

## Introduction

As part of its' support role to Care & Repair Agencies in Wales, Care & Repair Cymru regularly scans the horizon for good practice and good ideas, passing on this information where appropriate, for Agencies to consider.

## Overview

The UK Government Department of Communities and Local Government's (CLG) report 'Delivering Housing Adaptations for Disabled People (2006)' contains the following section, 'Use of Modular Buildings'

**7.16** Where access to washing and/or sleeping accommodation is to be improved it may be appropriate to consider the use of a prefabricated unit, rather than an extension of conventional construction or the loss of amenity caused by internal rearrangement.

Experience of such provision is limited but increasing, and although the greater cost savings only come from using the unit more than once there are other factors to consider.

Speed of installation does not significantly reduce the progress of the total time needed to progress an adaptation from enquiry to completion, but the reduction in disruption may be relevant where an occupier is to remain in residence during the work on site. Recent legislation has clarified the position with respect to ownership and the right of the local authority to recover the unit.

Reservations about appearance and reinstatement when the unit is removed can be addressed by good design. A (one English) local authority is committed to the use of 'removable buildings' and will complete 9 in 2003/04, with 6 planned for 2004/05. A number of the early units have been re-sited (3 times in one case) leading to considerable budget savings.

The current product is used in all cases on public sector properties (in the one English LA), where feasible. Early difficulties have been largely ironed out and one of the distinct advantages is that additional bedroom/bathroom facilities can be provided within 3-4 months of the recommendation of an Occupational Therapist.

A(nother) metropolitan borough council has negotiated substantial savings through the purchase of a standard range of equipment. A(nother) district council also has an agreed range of equipment for which contract prices have been negotiated'.

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Two concepts emerge from this, which might guide future practice in facilitating adaptive installations:

- An assessed self-contained portable structure, which can be classified by funding bodies as 'equipment' and partially or wholly exempt from grant application and planning processes, avoiding 'bottlenecking';
- A range of approved design specifications and benchmarked contractual rates for completion, which require only inspection and assessment during construction and at the time of completion, incorporating all known installation requirements

In 2008 a new grant ceiling of £30k for DFGs was introduced in England. CLG piloted a trial in partnership with English LAs and HIAs that summer, to assess modular and prefabricated structures.

I have spoken to Foundations about English HIA's experience since then, which shows generally that these structures were intended to be:

- **Recyclable** - capable of being dismantled or removed, and re-used with some renovation and/or modification.  
Where a client had urgent needs which were unlikely to continue for 10 years and their needs were clearly the result of a clinically-assessed condition, a charge was still made on their estate to recover the costs of DFG works. The cost of subsequent remedial works by house buyers to reverse the adaptations to the homes' structure was likely to be disproportionately heavy where the client had been assessed as able to pay, depressing the resale value of their property. Using a module appended to the main structure restricted the need to make costly and 'undesirable' adaptations to the property, creating new, purpose-designed living and bathing/WC space.
- **Designed and delivered to site within a tight timetable**, and approved by the LA's officers in advance
- **Easy to install/assemble**, with minimal delay in the design specification, approval and construction phases of the DFG process

Although structures of this kind appear to have these advantages, the **drawbacks Foundations have identified to date are:**

- Modular units often require huge cranes to install, creating insurance, traffic, and neighbour liaison problems for the installing agency
- They are difficult to successfully recycle where forming new doorways and closing old ones is necessary, e.g., and overhaul requires experienced contractual services. Adequate storage facilities are needed to secure them when not in use.
- Their unit cost has been found by English Agencies to be comparable to new build using conventional construction methods. Without the ability to recycle them consistently, the 'cons' outweigh the 'pros'

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Prefabricated timber structures used by HIAs were initially ordered from suppliers who did not manufacture them to Building Regulations standard, and without the required level of thermal efficiency. They were not successful in that form.

- They were reported by Foundations to be easy to assemble from a 'flat pack', with loads being broken down and taken into the clients' back garden without any difficulty
- Around 1-2 trial constructions would usually be enough for Handypersons to be familiar with the design and assembly methods
- However, Agencies have been dogged by difficulties with 'rogue suppliers' who exploited their unfamiliarity with their design and properties, and failed to fulfil contractual obligations

#### Current Practice Developments in England

Having spoken to Foundations and been signposted to several English Agencies and LAs for more information, one English C&R Agency Tech Officer referred me on to a specialist contractor in the West Midlands.

Edgbourn Building Contracts Limited have been trading since the 1980s and are involved in general property development including new build works, as well as specialised DFG contracts.

They have a longstanding relationship with Swedish building companies and methods, and Edgbourn's have applied an innovative approach to designing wet rooms and bedroom extensions under DFG. This has led to a complete package, known as the **PAB (Portable Adaptive Building System)**.

In many cases the need to make the most efficient use of the limited ground space available means that these structures are the most appropriate.

The PAB system is based on a foundation base developed by the Wykamol Group and their subsidiaries in Lancashire, to facilitate rapid erection of foundations for conservatories and other structures.

It incorporates piles supporting and a prefabricated ground beam unit, with a PAB floor panel prefabricated by Edgbourn, which carries the upper structure. Groundworks typically involve only a 12" excavation to take this base unit.

### A typical structure uses the following core elements:

**Helical screw piles** are driven into the ground using a high-torque unit adapted from a pneumatic driver: these piles were invented in the 1830s, and first used in the mud of the Thames estuary. They also support many seaside piers.

They are driven home and capped with flat steel plate heads which carry the ground beam unit. For remedial works on smaller structures like sheds and garages a jacking plate can be installed to restore the structure to the correct level. They can be used for underpinning single-storey conventional structures such as sheds, garages and housing.

A CADW project used larger versions to underpin the walls and dock frontage of Beaumaris Castle in Ynys Môn earlier this year.

**A prefabricated plastic box-section ground beam:** this is made to measure, and formed on top of the piles using push-home joints. It is filled with a grout which is allowed to set, forming a structural member

**Structural Insulated Panel (SIP) floor and wall units:** SIPs are formed by Edgebourn in their own manufacturing plant using facings of Oriented Strand Board (OSB3) sandwiching a foam or polystyrene core. The finished panel has load bearing properties 7 times that for a comparable timber frame, and forms a freestanding rigid unit with high thermal retention properties

**A typical time frame for completion of this structural shell is 2 days on site.**

- The SIP structure can be covered with impermeable boarding and directly rendered using 'Monocouche' through-coloured products.
- New developments include coverings mimicking brick and other masonry finishes.
- Where planning regulations require an exterior finish to match the rest of the structure, a freestanding brick shell wall can be erected around the SIP module.
- These structures work out as narrower in section than conventional cavity walls, maximising use of available ground space.

**Weatherproofing elements:**

**Double glazed UPVC door and window units:** in keeping with the high thermal performance of the SIPs

**EPDM flat roof membrane:** Ethylene propylene diene monomer is a synthetic roof covering which can be stretched up to 300% of its' normal length, allowing it to respond to changes in temperature and loads exerted by structural movement.

This gives a life of up to 40 years, and avoids the failures associated with conventional flat roof coverings

It also avoids the use of 'hot works' techniques on site and is quick to install.

**Where required, conventional tiled or slated pitched roof structures can be carried by SIP wall units, as they are structural elements with high performance**

### **Project Management**

Edgebourn have well-established working relationships with Care & Repair Agencies and Local Authorities in the West Midlands, Staffordshire, Gloucestershire and North Somerset and can therefore be assessed as credible contractors in delivering grant works under DFG.

The company state that a typical timeframe for creating a finished extension structure is 8 working days. A general guideline time for the completion of a fully-fitted extension would be around 8 weeks. Case histories are given on their website and in the promotional literature.

A key benefit of this type of system and a potential one for other possible designs is that the core elements can be fabricated and 'dry assembled' in the manufacturing facility before installation on site. This allows the funding body to be sure that all elements conform to the necessary and appropriate criteria, and match the agreed specification.

### **Client-Centred Outcomes**

There is a clear benefit for clients in using this type of system.

- One company manufactures and installs the extension, competing all external works, and liaises with the client throughout the construction process
- All phases in the design and manufacture can be approved by Housing Officers, ensuring that the agreed specification is kept to throughout
- Design to construction time is minimised, speeding up the delivery of works on-site
- Groundworks and the use of disruptive plant is kept to a minimum
- The number of tradespeople involved in the whole process is minimised, reducing the possibility of 'no-show' and competing contractual obligations delaying or disrupting works

- The overall build standard of the finished conversion conforms to all elements of the Building and Fire Regulations, exceeding them in key areas of thermal efficiency

### Conclusions

There is clear evidence that this type of structure is preferred by commissioning bodies where a rapidly-constructed unit is required to assist their clients under DFG grant.

This may have potential benefits for clients with urgent need for adaptive measures in the home where an efficient OT specification, and LA Housing approval, could lead to the design and manufacture of the required structure in a small time frame.

At the time of writing further research is needed to establish what the potential options might be for developing a system of 'rapid response' delivery of modular or prefabricated structure on-site, which for example could facilitate hospital discharges for people who are exhibiting symptoms of Dementia, for example.

As English practice shows, this can be used where the need is for level access shower/WC facilities or sleeping accommodation.

A further option which may offer better outcomes for homeowners, is the installation of a purpose-built 'bathroom pod' within the existing structure of the home.

This can be dismantled when no longer required, and re-used in other homes

### Known manufacturers of Modular and 'pod' designs

**Portakabin** [www.portaloo.co.uk](http://www.portaloo.co.uk)

Modular buildings which are frequently specified in place of new build, e.g. by Education authorities, NHS Trusts, etc

**Springfield** [www.spring-field.co.uk](http://www.spring-field.co.uk)

A range of options to blend the external finish of the module with the existing home

**Offsite Solutions** [www.offsitesolutions.biz](http://www.offsitesolutions.biz)

GRP modules supplied usually by crane



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### Adaptapod

[www.adapatpod.com](http://www.adapatpod.com)

A very basic pattern of external finish, supplied as a rental unit to facilitate hospital discharge

### Pod Modules

[www.pod-modules.co.uk](http://www.pod-modules.co.uk)

Suppliers to Public Sector procurement bodies in UK

### Stannah Stairlifts

Supplier of prefabricated timber extensions in 2008, discussed above

### Web links for Edgebourn and related suppliers

#### Edgebourn

[www.edgebourn.co.uk](http://www.edgebourn.co.uk)

#### Quickbase - Helical Screw Piling System

[www.quickbase.com](http://www.quickbase.com)

#### Thor Helical Remedial (Quickbase parent company)

[www.thorremedial.com](http://www.thorremedial.com)

**Need clarification of any of this? If so, contact:**

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