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Neuberger Hall Portland State University

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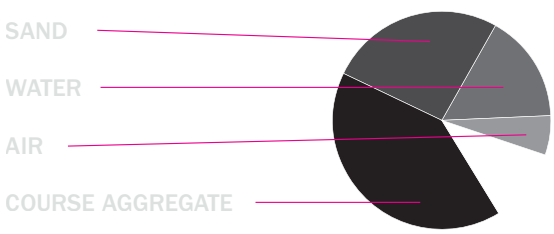
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CONCRETE'S CARBON FOOTPRINT

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.



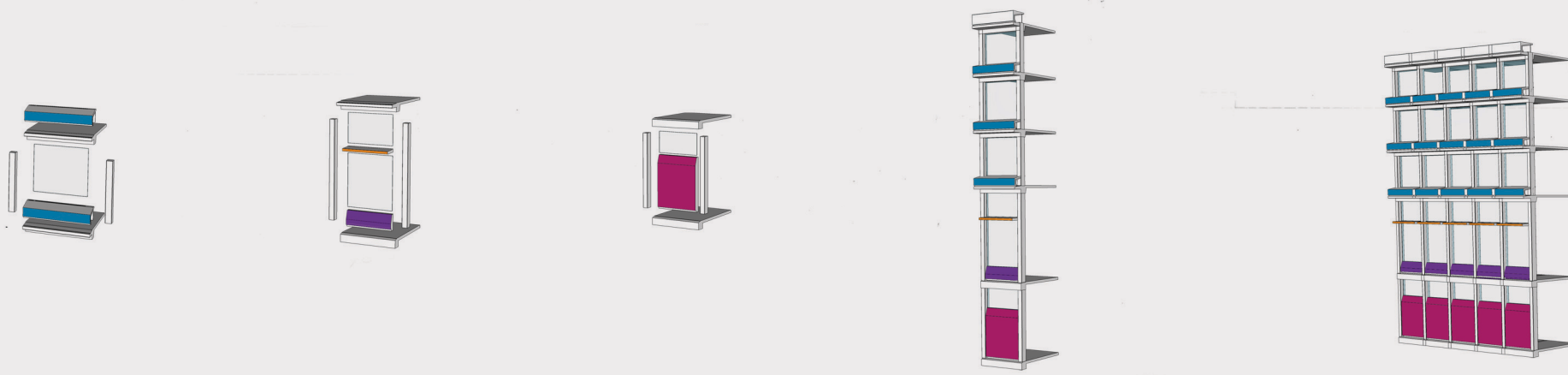
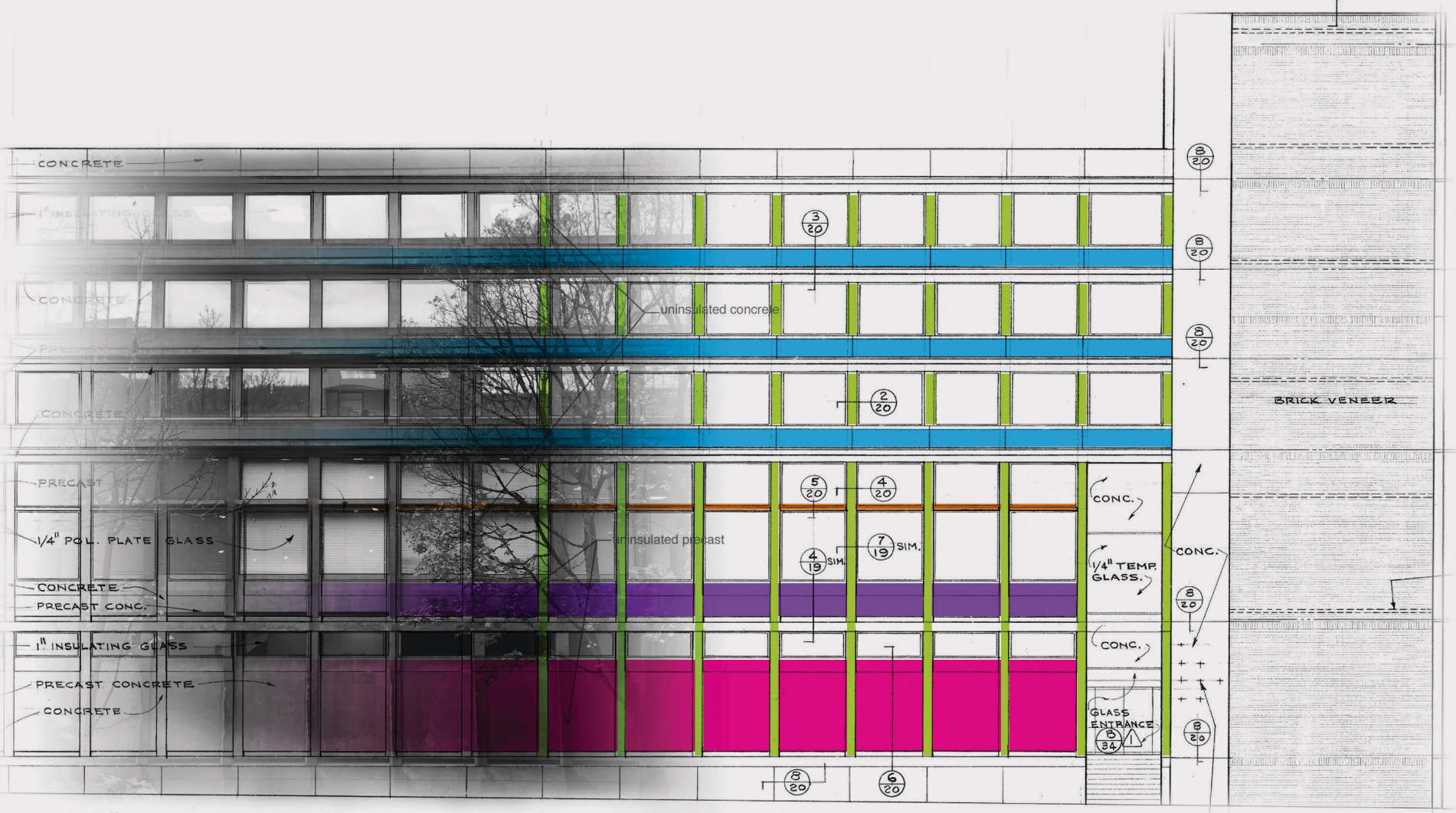
Concrete is the 2nd most consumed material after water. It can be broken down and used as an aggregate in the production of new concrete.

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

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.

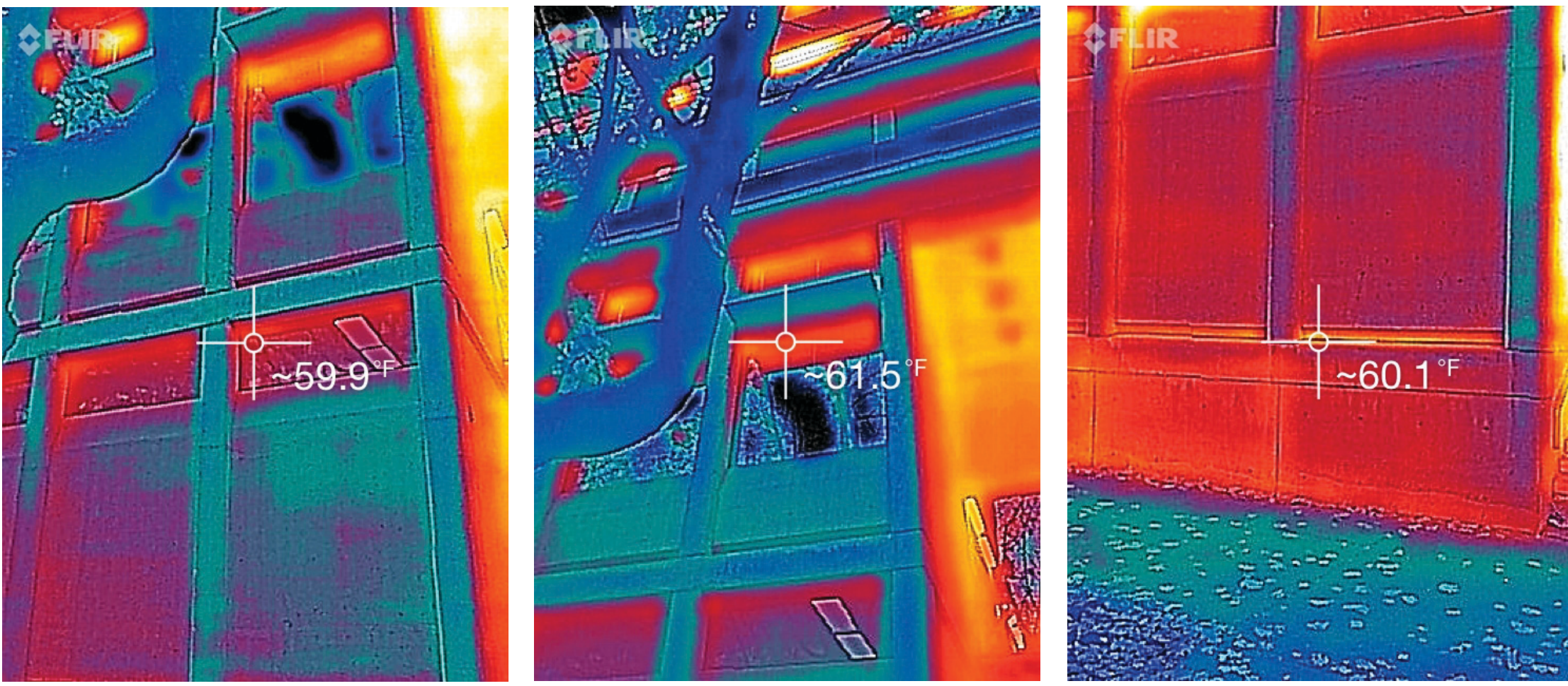
it can also be utilised as backfilling for pipe excavations, environmental constructions or foundations for buildings.

NEUBERGER'S EAST FACADE



EXISTING FACADE:
TOTAL U-VALUE: 1.12
TOTAL EMBODIED CARBON: 91,471 lbs

THERMAL IMAGES SHOWING HEAT LEAKAGE



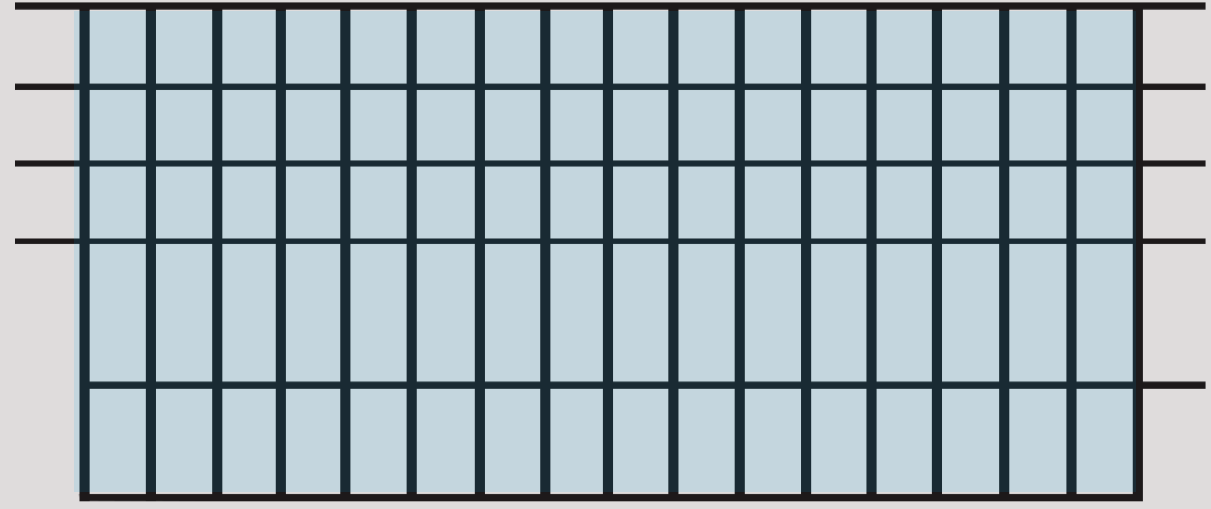
	U-Value	Area	Embodied CO ²
[Assembly 1]	.06	31.8 ft ²	162.18 lbs
[Assembly 2]	1.89	19.8 ft ³	249.48 lbs
[Assembly 3]	2.23	74.1 ft ³	933.66 lbs
[Assembly 4]	1.97	17.6 ft ³	221.76 lbs
INDIVIDUAL ASSEMBLY TOTALS	1.899		1567.08 lbs
FLOOR 1 TOTALS			25,073 lbs

	U-Value	Area	Embodied CO ²
[Assembly 1]	.06	85.4 ft ²	435.54 lbs
[Assembly 2]	1.89	25.3 ft ³	318.78 lbs
[Assembly 3]	1.33	8.4 ft ³	105.84 lbs
[Assembly 4]	2.72	18.2 ft ³	229.32 lbs
[Assembly 5]	1.97	17.6 ft ³	221.76 lbs
INDIVIDUAL ASSEMBLY TOTALS	.9458		1,311.24 lbs
FLOOR 2 TOTALS			20,979 lbs

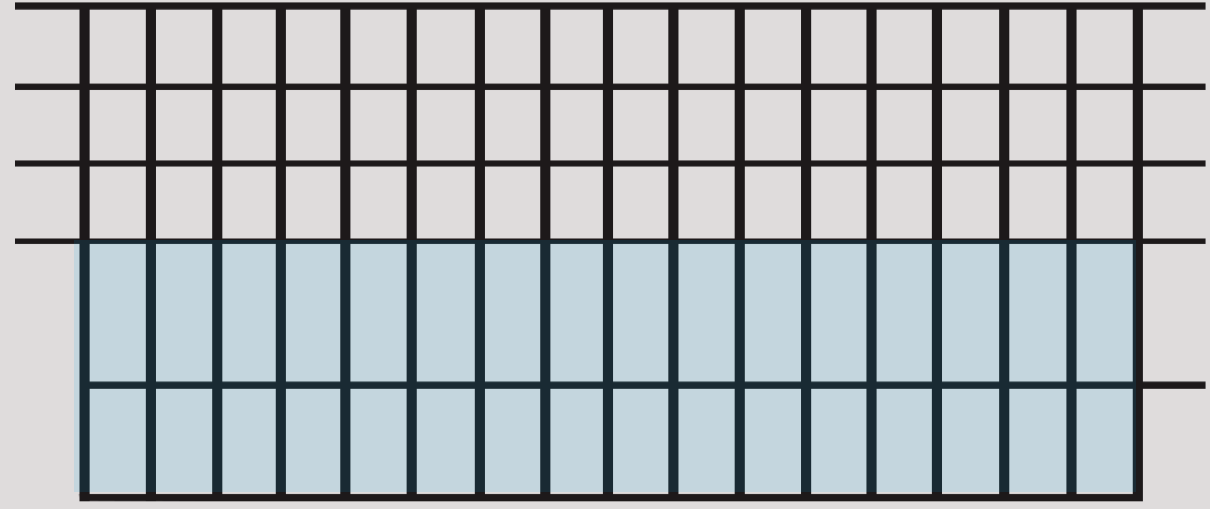
	U-Value	Area	Embodied CO ²
[Assembly 1]	1.97	28.7 ft ³	361.62 lbs
[Assembly 2]	0.6	40.4 ft ²	206.04 lbs
[Assembly 3]	1.89	12.4 ft ³	156.24 lbs
[Assembly 4]	0.36	9.3 ft ³	117.18 lbs
INDIVIDUAL ASSEMBLY TOTALS	.8671		841.08 lbs
MEZZANINE ASSEMBLY (3,4,5) TOTALS			45,418 lbs

ENERGY PERFORMANCE FOR PROPOSED ASSEMBLIES

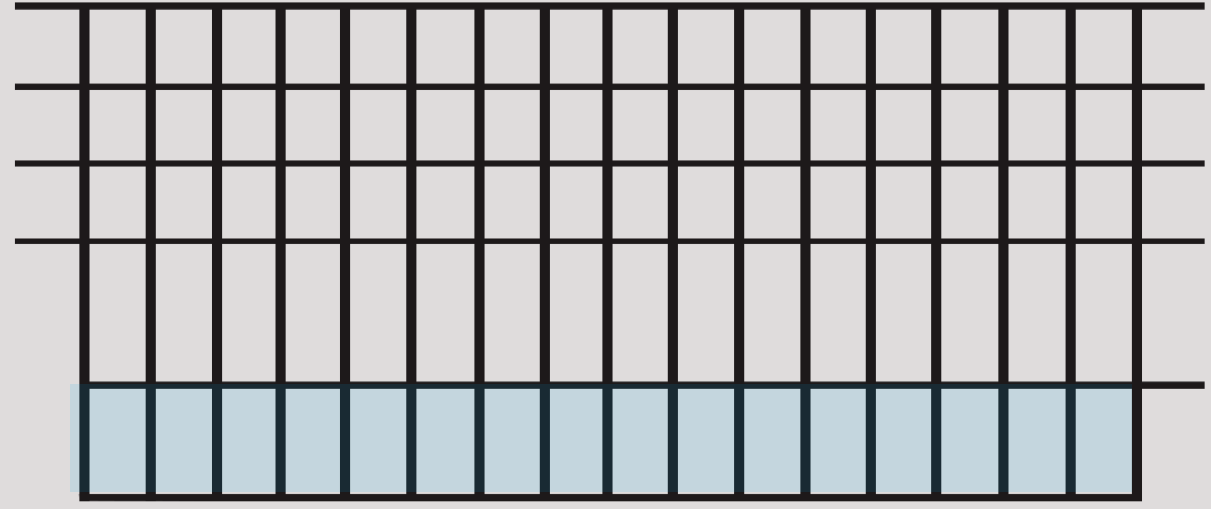
Black grid: 23% of facade remains in place and serves as a thermal bridge with a u-value of 1.93



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