

EMERGING TECHNOLOGIES SHOWCASE WEBINAR: THE BULLITT CENTER: ENERGY EFFICIENCY IN ACTION

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March 26, 2014

Question and Answer Session

Q: How did you get enough airflow from natural ventilation to achieve effective night flush? What elements in the building have thermal mass?

A: When we're doing calculations for buildings where we try to leverage natural flows of air, we use a program that basically does what we call bulk air flow analysis, which is a higher level analysis. It's a little more rudimentary compared to computational fluid dynamics (CFD) modeling, but the two are often used in concert together. The bulk air flow analysis is done first to see how things might behave, and then the CFD is done to back up that analysis. Natural ventilation is largely dependent on two effects. The first is wind movement – wind is a very powerful driver. If there are enough openings in the building, air can cross right through the building. The other effect is the stack effect where cool air will come in to the bottom part of the window and then warm air will escape at the top part of the window. We use both of those to help the air flow, and the analysis helps us prove that it works.

The mass in the building comes from really anything inside, certainly the concrete floors are probably the biggest mass element. But even sheetrock can be counted as part of the mass of the building in the structure itself. A church for example, or a cathedral in Europe which is a massive concrete or stone building, is one end of the scale for a very massive structure.

Q: And related, is ventilation demand controlled?

A: This building does not use demand control ventilation, although we considered it. The reason is that it is planned as an office building, yet demand control ventilation is more typically used in spaces that have high occupancy and then completely empty out, such as auditoriums or larger conference rooms. We considered it at first, but because we were looking at the natural ventilation, and the budget was running tight (cost comes into play here), we decided not to spend dollars on demand controlled ventilation.

Q: What is the current occupancy rate for the Bullitt Building, and the operating EUI (energy use index) compared to the design goal?

A: The design goal was set to 16 EUI. The building is fully occupied except for one floor, the 3rd floor which is empty right now. So the building is roughly between 80 and 85% occupied. Right now we are operating on average at a EUI of 10 to 11 or a little over, maybe peaking out at 12 occasionally. We think that with the current EUI, when we have a fully occupied building, we'll still be below our target of 16.

Q: How did the total cost (design and construction) compare to typical costs for other recent "minimally code-compliant" Seattle new construction? Also please remind us who the tenants are (and how representative are they of "typical" commercial tenants given the engagement requirements for a ZNE [Zero Net Energy]) building?

A: The building is definitely a premium building. The cost is somewhere around \$300, maybe a little bit over, \$300 a square foot. A code compliant office building will typically range around \$200 on a low end and \$250 on a higher end depending on the site and conditions and such. So there is definitely a premium built into this building.

The interesting thing with the tenants (and that is the next part of this question), many leases nowadays are built on the triple net formula, which means that the tenants pay for their energy use. Obviously since this is a net zero energy building, the tenants don't pay that piece. So there are some positive things to being a tenant here. The tenant mix include ourselves (PAE), and the Bullitt Foundation of course. The Integrated Design Lab from the University of Washington is on the ground floor and the second floor. The third floor is unoccupied and the fourth floor has a developer plus a mix of various small tenants using a co-work space. The fifth floor has a firm called Intentional Futures. There is definitely a mix of tenants that are interested in, and receptive to, ideas like not having a fully air conditioned building and they are interested in being in a building that helps tell their story as a business. Developers are keeping that in mind and trying to position their buildings to attract tenants with similar motives and similar agendas.