

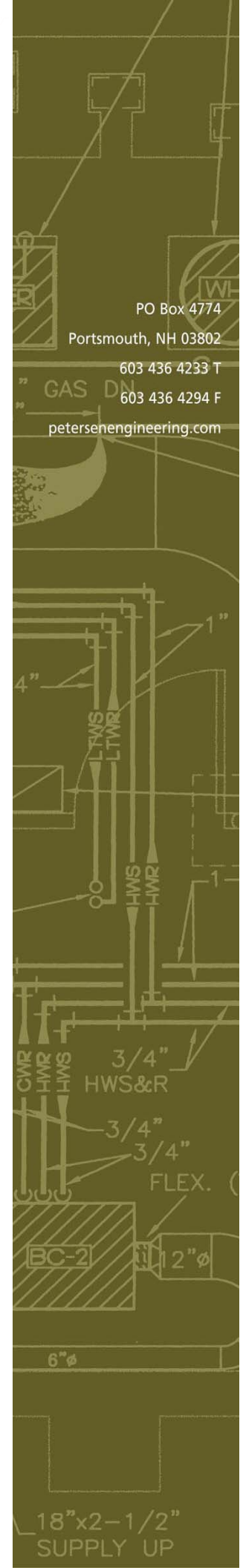


Meeting Minutes

Job Name: Green Woodlands
Job #: 0551
Meeting Date: February 17, 2006
Meeting Location: Banwell Architects
Attendees: Bob Green, Sandy Green – Green Woodlands (GWL); Stu White, Jeremiah Goulet – Banwell Architects (BA); Michael Bruss, Rick Alibrandi – Bruss Construction (BCI); Ed Levin – Paradigm Builders (PB); Paul Leveille – LEEDs Consultant; Henri Fennell – Envelope Consultant; Allan St. Peter, John Freed – Dufresne-Henry (DH); James Petersen, Ben Goss, Andy Arsenault - Petersen Engineering (PEI)
Prepared by: Andy Arsenault
Distribution: Stu White for distribution to all attendees

The meeting was held to discuss schematic design issues as they relate to mechanical systems and energy use. The following was discussed:

- 2-17:1 Petersen Engineering will complete energy code compliance paperwork for the building.
- 2-17:2 Hydro - Lisa Martin has met with NH DES. They have a relatively current file on the dam. No flow information is available yet.
 - a) The potential electrical generation from hydro can't be determined until flow information is known.
- 2-17:3 LEED - P Leveille presented the current LEED for Homes project checklist showing a total of 71 points which is at the low end of a Gold rating. The tasklist was reviewed.
 - a) The group agreed to not pursue WE 1.2 *Grey Water Re-Use System* since there is not much need for grey water as the toilets are foam flush and there will be no irrigation.
 - b) A shower heat recovery device may qualify for an Innovation and Design Process point.
- 2-17:4 Schedule – M Bruss asked that PEI have DD documents completed by March 10. These will include: Basis of Design, Floor Plans, Flow Schematic, Schedules, Specifications, and Sequences.
- 2-17:5 Petersen Engineering presented two cases for the house: occupied and unoccupied. During unoccupied times, the heat will be reduced to 50°F or lower with no ventilation and no domestic hot water heating.



- 2-17:6 B Green currently leaves when the generator is running to recharge the batteries due to the noise.
- 2-17:7 J Petersen presented a heating concept that uses a water storage tank to accumulate heat from renewable energy sources (hydro, solar PV, wood boiler) with an LP boiler as the backup. The heat in the water storage tank will be used to provide building heating and domestic hot water heating.
- 2-17:8 The key to this concept is to have a relatively low temperature heating system. This allows the tank to act as a flywheel, gathering heat from renewables when available and heating up, then efficiently discharging stored heat at a lower temperature when renewables aren't available.
- a) A radiant floor system would work well as it maximizes heat transfer surface area and minimizes the needed heating water temperature.
- 2-17:9 The electrical system will accumulate renewable electrical energy (hydro and solar PV) and store the energy in the battery system. If excess power is available after fully charging the batteries and meeting the plug and lighting loads, it will be used to heat the water storage tank.
- a) If the generator must run to charge the batteries, it will NOT be used to heat the water storage tank.
- 2-17:10 B Green asked if a Tarm boiler could be incorporated into the water storage tank system in addition to a wood stove in the house.
- 2-17:11 The building heating system will be:
- a) Basement – No heat.
 - b) 1st Floor – Radiant floor, possibly Warmboard.
 - i) B Green asked what adhesives are used in Warmboard. He is concerned about non-green products.
 - c) 2nd Floor – Indirectly heated by 1st floor.
 - d) Bathrooms – Supplemental steel panel radiators with local control.
- 2-17:12 The plumbing systems will be designed with freeze protection in mind. This may include:
- a) Ability to drain piping to the basement, either using manual valves (a part of the “closing the house for unoccupied times”) or possibly using automatic valves which would be triggered by a low temperature sensor.
 - b) Plumbing traps could be filled with glycol or they could be opened so that they don't hold water (a part of the “closing the house for unoccupied times”).
- 2-17:13 If a low temperature is sensed, an alarm needs to be sent off-site to alert someone.
- 2-17:14 Insulating security shutters will be used. These will be on the exterior and should be swinging with a means to tightly seal to window and door frames. PEI will need to know the thermal characteristics so that we can determine the unoccupied design heat loss.
- 2-17:15 J Petersen recommended that the envelope be as “beefy” as possible to reduce loads. This will simplify and minimize the size of the heating system. H Fennell suggested adding more insulation to the walls before the roof since there is more incremental benefit to improving the lower R-value. A Arsenault said that PEI would not run any piping in the exterior walls, this means that only a small space is needed for wiring.

- 2-17:16 J Petersen noted that the windows still have relatively poor performance compared to the remainder of the building envelope. Can window area be reduced? Can better performing windows be used?
- 2-17:17 The Greens confirmed that there will not be any air conditioning.
- 2-17:18 Natural ventilation will be used for summer heat relief by opening windows. There will not be a “whole house” fan to provide air movement as high and low windows will create a chimney effect.
- 2-17:19 PEI will provide a means to produce domestic hot water in the summer without using the space heating water storage tank. This will reduce stand-by losses.
- 2-17:20 PEI will refine the occupied ventilation requirements when final envelope details are completed and will re-calculate the building heat loss.

Please contact the author within ten days if you have any corrections to these meeting minutes.