

Home Performance Partners

Improvements that Pay™

Berlin Town Office
108 Shed Road
Berlin, VT 05602

11/7/2006

	Total w/tax
PROFESSIONAL SERVICES	
Geoff Wilcox	<u>\$250.00</u>
Materials Subtotal:	\$0.00
Tax on Materials:	\$0.00
Labor:	<u>\$250.00</u>
Estimate Total:	\$250.00

10-1-65. 42.00
Reg 11-13-06



Raymond Tanguay

From: "Geoff Wilcox" <gwilcox@CVCAC.org>
To: "Raymond Tanguay" <rtanguay@berlinvt.org>
Sent: Wednesday, June 21, 2006 9:04 AM
Attach: town of berlin.doc
Subject: eneryg audit write up

476-2093 x 4

Hello Ray,

Please find attached the write up of the energy audit done at the town office. I will mail a hard copy along with an invoice for \$250 for the audit. I will also be sending along an estimate for us to do the work. Can you inform us of the bidding process for the job so we can enter our bid officially. Please feel free to give me a call with any questions about my recommendations.

Also, as a resident of Berlin I would be glad to explain my findings and recommendations if this needs to be put in front of a select board or anything like that. Talk to you later.

Geoff Wilcox

10/25/06

Home Performance Partners Recommendations

Client: Town of Berlin, Ray Tanguay
108 Shed Road
Berlin, VT 05602

Summary: Home Performance Partners was called on to do an energy audit at the Town of Berlin's Town office. One section of the building was having significant ice damming problems during the winter. A blower door test was done to determine exactly how much air leakage the building had and where it was coming from. Both attics were inspected and evaluated. The oil boiler was also tested for efficiency and safety. The findings and recommendations are as follows.

Findings:

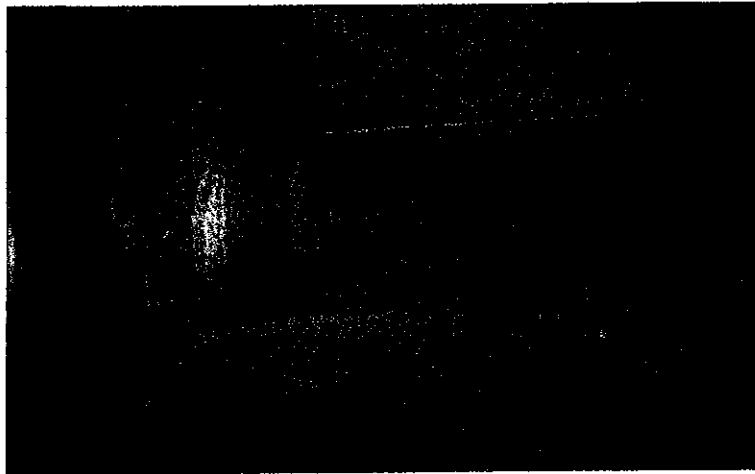
- The building was found to be quite drafty at 5,300 CFM50. The majority of the air leakage was coming from the attic of the original building. This part of the building has a drop or hung ceiling and fiberglass insulation stapled between the bottom cord of the roof trusses. There is no "air barrier" in this assembly, such as a sheetrock ceiling to stop air leakage from the office space to the attic. This lack of an air barrier is what is causing the ice melting on the roof, as well as the high heating bills.



There is no air barrier here to stop air leakage.

- The second attic over the police department was found to be much less leaky. There is a continuous sheetrocked ceiling

above the hung ceiling. There is some air leakage however at the top plates of the interior partition walls. This is due to shrinking of the top plate, or insufficient nailing of sheetrock at the top of the wall. What it adds up to is a thin crack between the sheetrock and the 2x4 top plate. This is a source of air leakage into the attic.



Heated indoor air leaks through the gap between the top plate and sheetrock and then filters through the fiberglass insulation which was pulled back for this picture.

- The HB Smith oil boiler was tested for efficiency and safety. The boiler was running efficiently and had a good draft. The combustion air safety device was working as the boiler was running safely with a good draft (with the exterior door shut).

Recommendations

Original Attic

- The original building needs an air barrier to stop air leakage. The most effective and efficient way to get this air barrier and effective insulation is to apply spray foam to the bottom of the roof deck. This could be applied from the attic onto the plywood roof sheathing, and the gable end walls in the attic. There would be very little disruption to the office below. Five inches should be applied on the roof and three inches on the walls. This must be applied continuous down to the concrete block walls, to stop the air leakage at this exterior wall to roof junction. Insulating the roof in this manner will give a superior

air seal and a true insulation R value of 35. Because of all the pipes and wires run above the hung ceiling, and because of the poor existing fiberglass insulation, installing a sheetrock ceiling above this drop ceiling would be impractical, not to mention a very disruptive job. The results would also be far inferior to the foam insulation.

There is approximately 1776 sf. of roof deck to insulate, and 288 sf. of gable end wall to insulate. NOTE: This foam may need to be coated with a fire retardant to meet certain codes.

Attic over Police Department

- The interior top plates in the newer attic should be air sealed with foam. This would entail pulling the fiberglass back from over the top plate, and then sealing with foam. There is approximately 139 linear feet of top plate to air seal. Also, all pipe and wire penetrations through the attic floor should be air sealed with foam.
- The 2 bathroom exhaust fans need to be vented out of the attic. The vent pipes need to be insulated to stop condensation and ice blockage in the winter. Each need approx. 25 feet of vent pipe and vent hoods installed.
- Exposed fiberglass insulation can lose up to 40 % of it's insulation value when exposed to cold temperatures. Also, when there is a lot of gaps and voids between the batts, (which there is) the R value of the fiberglass goes down some more. Encapsulating or covering the fiberglass with blown in cellulose will help to raise the effective R value.

Hot Water

- An electric hot water heater is the most expensive way to heat hot water. I recommend changing this to an indirect fired hot water heater which is a storage tank off of your boiler. This is much more efficient.

Audit and Recommendation by Geoff Wilcox
Technical Services Manager
Home Performance Partners
476-2093