



Addressing the short term housing crisis with an Innovative construction solution

A Proposal by Jon Baker  
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# What is Nomas?



## Nomas 'nəʊ.mæs Latin definition: nomad

*Nomas uses the principles of Nomadic Architecture; to be able to rapidly build a home to give shelter to your family, re-using the same building materials. leaving no trace of your structure on the land when you move on*

This describes the Nomas type of building, at its core is the principles of foundationless construction, deconstruction and reuse of materials and how these can be used to alleviate one of the most under reported housing crisis's in the UK.

Nomas have developed a low cost high quality housing system to address the ever increasing crisis of homeless families living in bed & breakfast and temporary accommodation in London and UK inner cities.

The Nomas system utilises brownfield and infill sites that are waiting, often for many years, to be developed by permanent housing.

It prevents out of borough rehousing keeping tenants in their locality, building new and keeping old communities together.

Its integral to the areas' regeneration and can be moved and adapted to eventually be part of the final masterplan, whether as part of the housing stock, schools or community buildings.

A kit of parts construction system, designed to be built by both skilled and unskilled local labour, reducing unemployment and aiding the local economy, evolving the unskilled workforce to become part of the initiative undertaking relocations and adaptations to the Nomas system.

Foundationless construction allows Nomas to be built on sites that were historically not financially viable or suitable for construction.

It can and should be social housing stock, owned and managed by the local councils, housing associations, or in partnership with developers.

Nomas is Flexible Life Building, built on two key principles, multi-sourced construction and design for deconstruction, its is the only construction system based on these principles

Multi source construction, when used in conjunction with BIM, permits rapid design, procurement and deployment and will give best value to the construction.

Design for deconstruction Is Building design that enables components and materials to be disassembled, deconstructed, recycled, re-used and reassembled.

A cost effective innovative construction system offering viable scalable alternative to volumetric and off site build systems, can be built in conjunction with private housing construction offering a holistic, innovative approach to housing.

# What's the Problem?

## Housing Shortage

Homelessness is now a major concern across the UK, especially London, where over 80% of the UK's homeless population are to be found. Homelessness has increased for three consecutive years and is set to continue to rise for the foreseeable future. It is becoming a serious problem for socio economic groups not normally affected.

There are now an estimated 185,000 people a year who are homeless and at the end of 2015 in London alone there was over 61,000 households – more than 85,000 children - living in government subsidised temporary and bed & breakfast accommodation.

## High Costs

The cost of this to the government is enormous, over the last four years The UK has spent almost £2bn housing homeless families in short-term accommodation.

## Temporary Measures

Councils are being forced to take drastic action to try and alleviate this growing problem, housing families in a variety of unsuitable accommodation, including B&B - which according to councils own guidelines should be avoided 'wherever possible' - private rental accommodation and even hotels. This type of unsuitable short term accommodation has many problems, small, lack of privacy and amenities such as cooking and laundry and with no permanence its deemed 'not suitable' for families with children.

## Benefit Cap

With the numbers of homeless rising, there is less suitable temporary accommodation available. Couple this with the new benefit cap and the reduction in tax credits it has the effect of making landlords increasingly nervous about housing tenants who claim these benefits. So more and more families are being pushed into poverty and therefore even more unsuitable accommodation.

## High Demand

But demand is so high councils are finding the construction of social housing to meet the urgent need either too slow or too costly and are implementing their own short term solutions with little consideration for the future welfare of the tenants or even the Councils future liquidity.

## Policy

One policy among many adopted by these councils is rehousing. Some 32,643 homeless households have now been rehoused out of their 'home' borough in some cases hundreds of miles away in other parts of the country. This growing initiative has seen a 123 % rise on the previous 12 months putting a significant strain on the destinations boroughs local services. Councillors in Enfield for example, where more properties and B&B rooms are secured by London authorities than anywhere else, have said the demand from inner London authorities is pushing up private rents and placing untenable pressure on schools and local services. The effect of this not only disrupts family and local ties but also is just moving the problem to another borough or county.

## Slow Construction

To compound the problem the construction of affordable or suitable social housing properties is well behind the actual requirement or targets with developers choosing to construct higher value housing for immediate sale, according to shelter in April 2014 year there were only 43 affordable houses available in Greater London (affordability is based on a median salary of £30,748.00 – actual should be £100,169.00) to purchase.

## Crisis Point

Both Labour and Conservative councils as well as the Government recognise that this is a problem that's now too large to avoid, initiatives are being undertaken to address various elements of the housing crisis, this document looks to offer one solution to the problem of housing homeless families in short to medium term accommodation.

# Brownfield Sites – Space to Build



## Brownfield Sites

Within Greater London the London Development Agency (LDA) have identified some 2068 brownfield sites, a total of some 3745 hectares, that's almost 2.5% of the total area of Greater London the LDA recommend that three quarters of these sites are suitable for housing development of some kind.

The majority of these have excellent transport links as well as low level infrastructure in place. However construction using traditional building methods on these sites is often expensive and the inner city industrial landscape less than desirable for prospective purchasers. Extensive landscaping and pre-treatment is often required (for example approximately 35% suffer from either full or partial contamination) so building only starts when house prices reach a high enough level to make the land viable and desirable.

Even in a housing bubble the viability to build on this land is still not realised and it can remain undeveloped awaiting another housing bubble, while the number of homeless families continues to increase.

## Infill Sites

There are also numerous smaller Infill Sites. Either parcels of land that have the same characteristics as the larger brownfield sites but are considered to be difficult to build on, or strips of land that are odd shapes or configurations having ground or access problems generally under 2500 sq.m.

These sites are not normally viable for the cost driven traditional construction systems or indeed off site and volumetric construction. This leaves them undeveloped or sold on for private sector residential development.

All London councils have these sites in their boroughs and form typically 45% of the brownfield sites.

## Delays

Once a brownfield site is identified, depending on its size, it can take anything up seven to ten years until construction has been completed, especially if it is part of a larger masterplan development. These sites remain untouched on average for four years, though in some case considerably longer.

In 2014 Greater London had approved planning permission for some 210,000 homes but at present the current construction rate is only 50,000 to 70,000 homes per year.

House builders already working at almost capacity with a supply chain under huge pressure and chronic labour and skills shortages delivering the governments targets is almost impossible for the private sector. This then has an inevitable knock on effect for the less attractive social housing sectors.



# Flexible Life Buildings – Exploiting Brownfields



## What is a Flexible Life Building?

A Flexible Life Building (FLB) is a structure based on the resource efficient principles of construction and deconstruction, reuse, rapid deployability, adaptability and flexibility. Its typically a foundationless building built around a demountable steel frame clad with an industry wide sourced Kit of Parts. It can be sited directly on suitable ground and when finished, after given period of time, it can be removed and re-erected in an entirely different location. Reconstruction can use some or all of the components again either in the same or different configuration, unlike volumetric or offsite construction.

If the buildings' usage needs to change it can be easily adapted throughout its life.

## What Sets it Apart?

What sets FLBs apart is its use of a Kit of Parts, industry standard components and materials sourced from a variety of national and international manufacturers, adapted to integrate with the buildings' framework and be robust and able to be reused. This approach means there are minimal modifications to existing, design, procurement and build models and the FLBs require little retraining of onsite operatives. More importantly, it does not require the setting up of specialist manufacturing facilities being reliant upon design and adaption of existing components and supply chains. With the Kit of Parts and framing systems being flat pack the reduction in transportation and delivery costs and the ability to construct on difficult sites will allow the development of rapid build schemes on areas that historically were not viable for a this type of construction.

## What Are the Benefits?

The benefits of using readily available materials are numerous:

By adopting multisource procurement not only are lead-times generally a lot less than volumetric and offsite, the cost and availability will be similar to traditional construction components.

With a relatively large palate of materials available, which can be added to when new materials become 'approved' and available, the design restrictions are minimal making it easier to develop workable solutions for both complex intricate spaces as well as the larger accessible spaces.

By having such a large material selection not only are the buildings enjoying excellent building performance these buildings can be desirable, creative and if needed designed to fit within particular schemes or styles.

## Foundationless construction

For FLBs foundationless construction strategies are essential, by removing the need for ground penetrations the benefits of this type of foundation are numerous. Without the need to excavate or construct foundations the on-site time and therefore cost is greatly reduced, and delays due to weather conditions are again reduced or in some case eliminated.

Without the need of foundations, building can now take place on land that was not commercially viable, contaminated land or land that requires extensive piling.

And when the permanent development needs to take place the site can be returned back easily to its original condition without the need to remove any concrete foundations.

# Flexible Life Buildings – How They Work



## Rapid Solution

This system of construction works because it utilises the inner-city brownfield sites, which have the highest concentration of homelessness. It fulfils the urgent need for a cost effective rapidly deployable housing solution. By using minimal modifications to the existing construction processes, from design, procurement and through to installation and its ability to integrate well with the principle of BIM, its adoption by the construction sector as a whole should be relatively straight forward. It is a form of disruptive innovation that unlike the majority of off site and volumetric construction is a easily scalable, can be sourced globally from an existing supply chain and most importantly is a readily deliverable solution.

## Freedom of Design

Working with component and material suppliers to adapt their products for inclusion within the Kit of Parts not only allows for a greater use and variety of materials it also gives a greater freedom of design and can be easily adapted to fit in the often irregular configurations of brownfield and infill sites, perfectly suited to a variety of site and ground conditions.

## Building communities together

The Nomas construction system develops close links with the community by employing local unemployed or low skilled labour as well as apprentice initiatives to work in conjunction with a few highly skilled operatives. Developing the skills they need to continually deploy and redeploy the Nomas building systems.

## Low Cost

The combination of multi-source Kit of Parts manufacture, a condensed build programme and a reduced skilled labour requirement, as well as the removal of any significant ground penetrations enables these buildings to be constructed at a similar cost to traditional built housing. The effect of this would be to compete with volumetric and full offsite construction as well as offering a similarly costed solution for the smaller and more complex infill sites.

## A Priority

According to Shelter there are now in the UK 1.8 million households waiting for a social house.

The population is set to rise to a further 15 percent to 73million by 2030, with a majority of the growth within inner city and urban areas. With further government cuts to housing benefit landlords are increasing shifting to the lucrative private sector rental leaving the council, who are legally obliged to house homeless families no choice but to house in even more unsuitable and costly accommodation. Meaning homelessness among families will continue to rise at a faster rate.

With the need, political will, resources and sites now available, the development of the FLB systems as part of a wider Kit of Parts construction system should be considered a priority.

# A Viable Solution



## Cost Calculations

For this particular exercise I have based the costing on the London Housing Allowance rates, these are the government approved rates for housing benefit for properties situated in inner and outer London. The North and South Circular Road is generally the dividing line.

The benefit received from the council is the basic rate and in most case can be 'topped' up by self payers. But councils are obviously keen to see this reduced to something approaching 80%

## Examples

A three bedroom property would have a rental allowance of £330.72 per week which is equates to £17,197.44 per annum

A two bedroom property would have a rental allowance of £265.29 per week which is equates to £13,795.08 per annum

A typical three bedroomed flat would have a Gross Internal Area (GIA) of 85sq.m. whilst a typical two bedroomed flat would have a GIA of 70sq.m.

Based on the above, if a three bedroomed FLB was to be constructed for an industry standard cost of £1,200 per sqm and utilised on three sites over a fifteen year period, the income generated would be £257,961 against a build cost of £102,000

The above costs include removal and repositioning, dilapidations and replacements of any parts that cannot be reused as well as any other incidental costs.

London Boroughs are also responsible for the up-keep and maintenance of the property and have typical annual allowance of £1200 per property

London Borough of Lewisham



# Lewisham – A Council Adjusting To The Housing Crisis



## Rising Population

The London Borough of Lewisham has a population approaching 300,000 and is considered to be one of the poorer London Boroughs. As Lewisham's population is set to increase the housing of these people will need to be addressed. Some 116,000 households now reside in Lewisham and as the population increases this is set to rise to 146,000 by 2031.

## Increase in Rental Charges

Lewisham has one of the highest rental percentages in all of greater London (55%). 25% of which is social housing and currently increasing.

House prices and rental charges have increased steadily over recent years. The average house price in Lewisham rose from just under £230,000 in 2009 to approximately £410,000 in 2014; an increase of 79%. Median monthly rents for a 2-bed property in the borough have risen from £997 in 2008 to £1,250 in 2013

## Homelessness

Homelessness, and rough sleeping in particular, is the most obvious expression of housing need. In Lewisham, the number of accepted homeless applications increased by 24% between 2010 and 2013, and the number of households in temporary accommodation has increased by 76% over the last 5 years. Across London, the number of households placed in temporary accommodation is increasing, and Lewisham is no exception to this trend. Furthermore, it is estimated that the number of people sleeping rough in London rose by 13% between 2011/12.

## Housing Strategy

Lewisham published their housing strategy for 2015 to 2020 with two Key objectives:

### Helping residents at times of severe and urgent housing need

### Building the homes our residents need

One of the initiatives being developed with Lewisham's housing department is the deployment of these Flexible Life Buildings onto their Brownfield sites.

Lewisham have well in excess of 50 sites, some more suitable than others.

The following three sites are typical infill sites which are able to be utilised and have been ear marked, with others, for development using the Nomas system

# Lewisham – Requirement

Four number sites have been Identified for trial and development of the Nomads FLBs

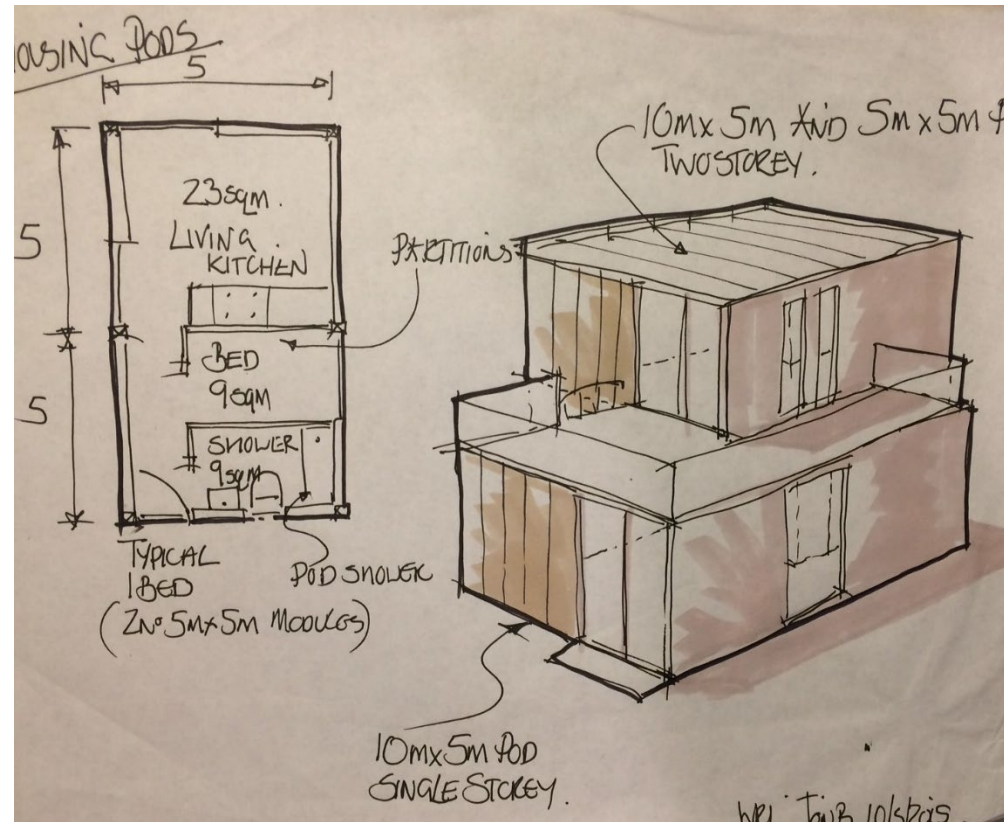
The following three sites are typical of the infill sites they are brownfield

70% 2 bedroom, 20% 3 Bedroom and 10% 1 bedroom

FLBs to be in position for 5 years and then relocated twice over a 15 year life span

Additional to this Lewisham have a three year target to complete 500 units for their ear-marked brownfield development sites

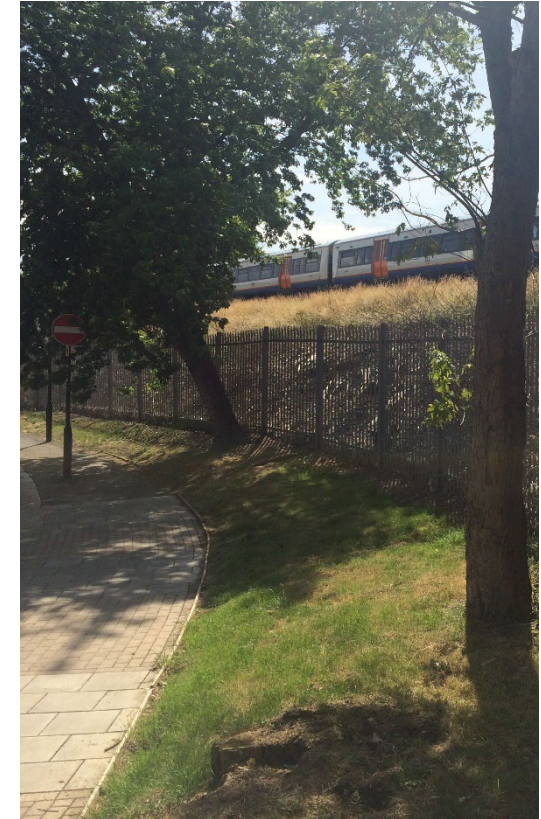
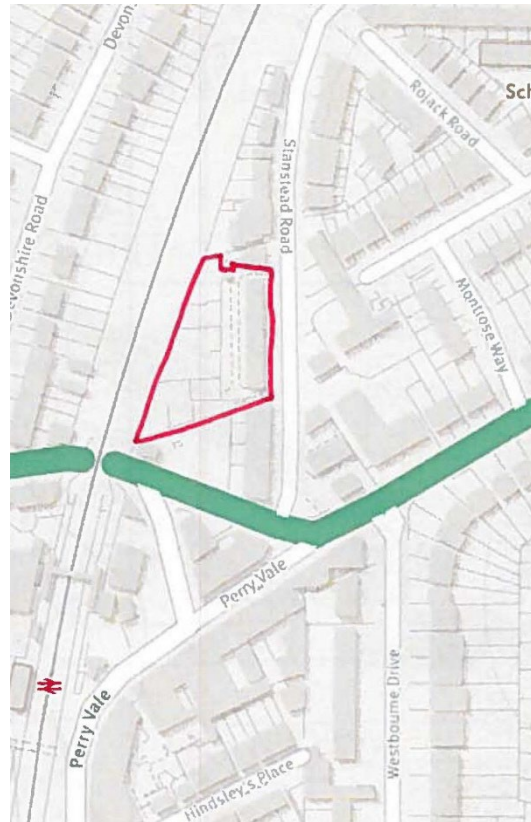
The development and installation of the cube house continues for sites within Lewisham as a separate initiative to this





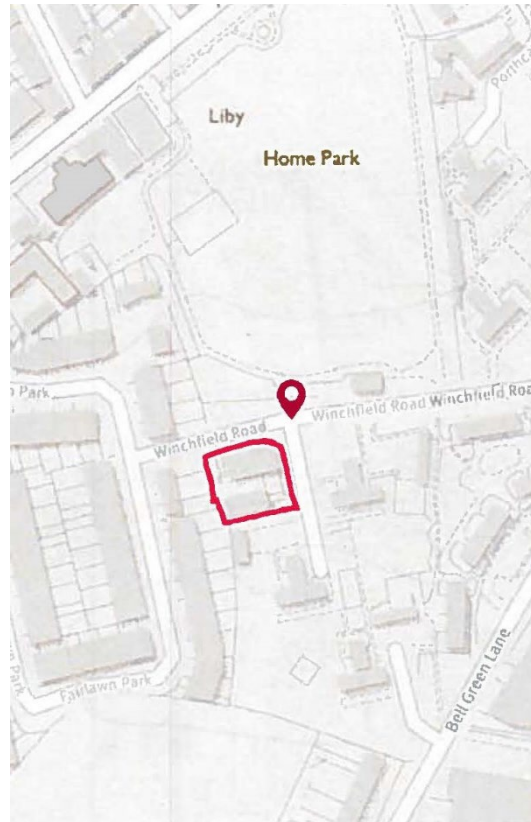
# Lewisham – Stanstead Road Infill Site

Stanstead Road infill site is a approximately 1850sqm (0.185Ha) within a residential area on steep gradient adjacent to the main railway line. The site at present is wasteland and some existing residential requiring demolition.



# Lewisham – Winchfield Road Infill Site

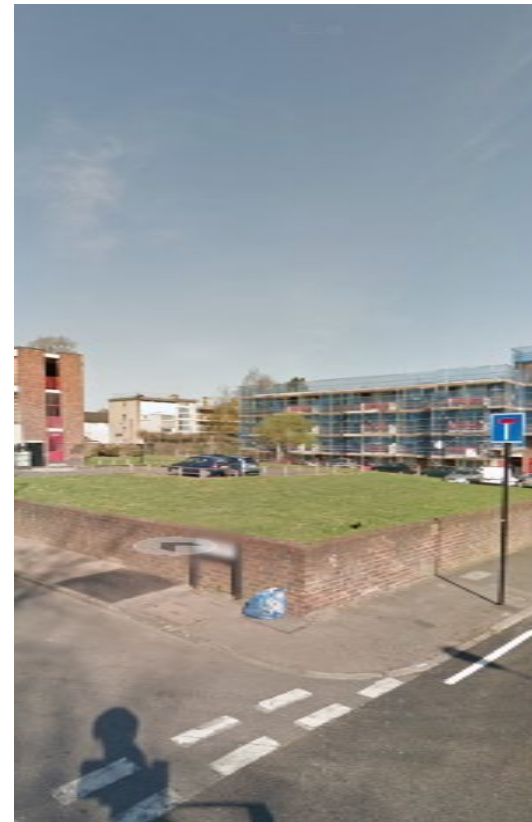
Winchfield Road infill site is a approximately 1100sqm (0.11Ha) within a residential area overlooking a park. The site at present is a council run residential home with car parking and hardstanding to the rear which will require demolition.





# Lewisham – Mona Road Infill Site

Mona Road infill site is a approximately 2000sqm (0.20Ha) within a residential area. The site at present is a green space.



# Recommendations



## The Kit of Parts

The continuation of the design and engineering work developing a Kit of Parts that fulfils the design principles of flexible life buildings.

It should be part of a much larger flat pack construction system that uses the principles of multi-sourced, low cost, rapid build construction for all types of social housing, from temporary FLBs to permanent.

The system should be where possible future proofed and based on the sustainable principles of resource efficient construction and design for deconstruction.

The KoP should be under continual development with a consortium of national and international component suppliers, construction companies, architects, engineers and cost consultants who have an understanding of the challenges found in the low cost housing and reusable and offsite construction.

Continue work with Academics and researchers to further developing the solutions for resource efficient manufacture, sustainability and deconstruction. This should also give an indication of future government policy changes that will effect FLB deployment.

## Financial

Commence work with cost consultants to develop procurement and purchasing models for the system based around purchase and leasing models for both Councils and Housing Associations

Establish a price point that enables the FLBs to be specified, procured and delivered rapidly for single and multi site deployment.

Due to the adaptability and reusability of FLBs and their components, a longer term procurement model should be adopted

Continue work with suppliers to investigate insurances and warranties as well as reuse and depreciation implications especially when used for multi-use deployments.

## Lewisham

Lewisham council are keen to work with a consortium to investigate and then if viable deliver solutions to their housing crisis utilising their many brownfield sites.

Using Lewisham as an exemplar site not only gives us the opportunity to develop and refine a system with a 'live' partner it will allow us to develop a model that can be replicated and implemented countrywide.

# Short Term Housing Shortage

## References

Homes For Lewisham Draft Housing Strategy  
Housing Department Lewisham Borough Council  
Shelter  
London Housing Allowance LHA July 2015  
LDA Brownfield sites review  
Barriers to housing delivery Mayors Office  
Bureau of investigative journalists  
Crisis  
Dept. of Communities and local government  
Inside Housing  
Office of National Statistics  
Removing obstacles for brownfield development - CPRE





# Jon Baker



Jon trained as a furniture designer and pursued a career in three dimensional design working on innovative and varied projects from flat pack furniture through to architectural cladding and construction systems, he was a successful and accomplished company Director before setting up his own project consultancy.

Jon's recent and long term collaborations with demountable building specialists began in 2012 and he has worked to design and develop the concept of the foundationless, demountable building system.

Jon was lead on a Technology Strategy Board funding project; Design challenges for a circular economy – Reusable Construction Components, A Sustainable Design Approach which allowed him to continue the development of the building system collaborating with academic, construction, architectural and commercial partners but with the support and assistance of the TSB funding.

The development of the foundationless building system is on going and at present Jon is looking at commercially viable applications within the Housing sectors and collaborating with some of the UK's more forward thinking companies and authorities.

Jon set up Nomas in 2015 with the sole aim to address the appalling problem of homeless families living in temporary bed and breakfast accommodation.



