCY & CONSTRUCTION TYPE**
  - 1. Fire resistance rating separation requirements per code
  - 2. Shall comply with:
    - a. NFPA 1 & NFPA 101 (Chapters 8 & 43)
- B. HISTORIC BUILDINGS**
  - 1. Shall comply with NFPA 101 – Chapter 43.10.4

2. Shall comply with IBC Chapter 3409
3. Historic buildings shall be rehabilitated in a manner consistent with the requirements of Section 106 of the National Historic Preservation Act and the Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitation of Historic Buildings. Scopes of work shall be reviewed and approved by VHCB's Historic Preservation Consultant in accordance with *The Programmatic Agreement among the Vermont Agency of Commerce and Community Development, the Vermont State Historic Preservation Officer, VHCB, and the Advisory Council on Historic Preservation for the Administration of the HOME Investment Partnership Program* ("the HOME Programmatic Agreement").

**C. ACCESSIBILITY REQUIREMENTS**

1. Housing that is rehabilitated with HOME funds must meet all applicable federal and state regulations regarding accessibility for persons with disabilities. An overview of these requirements is provided below, however the applicability of these rules is complex and therefore it is recommended that developers seeking HOME funds consult with a qualified design professional.
2. General:
  - a. Project shall meet applicable Federal & State Regulations & Rules
  - b. The number of accessible apartment units shall be determined by the code requirements
  - c. American's with Disabilities Act (ADA) - Title II (for public entities) and Title III (for places of public accommodations) implemented at 24 CFR parts 35 and 36, and 2010 ADA Standard for Accessible Design & attendant Design Guide (DOJ), as applicable
  - d. Fair Housing Act – covered multifamily dwellings as defined by HUD's implementing regulations at 24 CFR 100.201 must meet the design requirements at 24 CFR 100.205
  - e. Vermont Access Rules
  - f. Vermont Access Standards for Public Buildings & Parking
3. Other standards as may apply or be required by funding sources (i.e. USDA Rural Development)
4. Section 504 of the Rehabilitation Act of 1973 implemented at 24 CFR part 8
  - a. For "substantial" rehabilitation (projects with 15 or more total units and the cost of rehabilitation is 75% or more of the replacement cost)
    - i. At least 5% of the units (1 minimum) must be made fully accessible for persons with mobility impairments based on the Uniform Federal Accessibility Standards (UFAS)
    - ii. In addition, at least 2% of the units (1 additional unit minimum) must be made accessible for persons with sensory impairments.
    - iii. Common spaces must be made accessible to the greatest extent feasible
  - b. For projects with "less-than-substantial" rehabilitation (anything less than "substantial")
    - i. The project must be made accessible to the greatest extent feasible until 5% of the units are physically accessible, and common spaces should be made accessible as much as possible.
5. Vermont Access Rules:
  - a. The 2012 Access Rules Adaptable and Visitable Standards for dwellings went into effect on April 1, 2012. These standards include both federal Fair Housing design requirements, as well as state "visitability" requirements that were implemented via Act 88. They adopt the 2010 ADAAG standards as standards for all "public buildings," which include not only apartments, but also buildings containing "covered multifamily dwelling units" as defined in the Access Rules. These standards effectively capture almost all of VHCB's housing projects, and a good deal of private multifamily development. Thus, even though buildings may not normally be required to meet the 2010 ADAAG standards under federal law, they may still be required to do so via state law.

**D. BUILDING DESIGN**

1. The project developers are encouraged to draft an architectural program document outlining the goals for the project.
2. Building access – in general the access to a building shall be safe, logical, readily identifiable, sheltered from the weather, meeting the exit requirements to a public way. Pathways of circulation within a building shall also be safe and logical.
3. Means of egress components shall be in conformance to Chapter 7 of NFPA 101, including complete layout of the exits, corridor & stair dimensional requirements and arrangement, doors sizes and swings, door hardware, panic exit devices, door self-closers, interior finishes, walking surfaces, fire separations, stair enclosures, guards & railings, ramps, occupant load calculations, illumination, and signage.
4. Apartment layout:
  - a. Room sizes –minimum in accordance with IBC 1208 and/or local codes.

- b. Interior environment shall comply with Chapter 12 of the IBC. Note: Sections of IBC Chapter 12 not specifically adopted by State of Vermont to be used a design guideline parameter.
- c. Kitchens – in general, for apartment buildings – each unit will have a functional and code compliant kitchen
  - i. SRO's and other special housing types may be an exception
- d. Baths – in general, for apartment buildings – each unit will have a functional and code compliant bath
  - i. SRO's and other special housing types may be an exception
  - ii. in accordance with IBC 1210
- 5. Storage – adequate clothes closets, pantry & general storage shall be provided.
- 6. Amenity Spaces - provision for laundry facilities, bike storage, trash & recycling, and other utility or common spaces may be made in accordance with the goals of the project program. The project developers are encouraged to consider adding such amenities as may be appropriate to enhance the livability of the housing for the tenants.
- 7. Solid Waste Disposal – provision shall be made to enable the tenants and property management staff to handle and store solid waste in compliance with Vermont's "Universal Recycling Law"
- 8. Existing outbuildings and utility structures which are being retained, shall be in sound and serviceable condition, and not create health, safety, or undue maintenance issues for the project.

## **IX. REHABILITATION CONSTRUCTION STANDARDS**

### **A. SITE** (CSI DIVISION 2)

- 1. General:
  - a. Assure that the site is safe, clean & usable, and designed with details, assemblies & materials to provide ongoing durability without undue future maintenance.
  - b. Site design and engineering shall be by a licensed professional civil engineer, or other qualified professional.
  - c. Design and systems shall conform to all applicable codes, rules and regulations:
    - i. Local and municipal zoning
    - ii. Vermont Fire & Building Code – current adopted edition
    - iii. State Land Use & Development Act 250 Permit as may be required by project scope.
    - iv. NFPA Codes as they may apply
  - d. A Project Review Sheet shall be submitted to the Vermont Agency of Natural Resources (ANR) to determine other permit requirements related to site design and construction:
    - i. Sewer & Septic – Vermont Waste Water System & Potable Water Supply Rules – WW permit
    - ii. Domestic Water - Vermont Waste Water System & Potable Water Supply Rules - WW permit
    - iii. Stormwater Permits relating to erosion control & stormwater management & discharge
    - iv. Access to State Highways – VTrans rules & regulations as they may be required
    - v. Wetlands – Review with State Water Quality Division
- 2. Flood hazards:
  - a. Project shall meet FEMA federal regulations, and HUD's floodplain management requirements at 24 CFR 55.
  - b. Alluvial erosion per local municipality regulations
- 3. Sprinkler water service – Underground water service as required for building sprinkler system shall be in accordance with NFPA 24.
- 4. Drainage – assure that the grading surrounding the building will slope away from the building and drain properly, without ponding or erosion.
- 5. Sewer connections to municipal sewage systems & on-site sewage disposal:
  - a. Existing sewer laterals to be reused, should be evaluated to assure that they are serviceable & have a remaining useful life of 20 years, or covered by the capital plan.
  - b. New systems designed to conform to the State "Wastewater System & Potable Water Supply Rules" (WW permit) regulations.
- 6. Water service:
  - a. Existing municipal water supplies to buildings shall be evaluated to assure that they are serviceable, of adequate capacity & have a remaining useful life of 20 years, or covered by the capital plan.
  - b. Required new systems shall be designed to conform to the State "Wastewater System & Potable Water Supply Rules" (WW permit) regulations, and the American Waterworks Association (AWWA) guidelines.

7. Vehicular access to public way – site design shall conform to local zoning and VTrans regulations, as well as be sensible in its layout to maximize vehicular & pedestrian safety.
8. On-site Parking – parking shall be adequate for project type, meet local codes, and be designed to drain well, with a durable appropriate surface material. Handicapped parking shall be provided as required. Designers may utilize Institute of Transportation Engineers (ITE) guidelines in the design.
9. Pedestrian access & hardscape – In general, paved walkways within the site will be designed to provide sensible pedestrian access from the public way into the site, from parking areas, and provide access to buildings. All walkways should generally conform to applicable codes for width & slopes, and fall protection. Site stairs shall be safe & sound, constructed of durable materials, with proper rise and run, and with code approved railings as required. Accessible routes into buildings shall be provided as required by code.
10. Site amenities – site amenities may be provided which enhance the livability of the project including playground areas, seating, benches, patio areas, picnic tables, bike racks, grills, and fencing, etc.
11. Mailboxes - Provision will be made for USPS approved cluster mailbox units if required by the USPS.
12. Landscaping – lawns, ground cover, planting beds, perennial plants, shrubs and trees may be provided to enhance the livability, and to provide a positive aesthetic sense.
  - a. Planting choices specified should be low maintenance, non-invasive species, and of an appropriate size and scale - located, when adjacent to building structures, with regard to their size at maturity.
13. Solid waste collection & storage – if necessary, provision shall be made for the outdoor storage and collection of solid waste & recycling materials in receptacles (dumpsters, wheeled trash cans, totes). Enclosures may be provided and should be accessible as required by code.
14. Site lighting with shielded fixtures may be provided to illuminate parking and pedestrian walkways, and will conform to local zoning (& Act 250 if necessary).
  - a. Energy efficient lighting shall conform to the VHCB “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties.
15. Fuel Storage – On site outdoor placement & storage of fuels per applicable regulations and utility requirements.
16. Underground or overhead utilities – as regulated by code and utility rules.

**B. FOUNDATIONS** (CSI DIVISION 3)

1. Existing foundations shall be examined by qualified professional
  - a. Foundations to be adequately sized, free of broken components or deterioration which may compromise the load bearing structural integrity.
  - b. Design and implement structural reinforcements or reconstruction as necessary.
2. Above grade masonry unit block or brick shall be reasonably stable, plumb and sound with no missing units or voids.
3. Pointing of mortar joints shall be specified as necessary to assure the continued integrity of the structural assembly.
4. New below grade structures to conform to Chapter 18 of IBC as appropriate.
5. Basement floors:
  - a. Mechanical rooms - Provide sound concrete floors with raised housekeeping pads for equipment.
  - b. Tenant accessed utility spaces (storage, laundry rooms, etc.) – provide sound concrete floors.
  - c. Dead spaces –
    - i. provide concrete rat slabs,
    - ii. where earthen floors are to remain, provide wear layer of peastone (or similar suitable material) over vapor barriers.
6. Moisture mitigation
  - a. Water & damproofing – where possible and as may be required by existing conditions of groundwater & stormwater intrusion into subsurface portions of buildings, provide waterproofing or damp proofing as appropriate.
  - b. Provide vapor barriers covered with a wear layer of peastone over earthen basement or crawl space floors to remain.
  - c. Ventilation of basements and crawl spaces per IBC – Chapter 1203.

**C. MASONRY COMPONENTS** (CSI DIVISION 4)

1. Buildings with masonry bearing walls shall be examined for their structural integrity. Existing masonry building components shall be examined to assure sound condition, and repaired as necessary to provide the load bearing capacity, resistance to water penetration, and aesthetic quality to assure the assemblies will perform for the purpose intended.

- a. Masonry shall be plumb, and structurally sound.
2. Repair or replace deteriorated portions or missing units.
  - a. Brick veneer shall be sound, or repaired to be sound.
3. Masonry mortar joints shall be sound, and free of loose or deteriorated mortar, with no voids.
  - a. Pointing of mortar joints shall be specified as necessary to assure the continued integrity of the structural assembly, and prevent water intrusion.
4. Historic masonry designated to remain shall be restored to sound serviceable condition, and in accordance with Section 106 of National Historic Preservation Act.
  - a. Where masonry is considered historic, repairs will be carried out utilizing the Secretary of the Interior's "Standards of Rehabilitation" and related NPS Preservation Briefs for "Repointing Mortar Joints on Historic Masonry Buildings"
5. Chimneys
  - a. Assure structural integrity & reconstruct & point as necessary
  - b. If used for fuel heating appliances – provide lining as may be required by code and as prescribed by the heating appliance manufacturer.

#### **D. STRUCTURE**

1. A qualified professional shall examine each building's load bearing structure, and assess its existing condition to determine suitability of continued use.
2. In general, structure evaluation and design shall be in conformance with IBC – Chapter 16, per the State Fire & Building Code.
  - a. In most residential rehab projects where there is no change in use, it is not expected that the structure will be brought up to new construction standards.
  - b. Consideration shall be given if there are any proposed changes in use which would impact the historical loading.
3. Deficiencies identified shall be addressed and repairs designed and specified as necessary to correct such conditions:
  - a. Repairs shall be made to any deteriorated load bearing structural elements.
  - b. Reinforce, install supplemental or replace structural members determined not to be adequate for use.

#### **E. ENCLOSURE - SHELL (CSI DIVISION 7)**

1. Roofing
  - a. Existing
    - i. Examine existing roofing and flashing systems to determine suitability for continued use. Continued life expectancy of existing roofing should be a minimum of 20 years, or covered by the capital plan.
    - ii. Repair existing roofing as required.
    - iii. Existing historical slate roofs shall be repaired in accordance with the Secretary of the Interior's "Standards for Rehabilitation" project requirements if applicable.
  - b. New Roofing
    - i. New roofing shall be installed where existing roofing does not meet requirements for continued use.
    - ii. New roofing system components shall be compatible, and include - the nail base, the underlayment layer, ice & water shield self-adhesive membrane flashings, metal flashings and roofing.
      - Strip existing roofing and dispose of properly.
      - Examine exposed existing substrate for structural soundness
      - Install new roofing system per code and per NCRA trade practices, and manufacturer specifications.
      - Flashings – deteriorated flashings shall be replaced, and the weather proof integrity of the roof system shall be assured.
  - c. Ventilation
    - i. Roof assemblies shall be properly ventilated in accordance with applicable code requirements, and appropriate building science detailing.
2. Exterior Finishes
  - a. Cladding
    - i. Wood Siding –

- Examine existing siding for soundness – shall be free of major cracks, rot, and other deterioration which may compromise its useful life and be suitable to hold exterior paint.
  - Siding shall be free of gaps and holes and provide continuous weatherproof system.
  - Repair or re-side as necessary to provide a weather resistant enclosure.
  - Replace existing wood siding as necessary in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
- ii. Masonry
- Masonry bearing walls and veneers shall be restored as necessary
    1. Refer to Section C – Masonry
    2. Refer also to Section F.2.b for insulation requirements
    3. All work on historic masonry shall be done in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
- iii. Other existing cladding system types and materials shall be repaired and/or restored in-kind with matching or similar materials to provide a durable weather resistant enclosure.
3. Trim – Exterior trim and architectural woodwork.
- a. Existing wood trim:
- i. Existing trim to remain must be sound, free of defects & deterioration which compromises its use.
  - ii. Repair and restore trim to usable condition. Patch or replace in kind any deteriorated wood trim components.
  - iii. Repair of historic woodwork & trims shall be in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
- b. New wood trim shall be installed in a workmanlike manner. Reference may be made to Architectural Woodwork Institute (AWI) standards.
- c. Other trim materials (PVC, cementitious, etc.) which are suitable may be used as appropriate and shall be installed per manufacturer’s recommendations.
- d. Trim which is part of the weather tight enclosure shall be flashed or caulked with joint sealers as necessary to prevent water intrusion.
4. Paint
- a. In general, all existing exterior wood surfaces shall receive new paint coatings, except as appropriate due to the recent application of paint and/or the sound condition of existing coatings
  - b. Examine surfaces and apply paint only to sound acceptable materials / surfaces.
    - i. Prepare surfaces properly, removing loose or peeling previous paint.
    - ii. Paint prep shall be done in accordance with applicable lead safe standards. (See Section N.1.b)
  - c. Before painting, assure that any moisture issues which may compromise the life expectancy of the paint system are remedied.
  - d. Exterior paint systems shall be compatible, and installed in accordance with manufacturers’ specifications.
5. Porches, decks & steps
- a. Existing porches, decks, steps & railings proposed to remain shall be examined and repaired as necessary. Repair & reconstruction shall be carried out to assure that they will have a continued useful life of 20 years, or covered by the capital plan.
    - i. Inspect structure for soundness and reconstruct any deteriorated members as required.
    - ii. Install new support piers as may be required.
    - iii. Patch existing decking with matching materials, or install new durable decking.
  - b. Railings – shall be sound and adequately fastened to meet code requirements for structural loading. Repair or replace in-kind as appropriate.
    - i. Shall meet code requirements for height of protective guards, or have supplemental guards installed.
  - c. Steps shall be safe and sound and meet applicable codes, with railings as necessary.
  - d. Historic porches designated to remain shall be restored to sound serviceable condition, and in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
  - e. All porch elements shall be able to withstand the weather elements to prevent premature deterioration.

**F. ENCLOSURE – THERMAL (CSI DIVISION 7)**

1. Energy Efficiency - In general – most buildings will be rehabbed with a goal of increasing the thermal shell efficiency.
  - a. All VHCB HOME funded projects shall be subject to the VHCB “Policy on Energy Efficiency and Water Conservation in Multifamily Residential Properties”. Contained within that policy are the VHCB & VHFA “Multifamily Energy Design Standards”. As outlined in those standards all projects will either achieve the target energy efficiency objectives of the standard or present VHCB with an operational case for project sustainability pursuant to the financial structure of the project.
  - b. In both the design and implementation of project rehabilitation scopes of work particular emphasis should be made to maximize the effectiveness of the energy efficiency related work scopes.
2. Insulation
  - a. Insulation levels shall conform to the VHCB “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
  - b. Masonry walls shall be insulated utilizing current building science detailing to ensure ongoing integrity of masonry systems.
3. Air sealing – comply with the Vermont Multifamily Air Sealing Protocol (MASP) per the VHCB “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
  - a. Attention must be paid to the air barrier of each building, and should be well thought out, detailed, and carefully executed.
  - b. Blower door testing shall be performed to verify compliance and successful execution.
4. Indoor air quality
  - a. In general, all thermal upgrades to a building will take into consideration indoor air quality and moisture control/mitigation, and apply the current state of the art building science in this regard. Treatment of existing stone, concrete or masonry basement walls, and of existing basement earthen floors or uninsulated basement slabs, will be taken into consideration with regard to the need for moisture mitigation.
5. Ventilation
  - a. Venting of crawl spaces, attics and sloped ceilings shall be per code.
  - b. See Section E.1.c for roof assembly ventilation.

**G. ACOUSTICAL TREATMENTS –**

1. Dwelling units separated acoustically using Chapter 1207 of IBC as a guideline minimum standard.

**H. DOORS (CSI DIVISION 8)**

1. General
  - a. Doors to meet code requirements of NFPA 101 - Chapters 7.2, 8.3, 30.3.6.2 & 30.2.2.2
  - b. Meet egress requirements for dimensions, swing and clearances, and be accessibility compliant as required.
  - c. Be sound and secure.
  - d. New doors shall be installed per manufacturers’ recommendations & standard trade practice standards
  - e. Flash properly, and have shim spaces insulated.
  - f. Existing doors to remain – should be examined and determined to be suitable for reuse with a remaining life after restoration of 20 years, or covered by the capital plan.
    - i. Restore as required to provide useful life.
    - ii. Shall be tested and modified as necessary to operate properly.
    - iii. Install new weather stripping and sweeps to provide seal against weather elements and air infiltration.
    - iv. Historic doors designated to remain shall be restored to sound serviceable condition, and in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
2. Apartment doors
  - a. Apartment unit entry doors shall be fire rated as required.
3. Other doors – Access doors shall meet code requirements for fire rating.
4. Door hardware – door hardware shall operate properly, be secure and shall meet accessibility standards and NFPA 101 – Chapters 7.2, 8.3, 30.3.6.2 & 30.2.2.2.

**I. WINDOWS (CSI DIVISION 8)**

1. Windows shall be of legal egress size when required by code



- a. In townhouse apartments - existing windows which are non-conforming egress size shall be reviewed and meet the Vermont Fire & Building Code amendment to NFPA – 101 Chapter 24.2.2.3.3
- 2. Existing windows:
  - a. Existing windows to remain – should be examined and determined to be suitable for reuse with a reasonable remaining life after restoration of 20 years without undue future maintenance, or covered by the capital plan.
  - b. Capable of providing adequate seal against air infiltration, weather elements, and be determined to be appropriately energy efficient in keeping with the overall energy efficiency strategy of the project.
  - c. Install new weather stripping to provide seal against weather elements and air infiltration.
  - d. Air seal shim spaces & window weight pockets if possible.
  - e. Restore & modify as required to provide useful life.
  - f. Shall be tested and modified as necessary to operate smoothly & properly per code.
  - g. Historic windows designated to remain shall be restored to sound serviceable condition, and in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
  - h. Hardware shall be intact and operational, or be replaced with new hardware as required
- 3. New Windows:
  - a. Where existing windows do not meet the standards for egress, condition, and/or energy efficiency deemed appropriate to the project, they shall be replaced by new windows.
  - b. New windows shall be code compliant, and conform with the VHCBC “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”. Developers are encouraged to consider upgrading to Tier II level by providing R-5 windows.
  - c. Additionally, new window units should be tested assemblies meeting ASTM standards for water penetration & air leakage.
  - d. All windows shall be installed per manufacturer’s installation guidelines and specifications, and shall incorporate appropriate detail, flashings, joint sealers, and air sealing techniques.

**J. INTERIOR FINISHES** (CSI DIVISION 9)

- 1. In general, all interior finishes will be new and installed per manufacturer’s recommendations and the standards of quality construction per trade practices and associations related to the particular product or trade.
- 2. Per chapter 10 of NFPA 101 (Reference also Chapter 8 of the IBC).
- 3. Walls & ceilings
  - a. Where existing finishes are proposed to remain, they will be determined to meet the standard of being sound durable, lead safe, and have a remaining useful life of no less than 20 years, or covered in capital plan.
  - b. Where existing finishes are proposed to remain as part of a fire rated assembly, the State DPS shall assist in making a determination as to the suitability. Refer to Codes as they pertain to archaic materials, and relevant NPS Preservation Briefs.
- 4. Flooring –
  - a. Existing wood flooring in good condition should be repaired, sanded and refinished.
  - b. All new flooring materials (resilient flooring, wood flooring, laminate flooring, carpet, and/or ceramic tile) shall be installed over suitable substrates per manufacturer’s specs and the trade association practices.
- 5. Trim – Wood trim and architectural woodwork.
  - a. Existing trim shall be repaired and restored to usable condition, free of deterioration which compromises its use. Repair of historic woodwork & trims shall be in accordance with the Secretary of the Interior’s “Standards for Rehabilitation” project requirements.
  - b. New wood trim shall be installed in a workmanlike manner. Reference may be made to AWI standards.
- 6. Paint - In general, all interior ceiling, wall, and trim surfaces shall be receive renewed coatings of paint (or other – clear / stain) finishes. Painting shall be done in workmanlike manner, and in accordance with the manufacturer’s recommendations. All painting including preparation of existing surfaces shall be done in a lead safe manner (See Section N.1.b)

**K. SPECIALTIES** (CSI DIVISION 10)

- 1. Toilet accessories – each bath will have appropriate accessories such as towel bars, robe hooks, bath tissue holders, etc., installed and securely fastened in place. Accessories shall be located per accessibility requirements where necessary.

2. Medicine cabinets & mirrors – install in each apartment bath as appropriate.
3. Signage & identification – building signage shall be provided as appropriate:
  - a. Including building address 911 #'s, apartments identification, building directory, exits, stairways, common & utility spaces, etc. shall be in conformance to NFPA 101 – Life Safety Code, and be accessibility compliant & 911 approved.
4. Exit signage will be provided as required by code and be accessibility compliant as required.
5. Fire protection specialties – provide fire extinguishers in buildings, and in apartments as required by code and/or by state or local fire authorities. Locate as directed by authorities.
6. Shelving – provide durable, cleanable shelving for pantries, linen closets, clothes closets and other storage as appropriate, securely fastened in place.

**L. EQUIPMENT** (CSI DIVISION 11)

1. All new equipment to be ENERGY STAR® rated.
2. Existing equipment to be retained and continued to be used shall be in serviceable condition with an expected useful life of 20 years, or covered by the capital plan.
3. Equipment shall conform to the VHCB “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
4. Kitchen appliances –
  - a. provide new full size (30” – 4 burner) stove and refrigerator in each apartment.
  - b. Existing appliances to be reused shall be in good and serviceable condition.
  - c. Provide other appliances (microwaves) as may be appropriate to the project.
  - d. All appliances in accessible apartment units shall be accessibility compliant, and located in an arrangement providing required clear floor spaces.
5. Laundries –where adequate space is available and when appropriate to meet the project goals, washers and dryers may be provided in laundry rooms or in apartments.
  - a. Heat pump dryers are encouraged where appropriate and readily available.
  - b. Where a project is served by natural gas, consideration of the use of natural gas dryers is encouraged. In projects not served by natural gas, propane fired dryers should be considered for cost of operation reasons where feasible and appropriate.
6. Solid waste handling – Provide trash & recycling receptacles as appropriate to enable the tenants and property management staff to handle and store solid waste in compliance with Vermont law.
7. Playground equipment – Provide safe, code approved new playground equipment if a playground is appropriate pursuant to VHCB's Policy for Funding Affordable Housing Projects.

**M. FURNISHINGS - CASEWORK** (CSI DIVISION 12)

1. Kitchen cabinetry & counters
  - a. Existing cabinetry &/or countertops proposed to remain shall be in good condition with a remaining useful life of 20 years, or covered by the capital plan.
  - b. New cabinetry
    - i. Shall be of good quality – meeting ANSI/KCMA A161.1-2012 “Performance & Construction Standards for Kitchen Cabinetry and Bath Vanities” standards. Other industry standards for cabinetry may be used as guidelines such as the Kitchen Cabinet Manufacturer’s Association (KCMA) “Severe Use Specification – 2014”, the Architectural Woodwork Institute’s (AWI) Woodwork Standards, and Cabinet Fabrication Handbook.
    - ii. New counters shall be provided with a cleanable sanitary surface material impervious to water such as high pressure laminate (HPL).
      - Shop fabricated as one piece assembly where possible. Seal field joints.
      - Install level, and securely fastened to cabinetry
2. Bath cabinetry & counters – vanity lavatory tops, when used, should be one piece integral bowl with integral backsplash

**N. SPECIAL CONSTRUCTION** (CSI DIVISION 13)

1. Hazardous materials & remediation – see “VHCB Policy Position on Lead-Based Paint and Other Toxic and Hazardous Materials” - May 2001:
  - a. Asbestos – project will be assessed for the existence of asbestos containing building materials by qualified professional:
    - i. National Emission Standards for Hazardous Air Pollutants (NESHAP) apply.
    - ii. Removal of asbestos shall be carried out per Federal EPA & State regulations & rules.
  - b. Lead - Health & Safety and Lead Safe Housing:
    - i. All scopes of work performed pursuant to this rehabilitation standard shall support the maintenance of project compliance with the Vermont Rental Housing Health Code. Current code is available at [Vermont Rental Housing Code](#).
    - ii. Lead-Based Paint
      - Federal and state regulations related to lead-based paint apply to target housing, which is defined as any housing constructed prior to 1978, except housing for the elderly or persons with disabilities (unless a child of less than 6 years of age resides or is expected to reside in such housing for the elderly or persons with disabilities) or any zero-bedroom dwelling. Rehabilitation of target housing must be completed in a manner which insures the health and safety of workers and residents, especially children. A number of regulations apply when lead painted surfaces are disturbed in residential properties, primarily requiring the appropriate training of workers and the use of safe work practices. In some cases, use of federal funds for rehabilitation will trigger a higher level of lead paint treatments based on the amount of federal money being used. The following regulations must be adhered to during all rehabilitation of target housing.
    - iii. Federal Regulations
      - HUD Lead Safe Housing Rule (Title 24, Part 35) – Requires various levels of evaluation and treatment of lead paint hazards when federal money is used for rehabilitation of target housing. Assistance from VHCB’s Lead Hazard Reduction Program insures all requirements of this Rule are met. More information is available at: [HUD Lead Safe Housing Rule](#)
      - EPA Renovation Repair and Painting Rule (40 CFR Part 745) – Requires contractors conducting renovation, repair or maintenance that disturbs paint in target housing or child-occupied facilities to be licensed by EPA and use lead safe work practices to complete the work. Developers must insure contractors are properly trained and licensed. More information is available at: [EPA Renovation Repair and Painting Rule](#)
      - HUD/EPA Disclosure Regulations (Title 24, Part 35, Subpart A) – Requires owners of target housing to disclose all lead paint records and related information to potential buyers and/or tenants. More information is available at: [HUD EPA Disclosure Rules](#)
      - OSHA Lead in Construction Rule (29 CFR Part 1926.62) - Proscribes personal protection measures to be taken when workers are exposed to any lead during construction projects. More information is available at: [OSHA Lead in Construction Rule](#)
    - iv. Vermont Regulations Title 18, Chapter 38
      - Vermont law requires all work that disturbs paint in target housing and child care facilities to be completed using lead safe work practices. Rehabilitation completed according to the federal regulations described above will generally fulfill this requirement. Vermont does ban certain unsafe practices that are allowed under some of the federal regulations, including power sanding and grinding, dry scraping, and use of certain kinds of paint strippers. More information about Vermont’s law is available at: [VSA Title 18 Chapter 38](#)
      - It is important to note that Section 1760 of the Vermont law prohibits unsafe practices on any lead paint surface, and “all paint in target housing and child care facilities is presumed to be lead-based unless a lead inspector or risk assessor has determined that it is not lead-based.” [Unsafe Work Practices](#)
      - Section 1759 of the Vermont law also requires owners of target rental housing to complete certain Essential Maintenance Practices (EMPs) to reduce the risk of resident children ingesting lead. These practices include regular inspections for deteriorated paint, prompt and safe repairs, and submission of annual compliance statements online at <https://secure.vermont.gov/VDH/emp/>. More information is available at the web site listed above or at [Essential Maintenance Practices](#).

- Any questions regarding compliance with lead paint regulations should be directed to the VHCb Lead Hazard Reduction Program at (802) 828-5064 or the Vermont Department of Health – Asbestos and Lead Regulatory Program at (800) 439-8550, (802) 863-7220.

**O. CONVEYANCE SYSTEMS** (CSI DIVISION 14)

1. Elevators may be installed when appropriate and possible, when such elevator is part of the project's program goals, or as required by code
  - a. Installed per code NFPA 101 - Chapter 9.4
  - b. ASME 17.1 Safety Code for Elevators
  - c. Vermont Elevator Safety Rules
2. Existing elevators and lifts may be retained if they are appropriate to the use of the building and in serviceable condition with an expected useful life of 20 years, or covered by the capital plan, and approved by Agencies having jurisdiction.

**P. MECHANICAL** (CSI DIVISION 15)

1. General:
  - a. All mechanical systems shall be designed by a mechanical engineer or other qualified professional.
  - b. Energy efficiency:
    - i. All VHCb HOME funded projects shall conform to the VHCb "Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties.
    - ii. As outlined in this standard all projects will either achieve the target energy efficiency objectives of the standard or present VHCb with an operational case for project sustainability pursuant to the financial structure of the project.
    - iii. In both the design and implementation of project rehabilitation scopes of work particular emphasis should be made to maximize the effectiveness of the energy efficiency related work scopes.
  - c. All mechanical systems shall meet all applicable codes:
    - i. Vermont Fire & Building Code & NFPA 101 - Life Safety Code
    - ii. International Plumbing Code – Vermont Plumbing Safety Rules as adopted as part of the Vermont Fire & Building Code
    - iii. Vermont Energy Codes as they may apply:
      - Vermont Residential Building Energy Standards (RBES) for buildings of three stories or less (and/or)
      - Vermont Commercial Building Energy Standards (CBES) for buildings of 4 stories or more, and some mixed use buildings.
    - iv. Plumbing fixtures will be accessibility compliant as required
    - v. Fire & Building Code – Section 6 as pertains to boilers
2. Fire protection
  - a. In general, all buildings under this program shall have fire suppression as required by applicable codes with approved sprinkler system installed as required by NFPA 101 & NFPA 1, and approved by the Vermont Department of Public Safety:
    - i. System design to conform to applicable NFPA standard 13 or 13R
    - ii. System calculations & design shall be done by a person holding a NICET Level III certification or a Vermont Licensed Fire Protection Engineer.
    - iii. System installed by State approved persons holding appropriate TQP certificates.
    - iv. Underground water services for sprinkler system shall meet NFPA 24
    - v. Provide fire pumps, standpipes, and fire department connection as required per NFPA 13, 14 & 25.
  - b. Where possible – piping for the sprinkler system shall be concealed.
3. Plumbing
  - a. Where existing components of a system are to be reused, they will be examined and determined to be in good condition, code compliant and have a remaining useful life of a minimum of 20 years, or covered by the capital plan. Substandard or critical non-code compliant components shall be replaced.

- b. Water savings – shower heads & faucet aerators as required by the VHCBC “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
  - c. All fixtures, piping fittings & equipment shall be lead free in accordance with the Vermont Plumbing Rules.
  - d. Kitchen fixtures - New sinks & faucets, and associated plumbing to be installed in each apartment.
  - e. Bath fixtures - New water saver toilets, tubs & tub surrounds, lavatory sinks & faucets to be installed in each apartment.
    - i. Three & four bedroom apartments are encouraged to be designed to include 1 ½ baths minimum where adequate space is available.
  - f. Provision for laundry rooms or laundry hook-ups may be made per project’s program requirements.
  - g. Provision for other utility plumbing for janitor sinks, floor drains, outdoor faucets, drains for dehumidification systems, etc. may be made as desired or required.
4. Heating
- a. System design:
    - i. Designed and constructed to conform with the VHCBC “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
    - ii. Where existing components of a system are proposed to be reused, they will be examined and determined to be in good & serviceable condition, code compliant and have a remaining useful life of a minimum of 20 years, or covered by the capital plan.
  - b. Temperature control - The temperature in each apartment shall be individually thermostatically controlled. Provide adequate heat in common spaces.
  - c. Install pipe insulation with minimum 1.5” wall thickness
  - d. Minimum equipment efficiencies per Efficiency Vermont’s Energy Code Plus guidelines
  - e. Motors & pumps – high efficiency Brushless Permanent Magnet Pumps (BLPM) with variable frequency drives (VFD) per VMMPRP
  - f. Control wiring & control strategies per VMMPRP with outdoor temperature reset.
  - g. Finned Tube Radiation – where used - high output heavy gauge enclosure baseboard finned tube radiation is recommended to provide a more durable product with a longer expected useful life. Replace existing as appropriate.
5. Ventilation
- a. Code compliant indoor air quality will be addressed by the installation of either exhaust only or balanced (heat recovery) ventilation systems as required by:
    - i. Fire protection of system ducts per NFPA 101 – Chapter 9.2
    - ii. ASHRAE 62.2
    - iii. REBS or CBES
    - iv. VHCBC “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
    - v. Balanced mechanical ventilation systems are encouraged.
  - b. Ventilation controls shall be per applicable codes
6. Domestic Hot Water:
- a. System shall be designed as required for Efficiency Vermont certification level
  - b. Install pipe insulation per code.
- Q. ELECTRICAL** (CSI DIVISION 16)
- 1. Project electrical design should be done by a licensed electrical engineer, or other qualified professional.
  - 2. Project electrical must be installed by a licensed electrician
  - 3. Energy efficiency:
    - a. Designed and constructed to conform with the VHCBC “Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties”.
  - 4. Design shall be comply with all the applicable codes:
    - a. Vermont State Fire & Building Code
    - b. NFPA 101 – Life Safety Code
    - c. NFPA 70 - National Electrical Code
    - d. NFPA 72 - National Fire Alarm and Signaling Code

- e. NFPA 20 - Standard for the Installation of Stationary Pumps for Fire Protection
- 5. In general, the electrical system should be new throughout a building:
  - a. Where existing service entrances, disconnects, meters, distribution wiring, panels, and devices are proposed to remain – they will be examined and determined to be in good condition, code compliant and have a remaining useful life of a minimum of 20 years, or covered by the capital plan. The designer, in concert with the State electrical inspector, shall examine the system & equipment. Existing components of the electrical system may be reused as appropriate. Substandard or critical non-code compliant components shall be replaced.
- 6. Utility connections shall be installed per the rules & regulations of the electrical utility.
- 7. Electrical service & metering:
  - a. The service entrance size shall be calculated to handle the proposed electrical loads.
  - b. Metering and disconnects shall be per code & mounted at approved locations.
- 8. Elevator wiring shall conform to the ANSI 17.1 as modified by the Vermont Elevator Safety Rules.
- 9. Electrical distribution system:
  - a. Lighting and receptacle circuits shall be designed per code.
  - b. Locations & layout of devices & lighting to be logical & accessibility compliant where required.
  - c. Provision shall be made for the wiring of dedicated equipment circuits and connections for heating, ventilation equipment / exhaust fans, pumps, appliances, etc.
- 10. Artificial Lighting shall be provided using IBC 1205 as a minimum guideline.
  - a. All lighting shall be in accordance with the Vermont Residential or Commercial Energy Standards (RBES or CBES) and meet the minimum program requirements of Efficiency Vermont's Multifamily Checklist as required by the VHCB "Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties". Lighting controls and control strategies shall also be in accordance with RBES or CBES, and meet the minimum program requirements of Efficiency Vermont's Multifamily Checklist as required by the VHCB "Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties".
  - b. Developers are encouraged to upgrade to Energy Star® Category.
- 11. Site lighting with shielded fixtures may be provided to illuminate parking and pedestrian walkways, and will conform to local zoning (& Act 250 if necessary).
  - a. Energy efficient lighting shall meet the minimum program requirements of Efficiency Vermont's Multifamily Checklist as required by the VHCB "Policy on Energy Efficiency & Water Conservation in Multi-family Residential Properties" .
- 12. Emergency & Exit lighting / illuminated signage shall be per the Life Safety Code - NFPA 101.
- 13. Fire detection & alarms:
  - a. Shall be installed as required by code. NFPA 101 – Chapters 9.6, 30.3.4 and/or 31.3.4, and comply with NFPA 72, and NFPA 1.
  - b. Smoke detectors shall be installed per NFPA 30.3.4.5 and 9.6.2.10.
  - c. CO detectors shall be installed per Vermont State Fire & Building Code & NFPA 101 – Chapter 30.3.4.6 & NFPA 720.
  - d. Where required – system annunciation shall be in accordance with NFPA 1.
- 14. Communication low voltage wiring – provisions for TV, telephone, internet data, security, and intercoms should be considered and installed as appropriate to the project's use & livability.
- 15. PV Solar – an optional solar powered photovoltaic panel system may be installed in accordance with the National Electrical code, State energy code, and the regulations of the governing utility.