AIR BARRIER ASSESSMENT SUMMARY

FOR

TOWN HALL, COMMUNITY HOUSE, SWIFT HOUSE

CONSERVATION AND ALTERNATIVE ENERGY GROUP

~ **THE FOLLOWING IS A SUMMARY ONLY. PLEASE REFER TO THE COMPLETE AIR BARRIER REPORT, by Air Barrier Solutions, available at www.kentedrive.org.**

Air Flow is measured in three ways:
Stack Effect, where air travels through the top and bottom of buildings;
Wind Effect, where air moves through the side of a building because of an air pressure differential;
Mechanical Effect, where air moves from HVAC equipment causes an air pressure differences.

Air Leakage is when air moves uncontrolled through any building envelope. Air leakage not only represents:
a potential for energy savings, but also affects
the thermal comfort of occupants,
the air quality for occupants, and
the structural integrity of the building - all due to moisture migration.

It is essential to seal the air barrier before changing the HVAC systems.

TOWN HALL - Full Audit

A smoke puffer and visual inspection was conducted throughout the Town Hall.

To improve the air barrier, **the following is recommended**:

~ Block the rafter bays with fiberglass and Two-Component Polyurethane foam: 120 ft.
~ Install 1-inch Thermax to the underside of the rafters - 3,240 ft.
~ Install 1-inch Thermax to the gable and walls - 644 sq ft.
~ Seal all seams in Thermax with Dow tape and the edges with One-Component foam to create a continuous air barrier for the attic.
~ Seal the 8 penetrations found in the Boiler Room, for both air and smoke control.
~ Seal all assessable gap around the chimney - approx. 12 ft.
~ Weatherstrip all exterior doors.
~ Weatherstrip elevator control room door.
~ Seal gaps in the exterior walls on front and back of building - approx. 570 ft.
~ Install Thermax to ceiling of the Air Handler Room - approx. 296 sq ft.
~ Install Thermax to the Air Handler Room wall adjoing main building - approx. 85 sq ft.
~ Check all electrical outlets and seal around electrical boxes.
~ Open up all knee walls - most likely an air barrier will be needed on back vertical walls and at the floor and rafter junctures to completely seal space. These areas have not yet been opened up for assessment.
~ The large meeting room has a serious energy penalty due to inadequate insulation before the new roof was installed: we must live with this, but can seal the ceiling wall joint, one line - 192 ft.

* Note: Dow Thermax must be used because of its fire rating.
* Note: Recommended weatherstrip kits - Zerodraft kit from EFI.org

COMMUNITY HOUSE - Full Audit Not Concluded (due to time constraint)

A visual inspection and a blower door test was conducted at the Community House. The blower door test results were 6,000 CFM50. It appears the building is completely devoid of insulation. The windows were in fairly good shape.

The following is recommended:

~ Insulate the walls with High-Density Cellulose Insulation. The insulation to be blown to a minimum of 3.5 pounds per cubic foot.
~ Install High-Density Cellulose Insulation, approximately 3,150 sq ft, to the side walls of the community building.
~ Insulate the attic with a combination Open and Closed Blow Cellulose Insulation, approx. 1,925 sq ft, 12 inches minimum depth.
~ Insulate the attic slants, approx. 3,816 sq ft, 18 in, Closed Blow Insulation.
~ Weatherstrip and insulate the attic hatch in front part of building.
~ Any other attic hatches should be treated as well.
~ Caulk, weatherstrip, and/or install interior storm windows.
~ Weatherstrip all exterior doors.
~ These thermal measures should be done before HVAC system modifications are done and should be right-sized according to a Manual J. and other appropriate sizing tools.

We want to strongly advise the town to focus on getting a good, high-quality insulation job in the attic and walls before proceeding with any HVAC or window retrofits.

SWIFT HOUSE - Full Audit Not Concluded due to time constraint

A visual inspection and a blower door test was conducted at Swift House. The blower door test results were 5,600 CFM50. The historical nature of the building limits some of the potential retrofit measures.

The Polyisocyanurate Foam installed over the attic floor has bypasses all the way around the outside. This allows cold air to flow between the insulation and the heated space below. New wall insulation is present, however most of the fiberglass insulation viewed from the attic showed significant gaps.

The following is recommended:

~ The new closed cell foam board insulation on the attic floor, as it is currently installed, has little or no effective impact on insulating the structure because of large gaps under the floor deck. Anytime there's a gap along the edges of fiberglass, its performance is reduced dramatically. All gaps must be closed.
~ The perimeter of the attic floor needs to be made completely airtight: a Two-Component Polyurethane Foam can be used, or if that is too intrusive for an historic structure, the edges can be closed with fiberglass batts stuffed into poly bags. However the former is the more effective approach.
~ In the basement a large crawlspace allows substantial leakage. A seal-up should be considered here.