A DEMONSTRATION OF THE VIABILITY AND GROWING ACCEPTABILITY OF EARTH-SHELTERED BUILDINGS IN THE UK

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Contemporary earth-sheltered buildings are a viable building type in the UK and are becoming increasingly acceptable.

In support of this hypothesis, this paper undertakes a review of the history and development of the UK earth-sheltering movement from its inception with Arthur Quarmby's Underhill in 1975 up to the present day. The chronology identifies the movements champions, its benchmark buildings, and some of the key factors propagating its growth.

It's in this context that the earth-sheltered commissions of the authors Chartered Architects Practice, SEArch(Sustainable Ecological Architecture Ltd) is presented. The paper shows how this body of work has drawn on the movements architectural precedents, been influenced and informed by its proponents. A valuable source of reference has been *'The Compendium of Contemporary UK Earth-Sheltered Buildings 1966-2012'* which has been substantially edited and updated in compiling this Paper.

That there is an earth-sheltered movement in the UK is established. That the building type is viable is evidence by the 35 year history and increasingly diverse applications. That there is a growing interest is irrefutable given the growing numbers each decade. The statistics are compelling and have been interwoven into the narrative.

In summarizing the paper a forecast is offered as to the future of the UK earth-sheltering movement in the light of the recent publication, The National Planning Policy Framework.

Keywords: Earth-Sheltering, National Planning Policy Framework 2012

Introduction

Contemporary earth-sheltered buildings are a viable building type in the UK and are becoming increasingly acceptable.

In support of this hypothesis, this paper undertakes a review of the history and development of the UK earth-sheltering movement identifying it's champions, benchmark buildings, and key factors propagating its growth.

It's in this context that SEArch's expanding portfolio of earth-sheltered commissions is presented. The paper shows how this body of work has drawn on the movements architectural precedents and how each of SEArch's projects has been influenced and informed.

A valuable source of reference has been *'The Compendium of Contemporary UK Earth-Sheltered Buildings 1966-2012'* (Harrall. 2012) which has been substantially edited and updated in compiling this Paper. Data extracted from the compendium has been used to graphically plot the trends of the earth-sheltering movement through its proffered designs, planning decisions and their transition through to construction.

What then follows is a discussion of the findings of the paper, proffering possible future trends of the UK earth-sheltering movement.

In concluding the paper the author offers an insight into future SEArch earth-sheltered projects.

What is meant by earth-sheltering?

The expression *earth-sheltering* is interpreted by the author as being a generic term with the general meaning: *building design in which soil plays an integral part.* This integration may occur in a number of ways. By way of clarification, the author offers his extended definition as follows:-

Earth-sheltering definition

A building can be described as ***earth-sheltered*** if its external envelope is in contact with a thermally significant volume of soil or substrate (where "thermally significant" means making a functional contribution to the thermal effectiveness [(Baggs 1981) (Baggs 1991)] of the building in question.)

There may be said to be three forms of earth-sheltered building: -

(i) earth-covered
(ii) earth-bunded
(iii) subterranean

An ***earth-sheltered building*** may be designed to combine some or all of these forms.

An ***earth-bunded*** building is one where the thermally significant element insulates one or more of the sheltered elevations of the building. The bunding can be partial or total.
An ***earth-covered*** building is one where the thermally effective element is placed on the roof, but is more usually a continuation of the earth-bunding at the unexposed elevations of the building.
A ***subterranean*** building is one where the thermally significant element insulates all elevations of the building, leaving only the roof exposed; or, if the building is built into an incline, it may be that the roof is covered and only one elevation is left exposed.

The UK Earth-Sheltered Movement

An architectural movement could not, especially nowadays, occur without a society of like-minded individuals coming into being; but historically such movements have been sparked by the emergence of a few exponents of exceptional vision and drive, or perhaps, eccentricity. The contemporary British earth-sheltering movement is probably no exception.

Fig 1. 1996. Bond, M. Underhill. Arthur Quarmby

Quarmbys' Underhill

In the 1997 Yearbook of *The Guinness World Records* (Guinness Book of World Records. 1997) in the section on Architecture there is the following entry:-

" …British Buildings, First underground house. In 1972 Arthur Quarmby began digging his house, 'Underhill' in Holme, West Yorkshire. With an internal area of 325m^2 (3,500 ft^2) the house

has a 6m (20ft) diameter roof light, a figure-of-eight swimming pool, a music room, and a cave with a peat fire."

Completed in 1975, Underhill has remained to this day the family home of its Architect, Arthur Quarmby [See Fig 1]. Introducing his home to the *Huddersfield Daily Examiner* he said *"People don't like the idea of building underground. They think of all those snails and worms, the clammy darkness and cold. But as you can see, it's not like that at all. Earth-sheltering, in fact, is all about using combinations of light, space, vegetation and water to their full advantage, inside and out"* (Parkin 2002)

Providing further insight into his inspiration for *Underhill* in his own words during an interview with *The Sunday Telegraph, " … to build in a kindly way in a delicate and beautiful landscape, so that the house blended as much as possible into the environment."* (Davies 2003)

1975 – 1983: formative years

After *Underhill*, there was an intervening period of ten years before the second UK earth-sheltered building was built. *Mole Manor*, another Quarmby design. But the pioneers of the movement were the founding members of the *British Earth Sheltering Association (BESA)*. Before the formation of BESA, earth-sheltering as a concept entered the public domain during the period 1975 - 1983 as the result of a number of events, each independent of the other, each cited by BESA's eventual founders.

Between 1976 and 1983, Arthur Quarmby toured England giving a series of lectures *'Upside Down Architecture'* at the RIBA and Schools of Architecture. During this period, two US publications reached our shores. The first, '*Earth Sheltered Housing Design: Guidelines, Examples and References'* (1979), edited by British-born Ray Sterling (Van Nostrand, Reinhold. 1979). In the preface to this publication, Sterling, the then Director of *The Underground Space Centre*, states, *"The concept of earth-sheltered housing is rapidly developing as a viable alternative for Minnesota to reduce the dependence of housing on an uninterrupted supply of fossil fuel energy."*

The second book, '*Gentle Architecture'*, by the American Architect Malcolm Wells (1982) offers no better justification for earth-sheltering than the authors' perception of the degradation of our landscape by the built environment, *" You don't have to be very wise or very perceptive to see what a mess we have made of our beautiful earth."*

Adding to the international flavour, a scale model of Peter Carpenter's Welsh *Berm House (1980 - 1987)* was exhibited at the 1980 World Solar Forum in Brighton and then again the same year at the International Solar Energy Symposium Conference at the RIBA headquarters in London. (Monmouthshire Beacon. 1981)

The British Earth Sheltering Association (BESA)

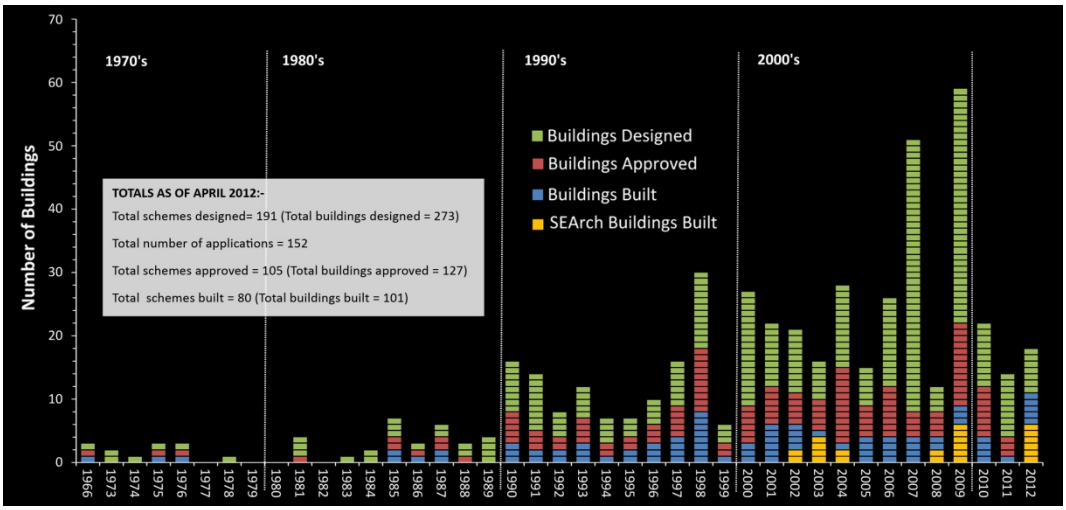
BESA was founded on Saturday 23rd July 1983 by three architects: Kevin Morel Rowlinson, Peter Southgate, and James Fitzpatrick. In their first published Bulletin in October 1983, they introduced the membership as: "… *Seven bold persons who have committed themselves to furthering the good word of earth-sheltered building design in this country …"* (Rowlinson. 1983). The evangelical note is unmistakable. By the end of the Association's first year, membership numbers had reached forty.

Confirmation that the group's message was being taken seriously within the architectural profession came from the RIBA. . On 9th April 1984, at the Building Industry Conference held at the RIBA's Headquarters in London at Portland Place, BESA members presented a talk titled, '*The Potential and Applicability of Earth-Sheltered Design in the United Kingdom'*.

Any chronicle of BESA's thirty years of activity will cover the greater part of the contemporary history of earth-sheltered architecture in the UK, where BESA has been the prime mover in publicising the concept of earth-sheltering and in promoting its practical application. BESA Secretary and earth-sheltered Architect, David Woods once remarked "… *almost all the UK earth-sheltered building stock can be linked back to BESA's membership list, either through the building designers or their owners."* (Harrall. 2006)

From the time of Arthur Quarmby's *Underhill* in 1972 up to the publication of BESA's December 1989 journal, seventeen years had elapsed, during which time only four earth-sheltered properties had been completed in the UK [See Table 1] Of these, three had commenced on site prior to the establishment of the Association. Only one other earth-sheltered property was under construction in 1989. This was the Sir Joseph Banks Memorial Centre for Economic Botany at Kew Gardens which opened in the spring of 1990.

Table 1. UK Earth-Sheltered Buildings 1966-2012: Annual Totals



' New ' BESA 1989

By the end of the eighties BESA's reigns were handed over to Peter Carpenter who had just completed his *Berm House at Caer Llan* and published the results following two years of monitoring. This data provided, for the first time in the UK, scientific evidence about the exceptional thermal performance of a 'zero-heated' earth-sheltered building. *Berm House* brought to the organisation the credibility of an earth-sheltered Headquarters.

The resurgence of BESA's national campaign continued with a stand at the *Green Show* at the National Exhibition Centre, Birmingham, 20 – 24 June 1990. This proved a turning point in BESA's membership numbers. In 1992 membership grew to 160, later, peaking in 1994 with 300 strong. Bolstered by an escalating membership and bulging post bag, BESA hosted the first National Earth-Sheltered Conference in September 1993 at Coventry University. Three further National Conferences occurred in 1995, 1996, and 1997. These proved landmark events in the movements prossilisation of earth-sheltering in the UK. Attendees from across Europe were drawn to the event to listen to national and international speakers that included Ted Cullinan, Max Fordham, Ray Sterling, Peter Carpenter and Arthur Quarmby.

The growth in interest in earth-sheltering at the beginning of the last decade of the 20th century was now manifesting itself in a variety of earth-sheltered building types - residential, commercial, and educational, demonstrating the adaptability of earth-sheltering.. Two such buildings were the

Crescent Wing at the *Sainsbury Centre* in Norwich, and *The Castle Mall Shopping Centre* also in Norwich.

In 1994 the first UK publication on earth-sheltering went on sale: '*Sod It: An introduction to earth-sheltered development in England and Wales'*, (Carpenter. 1994) edited by Peter Carpenter. To date, it is still the only significant publication in the field.

The increase during this period in the number of earth-sheltered buildings, either under construction or completed, marked the beginning of a period of sustained earth-sheltered building activity with numbers increasing throughout the remaining years of the twentieth century with thirty eight built.

Edward Cullinan's first earth-sheltered project, *The Archaeolink Visitors' Centre* in Aberdeenshire, was at the time the UK's largest earth-sheltered development and received widespread national press coverage and peer recognition, not to mention a plethora of awards.

The profile of earth-sheltering received an unexpected lift from TV ratings when millions of young TV viewers were introduced to *The Teletubbies* and their earth-sheltered home. Such was the phenomenon of the cult TV show that it was the experience of many earth-sheltered building owners and designers, that the term *Teletubby* became an epithet for their homes and work. Such was the phenomenon of *The Teletubbies* that the programme has been sold to 120 countries and translated into 45 languages.

With the assistance of *The Teletubbies*, 1997 proved to be a milestone in the development of UK earth-sheltering. The year was also to prove a turning-point in the battle against global warming as the world's most important climate change treaty was formulated in the Kyoto Protocol. As the arguments about the issues of global warming intensified and the debate about the likely consequences of climate change for the construction industry, speculation about the future design of buildings often featured in the Press.

The Hockerton Housing Project

Fig 2. 2005. White, N. *Hockerton Housing Project*, Brenda and Robert Vale

The national publicity of earth-sheltered buildings in 1997) had been fortified with a significant increase in their numbers and by the positive peer reviews, in particular the Hockerton Housing Project (HHP) [See Fig. 2] "*… the UK's first earth-covered, self-sufficient, ecological housing development*" (Artivix. 2005) HHP formally opened in October 1998 by the Construction Minister, Rt Hon Nick Raynsford MP.

This was the first time an earth-sheltered building had been designed to such high environmental performance standards with the benefit of input from academic research. The ideas underlying the HHP were developed by its Architects, Brenda and Robert Vale, from their first-hand experience of designing, building, and living in their own home, *The New Autonomous House* at Southwell

(Nottinghamshire) HHP awards include the Business Commitment to the Environment (BCE) Award 1999, the UK Solar Prize 2000 and European Solar Prize 2001.

By the end of the twentieth century, the UK's stock of contemporary earth-sheltered buildings had reached a total of thirty seven. Over the twenty seven year history of contemporary UK earth-sheltered buildings, there had been an increase each decade in the numbers of buildings constructed. One earth-sheltered building was constructed in the 1970s, four in the 1980's where the 1990's saw twenty nine earth-sheltered buildings built, and eighteen of those were completed in the second half of that decade. [See Table 1] Over half of the UK total of contemporary earth sheltered buildings were constructed in the last five years of the twentieth century, more than had been completed in the previous twenty two years.

The interest in earth-sheltering activity is usefully measured citing the fifty nine schemes recorded to date, producing eighty four buildings, sixty four of which were submitted for planning approval and forty subsequently achieving consent, a 56% success rate. Considering the majority of these applications were in the open countryside, this statistic is impressive.

A new millennium

The advent of the new millennium was marked by a growing global preoccupation with climate change and global warming with its potential for dire consequences. There appeared to be more open agreement about the repercussions of man's poor custodianship of his planetary environment than at any other time in history.

Earth-sheltering was at last emerging from its 'eccentric' niche at the onset of the twenty first century. This much was confirmed by Sarah Butcher writing a lifestyle article in the *Financial Times, "Seen for so long as an impractical oddity, underground houses appeared to be gaining recognition. An increasing number of underground buildings may soon see the light of day." (17/18 June 2000).*

Given the UK's growing environmental consciousness, it comes as no surprise that earth-sheltered buildings, now on the increase, began to take on many forms as the basic building type evolved and was adapted to meet clients' need to reduce their environmental impact.

A Sainsbury's supermarket launched the earth-sheltered scene in the twenty first century with its earth-bunded building at London's' Greenwich Peninsula. A comprehensive range of energy saving devices not previously seen on a supermarket were introduced to limit its' fossil fuel consumption and minimise its' environmental impact.

Introducing a new scale to UK earth-sheltering in 2000 was the Rheghed Cumbrian Visitors' Centre, Europe's largest earth-sheltered building at 85,000square feet.

The first year of the third millennium had got off to a promising start for the movement with three buildings completed and BESA's December 2000 Newsletter announcing the signing up of its 1000th member, cause for celebration.

Government recognition

The following year saw the building type deliberated at Westminster on the March 19th 2001 with Parliament's Select Committee on Health addressing the issue of earth-sheltering and its potential contribution to public health. They listed their findings in favour of the building type:-

(i) Reduced visual intrusion
(ii) Brings a green aspect to built-up areas
(iii) Double use of space - roofs can be used for gardens or open spaces
(iv) Potential for increased housing density due to the double use of space
(v) Energy efficiency"

In concluding their report they ask: *'What can be required?'* And this was no rhetorical question. Their reply, *" .. we can reasonably require earth-sheltering in any area where we permit the release of open space for development."* (Select Committee. 2001)

At the same time as the reports' findings were published, two high profile buildings espousing those characteristics identified in the Report were completed.

The first building, *Mile End Art and Ecology Park* (2001) in London, delivering exceptional energy-conservation credentials and achieving the client's expectations from earth-sheltering as explained on their website, *" ... as well as being innovative, cheap to run, and stunning to look at, the earth- sheltered buildings were also chosen to help overcome planning restrictions for constructing buildings on metropolitan open land."* (Sustainability Mile End Park. 2001).

The second building, Bill Dunster's *Earth Centre Conference Centre and Entrance Buildings (2001) near Doncaster* provided further evidence of the building types' diversity forming part of the regeneration of a former coalmining settlement, while providing a carbon-neutral building solution.

SEArch goes underground

Fig 3. 2005 Harrall J. *89 Gedney Road,* SEArch Architects

Adding more variety was the UK's first purpose-designed earth-sheltered architect's offices, those of SEArch at *89 Gedney Road, Long Sutton* completed in 2002 [See Fig 3] This was the first of two earth-covered buildings on the one site, both influenced by the Berm House and HHP. Architect/owner/builder Jerry Harrall, MD of SEArch sought a strictly low-carbon work-life existence choosing to locate his earth-covered home *87 Gedney Road* adjacent his Practice offices, advertising the strengths and virtues of a low-carbon work/lifestyle.

From the very first public announcement on 15th August 1997 of the impending earth-sheltered development, the Long Sutton project attracted a growing and increasingly diverse network of interested parties. It has featured in 75 articles; six radio programmes, twelve television features, received six national and international awards including the RICS Sustainable Building of the Year Award 2005. In total 6,500 visitors were recorded between 1987 to 2006, with 1200 in a single day, Saturday 9th September 2006 Lincolnshire Heritage Day (Harrall. 2006).

Sustainable building of the year!

Impressed by the success of SEArch's offices, the Flagship Housing Group commissioned SEArch to design the UK's first earth-sheltered social housing scheme, built in Honingham, Norfolk and completed in 2003. These four two-bedroom bungalows have reduced their weekly energy costs to under £4.00 per week, inclusive of VAT. These buildings and their tenants have provided a living example of the practicability of earth-sheltering with that most laudable of injunctions for our day and age: *Use less energy.*

Earth-sheltering's first social housing neighbourhood extolled the virtues of their low cost, low impact lifestyle to such an extent, that Government and national institutions formally recognized the project as an exemplar environmental project.

Defra launched its *Rural Services Review* (DEFRA. 2006) on 31st July 2006, reporting on the Government's achievements since publishing the first Rural White Paper, '*Our Countryside: the future in 2000'*. Honingham was featured under the title '*Friendly Houses don't cost the earth'*.

The DTI , included a case study of the earth-covered scheme on their Constructing Excellence website (DTI. 2007).

To top it all, the RICS in 2006 awarded it their 'Sustainable Building of the Year'. The other shortlisted projects that year included the National Assembly for Wales, designed by Lord Rogers.

The Judges said of the winning Honingham scheme, *"As energy and sustainability concerns rise up the agenda, this project sends out a powerful message to us all: sustainable housing can be commercially viable and deliver value for money."* (Ure. 2006)

A ring of truth

Later that year and adding some currency (although perhaps not credibility) to the concept of earth-sheltering, the film version of Tolkien's Trilogy "Lord of the Rings" was released. In The Sunday Telegraph , an article entitled 'The Rise of the Downwardly Mobile' reported, *"A small but increasing number of non-hobbits will also be heading back to their burrows, as the fashion for underground or earth sheltered living takes root among the big people as well. The Royal Institute of British Architects now lists more than a dozen partnerships throughout the country that specialise in underground buildings.*

Underground structures are more energy efficient and competition and bargain basement rates have made mortgage lenders less sniffy about financing underground homes than they were even a few years ago. Now one of the last barriers, customer resistance, has been rolled back. As increasing numbers of public buildings, libraries, schools, visitor centres, and even factories are being built into the earth, and people are becoming more accustomed to the idea." (Davies. 2003)

In Autumn 2004 BDP's (Building Design Partnership) ecologically high-performance earth-covered Business School for Napier University's Craiglockhart Campus, Edinburgh was completed setting a new environmental benchmark for the academic building stock.

Michael Reynolds completed his first UK off-grid Earthship project, the *Fife Visitor Centre at Kinghorn Loch*, Scotland.

During the first five years of the new millennium, twenty seven earth-sheltered buildings had been constructed, significantly more than in any previous five year period. The UK stock now totalled sixty four completed buildings from a recorded 142 known schemes [See Table 1]. Of the one hundred buildings submitted for planning approval, eighty two had achieved consent, an 82% success rate. Over half of these buildings were in the open countryside

In BESA's February 2006 newsletter, David Woods (Woods. 2006) reporting on the November 2005 AGM, *"It was clearly evident that much more was happening in the UK than BESA was always aware of, some of which had been included in Peter Carpenter's 'SOD'S LORE' which had been included with the last Newsletter. All in all it was a credit to BESA's efforts in promoting the concept of Earth Sheltering over the past nearly 25 years.*

Catch-up

BESA had given momentum to the emerging acceptance of the earth-sheltering concept now the Government was playing its part in raising energy efficiency standards in new buildings.

The Code for Sustainable Homes was launched by the Department for Communities and local Government in December 2006 as *"A step-change in sustainable homebuilding practice"*

introduced *"..as a means of driving continuous improvement, greater innovation and exemplary achievement in sustainable home building."* A year later the *Energy Performance Certificates (EPCs)* were introduced on 1 August 2007 as a result of European Union Directive relating to the energy performance of buildings.

These legislative advances in UK building standards were still woefully short of the performances being achieved by much of the earth-sheltering building stock. A timely demonstration of this difference in standards was portrayed by Michael Reynolds Brighton Earthship which finally opened in 2007. An off-grid earth-covered building, harvesting its own water, managing its own waste, generating its own energy and entirely naturally heated.

The promise of higher energy efficiency, planning expediency, observations of Honingham and a visit to Long Suttons' Gedney Road, led a retiring couple to build their own earth-covered home Jag-Hol. Both Honingham and Jag Hol, featured in an half-hour documentary at prime time on April 17 2007 in a programme called *Climate Change Matters*, which featured a variety of contemporary lifestyles in pursuit of a 'greener' existence.

A well rehearsed scenario

If after thirty years of a maturing movement there were any doubt about the viability and to a greater degree the general acceptance of earth-sheltered buildings, Barnsdale Walled Gardens provided irrefutable affirmation of their idiosyncratic attributes. In the wake of a previous planning refusal for a conventional bungalow Rutland District Councils' granted planning consent for an earth-covered dwelling in the 2.5 acre former Victorian kitchen garden of a large country house, Barnsdale Hall. Overlooking what was then Europe's largest manmade reservoir, Rutland Water located in the open countryside in an AOSL (Area Of Special Landscape) The owner was introduced to the concept of earth-sheltering and SEArch by the Councils' Energy Officer after his visit to 87/89 Gedney Road. Barnsdale Walled Garden earth-covered dwelling was completed in 2008. The building featured in a serialized regional television news piece together with regular coverage in both local and national publications.

End of an era

2008 was a watershed for BESA. The *'old guard'* of BESA, Arthur Quarmby (President), Peter Carpenter (Chairman) and David Woods (Secretary) announced their retirement at the November AGM. Peter Carpenter explained, *" Its time for BESA to move ahead with a new look and a new direction."*

David Woods aptly summarised his twenty years experience with BESA *".... being closely involved with BESA has helped me to cope with talking to other Architects, many of whom were frightened of catching the e/s disease. It has also provided a strong base for increasing the genuine interest shown by individual clients, encouraging many Local Authorities to consider an earth-shelter approach on its own merits and, most recently, Boris Johnson to propose the use of London's roof-scape to grow sufficient vegetables for consumption by the athletes at the Olympics 2012!"*

'Coming-of-age'

Rather aptly, the following year, earth-sheltering *'came of age'* The largest number of earth-sheltered buildings completed in a single year occurred in 2009, more than in any other year in the thirty five year history of the movement. Seven of these are now formally recognised as some of the most energy efficient buildings in the UK.

Fig 4. 2010 Harrall J. Unity Gardens

Six of these buildings are at Unity Gardens [See Fig 4] which was completed on 17th July 2009, the UK's first near autonomous social housing scheme. They recorded the highest design SAP Ratings in the UK (131A) achieved impressive air pressure tests($2.8m^3/h.m^2$@50Pa) After two years of monitoring their average energy consumption was $27KWhrs/m^2$/year, water consumption 68L/person/day(CfSH's Level 6 is 80L/person/day) generating 50% more energy than they consumed, harvesting half their water and are to a greater extent, naturally heated and naturally ventilated. In 2010, Unity Gardens was recognized as '*Social Housing Project of the Year*' (Sustainable Housing Awards. 2010).

The renown of the project was such that The Most Reverend and Right Honourable Rowan Williams, Archbishop of Canterbury paid a personal visit on 8th March 2010. He was reported as saying "*I wish I could bottle it up and market it*" (Williams. 2010)

Fig 5. 2010 Harrall J. 9 Hoddins Way

SEArch's second generation earth-covered offices at 9 Hoddins Way [See Fig 5] recorded the UK's highest SBEM(Simulated Building Energy Model) EPC Rating, an A+ together with the lowest recorded Air Pressure Test result of $0.94m^3/(hr.m^2)$@50Pa. Extensive monitoring provided affirmation of a near zero-heated commercial building with a heating load of $8KWhrs/m^2$/year, with an average annual internal air temperature of 22.2^0C and total building energy consumption of $44.7KWhhrs/m^2$/year (SEArch. 2012)

In reference to the environmental performances of both Unity Gardens and 9 Hoddins Way, Dr Gavin Dunn, Operations Director at Elmhurst Energy Services Ltd, says, " ..at the time of their construction they were some of the lowest energy demand buildings in the UK." (Dunn. 2012)

During the first decade of the twenty first century, forty seven earth-sheltered buildings were completed more than had been built in the previous twenty five years. The UK stock now totalled eighty four completed buildings from a recorded 246 known schemes. Of the 138 buildings

submitted for planning approval 116 achieved consent, an 80% success rate, with most located in the open countryside.

Virtual BESA

BESA formally re-emerged in October 2009 with a new website and a new agenda *"BESA itself is now entering a new era. Its central goal – to disseminate information about earth-sheltered building – is unchanged. But it has now shifted from 'paper-based' to 'web-based' communication."* As of April 2012, the website has 150 registered users and its 'Access Statistics' state *"We have received 363,060 page reviews since October 2009."* (BESA. 2012)

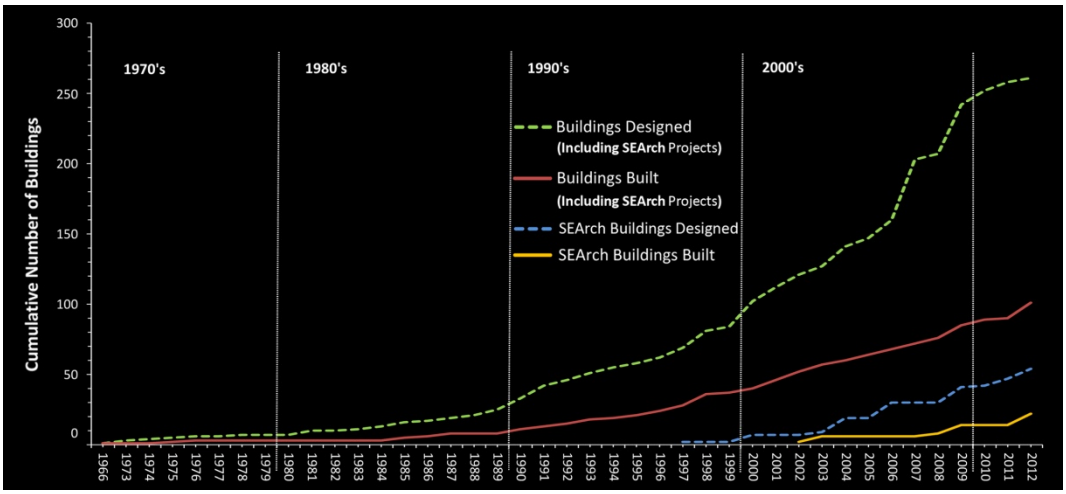
Earthing-up

A further five earth-sheltered buildings were completed in 2010/2011 with an additional twelve currently under construction and due for completion in 2012. These projects will bring the total UK earth-sheltered stock up to 101 buildings. SEArch has built fifteen earth-sheltered buildings to date with another seven under construction. The practice has firm commissions for another seven buildings and early enquiries for two more projects that could deliver fourteen buildings. If this portfolio of commissions is any barometer of the UK earth-sheltering movement, then we can say, it continues to grow at a pace.

Discussion

This paper maintains that earth-sheltered buildings are viable in the UK [See Table 2]. That they are practical on a day-to-day basis has been amply demonstrated. Commercial viability is now a matter of public record as is now their diverse application, their adaptability and affordability. Also in the public domain are the 152 schemes submitted through the Planning system, of which 69% received consent, with eighty schemes subsequently built, producing 101 buildings. Over half of those built are in the open-countryside confirming that earth-sheltered buildings are a planning expedient. The environmental credentials of the earth-sheltered building type are in the light of the Code for Sustainable Homes (CSH) exceptional. The early benchmarks set by the Berm House 24 years ago and by the HHP 15 years ago have still not been equaled by contemporary UK building performance standards. The unprecedented SAP, SBEM and Air Pressure Test results of Unity Gardens and 9 Hoddins Way have now placed UK earth-sheltering in a league of their own.

Table 2. UK Earth-Sheltered Buildings 1966-2012: Annual Totals



Also presented in this paper is irrefutable evidence demonstrating that the interest in earth-sheltered buildings in the UK has significantly increased each decade since the movements' inception thirty eight years ago. That trend appears to be continuing with a bumper year for building completions anticipated for 2012. No longer is the building type the exclusive domain of the self-build enthusiast. Institutions, Councils, Lords, Lady's, a professional footballer have joined the ranks of earth-sheltered building owners.

What then of the future for earth-sheltered buildings in the UK? In the words of Bob Dylan, "*The Times They Are a-Changin"*.

On 27th March 2012 the National Planning Policy Framework (NPPF) came into immediate effect with the biggest overhaul of planning regulations in a generation. Its' much publicized and debated reform is the introduction of a " *presumption in favour of sustainable development in the open countryside"* The NPPF qualifies this turnaround, proffering that buildings in the open countryside will need to be of *"exceptional quality"* and of an *"innovative nature."* The document goes on to say, *"Such a design should:-*

- *be truly outstanding or innovative, helping to raise standards of design more generally in rural areas;*
- *reflect the highest standards in architecture;*
- *significantly enhance its immediate setting; and*
- *be sensitive to the defining characteristics of the local area.*

Earth-sheltered buildings appear to match perfectly, the prerequisite qualifications for the newly introduced National Planning Policy Frameworks' *"presumption in favour of sustainable development in the open countryside."* To paraphrase Arthur Quarmby…*"Lets' ensure we build in a kindly way in our delicate and beautiful landscape, so that the buildings blend as much as possible into the environment."*

Summary

Contemporary earth-sheltered buildings are a viable building type in the UK and are becoming increasingly acceptable. That earth-sheltered buildings are viable is now incontestable. That the acceptability of earth-sheltered buildings is growing has also been shown to be true.

The evidence from SEArch's portfolio corroborates this; BESA's new role continues as befits our hi-tech era, The Compendium records a significant increase in the numbers of earth-sheltered buildings either built, under construction and in design, since the beginning of the new millennium. There have been more earth-sheltered buildings built in the first 11 years of the 21st century than in the twenty-four years preceding it. The recent changes in planning legislation now appear to favour earth-sheltered building solutions. The body of evidence shows that there is an increasing trend in the numbers of earth-sheltered buildings being designed, built, and occupied in the UK. It is a trend that implies that earth-sheltering in the UK is growing in acceptability. Finally, referring to a remark made by HRH Prince Charles, *"You don't have to build a hobbit house to be eco friendly."* (Tyzack. 2009) as this paper usefully demonstrates, *it helps!*

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