

Melissa Carr
Forest Glen Property Management
P.O. Box 1313
Glen, NH 03838-1313

BERGERON

TECHNICAL SERVICES LLC



P.O. Box 241
North Conway, New Hampshire 03860

Reference: Northface Condominiums, North Conway, NH.

August 24th, 2022

Melissa,

Thank you for setting up the ZOOM meeting last Tuesday. The topics that were discussed provided some clarity of what your group is looking to learn and provided us with some direction as to how to provide additional information. In the information that follows I will speak to the three topics that your group requested additional information for.

Double-Wall Pipe

As you will recall from various communications during our time on this project there has often been comments about the use of “double-wall pipe” however, there hasn’t been an in-depth study to determine if this material can be used during the improvement process of the woodstove installations at the Northface condominiums. To begin, please know that the terms, titles, or identifiers such as “double-wall pipe” or “metalbestos” do not appear within NFPA 211, the Standard for Chimneys, Fireplaces, Vents and Solid-Fuel Burning Appliances or in NFPA 1 the Fire Code Handbook. Instead, these are identifiers that have developed over time when people are referring to a type of pipe that can be used, *if listed for such use*, as a chimney connector, thimble or perhaps the actual chimney. There are two benefits that we usually see when double-wall pipe is being considered, those benefits are reduced clearances to combustibles and ease of installation in comparison to building a masonry chimney. This effort will consider the Duravent (brand) product as that is one that we see often.

Duravent makes a United Laboratories (U.L.) listed “DVL” product that is advertised as a double-wall interior stovepipe for connecting woodstoves to the chimney. This would be the “chimney connector” that we have referenced in conversation and in our reports and as is referenced within the NFPA Codes. The DVL product is only listed to be used “for connecting wood stoves to manufactured chimneys” and is listed for a minimum of 6” clearance to combustible walls and 8” clearance to combustible ceilings. So... knowing these dimensional facts, can the Duravent “DVL” product resolve the issues that exist with the chimney connectors at Northface? There’s no quick answer - let’s follow this through to see if we can produce a compliant installation.

1. The DVL connector will not be installed properly if it is less than 6” to the combustible wall. In the case of the woodstoves at Northface, we know that the masonry wall protectors were not constructed in accordance with the NFPA requirements as they are not vented at the base and at the top and they do not have the 1” free airspace between the back of the brick and the face of the gypsum that is attached to the face of the wall studs. The required 6” clearance for the DVL connector then has to be measured from the face of the wood studs (behind the brick masonry) to the closest surface of the DVL connector, as if the brick masonry didn’t exist. If the measured dimension is 6” or greater then the DVL connector will resolve the issue for clearances to combustibles for the chimney connector only but then....
2. The DVL product is not listed to be installed to pass through a wall or ceiling so, we have to determine if there is an approved “thimble” that can connect the DVL connector to the chimney. In the Duravent DVL information there is a “masonry thimble w/slip connector” which at first glance appears to solve the

thimble matter but, this thimble “Penetrates masonry chimney for connection of DuraBlack or DVL to Duraliner.” The Duravent masonry thimble w/slip connector cannot be used to connect the DVL chimney connector to a masonry chimney, it is listed only to connect the DVL connector to a manufactured chimney that meets the requirements of UL 103 HT, for example the DuraTech, All-fuel, double-wall chimney system. So... can we complete a listed (code compliant) double-wall installation by installing this (the DuraTech) inside the existing chimney? Answer: No. There are no provisions within the installation instructions that allow for installing DuraTech as a liner within an existing chimney and interestingly, the “liner” product they tell us to use, the “Duraliner” does not appear to meet the UL 103 HT listing requirement. Additionally, there is not adequate space inside the existing chimney flues or brick chimney boxes to install this item, even if there was a way to physically do so, which, I cannot believe there is.

Hopefully, the study shown above shows that the “double-wall” pipe cannot solve the problem by retrofitting double-wall into the existing chimneys at Northface. That said, we may have devised a plan for three woodstoves atop one another – the present configuration, using double-wall chimneys and components.

A Possible Plan:

1. Remove all three vertically stacked woodstoves and set them aside for reinstallation. Throw out their chimney connectors as these are not going to be reused.
2. Entirely remove the existing chimneys (and the through-wall thimbles) at the building exterior, down to ground level. Replace/repair the wall insulation and exterior wall sheathing as necessary. Throw out the thimbles as they cannot be reused.
3. At the interior of each unit – have the masonry contractor patch in the brick back wall surround to (as closely as possible) blend with the remainder of the masonry wall protector.
4. Design/layout a new double-wall chimney system for each of the three woodstoves. Start at the lowermost unit, and plan to use the DVL chimney connector, installing the lowermost one so there is at least 7” clearance to combustibles but preferably more. Connect this to the L402 Masonry Thimble that will be cut through the (just repaired) brick wall at an appropriate location.
5. At the outside of the building, install one DuraTech double-wall chimney system from the exterior “Tee,” which will connect to the L402 Masonry Thimble, all the way upward to the correct height above the roof. When installing this chimney, offset this first-floor flue slightly so as to not run into the chimney that will be installed at the second and third floors above. Perhaps, as an example, the first-floor chimney can offset to the right side of center to allow for the upper-level chimneys to be installed. The second-floor chimney can be installed so as to offset left of center and then the third-floor chimney can be installed to run straight upward. I believe that if carefully planned, the chimneys for three vertically stacked woodstoves (first floor, second floor and third floor) can fit in a relatively narrow space up the side of the building. If this can fit spatially, this could provide a compliant chimney system for the three vertically stacked woodstoves.
6. Repeat the above six steps for the three adjacent woodstoves, the ones that are presently venting into the other of the two flues.

After six double-wall chimneys are installed, one for each woodstove, construct a visually attractive exterior enclosure maintaining the required clearances to combustibles inside the enclosure. The enclosure could be finished in wood or could be brick or stone veneered to maintain the chimney appearance. Keep in mind that access will be necessary to the tee fitting at the base of each chimney to allow cleaning.

Pellet Stoves

Pellet stoves are somewhat similar but actually quite different, from the perspective of installation requirements, than solid fuel burning “woodstoves.” In the case of Northface Condominiums the question has been asked “can we replace the wood-burning stoves with pellet stoves?” The simple answer is “yes” but, in all actuality it is possible that installing pellet stoves may not be any easier or practical than correcting the woodstove installations as described earlier. Also, this would mean homeowners would have to get rid of their existing woodstoves, regardless how new or old, and purchase a new pellet stove which are expensive. For this study we are using the installation requirements for a Harman Absolute43-C Freestanding Pellet Stove as these are available locally through White Mountain Stove Shop.

Clearance to combustibles for the stove itself – this depends how the stove is oriented on the hearth. If placed square (parallel to the walls) into a right-angle corner, the required clearance to combustibles at the rear is 2” and at the side, 6”. If placed at a 45-degree angle with the right-angle wall corner behind the stove, the clearance to combustible requirement is 6 ¼” at each side. See figure 3.2 of the Harman literature. The required clearance to combustible materials is significantly less than required for a solid fuel (wood) burning stove.

Floor protection requirements – If the pellet stove is installed square (parallel) into a right-angle corner, the floor protection requirement to the right and left sides of the stove at the front of the appliance is 6”. In front of the stove, the hearth needs to extend 6” away from the front. Keep in mind however that the minimum requirements described do not appear to allow for the installation of the vent system at the rear of the stove. The stove will project farther out into the room than what the floor protection requirements indicate. See figure 4.10 of the Harman literature for a good graphic depiction of the space needed behind the stove. Overall, however, the required floor protection for this pellet stove is smaller than required for a typical solid fuel (wood) burning stove. Also see figures 3.3 and 3.4 of the Harman literature.

Venting requirements – pellet stoves provide several different vent configuration opportunities, many more than what is available for a wood burning stove. The Harman installation manual provides seven different venting configurations however of the seven, only one, venting method #6 “installing into an existing chimney with full liner” is being considered under this study. See Figure 4.6 of the Harman installation manual.

Using the configuration shown in Figure 4.6 of the Harman manual, the first component of the vent system will be the 3”x4” Harman adaptor increaser, then an elbow (90° fitting), then a straight section of vertical rigid pipe within the living unit, for this scenario we’ll say 5’, then another elbow, the through-wall thimble, a third elbow and then the PelletVent Pro BioFlex pipe which will run vertically through the existing chimney flue, (if it will fit) up to the necessary storm collar and termination cap. Keep in mind that if this will dimensionally work, there will be masonry modifications needed at the top of the chimneys. *NOTE: it does appear that three separate 4” BioFlex pipes can fit into an 11”x 11” internal dimension flue. They will not however fit into the flues that have been lined using the (so called) Ahren’s method.*

All components of the vent system can be from the DuraVent PelletVent Pro line as this product is listed for 1” clearance to combustibles inside the living areas and 0” clearance to combustibles when inside masonry chimneys. Sure... masonry chimneys are not combustible, and this seems downright silly but, this is what the U.L. Listing states for this product.

When designing a vent system for a pellet stove the designer has to consider there are “total allowable equivalent vent lengths” that cannot be exceeded and the vent system with the shortest equivalent length will work best. The Harman stove we are working with can be vented using 3” pipe (see *1 Product Specific and Important Safety Information* in the Harman manual) or with an available “increaser” installed, a 4” vent could be used. The total allowable equivalent vent length (EVL) using 3” pipe is limited to 20 EVL and 30 EVL for 4” pipe. In the configuration described earlier, the approximate math to see if this vent system might work is as follows:

Three 90° elbows at 5 EVL each equals	15 EVL
Five feet (5’) of 4” pipe running vertical at rear of stove to elbow	2.5 EVL (.5 per EVL for vertical runs)
Two feet (2’) of 4” pipe running horizontal through the wall	<u>2 EVL</u>
Total EVL used so far – to the vertical portion inside the chimney flue	19.5 EVL

Total equivalent pipe length (EVL) that this vent system can run in 4” vent is 30 EVL. After subtracting the “Total EVL used so far” from the above calculation, the final allowable vertical section of the vent can be calculated as 30 EVL – 19.5 EVL (calculated above) = 11.5 EVL remaining. However, a vertical “run” is .5 EVL per vertical measure so $11.5 \times 2 = 23$ EVL remaining. In this case, 23 EVL = 23 vertical feet of available vent.

Conclusion – using 4” vent and the Harman pellet stove that has been selected for this study, it appears that pellet stoves could (mathematically) work but there’s still a caveat remaining – Three 4” vents will definitely not fit into the Ahren’s lined flues and if these are removed, no one can predict what will remain. This is a serious risk that needs to be considered. Also, this installation scenario should be reviewed by both the pellet stove and vent supplier/installer to be certain they support this conclusion.


Third Floor Venting Directly Through the Roof

This item does not require any specific study. Either a solid-fuel (woodburning) stove or a pellet stove could be vented “straight up” from the third-floor units, through the concealed attic (truss) space and then through the roof to outdoors. The vent material for either solid-fuel or pellet-burning appliance would be the appropriate “double-wall” DuraVent product. There are some potential difficulties with this type of installation however:

1. There is no way to know, with certainty, what the configuration is of the structural roof framing members over each third-floor appliance. For example, in one unit, the chimney may be able to run straight vertical through the roof without having to work around, protect or otherwise address how to handle combustible roof framing that’s “in the way.” In the next third-floor unit over, straight vertical up from the appliance may place the chimney right into a roof structural member. It is likely that the roof structure will be at least somewhat different over each appliance.
2. Depending on what is decided for the chimneys that serve the middle and lower floor units, this third-floor chimney may conflict with the two from below. Careful planning should be able to prevent such conflict but, the planning aspect cannot be minimized.
3. Another “above the roof” conflict/concern is that the third-floor chimney will have its own integral components such as roof flashing, storm collars and cap to prevent water and weather from entering the building and chimney. Each of these components, particularly the flashing and cap, will take up available space which may “eat into” space that is needed for the chimneys coming upward from the middle and lower floor appliances. Again, proper planning should be able to alleviate this but, again, the planning aspect cannot be minimized.

The information and thoughts provided and expressed on the previous pages speak to each concern that the Directors mentioned in our recent ZOOM meeting. With this information provided, Bergeron Technical has gone significantly further and into much greater detail than what our Agreements had expressed. That said, it is my hope the Board will find this advanced information to be valuable in making their decisions as to how to proceed.

Sincerely,
Bergeron Technical Services, LLC


Shawn G. Bergeron, Sr.
Manager.



ENCLOSURES: Harman Absolute43-C installation manual, PelletVent Pro Catalog, PelletVent Pro Installation Instructions, Duraliner L402 Masonry Thimble Instructions, DuraTech All Fuel Double-Wall Chimney System Literature, DVL Vent Connector Literature

Cc: file