

## Casey Middle School - LEED Assessment of Building Re-use Options

For the three options to be presented at the 11/26 Casey DAT meeting, it is unlikely that the three LEED credits for building reuse will be achieved. Credits for construction waste management will be easier to achieve, given that a large proportion of demolition materials are diverted from the landfill. Another consideration for building reuse is embodied energy. The rationale for this assessment is below.

### Option 1 – Renovating the 1924 Building and Adding an 80,000 SF addition

It is unlikely that this option will qualify for MRc1.1 or MRc1.2 – Building Reuse – Maintain 75-95% of Existing Walls, Floors, and Roof. Although this credit is based on the surface area of all components, we can assume that square footage is a rough indicator of the reused percentage, given that it is the same use. The 1924 building is 56% of the existing square footage, significantly less than the 75% threshold to meet the requirements.

It is also unlikely that this option would qualify for MR.1.3 – Maintain 50% of Interior Non-Structural Elements. As the calculations for this credit include new square footage, using the same rationale as above, the percentage of reused components would amount to 37% of the total completed project.

This option would likely achieve 2 credits for MRc2.1-2.2 Construction Waste Management - Divert 50% or 75% From Disposal - with special attention to recycling of demolition material. However, because the addition in this option is less than 200% of the existing building, the reuse of the existing structure (by weight) could not be included in the calculations for these credits.

In addition, historic preservation can present challenges to meeting the LEED energy and IEQ requirements. Although a lower energy point threshold is required because of the inclusion of the existing building in the project, at minimum retrofitting the windows and HVAC systems would need to occur. The full scope of necessary upgrades will not be known until a rigorous analysis of the existing shell and mechanical systems has been completed.

### Option 2 and Option 3 – Saving Portions of the South and West Facades

As with Option 1 these options are not viable for any of the MR building reuse credits, but the MR construction waste management credits are achievable. In addition, the energy and IEQ requirements would be easier to achieve than with Option 1.

## Embodied Energy

The energy required to manufacture and transport materials to the site and the energy required to construct, renovate and maintain a building over time represents a substantial amount of energy; 15 - 20% of the energy used over a 50-year lifespan.<sup>1</sup> This energy, called embodied energy, often goes unaccounted for in calculations of building energy use, which often focuses on the energy required to operate the building - lighting, HVAC systems, and process energy. By reusing a building, a large portion of the embodied energy needed to build a new building is conserved. The LEED rating system's lack of treatment of embodied energy is the subject of an ongoing debate and it is likely that as costs for materials and energy rise, embodied energy and life cycle assessment of materials will be more emphasized in future rating systems.

<sup>1</sup> <http://www.architecture2030.org/news/faqs.html>