

CASE STUDY

An office building repurposed to a hotel

Most cities feature examples of post-war offices that have come to the end of their natural life. These buildings often have poor external cladding and inadequate space for modern services.

The conventional response is demolition, but the climate emergency is forcing a re-think as so much carbon is embedded in these existing structures and a new building will greatly aggravate the problem.

Upgrading out-dated offices to higher standards instead of demolishing them can work reasonably well. Another use, like hotel accommodation, may prove to be a more suitable long-term outcome, especially in a city like Edinburgh where hotel rooms are in demand.

Several 1960s offices have already been converted for the sector, successfully utilising the restrictions that impaired the offices space:

- Low ceiling heights and narrow floor plans of offices are suitable for domestic-scale hotel rooms.
- Services can be accommodated in the corridor ceiling.
- New cladding can provide much better insulation, combined with appropriate windows whilst improving the visual quality.
- Ground or top floors can be converted into reception or restaurant spaces.

The Resident Hotel's proposed renovation of Meldrum House, the old HMRC office on Drumsheugh Gardens, showcases these techniques and replaces an unsightly building with better architecture. Built in the late 1950s, Meldrum House has suffered from neglect and a lack of proper maintenance. Furthermore, the concrete cladding began to spall and fall away from the main structure, resulting in the building being overclad with a protective membrane.

During the design stages for the hotel, demolition and retention options were considered but a third option to replicate the existing building was also considered for a theoretical comparison;

Option 1: Demolish existing building and replace with new hotel

Total embodied carbon 1,780 tonnes of CO2 equivalent.

Includes 715 tonnes for the superstructure and 837 tonnes for the facades.

Option 2: Re-use and extend existing structure as a hotel

Total embodied carbon 1,083 tonnes of CO2 equivalent.

Includes 213 tonnes for two additional floors.

Includes 837 tonnes for new facades.

Therefore, retaining the existing structure saves approximately 40% of embodied carbon emissions but it would also be possible to consider further strategies through the following:

- Using low-carbon materials for the facades, which could include sourcing aluminium for the glazing systems from hydro-powered plants.
- Specifying internal materials with a high recycled content and which are suitable for future recycling, promoting the circular economy.
- Recycling some of the facade elements.

Conversion of an outdated existing building highlights two critical issues in the pursuit of net zero carbon. Around 85% of the existing building stock will still be with us in 2050.

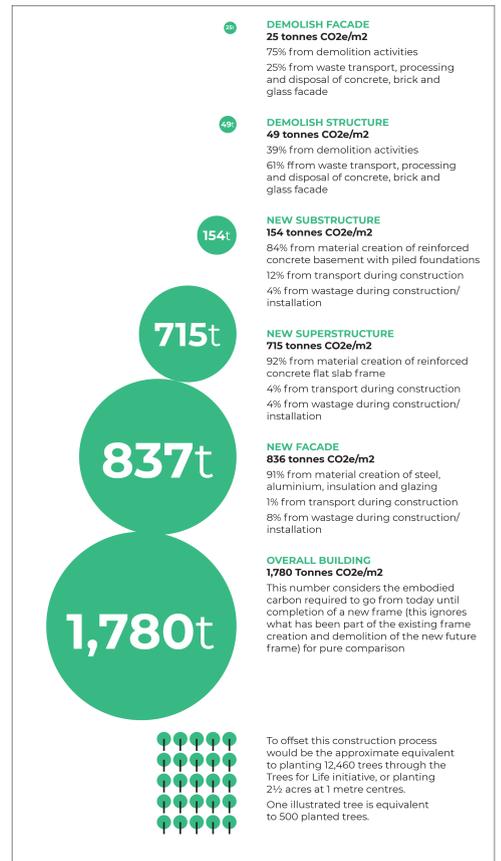
This means we must become more innovative at ways of repurposing all kinds of buildings for viable future use. Further, the design of all new buildings should consider easy conversion into something else in the future. Adaptable architecture is low carbon architecture.

Challenges and opportunities

- Changing mindsets to avoid demolition as a first resort.
- Commercial viability and the perception of second-hand stock.
- Finding inventive and attractive design solutions to converted properties.
- Saving time and cost as well as carbon by retaining existing buildings.
- Reducing VAT on building refurbishments.



Option 1



Option 2



Diagrams comparing the embodied carbon of the two different design options.

Client: Resident Hotels with Mactaggart Family & Partners

Architect: Michael Laird Architects

Brand Architect: PJMA

Client: Resident Hotels

Client's Representative: Rennick Property

Project Manager: Thomas & Adamson

Interior Designers: WISH Interior Architecture

Structural Engineer: Arup

M&E Engineers: Rybka

Acoustic Consultant: Sandy Brown

Fire Engineer: Atelier Ten



- 1 Existing office building.
- 2 Image of proposed hotel.
- 3 Detail of existing facade.
- 4 Plan showing how hotel rooms fit comfortably within the original office layout.

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