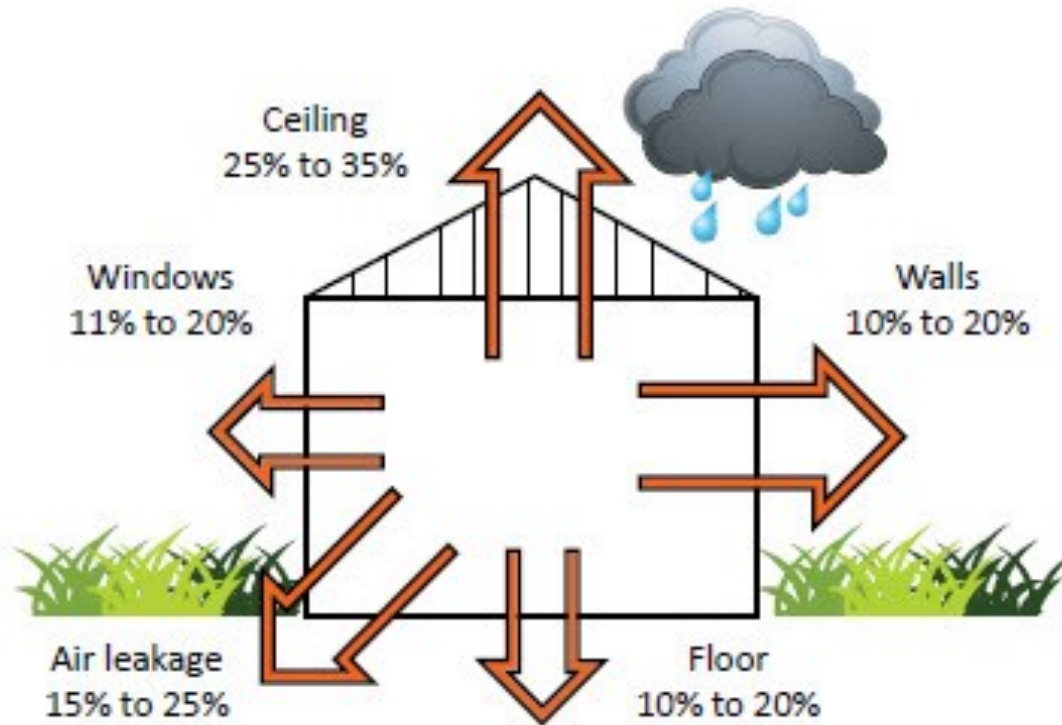
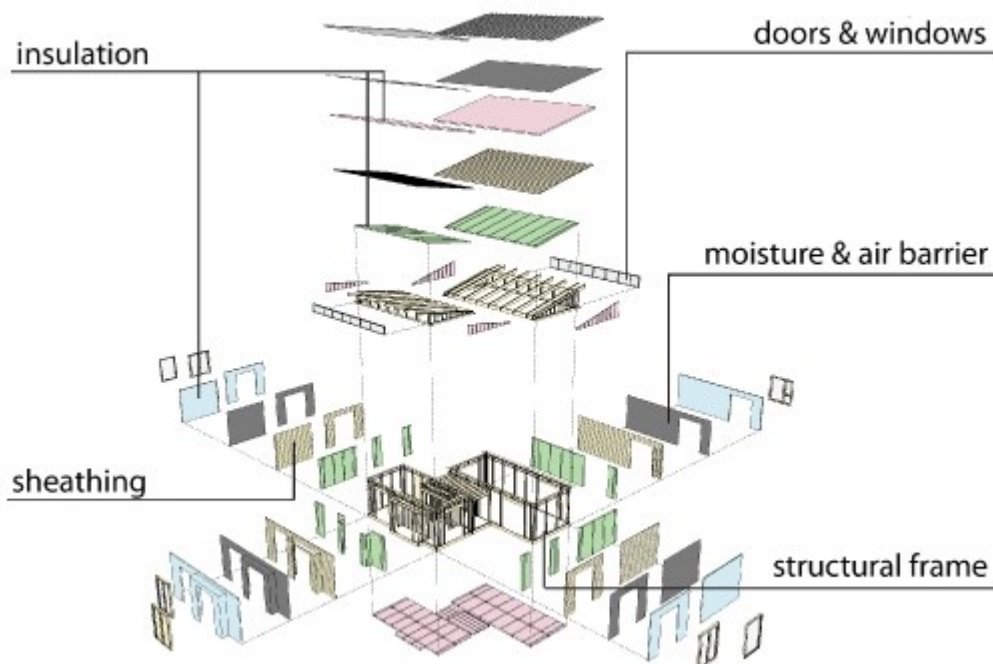


How Energy Escapes



Layers of a Building Envelope



Shoddy construction at Whatcom courthouse prompts call for 'multimillion-dollar' fix

By Ralph Schwartz

The Bellingham Herald January 27, 2015

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The consultant found several construction flaws, all with the same result: too much water getting behind the brick, and water pooling inside the exterior walls.

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Construction drawings, likely provided by the contractor at the time of the renovation, include cross sections of exterior walls done correctly. But the drawings consistently did not match what actually was built, Poppe said.

"Nearly every time we opened a wall, we found something different from the construction drawings," he said.

Normally, rainwater will find its way behind a brick wall on a building. A crucial job of the contractor is to install simple water-collection systems along small holes in the brick so the water can escape. Instead, the contractor, Strand Inc. of Kirkland, built inadequate or ineffective solutions — or no solutions at all — leading to evidence that the 23-year-old facade is beginning to fail, Poppe said.

HKP workers conducting the recent inspection were able to remove some bricks with their hands. Water has rusted the steel supports of the brick wall, destroying the brick and worsening the leaks.

Poppe asked the council for another \$80,000 to conduct further inspections to see if any of the modular brick panels can be saved. Louws and council members said they didn't see a reason to spend more money to learn what they already knew.

"Ultimately, we're going to have to put an entire new skin or exterior surface on this building," council member Pete Kremen said. "I think we should just go ahead. ... We already know that it's an abomination."

In addition, Louws said, more than half of the double-paned, hermetically sealed windows leak, so probably all of the windows will have to be replaced.

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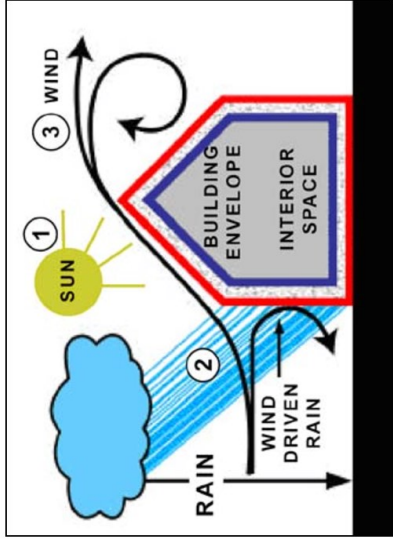
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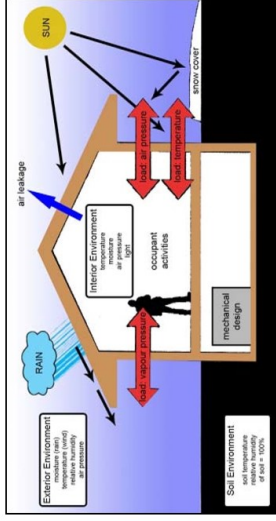
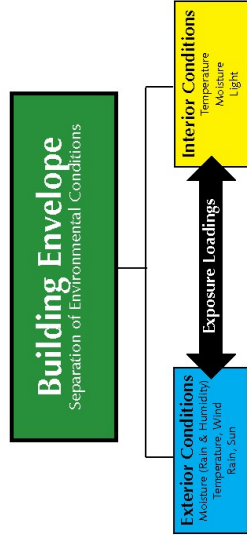
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Environmental Separation



Residential High-Rise Envelope Failure – Steel Stud Corrosion

14.0 Building Envelope Design Principles

The primary role of the building envelope is to separate different environments, typically the interior from exterior, by managing the flow of air, moisture, and heat between them. The envelope must also consider the impact of architectural orientation and styles, as well as heating and venting strategies, owner's expectations, and future requirements. Successful envelope design harmonizes all of these needs, while looking for synergies in design.

In terms of sustainable or green design the envelope must perform its functions for the life of the building without excessive maintenance or renewals. In addition, the materials should be locally extracted or manufactured, resistant to degradation, recyclable/reusable, and balance lifecycle cost and embodied energy. Together these characteristics define Envelope Durability.

The goal outlined for SEFC project is a minimum 100-year building service life. Typically, residential buildings are designed for 50+ years in Vancouver. To design for a 100-year building, the envelope will need to meet both today's and tomorrow's performance and energy demands. The envelope will require future-proofing. This means current residential design practices may not be appropriate. Building materials should be chosen for their initial and future performance, ease of disassembly, low maintenance and eventual reuse or recycling. Insulation should be appropriately placed for highest effective values (i.e., minimized thermal bridges), and allow increases in thickness or easy removal and replacement, as material's R-values improve.

The building envelope failures that have plagued Vancouver's condominium market since the early 1990's illustrate the importance of proper building envelope design and commissioning. The cost for repetitive maintenance, repairs, premature replacement, health effects and occupant disruption has escalated to multibillion-dollar levels. The repairs result in increased embodied energy, which over the expected lifetime of the building will far outweigh that of the originally constructed building. The envelope has obvious impacts on the sustainability of buildings.

This section outlines the principles of envelope design for the SEFC project.

Established in May 2005 at an on-site location, the SEFC Project Office initially focused on the development of Area 2A, the site of the Olympic Village. Its first major tasks included the consolidation and subdivision of the city-owned lands, procurement of environmental approvals for the foreshore and uplands development, selection of a developer for the building sites, and direct coordination of designers and contractors for the public spaces. The SEFC Project Office has also acted as the city liaison with Vancouver's 2010 Olympic Organizing Committee (VANOC) for all matters related to the Vancouver Olympic Village. Learn more about the role of the Project Office in Chapter Two: Planning + Olympics.

Madison Elementary to reopen Monday - 6 months, \$2.5 million in repairs later

Back to school is Monday – 6 months, \$2.5 million in repairs later

By LISA PEMBERTON

January 4, 2014

Olympia, WA After six months of being shut down for about \$2.5 million in emergency repairs, Madison Elementary School in Olympia will reopen its doors Monday.

“I think there’s a lot of excitement,” principal Domenico Spatola-Knoll said Friday during a tour. “There’s a lot of wondering what the first day is going to be like.”

Crews have:

- Replaced the building’s stucco exterior, which was damaged from moisture. In some areas, “they had to rebuild some of the structure of the school,” said Olympia School District spokeswoman Rebecca Japhet.

- “It was installed very differently this time,” she said. “We installed two additional layers of vapor barriers, including a painted-on water barrier and a rain shield that pulls moisture down and out before it can penetrate the building.”

- In addition, crews built the walls thicker, added control joints to make the building more flexible and used a rigid insulation that will help prevent moisture intrusion, Japhet said.

- “We worked with a national expert who agreed it is a robust system that will not leak,” she added.

- Addressed some safety concerns at the school. For example, a new window was put in the office so staff can have a clear view of the entryway, and the library has a new door that can shut during a school lockdown.

- Installed a new telephone system.

- Gave the school a fresh coat of paint – inside and out.

Japhet said the moisture-related repairs were paid for with the district’s unrestricted capital funds. The district plans to recoup that money, but it could take up to a year for that to happen, Japhet said.

“We don’t know yet because there were multiple subcontractors involved, and groups and entities and multiple insurance companies,” she said. “We don’t really know who’s going to be ultimately responsible yet.”

According to Olympian archives, the school was built in 1999 for \$5.8 million. It was scheduled for a new paint job last summer; but during preliminary work, crews noticed some cracking in its stucco exterior.

After further investigation, crews confirmed there was moisture damage in several areas, particularly around the school’s exterior windows, according to district officials.

In September, the school’s 60 fourth- and fifth-graders were moved to Roosevelt Elementary School. Its 140 students in grades K-3 temporarily attended classes at New Bridge Community Church, which was the original Madison school.

“I think we were very fortunate to be in just two main locations,” Spatola-Knoll said, adding that the school’s preschool program was held at the Olympia Regional Learning Academy. “I went from building to building regularly to meet with kids at both locations.”

Teachers began moving back into their classrooms in early December, and several staff members were at the school Friday to help unpack boxes.

“It’s a little hectic; it’s a little crazy,” said paraeducator and office assistant Joy Moorhead. “We’re getting a chance to clean out. ... Home – we’re home.”

The work isn’t finished. Repairs are still being made to the school’s play shed, and some of its students will continue being bused to Y-Care at Roosevelt until the state reissues a childcare license for Madison.

But “as far as what kids can expect when they come back, it’s business as usual,” Spatola-Knoll said.

Madison parent Brandy LeGault said she thought school officials did a good job keeping families in the loop on the construction project. But she was looking forward to the school reopening.

“It’s going to be very, very nice to feel as one united group again,” she said. “We’re all very excited to be back together.”

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