

Springbrook Hill Owners Association - Replacing Failed A/C Units Policy

Date of Adoption: April 13, 2020

Rationale

Replacement of the current units is not possible since the refrigerant used by these units is legally prohibited. Even though current A/C units are not Association property, they make use of commonly owned resources and are powered by Association paid electricity. Given current technology, replacements for the existing units may require external equipment which will impact the appearance of community buildings.

As a general principle of this policy, Unit owners have maximum flexibility to make decisions about the replacement (or not) of existing units consistent with their comfort desires and financial means. In developing approved options available to Unit owners, the Association focused on the impact of an option on the: 1) physical safety of neighboring Units and the Association's property, 2) impact of one Unit owner's decisions on the quality of life experienced by neighboring units, 3) financial health of the Association, 4) equity between various classes of Units and 5) appearance of the community.

The Association has decided to initiate and fund the migration of all air conditioning units to the owner's electrical panel over three years beginning in 2020, regardless of the need to replace air conditioning units. This action is intended to better align costs of powering air conditioning systems with the comfort decisions made by individual Unit Owners. In the case of the Garden Units, the "sub-metering" technique will be used to accomplish this objective.

Options

- No Replacement
- Replace with self-contained units
- Replace with ductless heat pumps
- Replace with ducted heat pumps
- Replace with contemporary versions of current systems
- Window A/C
- Cartridge units

Discussion and Policy

Policy suggestions for each replacement option are presented below. Each option has different implications regarding comfort and cost. These issues should be carefully reviewed in determining the best fit for each Unit Owner. See Appendix 1 for "A (very) simplified explanation of air conditioning".

With respect to all options, the Unit owner is responsible for removal of the compressor, electrical connections and power pole supporting the failed system. This work is to be completed by a licensed/insured contractor within 12 months of the system's failure. The Unit owner is financially responsible for restoring Common Elements and Limited Common Elements to an acceptable condition after the completion of the project.

The Association's Property Manager is to be notified at least 30 days prior to the commencement of this work. The Property Manager can block this work if he/she believes the proposed work cannot be carried out safely or conflicts with an Association project.

- No Replacement: Residents are free to enjoy Maine summers without air conditioning. They should be aware not replacing existing A/C capability may negatively impact the market value of their Units vs. similar Units with A/C.
- Replace with Self Contained/Portable Units: These units are powered by wall outlets but require an external exhaust. Several of these types of units also can be a source of supplemental heat. Policy elements are:
 - No Unit can have more than 2 such devices.
 - The exhaust must be through wall and, as much as possible, be away from the front of the buildings.
 - Permission to install the through wall exhaust must be gained from the Property Manager who is responsible for agreeing to the final location and approving specifics of the installation – materials, caulking etc.
- Replace with Ductless Heat Pumps: These units require an external compressor and either a ceiling or wall mounted air handler. Depending on the size of the space and number of rooms, there may be several air handlers in each home. Refrigerant lines connect the compressor and air handler. Electrical power is required for both the internal and external elements of the ductless heat pump system. In addition to providing cooling in the summer, these units can be a source of supplementary heat in the winter. Policy elements:
 - Due to the difficulty in placing the exterior components of ductless heat pumps in an acceptable location, this technology is not available to Garden Units.
 - See Appendix 2 for location requirements relating to siting exterior compressor units. These location requirements differ by class of Unit – Duplex or Townhouse.
 - With respect to Duplex units, any refrigerant or electrical lines running on the side of the buildings must be buried to the maximum extent possible.
 - Only a single exterior compressor unit can be used by each Unit, though this single unit can service multiple interior air handlers in the case of Townhouse and Duplex units.
 - If the compressor is in a roof slide area, a simple shelter can be constructed and attached to the building.
 - All installations must be performed by a licensed and insured HVAC contractor.
 - Permission to install the ductless heat pump system must be gained at least 30 days prior to installation, from the Property Manager who is responsible for agreeing to the final location and approving specifics of the installation – materials, caulking etc.
- Replace with Ducted Heat Pumps: Preliminary research suggests this option, though feasible, is substantially more expensive than use of ductless heat pumps. The information collected to date suggests this option will require new air handlers,

compressors, refrigerant lines and rerouting the electrical lines to the Unit owner's electrical panel. New ducts may be required.

- With respect to the location of the compressor, the principles outlined in Appendix 2 should be followed. With respect to Duplex units, any refrigerant or electrical lines running on the side of the buildings must be buried to the maximum extent possible. For Townhouses, these lines shall run through the foundation underneath the Unit's deck and to the air handler.
- Both the air handler and the compressor must receive electricity from the Unit owner's meter
- The Unit owner is financially responsible for restoring Common Elements and Limited Common Elements to an acceptable condition after the completion of the project.
- All installations must be performed by a licensed and insured HVAC contractor.
- Permission to install the ducted heat pump system must be gained at least 30 days prior to installation, from the Property Manager who is responsible for agreeing to the final location and approving specifics of the installation – materials, caulking etc.

5. Replace with contemporary versions of current systems: The current compressors use R-22 refrigerant. This gas has been regulated out of production due to global warming risks. Initial research indicates current compressors can be replaced by compressors that utilize R-407C refrigerant. The rest of the current system's infrastructure – air handler, duct work, refrigerant conduits, etc. – can be utilized by the replacement compressor. (It may be that other variants of refrigerant can be used, perhaps with additional costs or other considerations.) Installation of the R-407C compressor requires cleaning the current conduits and air handlers. The installer, however, will not warranty any components of the system other than the new compressor. The risk for failure of the aging non-compressor system components will be the responsibility of the Unit owner. Nevertheless, installing new R-407C compressors will be a lower initial cost solution than deploying whole residence heat pumps.

- a) Existing concrete pads and conduits can be used with R-407C compressors.
- b) This will be the only whole residence solution available for Garden Units.
- c) The Unit owner is financially responsible for restoring Common Elements and Limited Common Elements to an acceptable condition after the completion of the project.
- d) All installations must be performed by a licensed and insured HVAC contractor.
- e) Permission to install the R-407C compressor must be gained at least 30 days prior to installation, from the Property Manager who is responsible for agreeing to the final location and approving specifics of the installation – materials, caulking etc.
- Window A/C: This option is not feasible because units will not fit our casement windows. Even if feasible, this option is rejected on aesthetic grounds.
- Through the Wall: These through wall units are frequently found in road side motels. They are rejected on aesthetic grounds.

The following link provides US Dept. of Energy background information on heat pumps

<https://energy.gov/energysaver/heat-and-cool/heat-pump-systems>

The Association consulted Revision Energy (Liberty, ME) and Rockport Mechanical (Rockport, ME) in the process of developing this policy. While these two firms have become familiar with Springbrook Hill because of this contact, owners should not take these contacts as an endorsement, recommendation or requirement to do business with these firms.

A (very) simplified explanation of air conditioning

All air conditioning uses the same basic process. Systems differ using different refrigerants, different refrigerant distribution/air handling techniques and varied sizes.

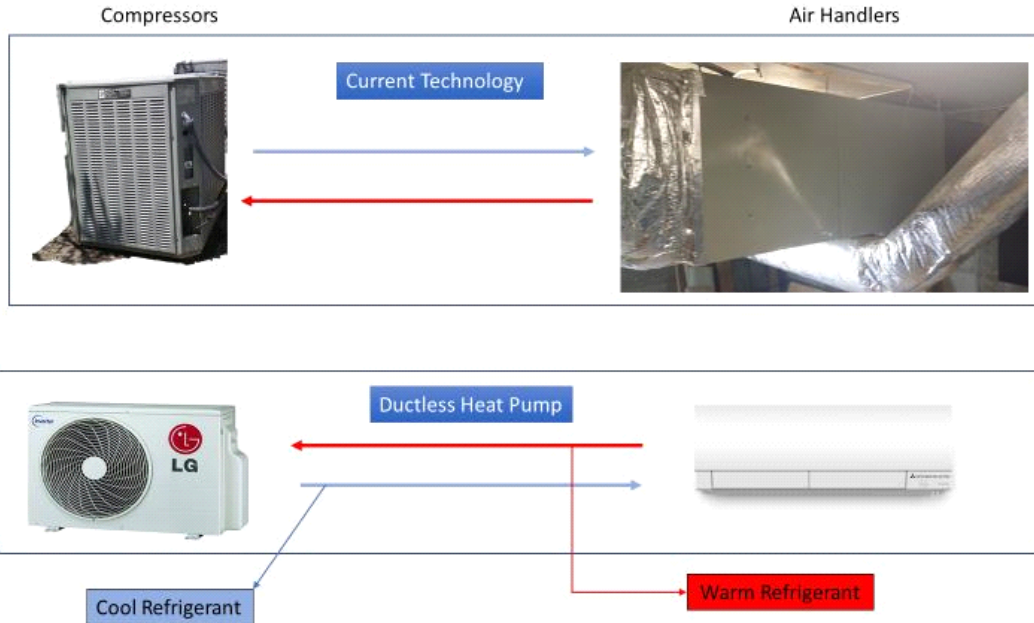
The machinery contains a compressor that squeezes a refrigerant gas to a liquid making it cold (hence the term compressor). Since this process releases heat the compressor is located outdoors in the case of our central air conditioning units, see picture below. In the case of room or portable air conditioning units, the heat is exhausted to the outside via the external components of the unit (room a/c) or a dryer like vent pipe (portable a/c).

The now cold refrigerant is piped to an air handler which exposes the cold refrigerant to the warm air in the home. (In a central air system, the air handler is typically out of sight in a closet or utility room. For the ductless split systems discussed in this paper, the air handler(s) is (are) in occupied room(s). See illustration below.) When in the air handler, the refrigerant absorbs the heat from the air in the home. Three events take place: 1) the warm air in the home is cooled, 2) the refrigerant becomes a gas and 3) the now warm gas is returned to the compressor. The cycle begins again.

In the case of ductless split systems, the process can be reversed to provide supplemental heat in winter.

For room and portable air conditioners, the compressor and air handler are contained in a single unit. For central and ductless systems, these are separate units as depicted below.

Appendix 1



Appendix 2

Location Requirements for Installation of Compressors Supporting Ductless & Ducted Heat Pumps

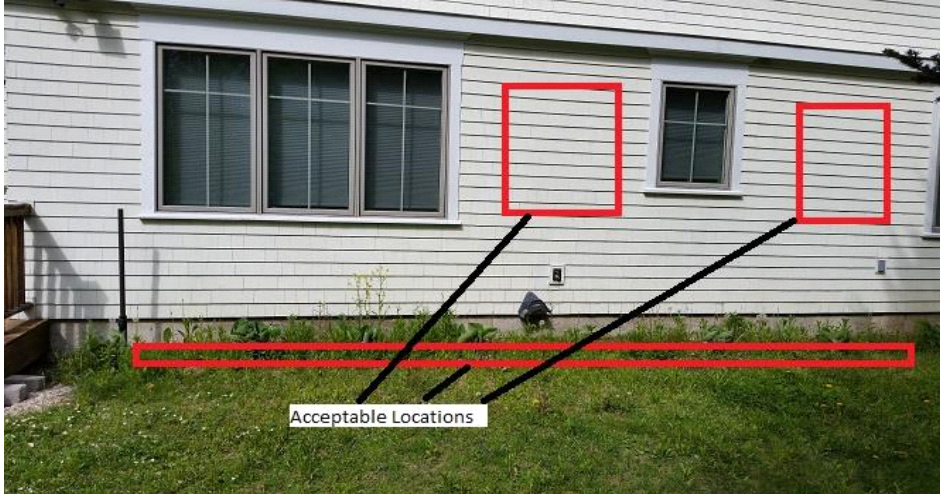
General principles

In determining the acceptable locations of the external elements of heat pumps, the Executive Board has balanced several conflicting factors: 1) minimizing the visual intrusion of these elements on the exterior of our buildings, 2) minimizing costs for the Unit owners and 3) maximizing the functional utility of heat pumps for Unit owners.

Duplex Units

The above photo is marked to show the approximate location of the compressor for these units. This is the rear of the building. The compressor can be mounted on the wall of the building or on the ground near the building. The Unit Owner should be aware that if a wall mount is chosen and vibration/noise is created that impacts a neighboring unit, the Executive Board may require subsequent relocation of the compressor to a ground-based location. Further, if the owner chooses a wall mounted location, he or she will be responsible for temporarily removing the compressor if required for the Association to repair or paint the area behind the compressor. Exterior electricity runs should be minimized. The refrigerant pipe runs serving the first and second floors of the unit may be placed on the exterior of the unit but must be located on the back side of the building, with the only exception being refrigerant lines, in the case of a ducted system that must connect from a compressor to the air handler. The refrigerant lines should run along the bottom 2 or 3 lines of shingles from the back of the building to the utility room door and then up to the flair/soffit to the garage door. Once above the garage door the line can enter the garage and be routed to the air handler in the garage attic. These exterior pipe runs must be

Painted white or the stain color of the building as appropriate given the color of the building component underneath the pipe run. Final location of all exterior utility lines is subject to Management's approval.



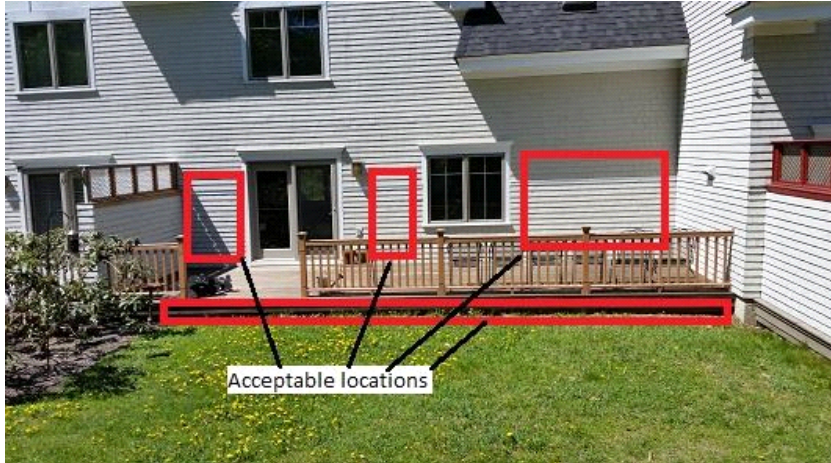
Appendix 2

Townhouse Units

Units A & D



Units B & C



The above photos are marked to show the approximate location of the compressor for these units. This is the rear of the building. The compressor can be mounted on the wall of the building or on the ground near the deck. The Unit Owner should be aware that if a wall mount is chosen and vibration/noise is created that impacts a neighboring unit, the Executive Board may require subsequent relocation of the compressor to a ground-based location. Further, if the owner chooses a wall mounted location, he or she will be responsible for temporarily removing the compressor if required for the Association to repair or paint the area behind the compressor. Exterior electricity runs should be minimized. The refrigerant pipe runs serving the first and second floors of the unit may be placed on the exterior of the unit but must be located on the back side of the building. These exterior pipe runs must be painted white or the stain color of the building as appropriate given the color of the building component underneath the pipe run. Final location of all exterior utility lines is subject to Management's approval.