Minnesota Overlay to the Green Communities Criteria™

Multifamily and Single Family

2009-2010 Overlay for use with
Green Communities Criteria 2008

MINNESOTA green communities™

A collaboration of the Greater Minnesota Housing Fund, the Family Housing Fund, and Enterprise

Minnesota Housing Finance Agency

How to use this Document

This Minnesota Overlay to the Green Communities Criteria 2008 document applies to **Multifamily and Single Family new construction and rehabilitation**[1] projects requesting Minnesota Housing financing and is designed to be used in conjunction with the national Green Communities Criteria 2008, available in Adobe PDF format at: www.mngreencommunities.org/resources/.

Green Communities Criteria apply to specific Minnesota Housing multifamily and single family development and owner-occupied rehabilitation programs which are referenced in the Sustainable Housing Design Standards Matrix on Minnesota Housing's website at the following link: www.mnhousing.gov/idc/groups/multifamily/documents/webcontent/mhfa_008271.pdf.

For new construction (multifamily and single family), the mandatory items are as marked as such in the Green Communities Criteria, and should be reviewed in conjunction with this Minnesota Overlay document.

For rehabilitation, the multifamily and single family mandatory criteria are listed in the table below. In addition, any other improvements enacted upon at the time of rehabilitation (replacement of equipment, systems, building components, or assembly of components) are required to comply with the corresponding mandatory Green Communities Criteria, except when the criterion specifically denotes new construction only.

MANDATORY REHABILITATION REQUIREMENTS	
Multifamily	Single Family
1-1	1-1
3-1	3-1
7-15	5-1b
8-1	7-10b
8-2	7-15
8-3	8-1
	8-2
	8-3

Existing equipment and/or appliances that remain (not improved) are exempt from this requirement. For the purposes of this document,

[1] Single family rehabilitation requirements apply to acquisition-rehabilitation-resale proposals under the Community Revitalization Fund (CRV) and owner-occupied rehabilitation projects under the Rehabilitation Loan Program (RLP); owner-occupied rehabilitation proposals made under CRV are encouraged to apply Minnesota Green Communities criteria.

Minnesota Housing does not differentiate between moderate and substantial rehabilitation.

Unless exempt or a waiver is granted (see below), conformance to all of the mandatory national Green Communities Criteria 2008 as modified in this document is required. All mandatory criteria in the national Green Communities Criteria 2008 documents, if not specifically modified herein, are applicable as written.

Please be aware that this Minnesota Overlay to the Green Communities Criteria 2008 document is subject to periodic revision and update. Such revisions and updates will not be made unless agreed upon by Minnesota Housing and both Greater Minnesota Housing Fund and Family Housing Fund for Minnesota Green Communities. Refer to Minnesota Housing's and/or Minnesota Green Communities' website for the most current version.

Units built with assistance from Minnesota Housing are not subject to the point system, home scale size limit or income limits listed in the national Green Communities Criteria 2008. Applicants responding to a Request for Proposals (RFP) and approved Rehabilitation Loan Program (RLP) Lenders are encouraged to pursue leverage from other sources, including Green Communities national funds from Enterprise, if applicable, and should note that eligibility and funding criteria may differ between these and other green building standards.

Exemptions and Waivers

Check with specific funders to determine how these criteria apply for specific types of projects.

Compliance with specific criteria may be waived if the borrower/developer/lender can demonstrate that the criteria creates a tangible hardship or is inadvisable for a specific project. Alternate means of meeting specific criteria intent will also be considered when necessary.

Other Resources

As you consider your project, this page may be a helpful resource: http://www.greencommunitiesonline.org/tools/

Section 1: Integrated Design

1-1	Green Development Plan
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

Add the following: Applicants and program lenders must complete the Method of Satisfying Green Communities Criteria and Certification form at time of application, or in the case of the RLP, at time of loan commitment. Once complete and approved by Minnesota Housing, this form may serve as the Green Development Plan.

The following certifications are attached to the Method of Satisfying Green Communities Criteria and Certification form and are required at various stages of the development process to verify compliance with all of the MANDATORY national Green Communities Criteria, as amended via the *Minnesota Overlay,* as follows:

Multi Family

- Certification of Intent to Comply – at time of initial application. Signed by Borrower/Developer and Architect.

Single Family

- Certification of Intent to Comply – at time of initial application for CRV and at time of loan commitment for the RLP. Signed by the Community Revitalization Fund (CRV) contract administrator or RLP Lender (minimum requirement) and Architect (if applicable).

  - for rehabilitation under CRV, proposals must complete the Method of Satisfying Green Communities Criteria with an anticipated range of rehabilitation items. Upon unit completion, the Method of Satisfying Green Communities Criteria must be completed for each completed unit. For RLP,

	complete and submit the Methods of Satisfying Green Communities Criteria with the overall project Scope of Work.
• Certification of Contract Document Compliance – at or prior to loan closing, or prior to end loan commitment. Signed by Borrower/Developer and Architect.	• Not applicable
• Certification of Compliance - at end of construction. To be signed by the Borrower/Developer, Architect and Contractor.	• Certification of Compliance – at end of construction. Signed by the Contract Administrator for CRV or RLP Lender, Architect (if applicable), and General Contractor (if applicable). Final certification is required by the entity that pulled the building permit in addition to the Contract Administrator.

Intent and Things to Consider:

For more information on putting together your Green Development Plan, see also:

mnhousing.gov/idc/groups/public/documents/document/mhfa_002395.rtf

www.aia.org/SiteObjects/files/18-11-02.pdf

www.hoksustainabledesign.com/pdf/10KeySteps.pdf

www.gmhf.com

www.csbr.umn.edu

Section 2: Site, Location and Neighborhood Fabric

2-1a LH	**Smart Site Location - Proximity to Existing Development: New Construction**
	MANDATORY Except for infill or rehabilitation projects

Modify the National Green Communities Criterion 2008 as follows:

How:

Incorporate the following: For multifamily, the site map criteria may be satisfied by submitting the Site Location – Proximity to Services map, Master Application Checklist item A7.

2-1c LH	**Smart Site Location - Proximity to Services: New Construction**
	MANDATORY Except for infill or rehabilitation projects

Modify the National Green Communities Criterion 2008 as follows:

How:

Add the following: The following facilities shall be added to the list of eligible facilities:

- **Arts or entertainment center**
- **Police station**
- **Fire station**
- **Fitness center/gym**
- **Restaurant**
- **Neighborhood-serving retail**
- **Office building or major employment center**

For multifamily, this criteria may be satisfied by submitting the Site Location – Proximity to Services map, Master Application Checklist item A7.

For Single Family, modify the proximity criteria to the following:

Development location	Proximity needed to meet criteria		
Metropolitan Statistical Areas (MSAs)	2 facilities within ¼ mile	OR	4 facilities within ½ mile
All other locations	Two facilities within one mile		

2-2	**Compact Development: New Construction**
	MANDATORY Except for rehabilitation projects

Modify the National Green Communities Criterion 2008 as follows:

How:

In addition to everything detailed under this item in the national Green Communities Criteria 2008, the net density calculation is modified as follows:

Net density is measured by taking the total dwelling units after construction, divided by the acreage of the entire tract down to one decimal point, minus dedicated acreage of public street rights-of-way, riparian and wetland buffers, open space that has been dedicated through a conservation program, and any site area designed as non-buildable area.

Some examples of non-buildable areas include land that is not economically feasible to be developed, such as easements, utility fall zones, unsuitable soil, steep grades, water features, wetlands, or nature preserves. Net density calculations do not include land that is set aside for future building phases or development.

Compact development net density requirements are modified depending on the location of the development in Minnesota:

	Net Density Required*		
Development type:	Single Family Dwelling Units	Multifamily Townhome	Apartment (e.g., condominiums)
Metropolitan Statistical Areas (MSAs)	5 units/acre	10 units/acre	15 units/acre
All other locations	5 units/acre		

For single family new construction on lots platted before January 1, 2008, with connections to infrastructure (water, sewer, streets) completed, projects are exempt from the density requirements if:

- Constructing 4 or fewer units on contiguous lots*
- Constructing units on scattered sites

*If constructing five or more units on contiguous lots, the density requirement applies.

Intent and Things to Consider:

Add the following: For single family new construction, optimize infrastructure cost savings through minimizing lot frontage. Lot widths of 40'-65' are encouraged for single family detached homes.

Narrowing street width can increase gross density while decreasing development costs and long-term maintenance costs. Narrow streets reduce storm water runoff, reduce traffic speed, and allow more room for sidewalks and landscaping.

2-3	Walkable Neighborhoods – Sidewalks and Pathways
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

Add the following: The actual construction of sidewalks and pathways may be waived for seemingly isolated new construction developments that are not subdivisions, provided that right-of-ways are reserved for future sidewalks or pathways.

A subdivision is hereby defined as a tract of land divided into five or more lots or parcels.

For rehabilitation: The actual construction of sidewalks and pathways may be waived for single family rehabilitation activities.

Intent and Things to Consider:

Add the following: Pedestrian activity and improved safety can be encouraged by placing the garage in the rear or on the side of a home which provides a more traditional residential streetscape.

Section 3: Site Improvements

3-1	Environmental Remediation
	MANDATORY

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Multifamily	Single Family
Refer to Minnesota Housing Environmental Assessment requirement located at: www.mnhousing.gov/housing/architects/multifamily/MHFA_000489.aspx	• Conduct a Phase I Environmental Site Assessment for: - Sites with five or more units where there has been a change in land use from industrial, commercial, institutional or agricultural to residential; - For new construction, where each individual residence where the unit is not connected to a city water supply - - For rehabilitation, where the unit is neither connected to a city water supply or an existing active well; - Where required as a condition of acquisition/purchase. • Developments of five or more new units on previous residential land uses are exempt from this Phase I requirements. • For new construction developments, coordinate this requirement with 2-1a – smart site location, proximity to development.

Intent and Things to Consider:

See national Green Communities Criteria 2008 for intent and things to consider.

3-3 LH	Landscaping
	MANDATORY If providing landscaping

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Provide a tree or plant list, complying with the following criteria: The selection of new trees and plants are at least 50% native species, 100% appropriate to the site's soils and microclimate, and not including invasive species.

Multi Family	Single Family
• New construction: provide a landscape plan – certified by an Architect, Civil Engineer or Landscape Architect	• Certified tree or plant list – certified by an Architect (if applicable), Landscape Architect (if applicable), or developed in strict accordance with the resources listed below
• Submission required – at construction documents stage	• Certification of Intent to Comply – at time of initial application.

Intent and Things to Consider:

For more information on developing a tree or plant list, see also:

http://dotapp7.dot.state.mn.us/plant/faces/index.jsp

http://www.extension.umn.edu/distribution/naturalresources/DD0486.html

http://files.dnr.state.mn.us/assistance/backyard/gardens/native_plant/nativelandscaping.pdf

http://www.dnr.state.mn.us/invasives/terrestrialplants/index.html

Section 4: Water Conservation

4-1b LH	**Water-Conserving Appliances and Fixtures: Rehabilitation**
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

If appliances and/or fixtures are scheduled for replacement, that replacement shall comply with the 4-1a overlay standard.

4-2 LH	**Efficient Irrigation**
	MANDATORY If irrigation is necessary

Modify the National Green Communities Criterion 2008 as follows:

How:

Install irrigation system designed by an EPA Water Sense certified professional, qualified landscape professional or qualified sprinkler contractor.

Section 5: Energy Efficiency

5-1a LH	**Efficient Energy Use: New Construction**
	MANDATORY New Construction

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Provide verification demonstrating energy efficiency by meeting one of the options for the applicable housing category as follows:

Single Family Dwelling Units & Multifamily Townhomes: This includes all residential buildings within the scope of Minnesota's Residential Energy Code (Chapter 1322) including all buildings with the following characteristics: not more than three stories in height, contains no conditioned common space that is shared between dwellings, and each dwelling unit contains a separate means of egress. Energy efficiency shall meet one of the following options:

1. DOE Energy Star Builder Option Package (BOP) Option: For this option components of residential structure must meet current DOE Energy Star BOP specifications for the applicable climate zone. (new construction units funded through the single family RFP are required to participate in the Energy Efficiency Verification pilot subject to pilot program protocols; units funded in the multifamily RFP do NOT require verification and field-testing); **OR**
2. HERS Index of 80 Option: For this option an Energy Star Home Energy Rating System (HERS) Index of 80 is required as established by the Residential Energy Services Network (RESNET) policy effective July 1, 2006.

Apartment Buildings & Condominiums: This includes all residential buildings within the scope of Minnesota's Commercial Energy Code (Chapter 1323) including all buildings that have at least one of the following characteristics: any conditioned space shared between units, **or** dwelling units without a separate means of egress, **or** at least four stories. Energy efficiency shall meet one of the following options: Energy performance at least 15 percent better than ASHRAE Standard 90.1 2004 must be demonstrated by either the COMcheck™ and Mechanical Efficiency Option **OR** the Building Energy Simulation Option as described below. Wherever the key energy performance parameters input into the COMcheck™ or Building Energy Simulation software for windows, insulation, lighting and mechanical equipment are not clearly shown on the project plans submitted to Minnesota Housing, performance documentation shall be provided in the form of manufacturer's submittal, manufacturer's literature or a printout of a listing on a third party industry website (such as EnergyStar, NFRC, ARI, etc.) with the applicable make and model clearly highlighted with a clear reference to the plans (e.g. labeling system used in the mechanical schedule).

1. COMcheck™ and Mechanical Efficiency Option: For this option COMcheck™ software (available at no cost from the US Department of Energy at www.energycodes.gov/comcheck/ez_download.stm), shall be used to document improvement in performance above ASHRAE Standard 90.1 2004 for the lighting and envelope. In addition to

documenting the envelope and lighting performance with a report from this software, the firm performing this analysis shall submit a signed letter indicating the project name, date and version of plans used for analysis, the option chosen in the Envelope and HVAC trade-off table (below), and a brief narrative summarizing the attached documentation. Each building using this option must meet **ALL** of the following performance requirements:

- Interior Lighting (Excluding Dwelling Units): 15% better than 90.1 2004 per COMcheck™ software report (using either space by space or whole building method)
- Exterior Lighting: 15% better than 90.1 2004 per COMcheck™ software report
- Domestic Water Heating: The minimum performance is based on the type of water heating equipment per the table below:

Water Heating Equipment	Minimum Performance
Gas-fired tank-type heater, single residential per system (multiples per system not permitted)	Energy Star
Gas-fired tank-type heater(s), commercial	90% thermal efficiency
Gas-fired instantaneous, residential	EnergyStar
Gas-fired instantaneous, commercial	82% thermal efficiency
Electric resistance, < 50 gallons	0.94 Energy Factor
Electric resistance, 50 – 99.9 gallons	0.92 Energy Factor
Electric resistance, ≥ 100 gallons	0.85 Energy Factor
Electric heat pump, residential	EnergyStar
Electric heat pump, commercial	Energy Code
Oil-fired, residential	0.62 Energy Factor
Oil-fired, commercial	81% thermal efficiency
Solar thermal, residential	EnergyStar
Solar thermal, commercial	50% Solar Fraction

- Envelope & HVAC Systems: The combination of envelope and HVAC system performance shall meet or exceed one column in the table below. Limited trade offs between the performance of the envelope and the performance of the heating and cooling equipment are allowed in a way that provides flexibility in design approaches for achieving the 15 percent energy performance improvement. Where commercial or non-listed HVAC equipment has a different rating scale, but clearly equivalent or better performance, it shall be permitted. Where commercial or non-

listed HVAC equipment is not available with equivalent or better performance, it shall not be permitted with the level of envelope performance in the column except for large systems serving only non-dwelling unit spaces or only outdoor air ventilation loads.

Meet All Requirements in Any One Column:		**OR**	**OR**
	Efficient Mechanical System	Balanced Efficiency	Efficient Envelope
Envelope % Better Than ASHRAE 90.1 2004 per COMcheck™ Software Report	**0-7.5%**	**7.5-14.9%**	**15% or >**
Gas-Fired Furnace	94% AFUE	EnergyStar	Meet Energy Code
Oil-Fired Furnace	Disqualified	84% AFUE	
Gas-Fired Boiler	91% AFUE	EnergyStar	
Oil-Fired Boiler	Disqualified	85% AFUE	
Air-Source Heat Pump, Heating Mode	EnergyStar	NM	
Ground Source Heat Pump, Heating Mode	EnergyStar	NM	
Electric Resistance Heat	< 5% of Primary Heating Source	< 5% of Primary Heating Source	
Air Conditioners	EnergyStar	NM	
Air Source Heat Pump, Cooling Mode	EnergyStar	NM	
Ground Source Heat Pump, Cooling Mode	EnergyStar	NM	
District Heating or Cooling	Disqualified	NM	

NM denotes no minimum requirement beyond the Minnesota Energy Code; **OR**

2. Building Energy Simulation Option: For this option, a whole building simulation is used to demonstrate that the whole building energy cost for the as-designed building is at least 15 percent less than a base building that just meets ASHRAE Standard 90.1 2004, the Minnesota Energy Code, or a more stringent energy code. The building simulation and base building comparison shall be performed following the Performance Rating Method outlined in ASHRAE Standard 90.1, Appendix G, version 2004 or later. Documentation of the simulation shall include:

- A signed letter from the firm that performed the modeling indicating the project name, date and version of plans used for model inputs, the energy code used for the comparison base, the percent reduction in energy costs for the as-designed building, and a brief narrative summarizing the attached documentation.
- Summaries of key building envelope and mechanical equipment performance assumptions used in the base comparison and as-designed building shall be provided in a form and with a level of detail that allows windows, insulation, lighting power densities and HVAC equipment efficiency assumptions to be confirmed against the plans (e.g. assumed fixture count, wattage and spaces for each fixture on the schedule).
- A hard copy of a graphical representation of the building envelope and zoning (lighting and HVAC) that was used for modeling.
- A hard copy of a simulation software summary output for both the base building and the as-designed building.

Intent and Things to Consider:

For more information on the Energy Star Builder Option Package for Minnesota, see:
www.energystar.gov/index.cfm?c=bop.pt_bop_minnesota.

For information on the HERS Index see:
www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS.

Multifamily

- Reducing energy and resource consumption and waste - are currently the most cost-effective methods of minimizing the negative environmental impacts resulting from their consumption. To the extent that development resources permit, reduction and waste-elimination of energy and resources should receive the highest priority in the development of sustainable affordable housing. Multifamily developments that propose the on-site development of alternative renewable energy sources (wind, solar, geothermal, etc.) will not receive any preferential funding consideration.

Single Family

- Energy Efficiency Verification Pilot Program (Pilot) – all new construction projects are subject to participation in the Pilot. Minnesota Housing administers the Pilot in which a representative number of units will be subject to third-party energy efficiency and ventilation testing.

See national Green Communities Criteria 2008 for intent and things to consider.

5-1b LH	**Efficient Energy Use: Rehabilitation**
	MANDATORY

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

For multifamily: If a system or component is scheduled for replacement that replacement shall comply with the 5-1a overlay standard.

For single family: (1) Create and implement an energy efficiency improvement plan in accordance with the technical guidelines as outlined in

the *Minnesota Weatherization Field Guide (Chapter 2.1.1)*.

Conduct an energy audit with a blower door test prior to construction, and generate a list of prioritized cost effective improvements for each rehabilitated home, and implement those improvements. This cost-benefit analysis can be performed by using established software or through a manual assessment. At the end of construction a post-renovation inspection and blower door test must be performed.

(2) If replacing heating, cooling, ventilation and/or domestic hot water equipment install EnergyStar rated mechanical systems.

Intent

Utility costs for low-income families can account for 19.5% of household budget (EPA national average 2001). The intent is to maximize financial benefit of energy efficiency and weatherization efforts in moderate renovation projects without adverse impact on home durability, indoor air quality and existing mechanical equipment. Working with a weatherization expert on a plan tailored to the specific conditions of each home will help maximize energy savings and ensure health and safety of residents.

Things to Consider

Check with your utility for rebates or programs that may help off set the cost of weatherization and mechanical equipment replacement.

Resources

Minnesota Weatherization Policy Manual
www.state.mn.us/mn/externalDocs/Commerce/Minnesota_Weatherization_Policy_Manual_070704032633_Master_Manual.pdf

Minnesota Weatherization Field Guide
www.state.mn.us/mn/externalDocs/Commerce/070704030802_Minnesota%20WFG.pdf

Listings of qualified auditors or HERS raters:
www.dunwoody.edu/custom/energyaudit.html#jobs
Minnesota Building Performance Association: www.mbpa.us

5-2 LH	Energy Star Appliances
	MANDATORY If providing appliances

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

If providing appliances, install Energy Star clothes washers, dish washers and refrigerators, **and additional appliances wherever possible.**

Intent and Things to Consider:

See national Green Communities Criteria 2008 for intent and things to consider.

Section 7: Healthy Living Environment

7-2 LH	Low / No VOC Adhesives and Sealants
	MANDATORY

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Unless low / no VOC adhesives and/or sealants will void/invalidate a warranty, specify that all adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District. If a warranty will be voided or invalidated as a result of use of low / no VOC adhesives and/or sealants, use the waiver process on the Method of Satisfying Green Criteria and Certification form citing the reason for warranty invalidation.

Intent and Things to Consider:

See national Green Communities Criteria 2008 for intent and things to consider.

7-4	**Green Label Certified Floor Covering**
	MANDATORY If providing carpeted floor coverings

Modify the National Green Communities Criterion 2008 as follows:

Intent and Things to Consider:

Add the following: Throughout the home, consider non-carpet flooring alternatives such as natural linoleum, Forest Stewardship Council (FSC)-certified or salvaged hardwoods, cork, bamboo, ceramic or stone tile, vinyl, or sealed concrete. In consideration of indoor air quality, consider restricting the use of sheet vinyl to high moisture areas, such as the bathroom and laundry room.

7-5a LH	**Exhaust Fans – Bathroom: New Construction and Rehabilitation**
	MANDATORY

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are connected to a light switch or are equipped with a humidistat sensor or timer, or operate continuously.

Multifamily exhaust rates for new construction and rehabilitation shall comply with ASHRAE 62.1-2007, Table 6-4, where each private bathroom shall include an Energy Star bathroom exhaust fan that provides either: 25 cfm ***continuous*** exhaust; or 50 cfm ***intermittent*** exhaust, wherein the ***intermittent*** exhaust is controlled by either the bathroom light switch, an occupancy sensor, or humidistat, none of which can be overridden by tenant switching or other tenant operation.

Intent and Things to Consider:

Exhaust and ventilation strategy covered by criteria 7-5a, 7-5b, 7-5c, 7-6a and 7-6b must be considered in a holistic, balanced and integrated manner in order to achieve the intended indoor air quality, energy efficiency and long term durability

7-5b LH	**Exhaust Fans – Kitchen: New Construction and Rehabilitation**
	MANDATORY For new construction and rehabilitation

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Install power vented fans or range hoods that exhaust to the exterior. Kitchen exhaust fan may be non-ducted only if the project's Mechanical Engineer determines it is infeasible to do so and there is at least one continuously operating bathroom exhaust fan.

Intent and Things to Consider:

Exhaust and ventilation strategy covered by criteria 7-5a, 7-5b, 7-5c, 7-6a and 7-6b must be considered in a holistic, balanced and integrated manner in order to achieve the intended indoor air quality, energy efficiency and long term durability.

7-6a LH	**Ventilation: New Construction and Rehabilitation**
	MANDATORY For new construction and rehabilitation

Modify the National Green Communities Criterion 2008 as follows:

How:

For single family dwelling units and multifamily townhomes [without common areas] covered by Mn. Energy Code 1322, compliance with Minnesota's code meets or exceeds the Green Communities Criterion requirements for 7-6a.

For Multifamily new construction as defined by Mn. Energy Code 1323, continuous ventilation shall comply with ASHRAE 62.1-2007, Table 6-1, wherein each dwelling unit shall provide 5 cfm/occupant plus 0.06 cfm per square foot of floor area. Efficiency/Studio and 1-Bedroom units will be defined as having 2 occupants; and each additional bedroom thereafter shall be considered as contributing one additional occupant. (E.G.: Two-bedroom units have a total of three occupants; therefore they must provide 15 cfm total for occupants, plus the square footage allotment.) This level of ventilation can be provided by the supply of fresh outdoor air (e.g. outdoor air intake connection to the return plenum of a continuously operating system); exhaust only continuous ventilation (e.g. the bathroom and/or kitchen exhaust fans required in 7.5a and 7.5b); or a combination of supply and exhaust air (e.g. heat recovery ventilation system).

For Multifamily rehabilitation, where ventilation alterations are scheduled, they shall comply with the criterion above.

Intent and Things to Consider:

Exhaust and ventilation strategy covered by criteria 7-5a, 7-5b, 7-5c, 7-6a and 7-6b must be considered in a holistic, balanced and integrated manner in order to achieve the intended indoor air quality, energy efficiency and long term durability.

7-10a	Basements and Concrete Slabs – Vapor Barrier
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

Incorporate the following: Cover all gravel with a vapor barrier with ASTM e 1745 minimum 10 mil thickness class A, 0.05 perms or less for greater puncture resistance.

Exemption: attached or underground vehicular parking garages.

7-10b LH	Basements and Concrete Slabs: Radon
	MANDATORY For new construction and rehabilitation

Modify the National Green Communities Criterion 2008 as follows:

How:

For multifamily rehabilitation: Testing is strongly recommended. Both testing and mitigation are mortgageable expenses.

For single family rehabilitation: Test the home for the presence of radon using the EPA Protocols for Radon and Radon Decay Product Measurements on Homes, Section 3. For CRV, testing should be performed, at a minimum, upon completion of the rehabilitation of the unit. For the RLP, testing should be performed prior to drafting of the Scope of Work in order to accommodate any necessary mitigation work.

If the radon test results in a reading of 4piC/l or more mitigation is required. For required mitigation, use a radon contractor/radon mitigation service provider listed on the Minnesota Department of Health's website. Mitigation work must be performed to the ASTM E2121 standard. Where mitigation is performed, a post-test verifying that radon levels are within an acceptable range is required. Test results should be provided to the homeowner along with supplemental information on radon.

Intent:

Radon is the second leading cause of lung cancer in the United States. Testing and mitigation if necessary will help ensure a healthy living environment.

Things to Consider:

<u>Rehabilitation</u>
The EPA testing protocol allows for either sequential testing or for simultaneous testing (use of a short-term test is allowed) and outlines measurement protocols for testing.

Testing in advance of the rehabilitation work is recommended under all programs. Early detection of the presence of radon above the EPA

recommended action levels could result in a more cost-effective rehabilitation if the work scope identifies and addresses mitigation measures early in the development of the project work scope.

New Construction
The Minnesota Energy Code, art. 1322.2103, Section AF103, requires radon resistant construction for all new one- or two-family dwelling units including townhouses. The energy code includes useful information and diagrams on how to construct the radon mitigation system which is referenced here: https://www.revisor.leg.state.mn.us/rules/?id=1322&view=chapter.

Resources:

Radon Zone Map of Minnesota: www.epa.gov/radon/states/minnesota.html

EPA Protocol: www.epa.gov/radon/pdfs/homes_protocols.pdf

Minnesota Department of Health Radon Mitigation Contractors: http://www.health.state.mn.us/divs/eh/indoorair/radon/mitigation.html

Minnesota Department of Health Radon Mitigation has a discount for MN residents from a national lab. These kits include lab analysis and return postage and can be purchased at www.mn.radon.comwww.mn.radon.com

7-11	**Water Drainage**
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

Add the following: Where a high water table is anticipated or observed, or has been documented in the soil boring report, or where specifically recommended by the Geotechnical Engineer in the required geotechnical/soil boring report, provide subsurface drain tile or other drainage system in strict accordance with the Geotechnical Engineer's or other qualified professional's recommendations, to divert underground water away from the structure. Coordinate these requirements with those of Green Communities Criteria 7-10a and 7-10b as modified herewith.

7-12 LH	Garage Isolation
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

Add the following: CO detection shall be in compliance with Minnesota's 2006 legislative requirements.

7-13 LH	Clothes Dryer Exhaust
	MANDATORY

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Clothes dryer vents must be rigid type and be exhausted directly to the outdoors.

Intent and Things to Consider:

See national Green Communities Criteria 2008 for intent and things to consider.

7-15 LH	Lead-Safe Work Practices: Rehabilitation
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

For Multifamily rehabilitation and CRV: Refer to the Minnesota Housing Lead-Based Paint Policy located at: www.mnhousing.gov/idc/groups/public/documents/document/mhfa_006247.pdf.

For the RLP, follow at all times HUD's Lead-Based Paint Guidelines, 24 CFR at Part 35.

Intent and Things to Consider:

See national Green Communities Criteria 2008 for intent and things to consider.

Resources:

Additional reference materials for single family available: www.mnhousing.gov/resources/apply/rfp/index.aspx

7-18 LH	Combustion Equipment: Includes Space and Water-Heating Equipment
	MANDATORY

Delete the National Green Communities Criterion 2008 and substitute the following:

How:

Specify power vented or combustion sealed equipment. CO detection shall be in compliance with Minnesota's 2006 legislative requirements.

Intent and Things to Consider:

See national Green Communities Criteria 2008 for intent and things to consider.

Section 8: Operations and Maintenance

8-1 LH	Building Maintenance Manual
	MANDATORY

Modify the National Green Communities Criterion 2008 as follows:

How:

For single family, this criterion may be satisfied by Section 8-2 Occupant's Manual.

Intent and Things to Consider:

Borrower/owner shall furnish such information as may be requested by Minnesota Housing with respect to the financial, physical, or operational condition of the development as well as the utility usage of the residents of the development in the form requested by Minnesota Housing.