Neuberger Hall Portland State University

Portland State University. School of Architecture

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**Concrete's Carbon Footprint**

90% of concrete mix emits a relatively small amount of CO₂ into the atmosphere.

The other 10%, cement, accounts for the vast majority of concrete's embodied CO₂.

Concrete's embodied CO₂ is roughly equivalent to 9% of its weight.

Roughly 40% of the CO₂ emitted from calcination will be reabsorbed through carbonation of concrete surfaces over a 100-year life cycle.

Concrete is the 2nd most consumed material after water. It can be broken down and used as an aggregate in the production of new concrete.

This recycled concrete is most commonly used for road base, pavement and sub-base as well as civil engineering projects, parking lots, etc.

It can also be utilised as backfilling for pipe excavations, environmental constructions or foundations for buildings.

There is potential for other uses, for instance, the Australian government guidelines state that up to 30% of recycled aggregate can be used for structural concrete without any noticeable difference in workability and strength compared with virgin aggregate.

**Neuberger's East Facade**

Existing Facade:
Total U-value: 1.12
Total Embodied Carbon: 91,471 lbs

Thermal Images Showing Heat Leakage

**Energy Performance for Proposed Assemblies**

Black grid: 23% of facade remains in place and serves as a thermal bridge with a u-value of 1.93

Energy performance for proposed assemblies:
- Proposed facade with 100% glazing: u-value 0.7
- Proposed facade with 50% glazing: u-value 0.59
- Proposed facade with 25% glazing: u-value 0.54