

# Guidelines for Installing Alternative Heating Mini-Split Heat Pump Systems

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## Overview

MRE has guidelines for installing alternatives to the originally installed baseboard electric resistance heat in condominium units. To date, the alternative systems installed have been limited to propane and kerosene heaters with external fuel tanks.

Mini-Split systems are now small enough and quiet enough to be installed in the close quarters that are typical of condominium complexes such as ours. They provide an economical alternative to electric resistance heat (40% of the cost per BTU – see Appendix C) and they provide Air Conditioning in the summer.

The MRE Board has met recently with heating contractors and another condominium association to develop guidelines for the installation of Mini-Split systems at MRE. Unit owners wishing to install a Mini-Split system now have the opportunity to do so provided that they adhere to the provisions of these guidelines.

## Terms

- **Adjacent** – Having a common border or contiguous or adjoining.
- **Common Area** – Generally any part of the property that is not inside an individual condominium unit. See the Mountain River East Condominium Declaration for exact definition.
- **Limited Common Area** – Generally refers to decks, patios, and garages. See the Mountain River East Condominium Declaration for exact definition.
- **Primary Heating System** – The baseboard electric resistance heating installed in every unit at MRE. Some units also have ETS – Electro Thermal Storage - heaters as well. For the purpose of this document, baseboard electric and any ETS device should be considered together as the Primary Heating System.
- **Traditional Alternative Heating System** – A Propane or Kerosene sourced heater installed in a single unit with its tank located outdoors in the Common or Limited Common Area.
- **Shed Enclosure** – An extension to the existing building that contains a propane or kerosene tank. Shed enclosures match the building construction and have roofs to drain water, ice, and snow away from the building.
- **Electric Resistance Heat** – Also known as simply “Electric Heat”. The mechanism used by the baseboard heaters installed in MRE units. Electricity is converted directly to heat by the filament in the baseboard. This has historically been the most expensive method of heating homes and businesses in New Hampshire.
- **Heat Pump** – An electromechanical appliance that moves heat between indoor and outdoor spaces using an outdoor compressor, refrigerant lines, and indoor heat exchangers. Heat pumps collect heat from outdoor air and move it into the indoor space during the winter. They operate

“in reverse” in the summer by collecting heat from indoor air and moving it to the outdoors (air conditioning).

- **Mini-Split** – A heat pump configuration consisting of a physically small, economical (compared to resistance heat), and relatively quiet outdoor compressor that is connected to one or more self-contained indoor heat exchangers (zones).
- **BTU** – British Thermal Unit. A measure of heat used for sizing heating systems and comparing heating costs.

## History of Alternative Heating Systems at Mountain River East

Electric Heat has always been the most expensive heating source in terms of cost per BTU. It is also the *least* expensive system for developers to install in new construction and it is the least expensive for the owner to maintain over time. For individual owners, however, the ongoing operating costs of Electric Heat can be prohibitive.

Shortly after the formation of the Mountain River East Condominium Association, the Board of Directors developed guidelines for the installation of Propane or Kerosene based Alternative Heating Systems. To date, 3 units have installed Kerosene systems and 3 others have installed propane systems. All 6 have external fuel tanks installed in the Common Area with shed enclosures. The location of each tank is a compromise that balances the physical length of a filling hose from a supply truck, the proximity of the tank to the unit with the alternative heating system, and the requirements of the Association for building aesthetics. Because the tanks must be kept outdoors and because they must be reasonably hidden from view, there is no way to avoid an impact to the Common Area - even if a tank were placed on a patio, the enclosure to hide it would connect to the building walls which are Common Area.

Unit owners **must apply to the Board for permission** to install Alternative Heating systems because of the impact on the Common Area. If approved by the Board, the owner must sign a license agreement that gives the Association the authority to revoke permission for the system and direct the owner to restore the common area to its original condition. No such revocations have ever occurred at MRE.

Standard window and through-the-wall air conditioners are prohibited by the By-laws at MRE. Some owners have portable, self-contained indoor air conditioners and have used them without any issues - however these machines are relatively expensive to run and generally do not provide “whole house” cooling.

## Mini Split Heat Pumps

Heat Pumps are not new, however recent advances in the technology have made them extremely popular for new construction and remodeling projects. Modern heat pumps can provide whole house heating at roughly 40% of the cost per BTU of Electric Heat and can continue to provide indoor heat even when the outdoor temperature is 13 degrees below zero.

In addition to economical heat in the winter, heat pumps also provide air conditioning in the summer. Recent advances in technology have reduced the physical sizes of outdoor compressors and have enabled them to run with noise levels comparable to home dishwashers.

## Outdoor Compressor Locations at Mountain River East

Generally speaking, the areas around our buildings are used as follows:

- **Rear (patio)** – primary outdoor gathering, cookouts, etc...
- **Sides** – secondary outdoor gathering (mostly not used). Arrivals/Departures (E units)
- **Front** – parking, wood storage, arrivals and departures (F, G, and G+ units)

The following outdoor compressor locations have been chosen **primarily to reduce the impact on outdoor activities at MRE:**

- All compressors will be installed at ground level.
- Compressors must be placed within 12 inches of the building wall.
- For G and G+ units, the compressor location is generally **beside the wood bin**. See existing shed enclosure for Unit 8 in Appendix B.
- For E and F units the compressor location is “tucked in” adjacent to the chimney chase on the side of the building. See existing shed enclosures for units 9, 19, 20, and 30 in Appendix B.
- **Outdoor compressors will be installed on the patio side of the building only in such cases where it is physically impossible to install the compressor on the front or sides of the building.**

There are exceptions to these general guidelines as not all of our units are identical nor are all of the buildings. The main exception exists for center units (unit numbers ending in 5 or 6) - these units have offset wood bins due to the electric service panel and therefore the outdoor compressor and enclosure will *replace the wood bin* for these units. Modifications to the wood bin may be necessary to fit the compressor in the space.

Note: if the installation of the compressor replaces the wood bin, then **the unit will have no outdoor wood storage available**. This is a trade-off that must be made by the unit owner in these circumstances in order to install a Mini-Split system. Storage of wood in locations other than the wood bin (including but not limited to entry ways, alongside the building, patios, decks) is absolutely prohibited

Compressors for E and F units will be physically smaller due to less square footage and fewer zones. This should easily allow for the placement of 2 enclosures in the cut-out space beside the chimney chase.

### Exceptions

If a compressor and/or enclosure cannot be installed as directed by these guidelines, the Board will work with the unit owner to find a suitable alternative. Installing the compressor on the patio side of the building is to be considered the very last resort in these circumstances.

### Replacing Existing Alternative Heating Systems with Mini-Split Systems

No more than one shed enclosure will be permitted per unit and therefore any existing alternative heating system (Kerosene/Propane) must be removed prior to installing a Mini-Split system. If a unit already has a shed enclosure on the front or side of the building, then that shed enclosure may be repurposed for an outdoor compressor. If a unit has a shed enclosure on the patio side of the building, that enclosure must be removed and the common area restored to its original state before installing the outdoor compressor and shed enclosure on the front of the building.

## Shed Enclosures

Mini-Split compressors require substantial airflow and the existing style of shed enclosure with fixed siding and clapboard will restrict airflow to the point of rendering the unit inoperable. To resolve this, the shed enclosures for Mini-Split systems will substitute "Garden Style" diagonal lattice for siding. The enclosures will use standard building trim and standard roofing (similar to existing shed enclosures) but the sides will be lattice instead of clapboard siding.

The shed enclosure must be water tight at the roofline and the roof pitch must match the pitch of the wood bin roofs. Unit owners will be responsible for the costs associated with any maintenance (painting, rot, siding repairs, etc ) required to portions of the building enclosed by the shed. The exterior of the shed – trim, lattice, and siding - will be painted by the Association but the cost of all other maintenance on the shed itself is the responsibility of the unit owner. The trim will be white and the lattice color will match the color of the building.

Each shed enclosure will be used to house one and only one outdoor compressor. No additional storage or other use of the enclosure is permitted.

Only the manufacturer's stand for the outdoor compressor and cement pad will be visible in the open space under the shed enclosure.

## Clearances

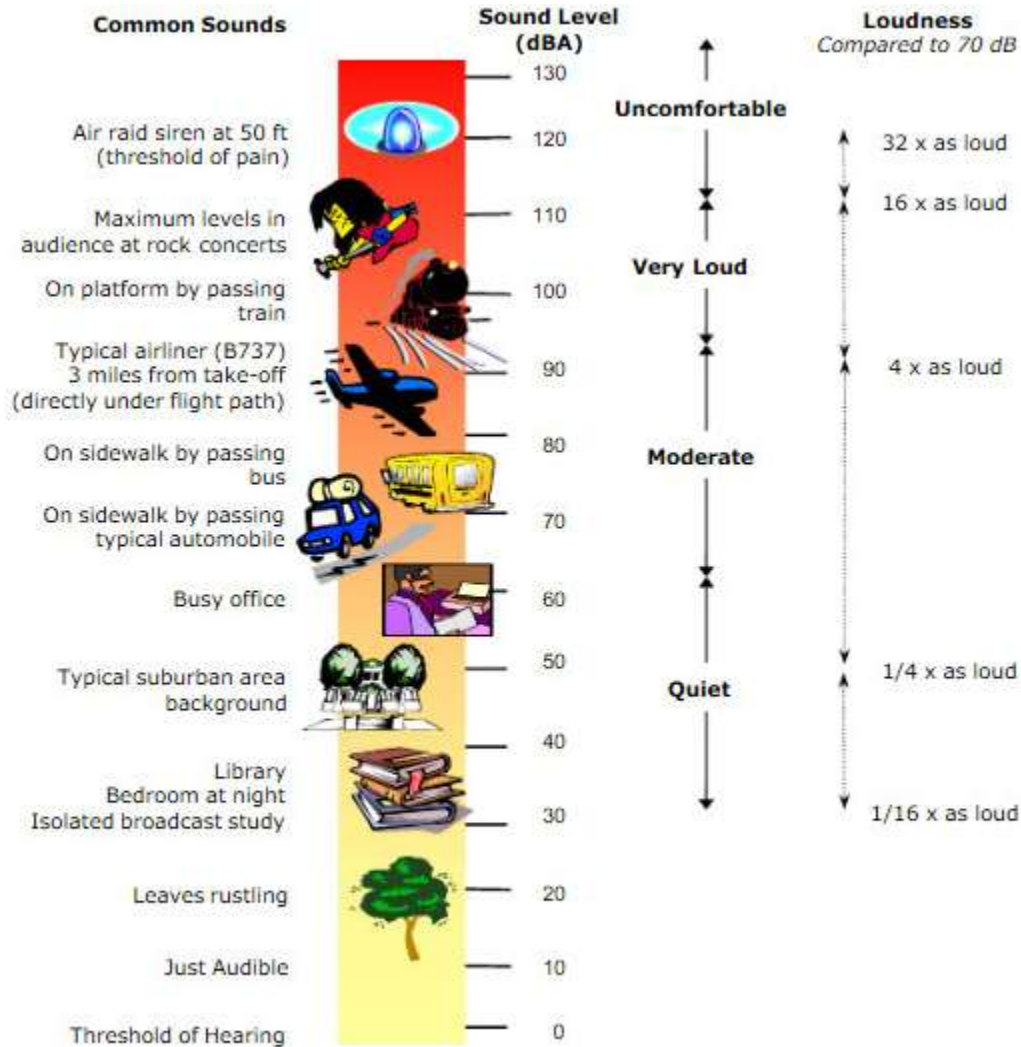
The shed enclosure must be at least 6 inches from any walkway. In some cases, walkways may have to be relocated and/or rerouted at the unit owner's expense to provide adequate space for the compressor.

The shed enclosure may not extend more than 6 inches from the outdoor compressor on the front and sides of the compressor. It is understood that this configuration may not conform to manufacturer's recommendations and may even impact the manufacturer's warranty. The unit owner acknowledges that any warranty impact is the owner's responsibility and not the Association's.

The shed enclosure must not extend beyond the building wall to which it is attached. For G and G+ units, this means that the enclosure can extend from the wood bin to the corner of the wall with the unit entry door but cannot extend beyond that corner.

## Noise Levels

Outdoor compressors must be rated at no more than 58 dB noise level in cooling mode and 60 dB in heating mode.



Source: Handbook of Environmental Acoustics, James P. Cowan, 1994

## External Visibility of Outdoor Components

Hoses, pipes, and electrical wiring **must not be visible outside of the shed enclosure**. The electrical shutoff box shall be mounted on the outside of the shed enclosure and shall be the only component of the system visible outside of the shed enclosure.

## Condensate Drain

Condensate from the indoor heat exchangers may be pumped into the laundry drain inside the unit and/or into the area under the shed enclosure. Under no circumstances may the condensate cause puddling or wet pavement on either the walkways or parking areas. Unit owners must ensure that condensate is drained appropriately so as not to be visible beyond the shed enclosure.

## Access for Maintenance

The shed enclosure must allow for access to the outdoor compressor for maintenance. Easily removable side panels or hinged side panels are acceptable options for this purpose. No shed enclosure shall be built in such a way that it must be disassembled in order to access the compressor inside.

## Snow Removal and Obstructions to Airflow

The unit owner is responsible for snow removal around the outdoor compressor and shed enclosure. The Association is not responsible for shoveling out shed enclosures however the management company will take care not to pile snow around enclosures when clearing walkways and parking lots.

## Indoor Component Maintenance

Maintenance of the indoor components of the system is the sole responsibility of the unit owner. Repairs for any damage to the building caused by a failure of these components (leaking refrigerant, condensate overflow, etc...) shall be the responsibility of the unit owner.

## Prohibitions on Use and Revocable License

The Association reserves the right to prohibit the use of any system that is not properly maintained and/or malfunctioning in any way. This includes systems that are leaking into the building or are operating above the maximum allowable noise level. The Association also reserves the right to terminate the license agreement governing the installation of the equipment. Upon termination, the unit owner must remove all externally installed components (including the shed enclosure) and restore the common area to its original, pre-installation state.

## Primary Heating System

The primary heating system serves as a backup to any alternative heating system. Unit owners may NOT replace (or degrade in any way) the primary heating system in the condominium unit (Baseboard Electric Heat). When units are unoccupied during the winter, the Mini-Split system can be set to maintain 55 degrees in the unit with the baseboard resistance electric thermostats set to 50 degrees in the kitchen and baths. It is expected that the baseboard electric will rarely or never turn on however it will be ready to turn on the following possible scenarios:

1. Power restored after power outage. Unit temperature is below 50 degrees – both the baseboard electric resistance heaters and the Mini-Split system will provide heat to restore the unit temperature. The baseboard electric resistance heaters will turn off when the kitchen and baths attain 50 degrees and the Mini-Split system will continue to run until the unit reaches 55 degrees.
2. Low outdoor temperatures cause heat loss to exceed the Mini-Split system capacity and kitchen/bath temperatures drop below 50 degrees. Note: Mini-Split systems should be sized to prevent this situation from occurring however external conditions such as a blockage of airflow (snow or debris blocks Mini-Split inlets or exhausts) may reduce the Mini-Split system output. When the temperature drops below 50 degrees in the kitchens and baths, the baseboard electric resistance heat will turn on to maintain 50 degrees in the kitchen and/or baths while the Mini-Split continues to provide heat in a diminished capacity.
3. Extreme low outdoor temperatures reduce the Mini-Split system output causing the temperature to fall below 50 degrees in the kitchen and/or baths. The baseboard electric

resistance heat will turn on to maintain 50 degrees in the kitchen and/or baths while the Mini-Split continues to provide heat in a diminished capacity. In extraordinary conditions, the Mini-Split system may shut down altogether until the outdoor temperature returns to the acceptable operating range. Refer to your manufacturer's documentation for specific performance profiles regarding extreme low temperature operation. Obviously, with the Mini-Split shut down, the baseboard electric resistance heat is the sole heat source for the unit.

## Licensing

The existing Alternative Heat License applies to Mini-Split systems. The signed license agreements will be recorded in the registry of Deeds along with an amendment to the Declaration for each system installed. The licensing agreement establishes the terms between the Association and the current unit owner while the amendment extends those terms to any future owners of the same unit.

**No new Licenses for Propane or Kerosene systems will be granted by the Board.** The Association will have one and only one Alternative Heating System option: Mini-Split heat pumps.

This does not in any way prevent owners from installing wood or pellet stoves/inserts.

This does not in any way impact existing licenses – it only applies to any net new license going forward.

## Adjacent Neighbor Notification

Unit owners applying for permission to install an alternative heating system must first notify their adjacent neighbors of the planned installation as well as providing adjacent neighbors with detailed plans for the outdoor portion of the installation. This notification is intended to allow the neighbors an opportunity to review the planned installation and to voice any concerns they may have to the Board prior to Board approval. Unit owners are encouraged to work with their neighbors to resolve any concerns with the planned installation prior to submitting an application to the Board.

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