

07.24.12

Robert W. Healy  
City Manager  
City of Cambridge  
795 Massachusetts Avenue  
Cambridge, MA 02139

Re: Martin Luther King Jr School, Putnam Avenue  
Carbon Accounting for Design Options

Dear Mr. Healy:

Based upon audience questions and comments at more than one of the four neighborhood meetings where Perkins Eastman presented the evolving studies and options during the MLK Jr. Feasibility Study process, it became apparent that certain attendees are concerned about the impact of Embodied Energy on the overall long-term sustainability of the project.

The City instructed Perkins Eastman to retain the services of an independent consultant capable of calculating and comparing the three proposed options to a “no-build” option, which retains the existing building largely “as-is”, merely upgrading its thermal and mechanical performance by approximately 30% (Current Updated Building). It must be noted that this “hypothetical project” does not meet the program space needs of 740 students in 3 schools (preschool, preK-5, 6-8). Alterations and additions would be required to accommodate the increased student body, which is the design proposed as the Existing Modified Option.

In addition to the crucial issue of program-fit, this “no-build” scenario does not provide a building that could accommodate the City’s Net-Zero requirement, begin to address the parking and associated open space issues, solve the seismic issues, re-orient the classrooms north/south for sun-control, increase the floor-to-floor heights or provide for natural light and ventilation to many underprovided spaces. This scenario was proposed and analyzed as a “base-line” for measuring the environmental performance of the new-build Clover and Pi (Preferred) Options which address all of these issues, or the Existing Modified Option which addresses some of these issues.

Perkins Eastman contacted the existing project MEP/FP engineers, the Net-Zero engineers and the project’s proposed LEED consultants and determined that they were not properly equipped to perform this task. The LEED consultant, formerly of the Green Roundtable, recommended Jim Newman of LINNEAN Solutions to perform this specialized work. Coincidentally, Mr. Newman is not only a Cambridge resident, but also a graduate of MIT. Prior to founding LINNEAN solutions, Mr. Newman was Director of Building Green.com, an online product and systems research and testing company. His bio is attached.

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Perkins Eastman and our engineers provided all the available project information to Mr. Newman, including drawings of the existing building, three-dimensional computer models depicting area, surface and volume of the proposed alternative options, and potential material and system selections. The City provided energy-use invoices to calculate existing energy use. Links to articles on the program used by LINNEAN Solutions include:

<http://leedcasestudies.usgbc.org/overview.cfm?ProjectID=1385>

<http://leedcasestudies.usgbc.org/materials.cfm?ProjectID=1385>

<http://www.athenasmi.org/>

The outcome of Mr. Newman's work is described in the attached Carbon Accounting for Martin Luther King Jr. School Design Options, dated 07.23.12. In summary, Mr. Newman concludes that by year 15, all three of the proposed design options surpass the "no-build" scenario for embodied carbon plus operational carbon emission reductions. After that point, both new options (Clover or Pi/Preferred) and the extensive renovation/addition option (Existing Modified Option), begin to perform progressively better and better on behalf of the environment as the years go by. Assuming an hypothetical 50-year life-expectancy for the building, a new building is substantially better for the environment than merely keeping the existing building, with all its programmatic, educational and design shortfalls.

When correcting for some of these significant deficiencies, as per the Existing Modified Option, the building becomes unrecognizable from its origins, equally intensive in construction effort, duration and disruption, and identical in cost to the Pi (Preferred) Option.

Given the unequivocal outcome of this carbon study by LINNEAN Solutions, Perkins Eastman strongly recommends the Pi (Preferred) Option over all others, as it provides all the benefits of the Existing Modified Option plus the added benefit of solving classrooms orientation, increasing floor-to-floor heights and then goes on to outperform all other options on all environmental measures, and does so for the same cost.

Sincerely,



John R. A. Pears, RIBA  
Managing Principal

cc: File/Alicia Caritano - PE  
Richard Rossi; Michael Black – City of Cambridge

Enclosure Carbon Accounting for Martin Luther King Jr. School Design Options,  
dated 07.23.12  
Bio for Jim Newman of LINNEAN Solutions