DEVECI, G. 2017. *Heritage Way*. [Design]

# Heritage Way.

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2017

# Heritage Way

Heritage Way was a new housing development of 30 affordable, low-energy housing units in Fraserburgh's Quarry Road. It was supported by the Scottish Government's "Greener Homes Innovation Scheme" as an exemplar housing model that promotes new approaches to the delivery of low-energy, efficient and affordable housing, using innovative modern methods of construction. Since its completion in 2017, the development has been monitored for energy use consumption, in order to provide a case study for the future of low-energy housing developments.

Material in this portfolio is currently taken from a single source:

1. A case study extracted from a publication by Architecture and Design Scotland (pages 3-7):
    - DEVECI, G. 2021. Heritage Way case study: project completed, 2017. In, Architecture and Design Scotland, *Using offsite construction for housing delivery in Scotland*. Edinburgh: Architecture and Design Scotland [online], pages 10-14. Available from: https://www.ads.org.uk/case-study-using-offsite-construction-for-housing-delivery-in-scotland/

Further sources may be added to this portfolio at a later date.

# 1. Heritage Way Case Study Project completed: 2017

Right: Heritage Way, Fraserburgh, images by Gokay Devici

## Introduction

Heritage Way, a new housing development of 30 affordable, low-energy housing units in Fraserburgh's Quarry Road, is an exemplar housing model supported by the 'Greener Homes Innovation Scheme' which was launched by the Scottish Government to promote new approaches to the delivery of low-energy efficient affordable housing using innovative Modern Methods of Construction (MMC).

The scheme, designed by Gokay Deveci of Robert Gordon University's Scott Sutherland School of Architecture and Built Environment in collaboration with Aberdeenshire Council, received a £1.3 Million grant from the Scottish Government. Since its completion in 2017 the development has been monitored for energy use consumption, the results of which will be used as a case study for the future of low energy housing developments.

## Background

The site is located in an area of town that consisted of a derelict warehouse and industrial units that was identified for regeneration, as part of the Aberdeenshire Local Development Plan (2012). The chosen site for Heritage Way presented certain challenges, however it also provided quality attributes and potential to enhance the social and urban regeneration of this brownfield site.

The Quarry Road site is exposed to the cold north-easterly winds coming off the North Sea which required a well-insulated and draft proofed 'fabric first' approach to minimise energy use. The main aim of the project was to incorporate a very high level of energy efficiency utilising MMC principles (embracing a range of offsite manufacturing and onsite techniques, providing an alternative to traditional house building) in order to minimise the additional capital costs involved, and evaluate longer term cost savings as well as measuring the performance. The ambition of the development was to achieve the 'Silver' level of Section 7 of Scottish Building Regulations or better as well as providing a high-quality design standard incorporating accessibility and adaptability that could be adopted in future developments.

## Procurement

The project emerged as the winning bid in the 'Greener Homes Innovation Scheme' competition that was looking for a social housing scheme that could demonstrate energy efficiency through MMC.

*"A site was available as part of an overall masterplan and I agreed to do the competition on the understanding that the monitoring aspect of it, to be done at RGU would be also part of that package. So, I took it on at the time, and the unfortunate thing was, we had only four weeks to design the whole thing!"* says Gokay Deveci.

A previous housing project completed by Deveci, Tigh Na Claddach in Dunoon (2010) was used as a model as it had demonstrated low energy consumption in use and involved some prefabricated elements of construction.

*"So, we thought that we should repeat that. But also take into account the new context, as this site, although also coastal is surrounded by industrial buildings. So, this is how the whole design formed, taking an existing model, reiteration, rethinking and actually designing in further prefabrication elements. We learned our lessons from the Dunoon scheme."*


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## Design

The design team took a holistic approach to embracing 'sustainability' without compromising the design in terms of originality, innovation, efficiency, form and relationship with context setting.

The design is based on a plan of 30 properties of interlocking two, three and four bedroom apartments and houses, capable of providing varied accessible accommodation, each with its own amenity space. The design provides adaptable semi-open plan layouts that suit various lifestyles and maximise natural light. Independent access to the one-bedroom apartments is served by external stairs. Three of the flats are designed to be accessible.

## Construction

The contractor, Robertson Construction, embraced all of the benefits of the MMC including, integrating or reducing processes for supply chain, reduced site management and closing the gap between the theoretical performance and reality.

The design utilised prefabricated, panelised and super-insulated 'I' beam roof and wall system, externally finished with lightweight cladding materials (either 'eternit' fibre slates or 'rheinzink' zinc (suitable for coastal locations). These materials were chosen principally for their weathering characteristics and appropriateness for location, as well as their cost saving potential due to the minimised loading on foundations. Carefully selected colours were used to add a strong sense of place and vitality.

*"In terms of the offsite prefabrication, it's a hybrid structure. Deeside Timberframe was the timber engineers and manufacturers. The method of construction was more on a component level where insulated OSB timber panels were manufactured for all the walls and roof. We were keen to see if the prefabrication and putting in the insulation, not on the site but in the factory, would reduce the cold bridging which is essential in terms of creating very low energy and passive house standards."*

*"The second type of the MMC prefabrication element is the zinc, again coming in prefabricated components to the site. This arrived in sections and we did the walls and the roof all in one go. The zinc installation was very quick." The choice of zinc was to be as low maintenance in the long term as possible, to meet the concerns of Aberdeenshire Council's maintenance department budgets, whilst also reflecting the context of the coastal site within one of the largest fishing ports in Scotland. The four different grey tones echo the sea and sky as well as the neighbouring industrial buildings."*

## Monitoring

The energy consumption in six of the properties has been monitored by RGU over a period of 15 months. It is expected that the post occupancy evaluation, looking at residents' experiences, as well as behaviour and performance of low energy systems, will help inform Aberdeenshire Council's future housing programmes.

*"It's been designed to show that MMC is capable of delivering house types repeatable at slightly different*

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Top: Heritage Way, Fraserburgh, image by Gokay Devici

*"Tighter collaboration between the design team members, in particular structural engineering and MMC manufacturing is important for delivery of the very low energy standards required."*

Gokay Deveci

*levels of insulation in order to meet various criteria. This was achieved by 300mm all-round insulation for all the houses to start with, and then I beefed up another 50mm for gold standard or 100mm for platinum standard. The post occupancy monitoring will take into account how much the costs will diverge and if the investment is worthwhile."*

## Feedback

*"From the resident's point of view, they are enjoying living there. Thermal comfort and running costs are obvious advantages. We also managed to provide an additional 15% floor space above the current space standards with open plan/ceiling spaces filled with generous daylight, which has created very spacious living areas and benefits from sea views."*

*"From a client point of view the zinc finish to the walls and the roof cladding as a single wrapping material was the preferred option despite the fact it was the more expensive option. However, for a long-life and minimum maintenance point of view it was the key focus for them, and for me."*

## Lessons Learned

### Contracts

*"Tighter collaboration between the design team members, in particular structural engineering and MMC manufacturing is important for delivery of the very low energy standards required. Maybe in hindsight, working with a partnering contractor is much better than an open tendering process. If you're trying to achieve an exemplary or template building, that others are going to use, I don't think an open tender is the best way to go. I would recommend having control over the selection of contract type."*

## Education on new technologies and Handover

*"My experience has shown that most of the social housing occupiers / tenants need a clear and robust handover in order to create a clearer and more successful understanding of how the buildings work. Some of the tenants were not fully aware of the low-energy components. These have ranged, for example, from not seeing the radiators to creating very high moisture levels in an airtight house due to switched off ventilation systems. Some tenants who were living in these very low energy housing schemes had not been made aware that they had a mechanical ventilation system in the house."*

## Conclusion

Heritage Way is a social housing exemplar and exponent of the Scottish Government's strategic priorities, in terms of low-energy consumption and affordability.

*"Architecture is a physical manifestation of culture and identity and housing is an important part of that. We do not want countless uninspiring housing developments in Scotland currently being dotted around the country which can be 'built anywhere but belong nowhere'. We need a new and emerging architecture in Scotland to regain the country's sense of culture and to take an ethical stance towards creating homes that once more put people first through dignified and appropriate design. In my experience, MMC is capable of delivering this part of our culture. But it must be seen as the 'quality and not the quantity."*

## Why Offsite?

**Gokay Deveci assesses Modern Methods of Construction (MMC) and its impact on future developments as exemplified in Heritage Way.**

- MMC homes are usually more energy efficient than homes built using traditional methods. This helps to reduce heating bills for affordable housing and also means the whole life running costs of such buildings could be lower than other homes. For this reason, Royal Institure of British Architects has said that if the whole-life value of residential units were taken into account at the procurement stage, it would increase the demand for MMC homes.

- MMC is particularly well suited to housing associations and councils that require high volume, repetitive designs that can be built offsite and transported to the building site to be erected. This makes social and affordable housing good candidates for the off-site approach, where there can also be advantages in the speed of delivery.

- There are still serious perception problems for quality and durability. Social housing will deliver a greater proporotion of MMC housing, but it is important that lower cost designs are fully tested to ensure that MMC is delivering sustainable, durable, high quality social homes. We do need higher levels of energy efficiency in order to address climate emergency. Inefficient homes built today will need retrofitting at a later date in order to comply with the more stringent energy performance requirements: The Chartered Institute of Housing confirmed that just 1% of new homes built in 2018 met the highest Energy Performance Certificate standard (Band A). This represents a waste of an opportunity to build housing that is future-ready and adaptable.

- Adaptability is crucial in terms of MMC construction, if it is going to be successful and capable of adapting to the impacts of climate change. New homes must adapt to the needs of the users by increasing comfort, energy efficiency, indoor air quality resiliency and safety.

Finally, the critical question is can MMC deliver modern homes that are: low-energy in use, good quality design, addressing character and identity and the potential to adapt to different context in terms of places and site conditions? Heritage Way, which is a hybrid construction model, is social housing delivered on a social housing budget and demonstrates that a quality build, eliminating many on-site trades, is achievable. It has therefore demonstrated that MMC can meet the criteria.