EXTERIOR INSULATION FINISH SYSTEMS (EIFS)

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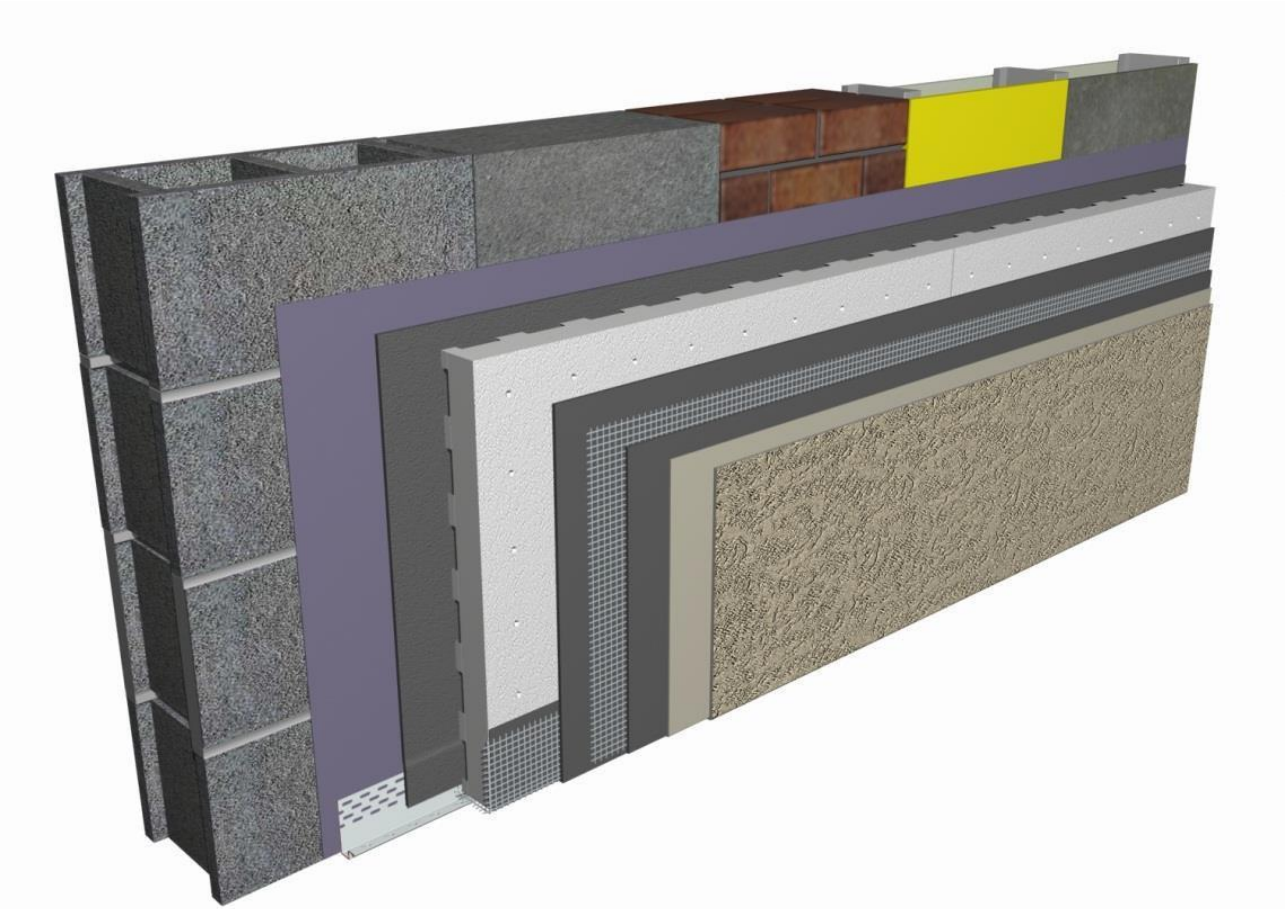
Exterior Insulation Finish Systems (EIFS)

EIFS are continuous insulation, rainscreen cladding that include:

- a lamina (first plane of protection from precipitation)
- thermal insulation (polystyrene or mineral wool)
- a drained air space
- and a Water Resistive Barrier (WRB) (second plane of protection)

Garden Variety EIFS



EIFS Performance

EIFS is an integral part of the building envelope that separates the indoor from the outdoor environment, in which it protects the building from precipitation, it restricts heat transfer, it controls air leakage, it controls condensation, and it resists fire.

Protection from Precipitation

- EIFS are extensively tested in accordance with the CAN/ULC-S716.1 Materials and Systems Standard that is referenced in Subsections 5.9.4 and 9.27.13 in the 2018 BCBC and in the 2019 VBBL
- EIFS with a geometrically defined drainage cavity compliant with Subsection 9.27.13 also provide the capillary break required in coastal areas

Thermal Performance

- EIFS is the epitome of continuous insulation (ci), which is defined as insulation that is continuous across structural members
- The National Energy Code prescribes minimum thermal transmittance values for above-ground opaque wall assemblies and independent testing has verified that EIFS can provide all of the required thermal resistance in Zones 4 and 5

Air Leakage Control

- EIFS Water Resistive Barriers (WRB) characteristically satisfy the air leakage requirement for air barrier materials stipulated in building codes
- Since EIFS WRBs must be continuous, they are well positioned to function as the air barrier for the opaque wall assembly

Condensation Control

- Building codes prescribe the placement of vapour barriers on the warm side of assemblies to control vapour diffusion from the interior so as to minimize the accumulation of condensation in the assembly
- Placing insulation on the outside of an assembly further restricts condensation once the dew point temperature of the heated indoor air is no longer within the assembly

Fire Protection

- EIFS with expanded polystyrene (EPS) insulation is combustible cladding that is subject to limitation based upon spatial separation and sprinklers
- EIFS with mineral wool insulation is non-combustible cladding permitted for use on all buildings and on all walls regardless of spatial separation or sprinklers

Fire Protection

- Building code article 3.1.5.5 is a permission to use combustible cladding in non-combustible construction and article 3.2.3.8 is a requirement to protect foamed plastic insulation from fire
- Article 3.1.5.5 does not apply to unsprinklered buildings over three storeys in height
- Both code articles are restricted to walls permitted more than 10% unprotected openings

RDH Study

- Early in 2020, RDH Building Science Laboratories completed a life cycle costing and thermal performance study that examined the comparative value of alternative wall cladding systems
- The study compared common cladding alternatives for two building archetypes in four climate zones over a 50 year period
- Life cycle costs included initial construction, energy use, maintenance, and repair

RDH Study

- The 6 storey wood building compared EIFS with EPS, brick veneer, and fibre cement cladding
- The 12 storey concrete structure with steel stud infill compared EIFS with EPS, brick veneer, precast concrete, and aluminum composite panels
- The four cities in the study were Vancouver, Calgary, Toronto, and Montreal
- All wall assemblies were designed to comply with the current energy code requirements of the respective province

RDH Conclusions

- EIFS with EPS is the most economical cladding to construct of all those studied
- EIFS with EPS is less costly to maintain and repair than fibre cement cladding, precast concrete, and aluminum composite panels
- EIFS with EPS has the overall lowest 50 year life cycle cost of all claddings studied

Sustainability & Resiliency

- Sustainable design seeks to reduce the consumption of non-renewable energy (i.e. fossil fuels), thereby reducing greenhouse gas emissions (i.e. carbon footprint)
- Resiliency is the capacity of a building to function under extreme conditions, such as those attributable to climate change

Passive Design

- Continuously-insulated airtight buildings are the cornerstone of passive design
- Passive House is an internationally-recognized science-based energy standard whose goal is to significantly reduce energy consumption in buildings
- The Ken Soble Tower in Hamilton, ON recently overclad with non-combustible EIFS is the first Passive House high rise retrofit in all of North America!

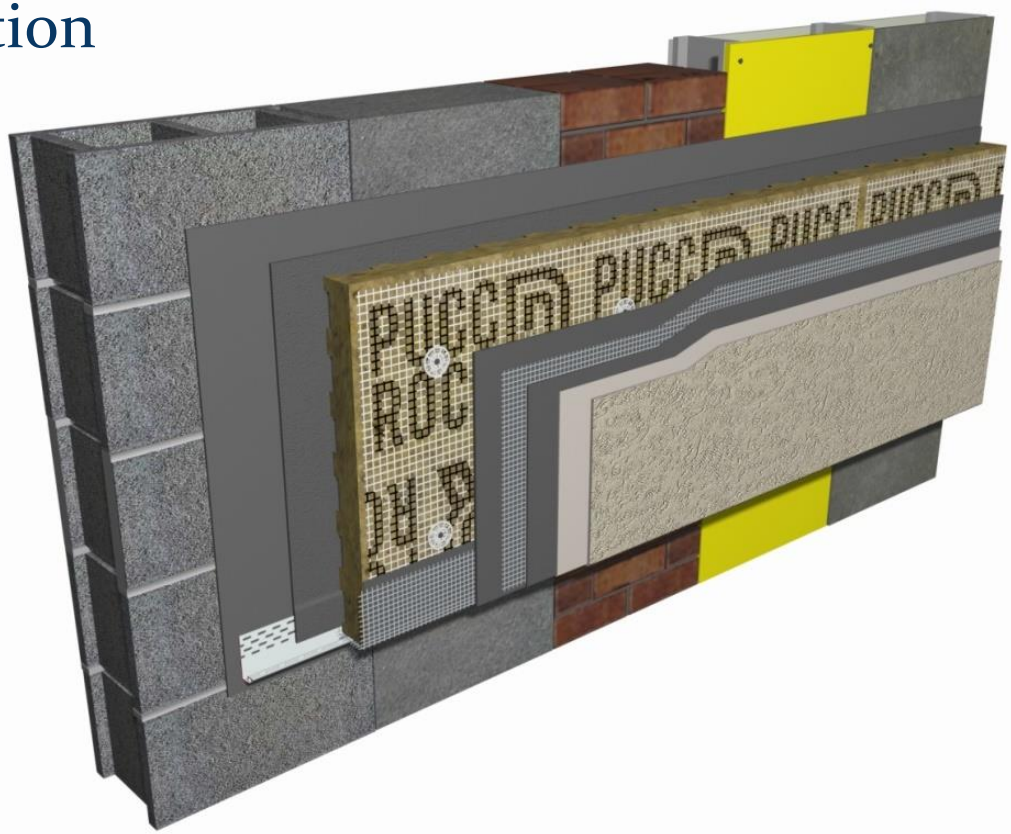
Ken Soble Tower

- Built in 1967, the 18 storey structure had been in a state of deterioration for years when CityHousing Hamilton decided to preserve and revitalize the existing building at a fraction of the cost of building a new one

- The retrofit would include every energy-related facet of the building from mechanical, to electrical, to plumbing, to life safety, and to the building envelope

Ken Soble Tower

The envelope retrofit included non-combustible EIFS with six inch mineral wool insulation



Ken Soble Tower

The Ken Soble Tower now stands as a fitting example of a future proof, well insulated, sustainable, resilient, energy efficient, airtight, safe, comfortable, affordable, valuable asset that is more than able to withstand climate change and counteract it

Ken Soble Tower

Aesthetics

- EIFS finishes are available in infinite colours, in a multitude of textures, and can simulate most commercially-available materials such as brick, stone, and granite

- Decorative mouldings and shapes can further enhance the appearance of any building clad with EIFS

In Summary

- EIFS is vital to a well-functioning building envelope
- EIFS is economical compared to the alternatives
- EIFS enables buildings to be sustainable and resilient
- EIFS is aesthetically diverse

Thank you

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