

The Sustainable Housing Challenge: a view from providers



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Global
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Unit



Creating great places to live

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EXECUTIVE SUMMARY

This report is based on research which has evaluated the willingness of housing developers to adopt sustainable housing benchmarking. The work has explored attitudes from a cross section of housing providers; volume house builders operating within the sub-regional housing market of Newcastle and its environs and pioneer, design and build, or bespoke developers and architects operating within the sustainable housing field. The principle aim of the report is to inform Newcastle City Council and Bridging NewcastleGateshead housing market renewal pathfinder what steps they might next take in order to progress a sustainable housing demonstration project and further, how the research might more generally be absorbed into policy and practice.

The research for this report was carried out between October 2004 and March 2005, part-time, by University of Newcastle's Global Urban Research Unit (GURU). In total seven companies representing the pioneer, or bespoke market and five volume house builders agreed to take part in the work. Information was gathered by a series of face-to-face, tele-conferencing, or telephone interviews. All the information provided has been anonymised in response to participant's wishes. Each interviewee was asked a series of questions on topics specified by earlier research on the standards set by existing projects, briefs and benchmarking; however, the exact wording was occasionally altered to suit the specific circumstances of the interviewee.

Some of the key findings of the report are not unexpected. The volume house-builders, with occasional exceptions, are not pushing forward on any key areas of sustainable development. Sustainability is not seen as a market driver at this time and they generally feel their client base is uninterested in sustainability issues. Having stated this, there is agreement across the whole housing provision field that volume housing built today is more sustainable than that built a decade ago. The use of some sustainable materials, better insulation, the installation of

energy efficient appliances and better site planning to include elements such as cycle paths, are relatively standard. Moving towards true sustainability, however, is far more problematic. Incorporating features such as on-site renewable energy production, or incorporating sustainable drainage systems, require a radical shift in the way volume housing estates and houses are designed and thus far, these are seen particularly negatively by most volume developers, who claim they could not recoup the increased cost that would be involved.

Bespoke providers though pushing sustainability boundaries on all fronts also concluded that some issues are more easily tackled than others, so that while some feel they had gone well beyond the standards generally required by BREEAM Eco-Homes; they still feel it is impossible to deliver car-free environments outside of city centres. What is also clear from the bespoke developers, however, is that we can build far more sustainably, than is generally the case and while sustainable technologies may be prohibitively expensive, other require modest, but nevertheless significant levels of gap funding from public sources to allow developers to compete with volume builders unless stricter building regulation and other controls are brought in across the industry.

INTRODUCTION

This research is part of a longer on-going project which seeks to develop a sustainable housing demonstration project within the Bridging NewcastleGateshead housing market renewal pathfinder area. The initial stages were completed by Newcastle City Council (NCC) and University of Newcastle's Global Urban Research Unit (GURU) in 2004 and involved a desk based review of existing sustainability standards within the UK context, followed by analysis of these standards to highlight overlaps, inconsistencies and omissions.

The results of this stage produced a draft generic housing brief covering a range of themes. These were:

- BREEAM eco-homes standards
- Neighbourhood service provision
- Transportation to and from and circulation within developments
- Building materials and construction
- Longevity and maintenance
- Internal aspects of buildings
- Thermal performance
- CO₂ emissions
- Recycling
- Water
- Ecology
- ICT
- Safety
- Marketing

The initial stages of the research also involved identifying a cross section of house builders, both volume house developers and pioneer of bespoke housing providers active within the field of sustainable housing to market test the generic brief. A list of companies that NCC wished to be contacted was, therefore, supplied as part of the briefing to the current project.

Tabulation of key issues raised by participants in this research is included in appendix A.

METHODOLOGY

All of the companies on a list of nominated house builders were initially contacted and asked if they would consent to being interviewed in connection with the project. This initial contact stage took much longer than expected, several of the larger companies failed to respond to multiple approaches by telephone, there appeared to be a general suspicion of the work and finding someone within organisations who could answer on the range of topics covered in the generic development brief proved extremely difficult in several cases. In the end not all companies approached were willing to participate, however five volume house builders took part; while representing the bespoke and pioneer housing providers there were, two registered social landlords (RSLs); a company specialising in student and key worker accommodation; a firm specialising in medium-high market sustainable housing; a small design and build company specialising in timber frame construction; a firm of architects who have been working with various clients to design bespoke housing in the Northeast and; a pioneering residential/commercial developer specialising in brownfield regeneration sites.

The interviews were semi-structured and followed the format provided by the form of questions outlined in appendix 'B'; these in-turn represent the various themes covered by the draft generic sustainable housing project development brief produced in earlier research by NCC/GURU. The questions were, however, adapted within interviews to address provider's particular circumstances and allow the research to respond to issues raised by the interviewees themselves.

Several of the companies were concerned with confidentiality and the sensitivity of the information they were supplying and it was agreed that all information would be anonymised. Interviews with the bespoke providers were recorded and transcribed verbatim, these have been anonymised by removing information which would identify individual companies and they are contained in appendix 'C' as interviews a to f; questions put to the interviewees are identified as 'I'. Most of the volume house-builders, however, requested that verbatim interviews were not provided in the report and so these interviews were recorded and summaries provided in appendix 'D' as interviews i to v. In the text direct quotes from verbatim transcription are identified in italics.

RESEARCH FINDINGS

BREEAM and eco-homes standards.

Across the industry the take-up of BREEAM eco-homes standards can be at best described as partial, though all but one of the bespoke companies had used BREEAM standards at some stage. Only one volume house-builders had BREEAM, however, and many of the others in this group professed no knowledge of them at all. Those using eco-homes standards on a regular basis felt there were no problems in meeting eco-homes 'very good' standard within their schemes. Raising standards from 'very good' to eco-homes 'excellent' however was "*in large measure a function of the location rather than product*" ; the financial implications were seen as minimal, but for example you could not improve from very good to excellent without first-rate transportation links.

Not everyone was entirely happy with the BREEAM check-list approach, however. It was felt by one interviewee that BREEAM scores could be easily manipulated to make developments look more eco-friendly without necessarily raising standards, they commented "*it seems to be one of those things where you know the rules from the outset you can then use the assessment criteria to give you an excellent output, as opposed to making an assessment after the building has been designed*". There was further disquiet that the self reporting nature of BREEAM was open to abuse and that secondary proof of evidence might be required to show standards had indeed been met.

The developer specialising in student accommodation also felt that there were no BREEAM standards that took the special requirements of this type of accommodation into account

A key point was the extra cost involved that building to eco-homes and sustainable standards generally. Thus when one of the bespoke providers were asked what the barriers were to building to eco-homes 'very good' or 'excellent', they responded '*competing for land against standard house builders*' clearly articulating the economic disadvantage to which he felt this put them.

Furthermore, those who had used these standards, were not necessarily that impressed with the standards they represented, or the benefits of going though

the rating process. One bespoke developer stated that they had only put one scheme through eco-homes standards, for two reasons the first was that they viewed the eco-homes excellent standards as inferior to their own; the second was that there was no compunction to do so, so even if they did go though eco-homes rating it meant nothing to the purchasers of their properties, "*we've not found that eco-homes rating system has been marketed to purchasers in a way that makes them come to us*".

These two issues seem to reflect reactions from volume builders, firstly in the case of the actual standards they represent since, though four of the five volume builders stated that they did not know about BREEAM when some of the 'very good' standards were explained to them, they indicated that they were already achieving these, suggesting by default that they are not necessarily that high. The second was the complete lack of public knowledge of, or demand for eco-homes standards. Generally the volume house-builders suggested they only incorporated what people asked for and only if people became more educated in issues relating to sustainability did they see an inducement to build more sustainable properties. One volume company had specifically produced eco-homes and thought that sustainable development was a selling point to a limited degree; though none of the others concurred with this view.

Neighbourhood services.

One bespoke provider commented that in urban projects, "*I'd struggle to think of one where we haven't done mixed uses with shops... by and large we're very keen to do that for many different reasons. One of those was services and sustainability arguments, but also we like the idea of having animated ground floors which help in terms and security and well-being and bring life to those streets and generally reinforce the viability of schemes*".

The most comprehensive experience of providing shops and neighbourhood services within housing developments, however, came from the social housing providers. One commented that they still provided community buildings within housing developments and on some of their larger developments they had built and owned shops, but had not built new shops for 30-40 years; the main draw back they felt was the complexity of funding and legal arrangements involved.

The other social housing provider also commented that in principle they were in favour of providing shops and services, but in their experience there often simply wasn't the demand to justify them "*in terms of sustainability*"; articulating tensions that arise in trying to meet sustainability criteria. Demand is naturally the key issue with providing mixed-use developments. One bespoke provider who had provided a restaurant within a small residential scheme felt the unit would remain empty until the surrounding area regenerated more, a factor out of the developer's control. The fact that developers would generally receive a far smaller return from say a shop unit, than an additional residential unit was felt to be the general problem in encouraging mixed use development. However one provider also commented, "*There are issues, but it depends what you want to do in life, if you're looking for an easy way out of everything, it's probably too much hassle*". Trying to ensure success for mixed uses, for example defining housing densities to support particular services etc was seen as almost impossible.

Most of the bespoke developers saw no problem in providing housing above shop units and some had had experience of this, though as refurbishment rather than new build. One developer did, however, comment that physical constraints were sometimes an issue and gave an example of where they had looked at building over a coach station. The huge open nature of the concourse required rendered the site impossible to develop as a transfer slab was not cost effective; in contrast a development over small shop units and a gym had proved ideal since services could be run through columns to upper floors which did not impact on the ground floor users. Another provider talked of conflicts of interest in terms of noise generation, use of bin stores etc, between residential and commercial users, but also added these things "*just needed to be sorted out*". The volume house-builders saw providing housing above shops as a specialist area, though all but one developer thought they would be prepared to develop such a scheme in the right situation.

All the volume house-builders expressed a willingness to provide shops within developments if they were large enough and if the demand was there for them. One issue discussed was that of timing as being a problem, in that if shops and services are not there at the beginning of a development it is difficult to get people to use them because they get into the habit of driving to nearby facilities; if they are incorporated in the early stages of development, however, there might not be the demand to sustain them. This generally concurs with wider research in

the field of transportation which suggests it is much easier to get people to switch transport modes at key changes in life, for example when someone moves house, than when people have become used to a mode of travel, no matter how inconvenient.

Generally volume house-builders see local shops and services nearby, but outwith their developments as being more positive in terms of marketing than necessarily providing them on-site; though two of the volume house builders also added that nearby schools were far more important than shops and other services.

Transportation and onsite circulation.

The bespoke providers were all extremely positive with regard to good public transport services, one of the social housing providers commented, "*we would always seek to ensure any development we do is close to a good transport node... and in fact we would, if appropriate seek to encourage local bus companies to divert services through new development*". The student and key-worker housing provider also stated that access to travel facilities was a key driver in development location. None, however, specifically mentioned 'green travel plans' suggesting this is still a somewhat under-developed concept among the group interviewed.

In terms of on-site circulation, only two developers were actively developing schemes to Home Zone principles; though one also added that they were not actually calling it a 'Home Zone'. They stated that designing in Home Zone principles did incur extra cost, but felt unable to quantify this in a straightforward cost comparison with other schemes. Three other bespoke providers, though not building to Home Zone principles knew about them and did seek to minimise the impact of cars and slow down vehicular traffic within schemes; this was mostly achieved by utilising physical measures and landscaping schemes. Two of the bespoke providers, however, had not heard of Home Zones at all.

Two of the volume house-builders had experimented with Home Zones. One felt they worked on smaller schemes, but not on larger developments; they further commented that they had employed architects to take a holistic view on reducing the impact of cars on their developments. The other volume builder stated that

they had had problems of implementation due to conflict with highway regulations, which had left them with very mixed views on the principles. Importantly this latter point was also an issue picked up by one of the bespoke developers.

Two respondents talked more generally of the tension of trying to ameliorate the impact of cars within developments and the car parking standards imposed by local authorities. One stated "*to my way of thinking on this apartment site, near the town centre, one car parking bay per household would have been sufficient, but they (the local authority) demanded 1.3*", one of the social housing providers stated suggested in some of their schemes that while many of their occupants did not own a car, local authorities have "*regularly sought to impose 2 parking spaces per dwelling, though they are now relaxing that a little*".

Nearly all the interviewees felt that car free developments were not feasible except in very central locations at this point in time. One bespoke provider commented, "*we'd aspire to car free developments, but no its virtually impossible*", another stated "*personally I don't think that would ever be particularly possible. Society is built so closely round the car that you have to accommodate it somewhere to a degree*"; another added "*We're looking at the moment at some semi-car free developments.... What we're saying for the shared ownership occupation is that it won't have car parking because it's about key workers walking into your place of work in the middle of town and you don't need a car. There is a bit of a dilemma and I'd be fibbing if I said we're doing all car free because we're not, the market and certainly people even in the middle of town seem to want places for their car*".

One developer said that they produced several car free developments, but these were all rehabilitation not new build, and again when asked if new build was a possibility, they responded "*no*". However, one interviewee said they felt a car free environment was possible "*in a concept community with exceptional transport options*". The provider of student and key worker housing however, was attempting to provide car free development and had found this achievable in some circumstances, where alternative transport was of a good enough quality.

In terms of car free developments the volume house builders mirrored the majority bespoke opinion, most felt that car free environments were not possible

and added that if a development brief demanded this they would be unlikely to tender for the development.

Ideas of car-pooling received a mixed reaction; one bespoke respondent stated, "*that requires a level of co-operation and commitment which I feel uncomfortable about requiring*", however, two bespoke developers were pursuing this. One was actively seeking to set up a car club, the running of this would be handed over to the local authority when it was up and running, they commented "...*on large developments where there is the economic base to do a car club we would want to explore it in the future*". The other company were also in negotiation with a local government transport body over adoption issues for their scheme. Size was naturally a key issue, one bespoke developer who was very keen on the issue, but whose largest development was only 20 houses stated that this was definitely too small for the schemes to be viable, they also went on to say they felt such schemes would work much better where employment uses were part of the development and such services could be more closely inter-dependant with these.

When asked about separating out cycle paths from vehicular movement one interviewee most developers were happy, but success seemed dependant on approach, one stated "*I'm far happier to try and plan the site so that pedestrian and cyclists can move around without going along roads, we did a lot of work in () which has a dedicated cycle system... and quite frankly its a waste of time*". Volume builders were relatively happy about putting in cycle routes and most had done so where asked for this in a planning brief; others had also provided cycle stores in flatted developments. Again the student and key worker housing provider actively promoted the use of bicycles, but found that users were easily put off, for example after break-ins to secure storage facilities.

Building materials and construction

Six of the seven bespoke housing providers stated they had control over sourcing materials, but there was little consensus over the implications of sourcing locally. When asked if they aimed to source materials locally, one definitely did not source locally because they felt it would raise building costs; two stated that they did source all materials locally and that it was not necessarily more expensive; two had no firm policies on this but one was "*looking at a sustainability strategy*

where sourcing local materials will be considered", in this case they thought local sourcing might raise costs but didn't have enough information to give a considered answer. Interestingly all of the volume providers stated they sourced materials locally and felt it did not affect cost.

One bespoke provider, however, though generally seeking to establish local sourcing raised an entirely different issue, "*I think we probably do but some packages are of national importance, national market, so for example when we put windows in we go to a very high specification, but there's only 3 or 4 people nationally that can do it*".

Various opinions were forthcoming when asked about long term durability, recyclability and reparability, one social housing provider stated these concerns were very high because they managed and maintained stock as well as building it for sale, they added "*we would not use PVCu window frames for the reason they are a disaster to recycle*". Others had less developed strategies, "*we certainly take into account long term durability and reparability. We've been less careful over recyclability, but as part of our sustainable strategy no doubt that will be a feature*".

Another bespoke provider commented "*...our design idiom is a very modern approach which puts you in a tricky position when it comes to steel and glass and things like that which are clearly not very green materials*" however the same developer was looking at recycled materials for cladding and went on to talk about exploiting opportunities as they arose. For example the use of French oak, a supply of which had been created by storm damage; suggesting the need for providers to be flexible and responsive in their approaches. Often the issue seemed a question of balance based on holistic knowledge, but as one bespoke developer stated with some materials there was no excuse of not specifying sustainably managed supplies, saying "*I mean you can buy FSC (Forest Stewardship Council) ply-board at B & Q!*".

Similarly there were mixed, but generally low key responses to the use of low embodied energy materials, though as one provider pointed out "*you've got to weigh up what the benefit, you look at a material like aluminium, obviously its environmental load far outweighs any benefit of the fact that its recyclable and exceptionally hard wearing, there are lots of things like that...*"

Lastly positive financial issues were also raised for example one bespoke developer, stated, "*We're certainly using the governments recommended lists for capital allowances so everybody has to access into that to get the best quality greener material in the supply chain so we can claim capital allowance on that. So, we do that as a general principles as part of our work*".

Prefabrication

Prefabrication was definitely seen as a growth area and many firms interviewed were already experimenting with systems. Some felt that this might initially increase building costs, but that this would be offset by other factors. There was general consensus through the industry, for example, that prefabrication was a way of ensuring increased build quality, as one developer put it "*two things, one is you can't get decent quality when you're up to your knees and snow and what have you, it much better to do it in a factory and secondly labour shortages are going to push us towards factories anyway*". Another stated "*It's the future as far as I'm concerned... its going to save a lot of time and wear from site problems*". One of the social housing providers added "*I think it will have quite a high impact partly because housing associations are obliged to look at off site manufacture and prefabrication, but also because we want to...*".

There was a note of caution added by one bespoke provider, however, "*I think we're the first private sector developer to work with a private speculative pre-fab system which is in []. Called [], modular housing, which we did in partnership with [] which has got very very high levels of passive insulation within the development*". However, there were problems, "*no-one in the lending industry has the foggiest about pre-fab they're used to a standard product. When we came to the pre-fab system there were worries about the shelf life of the buildings, though it's our view this is a good shelf life it will last as long as if not longer than a traditional build*".

Green roofs

Few of the interviewees had any direct experience of green roofs, though one specifically did not use green roofs because "*they interfered with our preferred option of rainwater harvesting*". The one firm that had actively pursued a green

roof on a development had given up because they could not get anyone to construct it. Only two firms who could potentially provide the roof had been found in the vicinity, but neither seemed interested in doing the work, when asked why they felt this was the case they were unable to answer though suggested "*it might have been too small a project, but on the other hand if they have an architect who's interested... you think they would make the effort to do it so they get their work out there...*".

None of the volume builders were considering green roofs perceiving them as too experimental, risky and as such potentially off-putting to their target market.

Longevity and maintenance

Most developers both bespoke and volume felt that developments they were involved in had a life expectancy of 100 years, some stated that 100 years was not really long enough. One commented that some of their stock was already over 100 years old. However when this provider was asked if they thought a 100 year house would be a selling point they said '*I think the answer is probably not because most people only stay in a house for 7, or 8, years, so I don't think it'll be a selling point but it could still be economically effective*'.

One interviewee expanded, "*what goes out of date is first of all the components and then the planning, the balance of space between rooms... you don't just sleep in bedrooms now*" and a "*100 year house... gets out of date rather than falls down*".

While there was general agreement, therefore, that at least a 100-year lifespan was possible the difficulty of making this demonstrable was felt to be intractable. As one bespoke developer stated, "...*if someone was to say we should be building houses for 200 years or 150 years life we would look to sign up for that. What the cost implications of it all, it's not so much that it's getting the lenders and other people to believe it and then have the proof to say it's going to last for 150 year because no-one bloody knows!*"

Orientation and passive solar gain

Passive solar gain was something many of the bespoke developers had either experimented with, or had on the drawing board though there was a certain amount of scepticism with some, "*in this country considering the hours of daylight the sun shines, you're going to need a back up system*" another commented "*it's a pretty low priority I have to say*". However two bespoke developers were using the principle with complete success, one noted its importance, "*the whole orientation thing is critical to us we did a project once [...] ... we made a fundamental error in the layout, it was just locked into RIBA design instead of the orientation and we've learnt a lot of lessons from that... using orientation to heat and wind to cool is very important to us*".

Three of the five volume house builders acknowledged passive solar gain as an issue of interest, one used the principle for conservatories, though not their main houses, one was linking it through to marketing and the premium people would pay for south and west facing elevations; and one was actively pursuing this in larger developments, but not to the extent of producing highly glazed elevations. Of the other two developers, one commented that they definitely couldn't achieve passive solar gain with their current housing designs and, therefore, were unlikely to undertake such a scheme.

Internal flexibility and standards

Most developers thought about flexibility though generally through the avoidance of load bearing walls, rather than in any more sophisticated way. One provider commented that they created large spaces which could be divided up at a later date, "*the way we wire that particular room, the way the room is designed, its designed to be split at a later date... basically making it adaptable but using conventional technology, rather than sliding panels etc*". Another provider had built a student study bedroom housing project, which had been specifically designed to be convertible to 2/3 bedroom flats for families, without any alteration, (even though demolishing internals wall would have been relatively straightforward) some of the study bedrooms were larger so they were interchangeable with living rooms. However, this developer went on to state they did not consider flexibility in schemes where they didn't own the freehold.

Therefore flexibility in this case was born out of financial necessity more than anything else. Two of the volume house builders were interested in flexible internal spaces and one had introduced these as an 'optional extra' considering a good selling point; though the remaining volume builders saw no advantage to them.

Lifetime Homes Standards received a mixed reception from interviewees. Two of the volume house builders were building to Lifetime Home Standards, though one added that this was only in their affordable range the other said that they felt the issue was being forced on them through building regulations, rather than actively embracing them. One developer said they were aware of Lifetime Home standards but were actively trying to 'resist' them, though did not expand on why. Of the bespoke providers two were positive, however, three of the bespoke developers definitely did not build to Lifetime homes standards, one said, though they agreed with the principles, they felt their standards were better and they disagreed with much of the detail incorporated in Lifetime Homes Standards. They went on to explain, for example "*... I disagree with the need for a through floor lift... we (build) a straight flight of stairs with a decent landing top and bottom so someone in a wheelchair can still get upstairs on a stair-lift... we are fully signed up to the principles behind it we just disagree with the detail of the standards*" another concurred, "*they are inflexible and the detailing is not necessarily that good*".

'Loose fit buildings' was not an expression that was widely understood among those who specialised in residential development. None of the volume house builders had any knowledge of the term. Only one bespoke provider, who specialised as much in commercial development as residential was very enthusiastic, "*we like loose fit, we've certainly been doing work with [] and [] about loose fit which I think is important. How successful have we been? It's an interesting one, the whole thing about adaptability of buildings is something which we've got a long way to go on*".

Thermal performance

Overall building to SAP ratings of 100 were not seen as a problem by most interviewees. When asked about the costs of building to a SAP rating of 100 or more most of the bespoke developer felt this was not a problem, one stated, "*I*

don't think it should be much more than building to less than 100 if it is your norm... We are already building at around 100 with no significant cost variation".

Could improved thermal performance be a selling point? One interviewee responded "*well, affordable warmth is one of those givens as far as we're concerned for rented housing... if they're buying a house I don't think (people) would buy one because its better thermal performance over another*", though another respondent commented they thought it was "*a good selling point, but difficult to quantify cost recouping aspect*".

One developer added that their main concern was not heat loss, but heat retention, finding that buildings overheated in summer. They stated that if climate change was going to bring hotter summers without cooler nights that keeping buildings cool would become a key concern.

Volume builders varied in their response to thermal massing, some stated that they were already building to high SAP ratings, however, there was a general feeling that most of their customers were not that interested in thermal performance and were unsure as to whether they would recoup extra construction cost and so consequently saw this issue as low priority.

CO₂ Emissions

There was a mixed reaction among the bespoke providers when asked if they could deliver a carbon neutral housing development. One firm were extremely positive and said they already prepared a carbon neutral development option for a particular site, for which they felt there was a "*definite market*" in the Northeast, however, they added "*whether the client is prepared to do that is another matter*". Another stated that although they couldn't deliver it at the moment they were looking at carbon neutral in a forthcoming planned development, not over the whole site, but at least a proportion of it. When they were asked if they felt there was a market for this they said that this was not the driving force behind this project, but that they were seeking to demonstrate the practical and technical aspects of such a development, they added "*it won't be commercially viable because the cost will be too high*".

One bespoke developer had attempted one carbon neutral scheme and had another on the drawing board, but admitted the issue was beset with problems, *We've attempted to do that, the CHP (combined heat and power) scheme we were doing in [] was an attempt to do that, but I don't think it's going to be carbon neutral. We're aiming to do a carbon neutral hotel scheme mixed use development in [] but again, you start off trying to be carbon neutral and as you go on it starts to slip, particularly when you've got budget problems, a lot of our scheme rely on grants initially so we do have problems".*

Two of the other bespoke respondents didn't feel it was a driver for them one of the social housing providers felt it was very much a niche market and they considered themselves more of a mainstream provider. Another stated that they could not see what it would mean for them "*not only have we not considered it, but we don't ask our contractors, or consultants to consider it*".

One of the volume house builders felt they could deliver a carbon neutral development, but hadn't done so because they felt there was no market for it. The others either felt they could not, or were unsure if they could. Generally they thought the high level of cost involved would not be acceptable to their customers.

Renewable Energy Sourcing

Of those who felt confident about discussing renewable energy sourcing among the bespoke providers, the general opinion was that it might be possible to provide enough energy on site and some were pursuing this, though it was still very much at an experimental stage, "*the work we are doing will inform us as to whether it's possible*". The general view however, was that it would be extremely difficult and relatively expensive, one provider said "*We've looked at wind power... to try out some little turbines, but the general feedback we get is it will never keep the energy going. We've looked at photo-voltaics and again the costs of the running to deliver 100% energy sustainability are horrendous at the moment so it's always been outside of our remit*".

More realistically energy saving, rather than self-sufficient, schemes were on the drawing board. Some had some direct experience already; opinion here was that geothermal and solar thermal had distinct possibilities, that photovoltaic panels

were not economically viable and that wind turbines were more of a gimmick than a serious proposition.

Two of the volume house-builders felt they would be able to produce a scheme that produced enough renewable energy for itself, but went on to state that such schemes would be prohibitively expensive; one also complained that it would end up looking "unsightly".

Other energy efficiency measure

Developers were asked about fitting energy efficient appliances and specifically about condensing boilers. Most of the bespoke providers had been fitting condensing boilers as standard for some time, and generally all participants knew that new building regulations would require condensing boilers from 1 April 2005; though not all the volume house-builders. One stated that they would not consider fitting condensing boilers, because the ones they fitted were already 'energy efficient' though what this meant was not specified. Generally where white goods were provided they were already energy efficient, though many of the bespoke builders did not provide white goods in their developments.

Recycling

Asked about whether providers would be prepared to provide recycling schemes on site, rather than the normal waste disposal system, several of the bespoke providers had already started experimenting with different waste management methods, though others relied on promoting and co-operating with local authority run schemes. Again there was a feeling that the size of the development was crucial as what was achievable onsite. One participant had been looking specifically at Scandinavian systems of having a recycling centre rather than a bin store, with 20-30 apartments sharing an enclosure where people separate their waste into different containers; "*it actually saves us money because if the bin lorry only has to come to the entrance of the scheme so the roads can be smaller*". Others were looking at providing containers for separating rubbish within units themselves. Such scheme needed tenants/purchasers to sign up to them before occupancy to ensure co-operation, though leading by example was also seen as important , "*we've just recently heightened the profile of recycling, we think if we show our customers that we're looking after the environment it will*

help them to look after the environment too". Further, making schemes easy to co-operate with was also seen as vital to their success.

The volume house-builders generally felt that a reliance on local authority kerbside recycling schemes was sufficient to meet their customer's expectations and they would probably not be interested in more waste management and separation. Two companies had given the issue some thought, one felt that in future owners would be more willing to compartmentalise waste, but not currently. The other actually had on-site compartmentalising schemes, however, they expressed a concern as to how much space they took up on the development; both these developers had also provided on-site composting schemes.

Onsite composting was not widely developed by the bespoke providers, however, one stated "*this is all stuff for the future and to be honest it there's food waste that would go into the local authority run composting scheme, we wouldn't seek to manage it ourselves*" again the general feeling was most of the bespoke developments were actually too small to warrant a centralised scheme.

Water

Experience with water recycling was mixed. Rainwater capture was the area which was most advanced. Where rainwater harvesting was employed one bespoke provider stated that even on relatively tight schemes it was possible to deal with surface water on site, "*without too much difficulty*".

Cost was the key element preventing grey water recycling, however. As one interviewee stated "*at the moment we feel the installation of the second set of pipes, the secondary infrastructure associated with circulating grey water would have such an impact that we wouldn't be able to recover the cost*". This was supported by another developer who said, "*We haven't done that, we looked at it in [] but I think when we looked at the logistics of collecting the brown water and storage, it became pretty awkward. There's quite a lot of kit to go into the building which turned out to be prohibitively expensive.*"

Reducing water consumption, however, was something that all of the bespoke and many of the volume developers were already designing into their schemes.

Many were already installing duel flush toilets, showers rather than baths and fitting aerating taps as standard. Though whether this reduced water consumption by 50% of a standard design had not been measured. The driver for these approaches however was sometimes more to do with reducing energy consumption to heat the water, rather than water consumption itself. As one respondent commented in relation to social housing "*its something that is driven by energy cost rather than water*" and another stated "*I think it would be unfair for me to lead you to believe that we were trying to save water. We're trying to save heating because it's the hot water that costs more than the cold*".

Practical experience of Sustainable drainage systems (SUDS) was somewhat limited, though one of the social housing providers stated that it was common practice in Scotland and the other while they did not have previous experience of SUDS that a new schemes was based on a SUDS scheme "*...balancing ponds, home drainage channels throughout the scheme and so on*". Two of the other providers were using SUDS systems without issues.

Three of the volume house builders were generally disinterested in water recycling and conservation. Two were thinking about these issues, one said it was a difficult area because they felt their customers didn't see water provision in this country as a problem. Both the companies had looked at SUDS and felt that potentially they were a good idea, however both also felt there were issues over adoption. One stated in planned use of SUDS that the local Water Company would not manage the scheme saying that this was the responsibility of the local authority, however the developer claimed he had also been unable to get the adoption of the scheme by the local authority and in the end the scheme had not gone ahead.

Ecology

All of the bespoke developers were positive about using native species in landscaping schemes, although for example one pointed out that as their work was almost entirely small scale and urban, they rarely had landscaping schemes in any case. None felt that using native species was a problem, but whether respondents were aware of exactly what constituted native species was another point, one said they used native plants to a large extent but went on to comment "*... but I don't think cotoneaster and berberis count as natives*" which they don't.

However the use of such plants is clearly based on their relatively low maintenance habit, introducing sustainability questions of a rather different nature as one respondent put it, "*the driver for us is about the environment which gives the appearance of sustainability I suppose*". There was also a concern that while native plants should be used for public areas that one of the social housing providers in particular would not want to restrict the plants grown with private gardens.

Two of the volume house-builders stated they had no interest in the ecology of sites at all. Of the other three, two claimed they had set out ecological gardens, though one also added that they found resistance from local residents as the areas tended to look unsightly and overgrown. Setting aside an area purely for ecological purposes was something that most of the bespoke providers felt was an interesting idea, but was very much site dependant, sometimes places were left to go to nature by default, however, "*its one of those things you've done just accepting that for part of the site its best for its to go to wilderness*". Another commented "*its depends on the development, certainly on sheltered housing and retirement housing... if they wanted such a garden I am sure we would enable it. On our general housing schemes our experience of providing communal gardens is not good*".

In terms of how you resolve conflicts between the environmental consideration and development of a site there was no consensus, one bespoke provider commented "*it's a matter of common sense, not trying to screw too much out of the site*", another bespoke provider suggested consultation as one way, but wasn't sure how well it worked, a point echoed by some of the volume house builders; only one respondent felt this was a role for the planning system itself.

ICT

One of the key issues raised with ICT enabling was keeping up with technological change. One respondent commented "*up to 5 years ago we would double cable every room... one for phone and one for IT... 3 years ago we started to install a single wire... because the culture was about dial up connection. We've moved on from there this year was the first year we installed broadband*". Another commented "*I think ideally we would have liked to go for cable free things, portable systems... but the moment it goes in it's redundant.*"

Another issue raised by one respondent was that while they themselves could install broadband capacity, external service providers could not necessarily meet the capacity for it. Many bespoke respondents, however, felt that broadband was the current standard, "*we haven't previously (installed broadband) because the last development we did was before broadband took off but we will be enabling it in the future*", when asked if it felt to be a selling point one respondent said, "*no I think it's expected*". None of the volume house-builders paid particular attention to ICT provision in their designs; one volume house-builder stated that they did not even provide a phone socket in properties.

Designing in the ability for utility companies to easily lay cabling through a development and into housing was not seen as a problematic issue, nor was it necessarily seen as more costly. One volume house builder who had tackled this issue, however, and stated it did involve extra cost went on to state that they had passed on the costs to utility companies, who paid them to design their developments in a way that facilitated utilities providers.

Safety

Secured by design standards were widely known. However, not all respondents were completely happy with them, or at least they way in which local police forces were interpreting them, "*I think secure by design is flawed, I haven't had dealings with it for 2/3 years with the police... when we last had it they were just saying stick some big roll of shutters up and we were saying no, we don't want to, we'll take the cost of having the windows broken on the basis that that stops and you end up having light and life coming onto the streets which is important...*" another stated "...*we're committed to the secure by design principles, but I don't think we're committed to how some police forces implement them...*".

The volume house-builders, though accepting Secured By Design also raised issues of interpretation. Three of the participants raised this issue, stating they felt there were tensions between Secured By Design and advice given in PPG3 and this brought them into conflict between local police architectural liaison officers and planners. The focus of this conflict was in planning requirements of permeability and addressing the surrounding area and Secure By Design aspirations of inward looking surveillance and limited access.

Marketing.

There was general agreement across the respondents that thus far public demand for sustainable housing was limited, one bespoke provider commented "*I think the housing field is controlled by people who don't seem to exhibit any interest in sustainability whatsoever, who still sell 95% of the houses in this country, it is a depressing picture*" and one of the social housing providers suggested "*I don't think the people moving into our properties... actually have an appreciation of the sustainability issues around them*". In terms of what can be done to induce building and delivering sustainable housing for the mass market, raising awareness among the public, therefore, was a key issue; one in which both central and local government had a role "*the authorities, the government have got, got to place higher emphasis on it, they have to demonstrate a greater commitment... to clearly demonstrate the benefits down the line*" another added, "*I don't think its something house builders can lead on, its about awareness raising and customer demands to which house builders respond*".

Generally respondents felt there needed to be an element of carrot and stick in approaches so for example, introducing tougher building regulations were important, "*the bluntest instrument is the building regs, if the regs demanded everyone built to eco-excellence for example then the cost of construction would be increased but when companies were bidding for land people's calculations would be the same*". Financial incentives were also vital either to the developer, English Partnerships process sell land at a cheaper price if it is being developed to a higher sustainability standard was cited as an exemplar of good practice by bespoke developers; or, to the consumer, for example, waiving stamp duty for compliant housing so that overall cost increases to the consumer were reduced in size.

There was some disagreement in responses to the final question which examined the viability of various sustainable components which might be included in developments in terms of their cost:return ratio. Generally however, photovoltaic panels and green roofs were felt definitely not viable; solar water heating panels and triple glazed windows were questionable; and landscaping and native species and SUDS were felt to have possibilities. Again there were some views that were exceptions when one interviewee was asked about triple

glazed windows for example he stated "*they're a waste of time. It's a fad and the weight ratios make them unworkable... in fact the double glazing in this country is crap... the most effective is proper secondary glazing*". One respondent viewed the cost:return in marketability in directly opposite ways to most feeling that in marketing terms only highly visible elements such as photovoltaic panels and solar water heating panels might be viable, whereas triple glazed windows or landscaping with native species were not viable marketing tools because while they might not be more cost effective people didn't notice them. This respondent further went on to state that SUDS might even be seen negatively, because people viewed elements such as the balancing tanks as "*a nuisance*".

One respondent who had been looking carefully at all of this technology, however, viewed this issue very differently and talked of the need to take a holistic approach. They suggested inserting one of two measures in isolation often didn't pay off "*because they're using one item and they want to see the benefits of this one item which may have been costed as part of the scheme, but the rest of the scheme is very traditional, minimum regs housing and the benefits are fighting all that then. If you look holistically, that's when you really start to see a difference.*"

Volume house-builders are developing a broad range of housing types from starter homes, to retirement properties and from affordable partnership properties to expensive 'family' housing. Throughout their market, however, they do not see sustainability as being a market driver for their target purchasers. However one developer the volume builder who had already developed eco-homes stated that they felt they needed to do something to show people that they "*really do care*" and to "*keep a good name*" in the market. One of the developers who at this stage was not at all interested in sustainable housing also stated that he thought this could change and that all the volume house-builders would probably "*jump on board at the same time*". A sentiment clearly echoed by one bespoke developer reflecting on city centre apartment building, which was started by small bespoke companies as a fringe activity a decade ago. In most city centres today, however, such companies had been effectively squeezed out by major developers, "*I think... its about showing them they can make money out of this (sustainable development)... and that's for local authorities to work with the little companies to deliver demonstration projects as we did here (i.e. in relation to city*

centre development) ". A clear and unequivocal support for NCC demonstration project approach.

CONCLUSIONS

Eco-homes

BREEAM Eco-homes ratings are the only set of nationally recognised standards for sustainable housing in the UK. However, eco-home standards are not seen as necessarily that high by those pushing back the boundaries of sustainable development. The 'check-list' approach may be flawed and, for example, the self reporting nature of the ratings might be open to manipulation and abuse. Moreover, moving from 'very good' to 'excellent' may be more about site conditions than really improving the quality of the housing provided.

Adoption of the ratings is, therefore, far from common practice even among those providing sustainable housing. There is no compunction to use them and widespread adoption of these, or alternative standards this will only occur with i) stricter building regulations, ii) financial incentives to developers (gap funding) iii) financial incentives to purchasers, such as waiving stamp duty on compliant housing iv) a massive and costly public campaign to raise awareness of the need for increased standards, or v) a combination of these.

Neighbourhood services.

Most developers, both bespoke and volume now seem to accept the idea of mixed uses. The key issue here seems to be proving demand. No-one seemed willing to offer any tried and tested calculations of housing density, distances from particular services etc., as a guarantee of success. A key issue appears to be timing and the need to provide shops and services early in developments so that new occupants get used to using these, rather than driving to those nearby. For volumes house-builders services, particularly schools, outwith developments are a more important driver than supplying services on-site.

Building residential units over shops is now a widely viewed as an acceptable practice.

Transportation and onsite circulation.

Many of the developers seem happy to consider the role of public transport in relation to their development, though no-one specifically mentioned 'green travel plans', suggesting that this concept may not be widely adopted. All developers, including the volume builders, stated that they were concerned with ameliorating the impact of cars on their developments. There still issues with local authorities in terms of highway regulations and parking standards, however, which though being relaxed, are problematic and this needs to be addressed by the authorities themselves.

The take up of Home Zones is at present patchy, though many of the bespoke developers suggest that they are incorporating Home Zone principles. The issue seems to be that while general principles are understood, there is a lack of knowledge of the precise parameters of Home Zone standards. There was also the suggestion among the small number who had attempted to develop Home Zones that the acceptance of them by highway authorities was not necessarily forthcoming.

There seem to be no issues regarding the provision of pedestrian and cycle routes and facilities within developments and generally the acceptability of cycle provision is uncontroversial.

The research suggests, however, that completely car free developments are unachievable at this time, except for relatively small scale core urban sites. The incorporation of car pooling, or car sharing, schemes was being actively investigated by some bespoke developers, though not all were enthusiastic. Of the two who had definite plans for such schemes on the drawing board, both were undergoing adoption negotiation with the local authority.

Building materials and construction.

Sourcing local materials does not seem to a problem throughout the industry, though exactly what was considered 'local' was not always clear. A local procurement strategy set out by the local authority, for staff, materials and supply chain seems to be the best way to add clarity to the process. Only construction

elements where specifications are extremely high to the extent they limit suppliers to a few sources, need to be sourced nationally.

Attention to the durability, recyclability and reparability of materials varies greatly between developers. The most balanced approach seems to be to look at schemes holistically rather than emphasise one, or two, building elements.

There appears to be a consensus that prefabrication is a way of improving quality in the development industry.

Green roofs may be possible within developments, but experience is very limited in this field and they can actually interfere with other sustainability measures, such as rainwater harvesting.

Longevity and maintenance

Building to an expected lifespan of 100 year was not seen as a problem and most of the industry expect their properties to last this long already. Proving this, however, was seen as the difficulty; no-one felt there was a demonstrable way of proving increased lifespan.

Orientation and passive solar gain

There was no widespread adoption of use of orientation and passive solar gain, but neither was there any demonstrable reason why it should not be more widely used. Two developers were using the principle successfully.

Internal flexibility and standards

Good internal flexibility can be achieved through conventional technology, at no extra cost, by careful planning of services. There is no reason why it should not have widespread adoption.

Lifetime Homes standards are worthy in principle, but they are rigid in their detail and not everyone agrees that the detailing is the best possible solution to certain issues. Alternative approaches to ensure that dwellings are adaptable and accessible for wheelchair users, for example, may be equally acceptable.

Thermal performance

Building to SAP rating in excess of 100 was not a problem and bespoke developers and some volume builders were achieving this already. There was a concern particularly among volume builders, however, that SAP ratings were not understood by purchasers and increased cost involved in better thermal would be difficult to pass on to the consumer.

CO₂ Emissions

A range of developers suggested that they could deliver a carbon neutral scheme at this point in time, however, whether it would be cost effective seemed generally doubted. The research suggests carbon neutral developments are more aspirational than achievable at this point in time.

Renewable Energy Sourcing

The research suggests that producing enough renewable energy on site again is probably unviable on many sites at this time and that site variation was crucial to limitations/possibilities. Based on the experience of respondents the most promising energy sources appear to be geothermal and solar thermal, with photovoltaic panels offering the least potential. A holistic view again may be the most appropriate, however, on schemes rather than trying to identify the benefits of individual energy sources.

Recycling

Various methods of onsite waste management were working successfully, separation of materials within individual dwellings, or at recycling centres were claimed to be equally successful. The scale of developments for schemes such as independent composting were, however, crucial.

Water

Installing water saving measure such as dual flush toilets and aerating taps now appears standard practice across the industry. Sustainable drainage and

rainwater harvesting are also becoming increasingly successfully used. There was little experience of grey water recycling revealed by the research, however. Though some of the bespoke developers had considered grey water recycling, the amount of separate servicing had made schemes prohibitively expensive.

Ecology

Ecology is largely ignored by volume builders, among bespoke the use of native species was widespread, the only issue here was one of maintenance. The set aside of ecological areas within developments was dependant on the scale of the project and education of residents.

ICT

Among bespoke builders the only issue of installing ICT capacity was one of continuous obsolescence.

The design of sites to allow easy cabling by utility companies is not a problematic issue.

Safety

Both bespoke and volume house-builders are agreed that a tension has emerged between Secured By Design standards and PPG3 aspirations for permeability and accessibility. Whether this was a problem with the standards themselves, or a matter of interpretation is not clear, but these issues need resolving.

Marketing

There is general agreement across the industry that thus far public demand for sustainable housing is limited. On the demand side, the buying public have little knowledge of the various standards and benchmarks and there are no financial incentives to buy more sustainable houses. From the developers point of view there are no financial incentives, or regulatory controls to induce them to supply sustainable housing. Some, or a combination, of these issues must be addressed in order to induce more sustainable housing into the mass market. While clearly central government has the major role in this, local authorities may also have a

significant impact by working with developers who are already building sustainably and encouraging sustainable demonstration projects through:

- The adoption of sustainability criteria in planning briefs;
- The release of public owned sites for such projects;
- The encouragement of sustainable developers to practice in the region
- General awareness raising campaigns with the general public and:
- The release of public funds to achieve the above.

RECOMMENDATIONS AND FURTHER RESEARCH

Increasing knowledge in the field

1. Undertake further research on the precise drivers behind volume house builder attitudes to adopting sustainable benchmarks and standards.

The information contained in this report is as comprehensive as possible within the restraints of the research. The size of organisation involved in volume house building; however, means that decision making processes are complex. The participants for this research were land managers who were able to give a broad overview of company policies and approaches. They were not always able, however, to give detailed information on how these policies were arrived at, or what exact incentives would be necessary to change them. It is suggested that a follow up piece of research which looked in-depth at one or more of these companies and their decision making processes would be invaluable in understanding the development of more sustainable house building practices in the UK.

2. Undertake a comprehensive overview of current policy and guidance to identify the gaps in the delivery process for sustainable housing.

Again the information contained in this report should be taken as base-line, or foundation work. The issues raised need a great deal of further exploration and development and each of the key themes raised warrants further investigation.

Progressing the sustainable housing demonstration project

3. Prepare a pre-qualifying questionnaire for firms interested in bidding for a sustainable housing demonstration project.

To move forward on a sustainable housing demonstration project the local authority should prepare a pre-qualifying questionnaire for firms interested in working with the local authority on such a scheme.

It is suggested that such a questionnaire need not cover all themes covered within this report, since some are already non-controversial, while for other the

consensus is that they remain unachievable at this point. It is recommended, therefore, that the questions cover those issues where those firms actively engaged in sustainable development appear to be making substantive progress. Model questions might, therefore, include:-

- 1) Have you completed projects rated as eco-homes excellent? Have you demonstrably exceeded standards rated as eco-homes excellent in any development?
- 2) What mixed land uses have you developed within residential developments? What strategies have you taken to ensure the on-going viability of these uses?
- 3) Have you prepared a 'green travel plan' for any development? If not, what strategies have you adopted to minimise the level of private car dependency on developments?
- 4) Have you built to Home Zone principles? If not, what alternative strategies have you taken to minimise the impact of vehicular traffic within developments which you believe meet, or exceed Home Zone principles?
- 5) Where you have not sourced staff and materials for a development within a 75km radius of that development site please justify your procurement strategy.
- 6) Provide examples of where you have successfully used passive solar gain within developments.
- 7) Please provide the SAP ratings for your last development.
- 8) Have you prepared plans for a carbon neutral scheme?
- 9) Please give an example of where you have harnessed a renewable energy within a development site. What proportion of that sites total energy requirement is met by this and other renewable energy sources?

Documentary evidence should be requested to support all answers.

4. Prepare a marketing strategy to attract those capable of producing high quality sustainable housing developments to the region.

This above process would ensure that only those firms currently producing schemes to the highest sustainability standards would qualify for short-listing in any demonstration scheme. Those pushing back the boundaries of sustainable housing are not, necessarily operating with the Northeast region. There is therefore, a marketing and promotional process that needs to be developed to ensure that these firms would be attracted to bid for the demonstration project in the first place.

5. Develop generic sustainable housing briefs for site both in and outwith public ownership.

The third recommendation of this report is that NCC adopt a generic sustainable housing development brief for all sites in public ownership. Further that the local authority consider what elements of this generic brief might be reasonably adopted for planning briefs on sites outwith public ownership and consider a policy on gap funding to cover the increased costs of developments built to higher sustainability specifications.

Consideration should also be given to the following:-

6. That NCC ensures that current highway policy is compatible with adopting schemes built to Home Zone, or equivalent, principles.
7. That NCC develops a clear policy on the adoption of car club/pooling schemes.
8. That NCC has a policy over the adoption of SUDS schemes.
9. That NCC produces clear SPG on the application of Secured By Design principles in the light of PPG3 and other current urban design thinking.

Appendix A – Tabulation of Key Issues.

Table 1 BREEAM and Neighbourhood Service Provision

	BREEAM	Provision of Neighbourhood Services
A	Adopted BREEAM, (very good standard) Issues of site specificity re 'excellent' standards raised	Have built mixed use sites, though stressed legal and financial complexities of doing so
B	Adopted BREEAM (aspires to excellent) Cost and site specificity of achieving excellent standard raised	In favour of mixed uses but stressed need to justify sustainability of demand
C	Didn't adopt BREEAM, knew little about their specs	In favour of mixed uses – development size key issue
D	Didn't adopt BREEAM Sceptical of standards - claimed open to manipulation	Have built mixed use developments – stressed technical aspects of compatibility
E	Adopted BREEAM – though commercial not housing standards Suggested contractors gen. very little interested in BREEAM	Have built mixed used buildings – stressed externalities and surrounding uses as key to success
F	Only BREEAM rated one scheme Adopted their own standards - felt these standards superior	In favour and have built mixed home/work developments
G	Adopted BREEAM to 'excellent' standard	Key to this developer – lots of mixed use building and development experience.
i	Aware of BREEAM standards but not adopted. Felt able to meet BREEAM standards, if required	Prepared to build-in mixed uses – raised issue of timing as important
ii	Not aware of BREEAM Felt able to meet BREEAM standards, if required	Would provide where local authority requirement. Nearby facilities more attractive than on-site.
iii	Not aware of BREEAM Felt able to meet BREEAM standards, if required	Would provide where local authority requirement. Nearby facilities more attractive than on-site.
iv	Not aware of BREEAM Felt able to meet BREEAM standards, if required	Would provide where there was a financial incentive to do so. Nearby schools raised as more important issue.
v	Not aware of BREEAM Felt able to meet BREEAM standards, if required	Would provide where there was a financial incentive to do so. Nearby shops and schools raised as an important issue.

Table 2 Transportation and Site Planning

	Key Issues	Home Zones	Car Free Environments	Car Pooling/Clubs
A	The need for quality and affordable public transport raised	Haven't built to Home Zone principles, but do minimise impact of car on developments	Only possible on rehab work in city core locations adjacent to good transport links	Uncomfortable with the resident co-operation required for schemes
B	Developer seeks to divert local bus services to new developments where appropriate	Have built to Home Zones without extra cost	Would aspire to these but not currently achievable	Car club on drawing board – plans to hand over running to local authority
C	Raised conflict between parking standards and minimising car impact	Had not heard of Home Zones	-	-
D	Seek to locate all developments adjacent to existing public transport	-	Aim for car free, but only possible in city core locations	-
E		Had not heard of Home Zones	Car free seen as not possible	-
F		Willing to design Home Zones – but raised highway adoption issues	Possible in a 'concept' community	Size of development seen as key to success – though mixed use with employment might be also be key
G	Found increasing pressure to accommodate cars within schemes – have resorted to expensive underground solutions	Built schemes to similar standards, but not called Home Zones	Semi-car free possible	Currently exploring car pooling awaiting local authority approval for scheme
i	Using landscaping and PPG3 layouts to reduce impact of cars on sites	Had built a Home Zone and had problems in implementation – leaving developer sceptical	Car free not seen as possible	-
ii	Developer responds to local authority site specific requirements on transport matters	Do not see market driver in building Home Zones	Car free possible in tight city centre schemes	-
iii	Developer using basic traffic calming measures within schemes.	Home Zones viewed as unworkable	Car free not seen as possible	-
iv	Are willing to respond to traffic amelioration requirements when included in design briefs	Using Home Zones in some schemes – these involve increased costs	Car free not possible in North East – insufficient public transport infrastructure	-
v	Have employed architects to look holistically at reducing car impact on developments	Felt Home Zones only possible on small schemes; unworkable on larger developments	Felt car free impossible to enforce and therefore unworkable	-

Table 3 Materials and Construction

	Sourcing Materials-	Durability, recyclability and reparability	Green Roofs	Prefabrication	Longevity
A	Did not source locally – predicted increased cost in doing so	These issues were key because the developer also managed stock – regularly opted for higher capital cost for long term value	Experimental scheme only	Seen as way forward currently using off site manufacture for frames and panels	100 yrs lifespan for structure possible – obsolescence seen as in the internal planning and use of units
B	Not a policy to source locally – felt it might raise cost	Durability and reparability considered recyclability less so but of increasing importance	Experimental scheme – may be repeated	Only used on one scheme – but seen as increasing the way forward	100 yrs lifespan achievable – not a selling point- people only live in houses gen 7/8 years
C	Always sources locally – not seen as more expensive	Expediency seen over-riding factor; willing to experiment with materials	-	Developing own factory for off-site manufacture	100 lifespan easily achievable and much longer for timber frame
D	Do not control -left to contractors	All seen as key issues	-	-	Build to 60 years life currently; 100 possible; issues of guarantees and funding raised
E	Source materials and services locally where possible	Pay much attention to balancing these requirements which is not necessarily straightforward	Had a scheme on the drawing board – but found it impossible to get a contractor to build it	-	100 year lifespan not seen as long enough
F	Always sources locally – not seen as more expensive	Seen as key part of buying decision	Do not use them – they would interfere with this developers rainwater harvesting option	No current experience, but possible in the future	100 yrs lifespan achievable
G	Generally source locally – but some specifications only met by a few national suppliers	Seen as very important – but partly tempered by modern design philosophy	-	Currently successfully incorporating some prefabrication	150-200 years lifespan achievable – but raised attitude of financial institutions
i	Heavy materials sourced locally – no increased cost	All seen as key issues	Too problematic and risky	Increasingly incorporated within schemes	100 yr lifespan probable – but not a selling point
ii	Most materials sourced locally – no increased cost	Durability particularly important – but would be willing to use recyclable materials	No plans to introduce green roofs – seen as off-putting to customers	Currently have a pilot project on site	Felt lifespan would 'vary' – and longevity is not a selling point
iii	Most materials sourced locally – felt this created a strong and competitive market lowering cost	Using some sustainable materials but cost seen as more important driver	Too problematic and risky	Not currently used – but plans to use it in the future	Felt 100 yrs was possible, but no guarantee would be possible and not a selling point
iv	Most materials (though not all) are sourced locally – no increased cost	Do not specifically look at these issues	No plans to introduce green roofs – seen as off-putting to customers	Used prefabrication in past. Are currently reconsidering re-introduction	Houses should last in excess of 100 yrs – but 25yr mortgages make this unimportant
v	Most materials sourced locally – no increased cost	-	No plans to introduce green roofs – seen as off-putting to customers	Currently used by this firm's US sister company – currently investigating UK application	-

Table 4 Energy and Internal Standards

	Orientation and Solar Gain	CO₂ Neutral Development	Renewable Energy Sourcing	Internal Flexibility	Lifetime Homes Standards
A	Limited experimental project – low priority	Not been evaluated – seen as too niche for this developer	V limited experience of geothermal – solar and wind power seen as too complex	Load bearing walls avoided to allow flexibility within house shell	Not adopted – principles agreed with but not detailing
B	No current experience, but schemes on drawing board	Could not deliver at present – looking at part of schemes as a pilot	No current experience but developing a pilot study	Limited experience – have built for re-modelling but hadn't done any	Used as standard
C	Not seen as important in UK	Not cost effective	-	Designs not fully flexible, but timber frame construction easily adapted	Had not heard of Lifetime Homes
D	Not seen as driver for this developer	Not seen as driver for this developer	Not seen as driver for this developer	Specifically designed in where company had long lease and management of properties	-
E	-	Interested and felt possible – but finding a client willing to take the risk would be problematic	No experience – but seen as interesting possibility	Load bearing walls avoided to allow flexibility; but no experience of anything more sophisticated	Had not heard of Lifetime Homes
F	Standard approach in developments	Scheme on drawing board	Self-sufficiency possible but difficult. Solar thermal and geo-thermal seen as currently viable.	Load bearing wall avoided	Used as standard
G	Currently designed into schemes	Have not been able to deliver a scheme yet due to costs – but very much planned	Investigating possibilities – use of wind power (partial at best) photovoltaics specifically rejected	Adaptability used as standard approach	Not used – seen as inflexible detailing
i	Try to incorporate passive solar gain and recognise market advantages of this orientation	Could not deliver a scheme and felt customers unwilling to pay increased costs	Could produce a scheme, but do not think customers would pay additional cost (photovoltaics optional extra on executive homes)	Not attempting to produce flexible buildings	Only used on affordable home range
ii	Insufficient market demand	Could deliver a scheme but not seen as attractive to customers	No experience but felt they could not deliver a scheme; though site condition crucial too.	No experience, do not feel there is market demand	Did not know about Lifetime Homes standards
iii	Principle used for conservatories, though not houses	Not a strong enough market demand to warrant one	Possible to deliver a scheme but it would be expensive and unsightly	Ability to move walls an 'optional extra' at design stage only	Did not know about Lifetime Homes standards
iv	Aware of issues but do not feel it is a major issue with housing schemes	Unsure of deliverability – plus not enough market demand	-	Not attempting to produce flexible buildings	May adopt standards as feel there is move in regulations toward them
v	Currently introduced into some larger schemes	Unsure of deliverability – but probably not cost effective	Do not think scheme could be self-sufficient but have experimented with wind turbines	-	Currently trying to resist their adoption

Table 5 Recycling, Water, ICT, Safety and Promotion

	Recycling	Water	ICT	Safety	Promotion
A	Experimenting with on-site recycling centres to replace bin stores	Reducing energy use to heat water important. Grey water recycling prohibitively expensive. SUDS used on larger schemes	No particular provision	Secured by Design adopted as standard	Sustainable housing seen as niche – need for a huge public awareness campaign
B	Promote local authority kerbside schemes	Currently investigating grey water recycling. SUDS being incorporated on a current scheme.	Broadband to be incorporated on future schemes	Secured by Design adopted as standard	Need for greater emphasis from local and central government; plus grants.
C	-	-	Broadband standard	Felt security 'overkill' damaging to developments	-
D	Promote local authority kerbside schemes	Reducing energy use to heat water important. Grey water recycling prohibitively expensive	Broadband to be incorp'd on future schemes - keeping up with tech a prob.	Do not use Secured by Design – but feel own consideration lead to v high standard.	Uses sustainability to market their own distinctiveness; but only where they see a clear driver do they adopt standards
E	Size of development key to viability	-	Broadband standard	Secured by design had been used where part of a brief to do so	Need for tougher regulation and holistic view of schemes taken
F	Size of development key to viability	Rainwater harvesting and SUDS used. Grey water recycling not viable	-	Secured by design standards given 'modest' importance	Tougher regulation and financial inducement needed
G	Waste separation inside dwellings standard	Grey water recycling prohibitively expensive. Current schemes for rainwater harvesting.	Broadband to be incorp'd on current schemes - keeping up with tech a prob.	Secured by Design standards rejected	Need for exemplar demonstration projects
i	Have introduced schemes – concerns over space requirements	Grey water schemes have been used – but there is consumer apathy. Adoption of SUDS schemes an issue	Will provide when there is demonstrable demand	Secured by Design adopted but conflicting advice given by local authority and police	Customer demand would induce developer to build to higher sustainability standards
ii	Local authority kerbside collection seen as sufficient	-	No provision (not even phone line)	Secured by Design adopted but conflicting advice given by local authority and police	Need to make higher sustainability more affordable so house prices are unaffected
iii	Local authority kerbside collection seen as sufficient	Do not consider water reduction as a particular area of concern in UK	minimum provision	Certain features designed to Secured by Design only	Legislation would provide the greatest inducement to producing sustainable housing
iv	Local authority kerbside collection seen as sufficient	Grey water schemes not used but SUDS have been tried. Developer highlighted disputes between water authorities and local authorities about adoption.	minimum provision	Secured by Design under consideration	Legislation would provide the greatest inducement to producing sustainable housing
v	Introduction of schemes under consideration	Have not used SUDS because of perceived issues with adoption	-	Secured by Design adopted but conflicting advice given by local authority and police	Need to make higher sustainability more affordable so house prices are unaffected

Appendix B - Form of questions.

Sustainability brief: Interview questions for...

General sustainability standards

- Do you have a good working knowledge of BREEAM eco-homes standards
- What is your opinion of these standards?
- Do you feel you could viably produce housing (and any other construction linked to it) to BREEAM “Very Good” or “Excellent” standard?
- Have you produced schemes to these standards before?

Neighbourhood services

- What are your views on building shops and services within housing developments?
- Are there any drawbacks?
- Would you be willing to build housing above shops, and if not why?
- How significant is the presence of local shops to the marketing or sales of a housing scheme?

Transportation

- What are the most important issues are far as you are concerned with relation to transportation and sustainability
- What are your views on Home-Zone principles? Do you believe you could fully encompass them within a development without additional costs?
- Do you employ other design features to ameliorate the impact of cars and parking onsite?
- Under what circumstances do you believe a car-free development would be possible?
- If a brief insisted that a development was car-free, what measures do you think could compensate for it (a good local bus service for instance, or communal car pooling schemes)?
- Would you be willing to provide cycle paths in a development physically separated from the roads?
- What features do you currently employ or would consider to encourage walking/cycling within developments?

Building materials & Construction details

- Do you make attempts to source all materials locally?
- Do you believe that doing so would raise building costs?
- What consideration is given to long-term durability, recyclability and reparability of materials?

- Would you be willing to source and use recycled materials?
- How much emphasis is placed upon using renewable materials with low embodied energy?
- Do you have experience of building either ‘extensive’ or ‘intensive’ green roofs?
- What are the barriers to creating green roofs as standard (if any)?
- What experience do you have of prefabrication?
- What impact do you believe prefabrication will have on your business in future?

Longevity and Maintenance

- Do you believe it is cost effective to build housing with an expected lifespan of 100 years or more? Should expectations be even longer?
- Would 100 year housing be a selling point?
- How could this goal be achieved to the benefit of:
 - The developer
 - The building industry in general
 - To the end customer

Orientation and solar gain

- How much experience do you have of passive solar gain?
- Do you believe you could deliver a housing development involving sunspaces or highly glazed southern elevations?

Internal aspects

- Do you have any experience of designing flexible internal spaces in residential developments i.e. where walls can be easily added, removed or moved? Do you think this could be a selling point?
- What is your understanding of “loose fit” buildings?
- Do you build to Lifetime Homes standards, and if not what are the barriers to doing so?

Thermal performance

- What is your experience of building with high thermal massing?
- How much greater do you believe the costs would be of building to a SAP rating of 100 or more? Do you believe it would greatly affect the design of the building?
- Could improved thermal performance be a selling point? Would it recoup any additional costs?

CO₂ Emissions

- Do you believe you could deliver a carbon-neutral development?
- Do you believe there s a market for carbon-neutral housing strong enough to be commercially viable?
- Would such a high level of sustainability add value to a development?

Renewable energy sourcing

- Do you believe you could provide a development that produced enough energy for itself, on-site, through renewable sources?
- Which renewably energy sources have you previously used, and which would you see as being viable now?

Other energy efficiency measures

- What would make you consider fitting condensing boilers as standard?
- Do you now, or would you consider, fitting energy efficient appliances as standard?

Recycling

- Would you be willing to provide a recycling scheme to be used instead of the normal waste disposal system?
- How willing do you think potential buyers would be to fully compartmentalising their household waste?
- Would you be willing to establish composting facilities and management onsite?

Water

- Have you used grey water recycling/re-use systems in previous developments?
- What measures would be necessary to reduce mains water usage by 50%? Would this be easily attainable?
- What is your previous experience of SUDS?
- Do you now, or would you consider, fitting water efficient appliances, toilets and showers as standard?

Ecology

- Can you see any disadvantages to using only native species?
- Would it be viable to set aside part of a site purely for an ecological garden?

- In your experience, what is the best way to resolve conflicts between environmental consideration and development on a site?

ICT

- How much ICT infrastructure do you usually install into a new house (e.g.: broadband cabling)?
- Do you design in the ability for utility companies to easily lay cabling through the developments and into the housing? How easy would this be?
- Would this be a selling point sufficient to cover any additional costs incurred in construction?

Safety

- What importance do you give to building to ‘Secure By Design’ standards?
- What means do you incorporate to ensure security onsite, or to reinforce perceptions of safety?

Marketing

- What is your normal target market?
- Would sustainable housing represent added value to your average customers, sufficient to cover additional building costs?
- Do you perceive sustainable house builders as gaining a market lead, or as a fringe activity with little long-term relevance?
- What would be the single greatest inducement to building and delivering sustainable housing for the mass-market?
- What are the current barriers to doing so?
- Which viable elements of sustainable building would provide the best (on a ‘cost : return’ ratio) marketing features? Or create the greatest barriers?
 - Green roofs
 - Photovoltaic panels
 - Solar water heating panels
 - Triple glazed windows
 - Landscaping with native species
 - SUDS drainage systems

Appendix C – Interviews with bespoke housing providers

Interview A

Just before I get into the questions can I just ask you what your job title is?

A

Director of Business Strategy – []

I

I sent you the questions I'm not sure if you've had a chance to look at them.

A

Yes I have, can I preface what I'm going to say with the point that the way that I'll answer these questions is that it relates to those projects with which we have the ability to determine the product. The reason I'm making that point is we do quite a lot of work which is just buying existing satisfactory properties which obviously aren't applicable here and also we do quite a lot which is also just buying packages from house builders where there're discharging a section 106 obligation and I'm discounting all of those and just looking at that part of the work where we're in a position to make the decision ourselves.

I

No problem at all.

A

And that is quite a significant part of our activity you see, that non-controlled part.

BREEAM and eco-homes standards

I

I understand... If we could kick off with the general sustainability standards and BREEAM eco-homes standards. Is this something that you endeavour to work to?

A

Yes members of my team, some members of my team, are qualified/authorised assessors for BREEAM

I

Do you work to v good or excellent?

A

We work to v good usually and our assessment is to go from v good to excellent is in large measure a function of the location rather than the product. The financial implications on the development are minimal but you can't get from v good to excellent unless you've got v good transport connections for example.

I

They tend to be site specific

A

Rather than to do with the dwellings

Neighbourhood services

I

In terms of where you have your own developments, have you attempted to build other services like shops within the development?

A

We have built community centres, we have not built shops in the last 30/40 years but we do have some of our bigger estates where we've built and still own the shops.

I

Do you think there are any issues/drawbacks with trying to provide...

A

Complexity of funding and legal arrangements and so on

I

Do you think the presence of local services, whether they are within your site or just out with, are significant in terms of your marketing or sales of your housing schemes?

A

Yes, particularly for rented accommodation. Our site appraisal gives a fairly high, or a very high, importance to accessibility to local facilities which is everything from shops to chemists to doctors surgeries to schools.

I

What about building over shops?

A

We've done that on a refurb basis, we've done probably about 100 odd in [] for e.g. Quite a lot of the nice bits above the shops in [] are us. We've not build new but done a lot of rehab work, converting vacant floor space to residential.

Transportation and on-site circulation

I

In terms of transportation what do you think the most important issues are concerned with transportation and sustainability?

A

Well availability and price of good quality public transport is the key issue and that's obviously very important particularly for our social rented product because basically we're housing very poor people, quite often people who are elderly or impaired mobility and so on so decent quality public transport is very important.

I

What about the Home Zone issues, have you built to Home Zone principles?

A

We've never built anything specifically that issues the Home Zone principles but we as a basic premise we always try to minimise the impact of cars and parking.

I

What kinds of things do you do to try and achieve that?

A

Narrow down roads, pinch point sharp corners, and then when you get, the groups of houses tend to have a static space in front of them rather than houses along a long street that people blast along. When you're in the initial groups of houses the objectives should be kids playing and pedestrian...should feel the predominant activity there.

I

Do you think it's possible to produce a car free development?

A

We've done several and all of those, the circumstances have been that they're v central or adjoin transport links so for instance we've done car free developments on []. It's all been rehab work but we've taken existing buildings and put flats in them and had absolutely no problem about car free

I

Have you ever attempted to do a new build car free?

A

No. We always try to minimise the car provision but never done car free new build

I

What about things like in-building things like communal car pooling and that kind of thing to try and meet car free developments?

A

That requires a degree of resident co-operation commitment which I feel uncomfortable about requiring. Location, access to good train and bus services – yes. All being in a central location – yes. To be in a more remote location and then this scheme only works if someone is willing to organise a car pool and continue to run it in perpetuity, that is not a route that I would feel comfortable with.

I think I can speak fairly safely for the group as a whole by saying that.

I

What about things like cycle paths and their physical separation from other vehicular movement?

A

I'm far happier to try and plan the site so that pedestrian **and** cyclists can move around it without having to go along roads. Rather than separate cycle ways, we've done cycle ways for instance, we did quite a lot of work in [] A few years ago which has dedicated cycle way system and also [] which has the [] and quite frankly they were a waste of time.

Building material and construction details

I

If we move on to building and construction, do you attempt to source materials locally?

A

No

I

Do you think if you did it would raise your building costs?

A

Yes

I

What consideration do you give to long term durability, recyclability and reparability of materials?

A

V high, because we own, manage and maintain the stock rather than just build and sell and therefore we regularly go down the route of higher capital cost for long term better value.

I

That certainly applies to durability and reparability what about recyclability?

A

Ditto, for instance we would not use PVC new window frames for the reason that they're a disaster to recycle. We use timber frame, timber window and door frames explicitly because the environmental impact of going for the PVC option is unacceptable.

I

How much emphasis do you place on renewable materials with low embodied energy?

A

We tend to look at low embodied energy but I'm not sure that we...renewable materials – do you mean recyclable. No, that means materials which can be renewed at some stage in the future?

I

Exactly, yes

A

Yes we do place a fair amount of emphasis on that, yes

I

Have you ever had any experience of green roofs?

A

What's a green roof?

I

Basically it's a living planted roof.

A

Right, so physically green with grass growing? I think we've done one or two on an experimental basis in the South but it's not something we have any significant experience in.

I

What about prefabrication?

A

We've got a national partner agreement with a firm called [] which I can't quite remember what it stands for but it's something []. We're going down the route of pushing ahead with off site manufacture and not just timber frame but also fully furbished, fully insulated panels delivered to site.

The pilot for that is on site in [] as we speak.

I

From what you're saying it sounds like that will become an increasing part of your development

A

Yeah, you obviously didn't read my article in [] last week where I was saying just that!

I

Sorry, I have to confess I didn't

A

Basically, two things, one is how can you get decent quality when you're up to your knees in mud and snow and what have you it's much better to do it in a factory and secondly, labour shortages are going to push us towards factories anyway.

So the impact on our business in the future will be significant for that very reason.

Longevity and maintenance

I

Just turning to longevity and maintenance

A

Can I challenge you on this?

It's a very... do you believe it will be cost effective to build housing with a life expectancy of 100 years or more. Yes or No, I mean the thing is what makes a house unsuitable, there are three things. One is the structure, basic structure of all the houses we build I'm quite satisfied will be here well over 100 past.

What goes out of date is first of all the components and secondly the planning, you know the internal planning, the balance of space between rooms, space in bedrooms to put more kit, you know you don't just sleep in bedrooms now. So you can get a house which will be standing 100 hence but it's obsolete so the obsolescence is to do with the planning and components rather than the basic structure and if you accept that thesis then I don't see how you can sell something as 100 year house as it gets out of date rather than falls down.

Internal flexibility and standards

I

Can we turn to internal aspects, the idea of inbuilt flexibility; is that something that you try and achieve?

A

Yes

I

And the idea of 'loose fit' buildings again...

A

Well for instance on our, we do it anywhere on our standard house types but it's an important element in the modern method of construction work, is to have clear stands so there's no internal overbearing walls at all for two reasons, one, to minimise foundation costs and two, is to allow flexibility of re-planning the house within the shell.

I

Do you build to lifetime home standards?

A

No we don't for the simple reason that in certain respects we achieve standards that are higher than lifetime homes in other respects we disagree with the philosophy, as it happens [section removed]. I disagree with the need for the through floor lift and the tracks from the bathroom to one bedroom. So I think those are unnecessary things to design in because the particular requirements of particular people with limited disability are so personal that even if you build them in they're probably not quite what are needed anyway.

What we also do for instance, lifetime homes doesn't have wheelchair accessibility upstairs, what we've said is have a straight flight of stairs with decent landing top and bottom so someone in a wheelchair can still get upstairs on a stair-lift rather than a through the floor lift. So we are fully signed up to the principles behind it we just disagree with the detail of the standards.

Orientation and solar gain

I

Orientation and solar gain. Do you have experience of passive solar gain in your developments?

A

Yes but limited. We participated in, (I think it was called the Dept of Energy in those days) funded project looking at increasing the amount of passive gain in existing housing and we did a couple of pilots looking at how to increase passive solar gain as part of modernisation programmes.

I

And is this something you think you might do again in the future?

A

It's a pretty low priority I have to say and as a result there might be the knowledge in the organisation but I'm not sure the knowledge is applied.

Thermal performance

I

Something that's quite connected to that is thermal performance and what's your experience in building to high thermal massing?

A

Thus far before we started with the modern method of construction approach which is based on a insulated timber frame the approach has been to go for high thermal mass so what we've done is get a low bearing inner leaf of dense concrete block and then a wide cavity with insulation into it so that the inner leaf gets warm and therefore becomes a heat store. So that's, we adopted that approach as a design solution probably about 10 years ago now. But as I say we're about to dump it because we're going to timber frame.

I

What about sap rating?

A

We're over 100 already

I

Could improve thermal form as being a selling point?

A

Well, affordable warmth is one of those givens as far as we're concerned for rented housing I'm not sure that it would have been much of a selling point, it's one of those package of things that people feel good about but I don't think they would – if they're buying a house – I don't think they would buy one because it's better thermal performance over another. But its v important as far as social renting is concerned because basically the less it costs tenants to heat the homes the more change there is of them having some money left to pay the rent to us!

I

Going on to CO2 emissions. Do you think you could develop a carbon neutral development?

A

To be honest I don't know we've never evaluated it. My feeling is we're a mainstream rather than a niche market product and the only carbon neutral scheme I know of is BEDZED.

I

So are you saying you don't think it's a strong market at the moment, it's more of a niche market?

A

That's right yes and we are v clearly in the mainstream sector of the market, whether that's rental or sale.

Renewable energy sourcing

I

Turning to other energy issues, renewable energy. Do you think you could provide a development that provided enough energy for itself onsite through renewable sources?

A

Doubt it, we've actually got experience of using things like, where you drill a pipe into the ground linked...

I

Geothermal?

A

... yes, to a heat pump and so on, we've done one or two schemes using that and they're getting to the stage of occupancy v shortly and we will evaluate them but they're not completely energy self sufficient.

I

And is that the only renewable energy source you've used?

A

Yeah, we've not looked at windmills and things like that and we've tended to shy away from solar panels – too complex

Other energy efficiency measures

I

Condensing boilers.

A

We've been fitting condensing boilers for quite a while

Recycling

I

Shall we move on to recycling, would you be willing to provide a recycling scheme instead of normal waste disposal?

A

Yeah that's something we're working on at present as the brief. Have you heard of this thing called []. We're working with [] who are going to start building houses in the UK, something they're doing in [] and there was a big press explosion about it, but as part of the standard brief for that, which is what we're calling a recycling centre rather than a bin store so maybe 20 or 30 apartments will share an enclosure where people will separate the waste into different containers and that will be a positive marketing thing. It actually saves us money, because if the bin lorry only has to come to the entrance of the scheme the roads can be smaller but we're selling it as a recycling thing.

I

And you think you'll get co-operation from your occupants?

A

Yep, I mean they've got to be aware of that before they buy.

I

Have you established composting facilities on site?

A

This is all stuff in the future and to be honest if there's anything food waste that would go into a local authority run composting scheme, we wouldn't seek to manage it ourselves.

Water

I

Water, have you used grey water recycling?

A

To a v limited extent yeah

I

And, sorry can you expand a little

A

Just one or two pilots

I

Do you think you could be able to reduce mains water by 50% and if so how would you do it?

A

Well, 50% from what? As part of our approach in terms of affordable warmth for our customers one of the things is showers over baths because they use a lot less water and therefore need a lot less hot water so it's something that's driven mainly by energy costs rather than water although of course water poverty, where there's a meter supply is obviously important as well, so we're probably doing things almost by default which are reducing mains water usage. I haven't got a clue about whether that's 10% or 50%

I

Do you think about using aerating taps?

A

No we don't, and I don't know why. Trouble is I'm not sufficiently close to the work these days to know, I mean aerating taps are something which when I was dealing with detail specification items weren't even on the market.

I

Do you have experience of SUDS?

A

Yeah [section removed] in Scotland it's a local authority requirement and we're quite au fait with that, it's just a natural component to development on bigger schemes.....duel flush toilets and showers are standard

Ecology

I

Ecology, do you use native species in your landscaping schemes?

A

To a large extent yes, though I don't think that cotoneaster and berberis count as natives

I

I don't think so no!

A

And they're quite important in terms of management and security – spiky things. Apart from cotoneaster and berberis we're probably quite good in that respect.

I

Have you ever set aside areas for ecological gardens?

A

That sounds like something that assumes a larger site than we do, we tend to do fairly small in fill sites. When we have done larger sites there has been a fair range of open space and planting which has involved a variety of habitats but it's not been a specifically an ecological garden type of approach, it's one of those things you've done just accepting that for part of the site it's best for it to go to wilderness.

I

In your experience what's the best way to resolve conflicts between environmental considerations and development?

A

It's a matter of common sense! Not trying to screw too much out of the site

ICT

I

In terms of ICT do you take that into consideration in your residential developments? Do you install broadband and that kind of stuff?

A

We don't install broadband but then I didn't realise you needed to once you've got a phone line. We have living room and primary bedroom have phone sockets and we're progressively increasing that to be more and more rooms have phone sockets in and that's all you need for broadband if you then have a filter.

Safety

I

You were talking about spiky plants and security, do you adopt secure by design standards?

A

Yes, as standard

I

Apart from the planting approach, what else do you use to ensure perceptions of safety on site?

A

Two things, one which I suspect most residents don't even twig is planning it to minimise rat runs and expose back gardens and things like that, the planning to minimise security problems and the other one which occupants do notice is a pretty high spec in terms of doors and windows

Marketing

I

Lastly, a series of questions on marketing. Do you feel that sustainable housing is going to be an increasing part of the market or whether you think it's always going to be a little to one side more developed by particular niche developers?

A

I have to say that stuff which is heart on its sleeve sold as sustainable/ecological friendly is something that I see as niche but what we do for reasons primarily to do with affordable warmth and long term sustainability in management and maintenance terms is we are greener than the mainstream but we're not going for the high moral ground. It makes good business sense to be sustainable because our business is long term

I

Do you think you can induce more interest from the mass housing market in the short to medium term?

A

I don't think that's something that the house builders can lead on, it's about awareness raising and customer demands to which house builders respond. We're greener than average but that is for reasons to do with long term sustainability of our rental stream. We don't wear our heart on our sleeve about our sustainability and I suspect if we did it wouldn't make much difference

I

One last question, looking at particular return ratios of these would give the best return,

A

Triple glazing – three
Solar Water heating panels – four
Landscaping native species – one
Photovoltaics – five
SUDS – two
Green Roof – six

Interview ends I thank A for co-operation.

Interview B

I

Can I confirm your position within []?

B

I am Development Services Manager

I

Did you get the questions?

B

I did but haven't really looked at them!

BREEAM and eco-homes

I

Just to start off, thinking about BREEAM, eco-home standards, are these something that [] work to?

B

Yes

I

To v good or excellent?

B

We target v good with an aspiration to achieve excellent where we can and are seeking to do so on a no of dwellings on a large development that we're hoping to get off the ground v soon.

I

What are the issues involved in raising standards from v good to excellent, are they site specific, or cost related?

B

Partly both , though site conditions are v important

Neighbourhood services

I

Looking at current, or completed developments, what are your views to trying to put in shops or services within housing developments?

B

We would certainly favour it where appropriate, where there is a clear need for it but in our experience particularly in [] the number of local services that are already closing suggests there isn't a demand and we would only do it where there is a demand and where it can be justified in terms of the sustainability of the services themselves.

Transportation and on-site circulation

I

In terms of transportation, what do you feel the most important issues as far as you're concerned are in relation to transportation and sustainability?

B

We would always seek to ensure any development we do is close to a good transport node. Generally in [] which is where we do most of our development that would be local bus services rather than rail and in fact we would if appropriate seek to encourage local bus companies to divert services through a new development

I

Do you or have you tried to build in 'Home Zone' principles?

B

[section removed] I'd have to answer yes to that. The big development that I've already mentioned, the whole master plan is based around the concept of Home Zone

I

Do you think you can incorporate these without incurring extra cost?

B

I think not

I

Is there anything else that you're employed to minimise the impact of cars on site?

B

We try to provide in curtilage parking where that is possible but we have the dilemma of authorities regularly sought to impose two parking spaces per dwelling, though they are now relaxing that a little. One thing we've looked at, and I'll keep referring to this major scheme because it's our one project at the moment, there we have sought to remove the cars from the distributor roads by putting access courts to the rear with car access and separate garages so that parking is not on the frontages but is on the back

I

Do you think it's possible to create car free developments?

B

We'd aspire to car free developments but in realistic terms no, it's virtually impossible

I

What about the provision of cycle paths and things like that?

B

Oh yes, we where appropriate always seek to provide suitable cycle routes

I

What do you think are the most important things to incorporate to encourage walking and cycling in developments?

B

Removal of conflicts between cars and pedestrians and cycles where possible, attractive routes obviously, and safe routes in terms of criminal activity

Could I just go back, you refer in the papers sent through about car pooling. We are pursuing a car club, partly because it's the city of []'s policy now to seek financial contributions from developers towards a city wide car club but we wanted to go a bit further and promote our own car club as an example of good practice that we could hand over to the local authority when it was up and running. So on large developments where there is the economic base for a car club we would want to explore it.

I

That's within your [] development?

B

Yes

Building materials and construction details

I

Building and construction, do you attempt to source materials locally?

B

I have to say at the moment it isn't policy, but we are looking at a sustainability strategy where local sourcing will be considered. [section removed]

I

Do you think this is something that might raise cost?

B

I think it could, depending on materials, distance and availability but we haven't really got enough info to give a considered answer to that.

I

Turn to long durability, recyclability and reparability of materials. Is this something you take into consideration?

B

We certainly take into account long term durability and reparability. We've been less careful over recyclability but as part of our sustainable strategy no doubt that will be a feature.

I

I guess the same will apply to sourcing recycled materials?

B

Yes.

I

In terms of renewable materials, how much emphasis is placed on those with low embodied energy?

B

I'm afraid we haven't got a v good record on that, we haven't really considered it per se yet

I

Green Roofs, have you considered that?

B

We've never used them but we have explored their use and have a scheme that we did a master plan for 3 years ago where one of the submissions included green roofs which we were v keen to look at but it didn't go anywhere at the time so no we haven't but we probably will

I

Pre-fabrication?

B

We've got little experience but we've done one scheme, a block of flats in [], that was timber frame part volume metric, part construction and part flat pack but that's our only direct experience so far

I

What effect do you think pre-fabrication will have in the future?

B

I think it will have quite a high impact partly because housing association are being obliged to look at off site manufacture and prefabrication but also because we want to, it will have a considerable impact on our business in the future

Longevity and maintenance

I

In terms of longevity and maintenance, do you think it's cost effective to build houses with a lifespan of 100 years or more?

B

The answer has got to be yes, purely because we are celebrating our centenary and our stock is 100 years old! And we're modernising and improving that stock so I believe it ought to be cost effective

I

Would building a 100 year house be a selling point?

B

I think the answer's probably not because most people only stay in a house 7/8 years, so I don't think it'll be a selling point but it still could be economically effective.

Orientation and solar gain

I

Going on to orientation and solar gain, do you have experience of passive solar gain?

B

No, on schemes that have been built but yes we have looked at sent spaces and highly glazed elevations on this developments we're planning at [], it's one of the features we're promoting.

Internal flexibility and standards

I

Internal aspects, designing inflexibility so things can be moved around relatively easily, do you have any experience of that?

B

Limited experience where we've built with walls that can be remodelled. We've no experience of when this has actually been done, I don't think we've been in the game long enough to have got any properties where people have wanted to change things but I do think it could be a selling point

I

What's your understanding of 'loose' fit buildings?

B

None

I

Lifetime home standards, do you seek to build to those?

B

We build to them [section removed]

Thermal performance

I

Thermal performance, do you build with high thermal massing?

B

No

I

How much greater do you think the cost would be of building to a sap rating of 100 or more?

B

I don't think it should be v much more than building to less than 100 if it is your norm, it's all to do with economies of scale, department of standards that make is easy to achieve that sort of level. We are building already at around 100 with no significant cost variation

I

In terms of the end user, do you think this is something that people are interested in?

B

I think out of ignorance they're probably not interested but would be if they were promoted more widely, with an understanding of the benefits. And the other point of course, people aren't in properties long enough to think they will get a benefit over time whereas we tend to look at it over the lifetime of the building itself.

CO2 Emissions

I

Turning to CO2 emissions, do you think you could deliver a carbon neutral development?

B

We couldn't at the moment but again, as part of our big development in [] we're looking with [] at whether we can deliver carbon neutral housing. It certainly wouldn't be over the whole site, but over a proportion of the site

I

Do you feel there is an end market for that?

B

I don't think we've considered that, what we're seeking to do is demonstrate the practical technical aspects of carbon neutral and it may be that our experiment will demonstrate that it won't be commercially viable because costs will be too high

Renewable energy sourcing

I

Turning to renewable energy sourcing, do you believe you can provide a development that provides enough energy on site through renewable sources?

B

We don't know, certainly the work we're doing will inform us as to whether it's possible but I don't think we have a view as to whether it will be possible or not.

I

Have you used renewable energy sources in any developments?

B

We haven't, this scheme is a test bed for possible sources

Other energy efficiency measures

I

My next question is slightly defunct by virtue of in-coming legislation, but in terms of all appliances, do you make sure that you fit energy efficient appliances?

B

We do fit condensing boilers as standard, on our normal affordable housing we don't provide white goods for example. Where we do provide white goods on schemes, yes we do look at the energy rating

Recycling

I

In terms of recycling, would you be willing to provide a recycling scheme on one of your developments?

B

We'd promote it and enable it, I'm not sure because we've not asked ourselves the question yet whether we would provide a recycling scheme ourselves. [] as an authority already have recycling of glass, paper, cans so we would promote that but whether we could extend that to materials that the council don't currently recycle I'm not sure

I

I guess the same would go for composting facilities?

B

Yes, we're already doing that in our existing [] so yes we'd look at that on a development of an appropriate size I think there's a basic mass you need before these things become practical

Water

I

Turning to water, have you used grey water recycling on developments?

B

Only in a limited way with the use of water butts, for watering gardens and car washing, we do provide water butts as standard. We haven't done any grey water recycling for toilet flushing and so on yet but we are looking at it for this scheme.

I

Do you think you could reduce mains water usage by 50% would this be attainable?

B

Not sure and doubtful

I

Do you look at the efficiency of showers and toilets and that kind of thing?

B

We do use low flush WCs, we haven't fitted showers as standard but will be doing in the future so we'll be looking at the efficiency of showers in terms of water consumption and we will be fitting in the future aerating taps

Can I just mention SUDS....we've no previous experience of SUDS in terms of incorporating suds in a scheme but the scheme in York is based on a SUDS scheme we've got balancing ponds, drainage home, drainage channels, so on throughout the development so it's v much a suds scheme

Ecology

I

Ecology and landscaping - can you see any disadvantages of using only native species?

B

No because we try to use native species anyway, certainly in [] we're wedded to British native species as far as possible but we don't restrict our tenants to that principles so I don't think we've

experienced any disadvantages providing the development is designed properly so you take into account root damage and that sort of thing.

I

Would it be viable to set part of the site aside for an ecological garden/area?

B

In depends on the development, certainly on sheltered housing and retirement housing where there is a particular community where we empower them to ask for things they might like if they wanted such a garden then I'm sure we would enable it. On our general housing schemes, our experience of providing gardens of any sort are not good, we end up spending an awful lot of time maintaining and repairing them because of damage so I think it would depend on the nature of the scheme

I

Lastly, what is the best way to resolve conflicts between environmental considerations and development?

B

I think consultation and talking is one way but on this large scheme we've done no end of talking and consultation for 6 years and we haven't won the sceptics over so I think it is compromise, consultation but I'm not sure how well it works.

ICT

I

ICT infrastructure, do you install broadband?

B

We will be doing, we haven't previously because the last development we did was before Broadband took off but we will be enabling it in future

I

Will you be designing in the ability for companies to easily lay cabling through the developments into the housing?

B

Yes I'm sure we will

I

Do you see this is being problematic or not?

B

No, we're working with a local housing developer on the small scheme in [] and he's already marketing houses as broadband enabled, extensive internal infrastructure for piping entertainment round the house and so on and he would only do it if it was sufficiently of a selling point so I think it would be a selling point for those houses we sell and I think it would be a feature that we should put in for rental properties, why differentiate between a tenant and an owner?

Safety

I
Safety,

B
All our schemes have to achieve secure by design status

I
What means do you incorporate to ensure onsite security?

B
All the things secure by design require, in terms of physical aspects but we also promote and enable neighbourhood watch and support groups, give security advice to residents. We will also, if a residence wants a security feature that they haven't got on their property, if they purchase the materials we will install it free of charge so things like external security lights and so on

Marketing

I
Lastly, marketing. I would be interested in your views about whether you feel sustainability or sustainable housing developments are gaining a market lead or whether you feel they are a fringe activity that won't affect the mass housing development

B
I can't comment from much experience because although we build for shared ownership we build to the same standards so we don't differentiate so I can't point to similar dwellings but one is built to sustainable standards and one isn't and say how easily we can market the one as opposed to the other. I don't think the people that move into our properties, be they part owners or tenants, actually have an appreciation of the sustainability issues around them. They go as far as energy efficiency and that's it and that's probably because we're not selling the message

I
Who, or what mechanisms need to be in place to actually get this message across?

B
I think this is largely a political thing, the authorities, government have got to place a higher emphasise on it, they've got to demonstrate a greater commitment through grants to allow existing properties to be improved and we're talking about energy efficiency mainly rather than the broad concepts of sustainability but I think it's education across the broad to providers and users and where possible, to clearly demonstrate the benefits down the line, to show how pay backs worked out in real terms and so on...

I
If I could just run through...looking at them in terms of how viable they are....
Green roofs?

B
I can't really answer that because I've got no experience the theory tells me the cost return ratio ought to be fairly good but I can't answer with any knowledge I'm afraid

I
Photovoltaic Panels?

B

I've just reread bullet point there...which viable element of sustainable building would provide the best marketing features...so it's marketing so it's not the payback of the things itself I suppose...I think photovoltaics would have a good cost return in marketing terms, it's visible, people understand what it's doing and I suppose they'll see a saving in electricity bills. The same with solar water heating panels, there's a direct saving that you can see there

I

What about triple glazed windows?

B

That's less so because even though there are savings, do people identify them with the windows because it doesn't actually do anything, you can't see the meter going round less slowly perhaps

I

Landscaping with native species

B

I don't see that as having much marketing benefit, I don't think people will really appreciate or understand it

I

SUDS

B

That could possibly have a negative...I think people often see the present approach to SUDS, particularly balancing tanks, as a nuisance

Interview ends I thank developer B for their participation.

Interview C

Eco-homes

I

You are managing director of [] ? Do you have a good working knowledge of BREEAM, eco-home standards, what do you think about those?

C

I've not read anything about them, I don't know too much about them.

I

So you're aware of them but you don't pay any attention in your own construction. You were talking about the timber frames and saying you wanted to do something sustainable, you haven't checked that it's to eco homes standards or anything?

C

Well it is eco friendly because apart from the plastic everything is recyclable. It's no block and brick, its timber frames with a brick skin, you can see them over there behind you.

Neighbourhood services

I

What are your views, if any, on building local facilities within housing developments, for example, providing shops and services?

C

We were offered a piece of land in Lancashire where there was going to be a big village. Including a 40 bedroom nursing home, a shop, a small Tescos, doctors' surgery, hair-dressers salon, take-away, also a pub on site. I don't mind doing things like that.

I

Do you think that's a positive thing to try and get mixed use if possible?

C

Oh yes certainly, I think there's always possibilities of things like that providing you get sufficient land

I

Are there any drawbacks

C

Not really if there is sufficient land and demand.

I

Would you be willing to provide housing above shops?

C

Yeah, again if the site was suitable.

Transportation and external circulation

I

What about Home Zone principles?

C

What exactly are these about?

I

Home Zones are ones that try and reduce the impact of traffic on the development. Is that something you've thought about in this particular development?

C

It's quite strange really, you're been sponsored by Newcastle Council and they insist on 1.3 car parking bays on every development so it tends to be a bit of an anomaly asking this sort of question. On my way of thinking this on apartment site, near the town centre, one car parking bay per household would have been sufficient but at the same time they demand 1.3

I

In fairness, it will be another section of the authority, but I take your point and it will be reported on. What about things like cycle paths, pedestrian circulation. How much do you take that into consideration with your designs?

C

Well again we have to adhere to what the town planners insist upon. With this particular site I've always envisioned a self-contained estate hopefully, well, they went along with it most of the way. Our initial.....

[interruption to interview]

Building and construction

I

Ok, moving on to ...materials. Do you source materials locally?

C

Yes all of the materials

I

Do you think this is more expensive.

C

No, not necessarily.

I

What consideration do you give to things like durability, recyclability, and the reparability of the materials that you use?

C

I'll be honest, that's not part and parcel of my brief. I look at it from an aspect of expediency. When I look for materials I look for expediency, not necessarily cost effective either. All I'm

concerned about is that I can use that material, it's durable, and it'll go on whether it be paint, timber, block work or whatever.

I

So do you try and rely on stuff that you've used before as you know its performance?

C

Actually, I'm a bit if a pioneer in that respect, I'll try anything,

I

Ok. So in terms of recycled materials for example, what would tempt you to try something, would it be cost?

C

I build my own timber frames, I haven't got the factory yet but I've got 63 orders and 3 of those are eco-houses and I've now got to look into the insulation, paper maché fibre...it's been treated and it's recycled newspaper and it's for the insulation for the walls. What I'm going to have to do is source something where it comes out in rolls as opposed to being pumped in because I want it for internal walls as well as external.

I

You were talking a little bit about pre-fabrication with your timber frames and everything. Do you think pre-fabrication will take over more and more in the future?

C

It's the future, as far as I'm concerned. This factory that I'm planning is 1.5 acres and the actual panels that are coming out of there, you're going to have the plaster boards the ??, the plugs on, the studs, the insulation then the actual timber then the membrane and it will just be dropped in so it's going to save a lot of time and wear from site problems. All the heating is going to be under floor heating, it's all done by manifold, and it's a doddle. There's going to be a lot of R & D in this but at the end of the day that's where I want to be looking at. Even the bathrooms, the client will be able to pick the tiles and then the bathroom, the toilets, and hopefully the kitchen will be manufactured in the factory and be craned in.

I

Do you have any experience of green roofs?

C

What?

I

Green, living planted roofs

C

Well I've heard about them... but no, no experience no.

Longevity and maintenance

I

In terms of longevity and maintenance of your properties, do you believe it's possible to build housing with an expected lifespan of 100 years?

C

If you look in America timber frame houses have been there since the 16th Century. You go to Norway, Sweden, it's the same.

Orientation and solar gain

I

A bit on orientation and solar gain. Do you think about things like passive solar gain, the orientation of rooms to the south?

C

With timber frames you can exchange units in these houses and you wouldn't need gas for your central heating. You need one radiator in fact for these houses, the biggest house is 1500 sq foot. You need one radiator at the bottom of stairs and that will heat the whole house.

Solar energy would obviously be an advantage but this country, considering the hours of daylight, the time the sun shines, you're going to need to have a back up system.

Internal standards

I

In terms of the internal standards how flexible are they in terms of internal walls being moved and that kind of thing?

C

Well they can be moved, they're all stood a cut of timber frames. We do have a certain amount of low bearing walls but at the same time that's nothing that can't be overcome. So they can be moved.

I

Is that intentional or is that just as a result of your building methods?

C

What happens is we get designs from our architect, they submit them to the company that supply us with our timber framesspend quite a bit of money on software it'll have an overview from conventional building, which is block and brick, to timber frame and everything will be as per timber frame. When it comes off the assembly line which is a machine I'm buying it's all CAD orientated and all the studs come, you slot them in by crane, external walls, windows, everything. You can build a house in 6 weeks.

I

Do you know about lifetime home standards?

C

Lifetime? No what are they about?

I

Lifetime home standards are basically standards looking to try and build houses that people can live in literally over their life so if they become wheelchair bound, they're accessible in those kind of ways

I

Oh yeah, I understand that...

Thermal performance

I

Could increased thermal performance be something that you would use as a selling point for the property?

C

Possibly in a more acceptable climate but not here.

I

You were saying you could heat the houses with one radiator, is that something you push as a selling point?

C

Yes, it's all new value.

CO2 Emissions

I

What about a carbon neutral development? With no output of CO2 at all?

C

I agree with that, but you've got to balance things out in order to use this type of technology because there's a cost and then you're putting the cost onto the client and a lot of clients look at it and go no, I'll have the standard solution its cheaper...

Energy efficiency

I

So we were talking about cutting down energy consumption, what about the things that you put into the houses. Do you put in condensing boilers and that kind of thing?

C

Yeah, we've got a, not so much a condensing boiler, again it's got to go to costs and when you think about this area you're talking about getting plots of land in Newcastle that the council are going to utilise for eco-housing. Because it is new technology there's quite a cost so one out weighs the other, we put combi-boilers in with reservoirs. They're big boilers, more so than as required for that type of houses.

Water

I

Moving from energy to water, have you had any experience of grey water recycling on developments?

C

No, it's something I've not had any experience of but I've seen it in operation when I was in the army and also in the Far East but I can't really say I know anything about it.

I

Do you have experience of SUDS? Er, sustainable drainage systems

C

No

Ecology

I

Can you see any advantages to using only native species

C

Oh I'm all for that – we only use native trees...

I

Would it be viable to incorporate an ecological garden in part of a site

C

Maybe, but it's a matter of costs and returns on the site...

ICT

I

Switching subjects, on to ICT technology. Do you put the infrastructure into your houses, things like Broadband, cable things like that?

C

Yes we do

I

Do you think this is an important selling point?

C

No not really, I think it's expected

I

Do you think home office working will become more significant?

C

Oh yeah! With Prescott screwing the roads up, the transport up, you've just got to look on the turnpikes, in the morning nothing moves.

Safety

I

What about issues of trying to promote conceptions of safety in your developments. Would you consider that at all?

C

We go through the normal crime prevention but, I'm an ex-military policeman and I know full well that anyone who's determined will get into your property and as for safety, unless you want to spend money to protect yourself, I think you can overkill a development.

I

So do you think that can be off putting if it is too obvious?

C

Yeah, definitely!

Marketing

I

A little bit on marketing. Who are you basically marketing your properties at?

C

It's middle of the road area, the houses will sell here are valued in excess of £185-£215, 000 and I mark them at between £150-165,000. It's my business, it's my company, essentially I have my targets and as long as I obtain those targets I'm a happy soul. I see your Bellways, your Barratts, and they do things in phases and consequently people come in, the same house that was valued at something like £20,000 less and between the bigger development companies and the estate agents, they drive the market to the point of almost extinction...

I

How important sustainable issues are in your sale and promotion, that kind of thing?

C

When I decided on timber frame I had so much resistance from people who, from what I consider a load of crap, said you won't sell them, you won't do this, that or the other. But that site has all sold, and pretty rapidly. I've got another 177 houses to build and they're all sold. The investor that's coming in to buy them, he could pay 85% of the mark up value and that's where he's going to make his money when he puts his own ...

I

Which of the following elements of sustainable building would provide the best cost:return ratio in terms of marketing your development green roofs?

C

I really don't know

I

Photovoltaic panels, do you think....

(Telephone...obscures answer)

I

Triple glazed windows?

C

Waste of time. It's a fad thing and the weight ratios make them very heavy, unworkable. True double glazing, all you need is about 6 inches and you get that. The double glazing in this country is crap, you need an external window, a gap, and a second window. That's the most effective is proper secondary double glazing.

I
Solar water heating panels?

C
Yeah I suppose you could use those, but again it's all to do with cost., I've not really investigated them

I
SUDS drainage systems?

C
Are we talking about as a site, an estate situation?

I
Yes

C
Yeah provided I'm paid for it.

I
What about landscaping the native species?

C
Yeah... every time we submit drawings for an estate of this size, we also must supply hard landscaping designs as well, well all assuming we can get the trees!

Interview ends I thanks C for participation.

Interview D

I

Before we begin can I thank you for the information you sent through it was very interesting...

D

Well I wasn't sure whether it would be v helpful bearing in mind you were going to ask some questions but I thought I'd send it anyway.

I

It was useful to give me a bit more background on your company because I don't know much about []. Before we turn to the questions could I just ask your title?

D

I am Director of Architecture, Planning and Product Specification

I

Many thanks I have a series of questions here, I'll just ask away until you feel we've covered everything if that's OK. I know from our previous conversation that you're mostly interested in the holistic aspects of sustainable development, the ideas of mixed use and reducing traffic impact. I have been asked to ask questions about more internal issues as well, which I hope you don't mind me going over.

D

Not at all

BREEAM and eco-homes standards.

I

We talked v briefly on the phone about BREEAM and eco-homes standards and I thought you made some interesting comments about the fact you felt they are standards that don't always apply to every situation. Could you expand of this a little?

D

My experience of BREEAM before I joined [] was mostly in the office/commercial market. From memory the book was about 2 inches thick and a check list, you do your scores then you look at it then you prepare it for the schedule and it said excellent at the end of it or poor, or whatever... but then you ended up putting air conditioning in as a sort of way to get certain score

I

I.e. the scores could be manipulated?

D

It seemed to me that when you try and use BREEAM for student accommodation all the assessment are not specifically tailored for that consideration. What that means is you're getting a result which can't be properly evaluated or weighted and so in our case there isn't a BREEAM evaluation kit specifically for student accommodation. .

I

So give n your experience including that before Unite, do you feel BREEAM is useful or not really?

D

It is useful in so far as you can evaluate things on a level playing field. I think it didn't seem to...it seems to be one of those things where you know the rules from the outset, you can then use the assessment criteria to give you an excellent output as opposed to making an assessment after the building has been designed for the purpose so you can turn everything round and put this in and this in because it gives you a better assessment at the end.

I think in our case a couple of occasions where we've had to do SAP calculations particularly in Scotland, where the cost of the electricity has been taken into account and the better the arrangement we have with the Scottish, or whichever electricity provision companies, whatever the better rate of electricity is, if we are using the best, the cheapest rate of electricity that has an effect on the way in which the SAP calculations are made. Therefore I believe that to be manipulating the process of producing SAP calculations rather than using the SAP calculations as a bench mark on which to improve on in the future.

Neighbourhood Services

I

Turning now to more general holistic issues with sustainability, I wonder if you could make more general comments about building shops and services within housing and the way you see that from your own perspective.

D

In the main we work on brown fields or city centre sites. In Liverpool we have one of our largest developments it's about 1200 bedrooms and that's called Grand Central. Grand Central has a huge area of ground floor commercial space which is let in various ways, well some of it's unlet, some of it's let. The way in which we accommodate the drainage from the student flats above is a good example in the way it's integrated with the commercial units (I think in one part we've got a gym which is quite small and unsophisticated in one corner), in the other areas there're more shops. They integrate v well and so long as the usage can integrate, so long as the special requirements can be integrated it work well.

I would suggest that putting student accommodation on top of a Sainsbury's, for example, is probably not ideal because Sainsbury's want rather large open plan spaces so you can have huge aisles of groceries whereas if you put it in some other type of store, say clothing shops where the clothes displayed are set out in a more random or different approach to the layout of a shop, the impact of the columns and the services that have to run from the student accommodation will have less of an impact on certain types of commercial use compared to other types.

I

Do you think there are any drawbacks with trying to mix uses?

D

Only where the structure required is substantially is different. We've looked at a bus station for e.g. and the turning circle of coaches is huge the open plan nature of the concourse and the way in which busses have access to baggage store within the coach itself at the side or at the back and people have to get to those areas and this all affects the way in which we could accommodate the

students above because again, a transfer slab is not cost effective...therefore it really does depends on the nature of the use.

We're looking at one at the moment in London which is a school on the lower couple of floors and student accommodation I think is on floor 3-6 with the amenities base for the students being on the ground floor but having a completely different separate entrance so it becomes a building which is an integral building, an integral design, with two distinct parts. A part which reflects the use of our customers, the student themselves, and a part which reflects the use of the school and the way the school wants to control and manage their environment. So long as it's possible to ride that separation, separate access, separate facilities, separate servicing, then there is a lot of opportunity to combine usage but it's only when you go to the really extreme types such as a police station, or the Sainsbury's, that you have...a fire station was another one we looked at but again, it didn't work.

Transportation and circulation

I

Moving on a little bit to transportation. Basically what do you feel the key issues are between the relationship with transportation and sustainability and have you attempted building Home Zones?

D

Our approach is the location has a bearing on quite a few of our fundamental drivers including the rent from our customers which helps the off-set the cost of the building over 25 year term. Our users are from a certain demographic and cultural background. There is a tendency for them to have a low income, or v low income, and therefore they don't have a lot of options in terms of travel facilities. So we capitalise and work within that environment to develop a strategy which often takes the building to where it's needed, close to educational institution, or the city centre and do without car parking for e.g., relying on buses, rail, underground, something like that. Therefore, the sustainability of the location with regard to the transportation infrastructure and the need of our customers is absolutely key. They all interact together. What I'm saying about the driver, the culture of the student may well be described as; roll out of bed and fall into the classroom at 10am and we can use that...accommodation close to the institution then generates higher rent which allows us to make the potential ?

I

Do you specifically aim to create car free developments or is it just because, as you say, few of your occupants will have cars you're able to get away with not providing for them. I'm just wondering which comes first really?

D

We specifically aim to have car free developments. Car free developments have other things which generate advantages for us. I think I sent you the...some notes for, [] in []. In that particular area again we're looking at a car free development from our perspective although there are operational car parking spaces to allow some of our customers to use whatever transportation they want. That's probably one of the situations where we're introducing the most no of car parking spaces. So in an industrial area the infrastructure is there already and we're pushing towards this sustainable car free development and generating the transportation that will make

that community work. And that's not just us, that's the [] are developing the whole area of which they'll put private housing and there'll be service type facilities there, if not shops.

I

I picked up from the material that you sent that you seem to be quite keen on providing cycling facilities. I wonder whether you could make a few comments on the importance of that.

D

We have been providing cycle provisions in the ratio of one cycle space per five customers and we've got about 26,000 beds in our portfolio now and the truth of the matter is that whilst we might provide such a high standard it's not always taken up and we do get some accommodation managers saying I want something else because it's not actually in use and I think there will be a cultural change. When we look for the location of the building, the location is usually something which is a clear cycling distance from the institution, it depends on the cycle routes themselves, the safety of the roads. It also depends on how far our customers have got to travel on day one, you know, if they live in [] and they're going to [] bringing a bicycle is not the easiest option.

To that end and to help...using or promoting the provision of cycle facilities helps us to ensure the building pacifies all the needs of the occupiers...students are quite outgoing people and they want to go to various different things, they want quite an expansive life. The bicycle gives them the independence they need so long as they're within reach of the sort of things they can do using their bicycle but still we found that the take up hasn't been as great as perhaps we anticipated and I think in the main that was to do with the cultural shift, we're still towards cycles but we're actually there yet. There is still not necessarily the best provision of cycle routes in this country as there are in other countries and I think over time we'll see the take up will be greater. We do make them lockable, there're sheds or enclosures as well as free standing stands which might be outside doors so you can leave to bike outside for a couple of hours or move it into the secure store where you can leave it for a week, there are various different methods again not all of it is taken up. Sometimes we find that people do break into the secure storage and that turns off the desire of our customers to replace their bikes.

Building materials and construction

I

If I can turn to construction now and some various questions about building materials and construction details. Do you attempt to source all your materials locally to your developments?

D

If anything, the construction methodology is something we spend v little time controlling. We have a methodology which supports our customers experience inside our building, the facilities and we also have a methodology about our relationship with various universities, to provide for their needs, but when it comes to the construction methodology we work on a design and build system whereby we can work with our partner contractors so that they have control over the actual way in which the building is built and the materials they're using.

I

OK. What about things like giving attention to the long term durability, recyclability and reparability of materials; do you take any role in that?

D

Yes we do actually. There are some things which we control as part of the experience that I was telling you about. I know we talked about electric heating and the way in which we operate that, we can get the best value because obviously we don't have heating on all the time, electricity is very expensive, our rents would go up. So we have a methodology by which we say to our customers this is what we're offering you, it's a push button timer so that the heating comes on for three hours and if you want it on again after three hours then you push the button again, so if you're not in the room you can't put the heating on. So there's a sort of understanding about what we're offering.

In specific terms, going back to your question, what we want to do is suggest that the things within the building last an appropriate length of time so carpets and floor materials may be fashion items where in 10 or 5 years the whole approach, the feeling and experience of the interior may change substantially. We don't want material which is 25 years old so we control how long we want that experience to last and then we allow for the replacement of that in 5 years time so we can refit certain elements of the building over 5 years and then over 10 years so that over the life of the funding arrangement that we have we can afford through our sinking fund replace those elements that have the life expectancy that we control.

Longevity and maintenance

I

What about the durability of the buildings themselves. What lifespan do you build to?

D

60 years for the structure, excluding the roof. Roof lifespan is 25 yrs.

I

Do you think it's possible (excluding the roof) and would it be economic to expand the expected lifespan to over 100 yrs.

D

Yes I would have thought so, I would have thought it would be relatively easy. Think back to the turn of the century, Victorian buildings were still around for 100 years and they didn't have the technology to build them in the way that we do today. The guarantee that you get from the designer or contractor is effectively only a year so any increase over the 60 years that you've already asked for its design life is a risk that we take...our funding is 25 years so our funders only get the credentials that prove that the building will last 25 years. It is possible, I'm not sure what the implications would be.

I

Do you think a lifespan of over 100 years would be a selling point for a development?

D

[inaudible section of tape]

...interview continues

Internal aspects

I

If I can ask a few things about internal aspects. This may not be particularly relevant to student accommodation I think it's probably more about housing and creating lifetime housing but do you think about in-building flexibility into your buildings so that, perhaps if the nature of student accommodation were to change in the next 50 years or so, there would still be some possibility of using the buildings in some way?

D

We do think of alternative usage, but the buildings that we build with load bearing structures tend to be the smaller buildings, the larger buildings we build we constructed steel or concrete frames. In some cases in, Glasgow and Portsmouth, we used tunnel form and rather than have the tunnel form make up individual bedrooms we've had the tunnel form straddle two bedrooms so that the internal wall between the two bedrooms can then be taken out.

One project in London Borough of Newark used to be a telephone exchange the offices so, that was a strange building and we looked at it specifically because we were only sure of the market for our type of accommodation in that area on London. We looked at it and designed it specifically so that it could go from student accommodation to 2/3 bedroom flats without demolishing any walls, even though the internal walls could be demolished because they were a lightweight structure, we designed it so that some rooms were larger so they could be used as a living room, the use was interchangeable. We do actually think of that. I think in the areas that we don't look to option this possible reconfiguration or possibility of future changes are buildings where we don't own the freehold. If we only hold a leasehold such as we will in the area where I explained that school, the school will be on the lower level and our modules will be on the upper level and in the main we are not designing that to be interchangeable because our lease has a certain life and we don't expect to go back and either sell or change that building around within the lifetime of the lease. The less ownership we have of the building the less likely we are to consider that.

Thermal performance

I

Some question on energy now. You mentioned some difficulties you felt over things like SAP ratings. Do you think that if you're improving thermal performance is something you can sell your buildings on? Do you use it as a promotional point?

D

The cost of the construction of our buildings is v easily assessed, however the cost of running of the buildings, keeping it in good repair and giving it a useful life, heating it and giving our customers an experience that they will remember over 25 years is far more expensive than actually building the building, so to us if we can save utilities cost and heating for e.g., by increasing the thermal standards within the building then we're willing to consider that.

However there is a drawback, in our case we don't find in the main that it's difficult to heat the building we find that because our buildings are erected so quickly or because they are lightweight structures they actually tend to overheat in the summer. We don't provide air conditioning but that could equally be considered an energy cost if in some circumstances the climate change and we ended up with a longer hotter summer without cool nights we would find that we might have difficulty keeping our buildings at the desired temperature and that's a concern to us at the moment. The energy costs I don't think are just about how much additional thermal insulation you put in over the winter, it's about what the cost might be in the summer as well.

CO2 Emissions

I

Do you believe that you could produce a carbon neutral development? Do you see yourself doing that in the future?

D

Again it's not a driver to us, there's nothing at the moment that stands out says [] if you produced a carbon neutral building that would mean x,y,z to you. There is nothing that stands out so we have not only not considered it but we don't ask our contractors or our consultants to consider it.

Recycling

I

Recycling, in terms of things like waste disposal, do you think about recycling in your buildings?

D

Yes we do, we work with the local authority in each of the areas that we build to get the best of out recycling bearing in mind they have an obligation I think next year to have kerb side collection and we do try to contain the refuse facilities to one location to try to make it as easy as possible for our customers. 26,000 bedrooms, I think a lot of people would describe a situation where some of our customers open a window on the 3rd floor and throw the black bag in the general direction of the bins and I've got to say that probably happens quite a lot and no matter what we do about it that's the culture of some of our customers. But nevertheless we've just recently heightened the profile of recycling we think that if we show our customers that we're looking after the environment it will help them to learn to look after the environment and they will therefore in turn treat our buildings with more respect than if we weren't looking after the environment. So there's a cultural change, we're shifting from the old bin store, which is what we used to call it, to a refuse and recycling room, which seems to have a different impact. We don't have portage so that we don't bring the rubbish down our customers have to do that but we want to provide for them the facilities so that they can work within the recycling regime that's agreed with the local authority.

Water

I

What about actually grey water recycling and SUDS, do you consider these in your developments?

D

I always call it brown water recycling! We looked into this a couple of times and we've worked with a consultant to try and look at how much rain water we could catch and then use to top of recycled water. At the moment we feel that the cost of the installation of the second set of pipes, the second infrastructure associated with circulating the grey water would have such an impact that we wouldn't be able to recover the cost over the lifetime of our appraisal. Now, that's only a couple of years ago, maybe three years ago. I think this is all about what the driver is for us, we looked into it, it's an outside project, there were no targets, objectives, no end gain and so it's one of things that we've looked into but haven't because we didn't see how it could work for us.

I

What about water efficient appliances, showers, toilets, have you thought about fitting those as standard?

D

Yes we do, we've got a plumbing system, we have our own en suite bathroom manufactured for us in Italy and we have a strategic supply in Britain that allows us. We were building about 3 and a half thousand, 4 thousand rooms this year which will open in Sept 05 so we've got those on order with the Italian company that we order from. Of course when we develop the system we worked with them for a nozzle on the lever tap so that it aerates and gives you the feeling that you're not being mean with water. I don't when you were at school whether your school had spray types taps but that was the culture that some people adopted 20-30 years ago what we've got is an advancement of that where you have an aerated water and also use something in the tank and the cistern that allows us to flush with the minimum amount of water and we do provide showers rather than a bath. I think it would be unfair for me to lead you to believe that we were trying to save water. We're trying to save heating the water because it's the hot water that costs more than the cold water. The irony is that we only realised when one of our buildings that we were using hot water to flush the machines because they've been incorrectly placed by our contractor. When our hot water, electricity bill was astronomical.

Ecology

I

Turning to landscaping. What extent do you try and be ecological in any of that aspect?

D

I don't think we do actually, it sounds terrible now. The driver for us is about the environment which gives the appearance of sustainability I suppose. We don't want it to require maintenance because that requires us to maintain it and we're not an office with high income we're actually relatively low income, student have v little money to spend on rent. What we find is that actually we don't have a lot of landscaping in our area because we try and build in brownfield sites where previous developments have been on the site and we're trying to provide an appropriate level of density to create the environment and community that we need.

Actually there aren't in the main large areas of landscaping at all because it's an urban context. We have of course built some buildings for some universities which... and a hospital. in your area in Newcastle and we provide the accommodation for key workers and opposed to students that sits in a garden which is part of the hospital and really in consideration of that we weren't looking at a sustainable landscape where we grew... I do recall one instance in Bristol rather than use a landscape which was designed by a landscape architect what we looked at doing was creating a mix of seeds which creates a mulch and you spread it over the bank so that it grows at its own rate and those which are best suited to the area spring up first and then it changes over time but I think we've only done that once so it would be wrong of me to say that we do that.

ICT

I

ICT, do you consider putting that into your accommodation? Not necessarily the student but the key worker accommodation?

D

Up until 3 years ago we used to double cable every room so you have the 5 standard cable...two of them, one for a phone connection and one for an IT connection and the IT facilities 3 years ago were rather less sophisticated than they are now....3 years ago we started to install only a single wire and provide a telephone service because actually the culture again, perhaps not last year but the year before, was a culture which was about a dial up connection to the internet. We've moved on from there, this year was the first year we installed broadband in 10,000 of our bedrooms in partnership with BT and this year we're upping the number within our existing estate and all of our users will have broadband installed. BT can't deliver us 100% take up, they can only deliver us 66% take up so actually the total capacity...if 100% of people in every building want it we don't have that capacity because BT can't give us that. But the key issue is yes we do and were keen to provide this.

Safety

I

Safety, do you think about secure by design standards?

D

Yes, we look at passive security and carry out risk assessment to ensure ground floor bedroom occupiers are not put in any risk in comparison with upper floor bedroom occupiers, we look at the surrounding areas, and we make an assessment of the surrounding areas to make sure they're safe and secure. We look at external lighting to provide the best level of external lighting and we provide cctv monitors recording and a link to our control centre in Bristol so the control centre at any one time can dial up any camera in any of our buildings and monitor, or control the view of that camera. So we're looking at security all the time. We back that up with 3 levels of protection. The bedroom has a lock on it which is card access the bedroom and that has just been reviewed. We are changing our supplier to [] who you've probably seen on the majority of hotels they have a card. We then have a flat front door so that's two levels of security and then a third level is the building front door.

We then have an intercom between the outside and the hallway and we also have, although we don't put a doorbell in because we find if you have 16 bells someone who wants to get in will ring every one until someone lets them in. With us we've learnt, no-one can let them in because you have to come downstairs to let them in. Of course it doesn't stop tail-gating but that's another problem. So we have various levels of security that we feel are appropriate for our building. If you remembered when you started talking about BREEAM I said I didn't know of anything that allowed us to make an assessment for BREEAM for student accommodation and I don't know of anything in secure by design which allows similar....secure by design is for residential housing. But we consider that our level of consideration of all security matters are to a very high standard and so we offer that to our customers.

Marketing

I

Lastly some questions on marketing. How much you perceive sustainability as something that you can use as a marketing tool, to gain a market lead in a certain area...

D

Where we have the sustainability of the location and the use of the building we consider it vital but we do think that gives us an advantage over our competitors even in student accommodation. The sustainability of the environment is something we feel helps us directly, but at a different

level, in our discussion with our customers because that's about the way in which you recycle, you offer recycling and the way in which you encourage other people....so we do feel that we provide that and it does offer us an advantage.

The areas that we don't see it helping us are perhaps the things which didn't really have a client at the end of the day. You talked about carbon neutral, well we're not sure at the moment, there's a bigger picture here, and we're only a small fish in that pond, and there isn't any driver for us, we don't see how we're going to contribute to that and therefore with that level of sustainability we probably at the moment don't see any need to push that forward to make it work for us. But the other levels of sustainability I think we do feel that it works.

I

Can I ask whether any of the following you would see as worth considering from a cost return market viewpoint, photovoltaic panels, solar water heating panels, triple glazed windows, landscaping with native species or SUDS?

D

We would consider those if there was a v clear cost effective basis but without we wouldn't and at the moment there probably isn't.

Interview ends I thanks D for contribution.

Interview E – (this interview tape was very poor there are some gaps in transcription)

BREEAM and eco-homes

I

First of all do you have what you would describe as a good working knowledge of BREEAM eco-homes standards?

E1

We have working knowledge of BREEAM but not with regard to housing eco homes at all. We have worked BREEAM standards on commercial buildings.

I

Why is that?

E1

Because we the vast majority of work we do is commercial work. I look upon [] As a commercial job rather than a housing job in that it's a development lead flats for sale project.

I

Did you look at BREEAM with relation to []?

E1

No not at all. The other thing about [] is that it is design and build which means it's the contractor that takes the responsibility for the detail, design and spec of many items. The contractor then hires us rather than [] after a certain stage in the development. The contractor, was not required by the employer to use BREEAM standards and therefore didn't, has v little interest in those sort of things and is governed by what he can do to make a profit.

Neighbourhood services

I

Sure. If you were taking on another housing development can I ask you about things like integrating other services within housing, shop units and so on. I mean actually [] there was an idea to have a restaurant as well, I don't know if that's still in there?

E1

It's still there, but nobody's taken it up because the area needs to regenerate a bit more before that is an interest. As it happens we're now working on the very first stage of another project which will involve housing and will also involve other types of mixed use on the site. And that's, it's really planning [] lead in what they're saying you know we want more sustainable communities and by that we want mixed uses, we want housing that is not just one bedroom for sale units, we want family units. We want, they talk in planning terms about active street frontages, i.e. they want something happening in ground floor level which is lively instead of just either car parking or blank walls. So that sort of mixed use type of development is becoming quite big in the city's brief to developers. The one we're looking at is going to have to follow that pattern otherwise the developer quite simply won't get planning permission.

I

What's your opinion of that?

E1

I think it's entirely relevant in certain areas of the city. If you said where's it not relevant I'd have to think it about, but this current one we're looking at in [] and I think [] is a community that's always been seen to be like that already and one would hope that should be promoted, that mixed use and mixed activity and there are already bugged down there but there's scope for more.

I

Do you think there are any drawbacks in designing services in housing?

E1

I don't see any drawbacks at all, I think for housing to have other services available is a great thing. I think the snag to it is the developers don't see it as worthwhile, they won't earn any money. They can't get the return from, for instance, a shop unit that might turn out to be a newsagents that they can from that same space being used for a residential unit for sale, they can't make it work. And I think the other thing is that you can supply the space but that doesn't suggest that someone will take it up because a newsagent has to... it's his business and he has to make sure it's viable and he might not think it's viable with such a residential small population.

Transportation and circulation

I

If I can just turn to transportation issues. What are your views on things like Home Zone serving principles??

E1

Doesn't ring any bells.

I

It's basically an idea developed from Dutch models of things like shared services, and trying to ameliorate the impact of vehicular traffic within housing development.

E1

Sounds desirable, again I think it's an area thing, isn't it? You could argue that putting an urban based residential scheme on a street like [] gives you none of that but you wouldn't expect it to because it's a bustling city street but I think in enclaves in certain areas that's entirely laudable.

I

Do you think that a car free environment would be possible in certain spaces?

E1

Personally I don't think that would ever be particularly possible. Society is built so closely around the car that you have to accommodate it somewhere to a degree.

I

If the brief insisted, do you think there are measure you could introduce that would compensate for a car free environment, e.g., things like car pooling or high quality bus services etc

E1

I'm not sufficiently knowledgeable to answer that, I think the answer would be I would probably have to say no to a degree. I'm just so aware of the pressures of the car on everybody on whatever scale of living...I would find it difficult to think, you know, think of [] – it's quite a vibrant area

already but not particularly well serviced by any public transport services there's one bus route that comes across the [] which is quite a long way from some of the people...so you could argue that you would have to put something in instead of just cars but I'm not aware that there is anything there that's in place.

I

How about the needs of pedestrians and cyclists? Would you be willing to design in separate pedestrian and cycle routes physically separated from road traffic?

E1

I think so, in that sort of environment where you've got a natural topography to work with there's a lot of scope to make sure vehicles are nowhere near certain areas.

I

Are there certain features to encourage more people to walk and cycle...

E1

I'm talking about such a small site, you can walk end to end within about 3 mins I'm not sure....I can only talk about our own experience on the sort of jobs we do. I would have thought you'd be doing a large housing, if you're doing [] which has [] at one end, projected town centre in the middle of it, projected business park at the top end, I would have thought that would be ideally configured for having pedestrian cycling routes nowhere near cars, nowhere near interfering with any other conflicting needs, I think that would be a great idea.

Building materials and construction

I

In terms of the construction of the developments do you try and source materials locally?

E1

Yep, we try and source materials and services locally if we can. I'm not best qualified to tell you but there are a couple of guys in the office who are much more clued up on materials which are more environmentally friendly etc. Going towards that route which is something that this new development could have and if it happens we will be looking to try and create something a little bit different and certainly take that degree of sustainability into...

I

I've got a series of questions about long term durability, recyclability, would they be best put to someone else?

E1

They might be, I'll see if E2 is available...

[part of tape inaudible... tape continues]

E2

...massive step up from a brand new spanking development right on the waterfront because its reusing the existing building with an infrastructure that's already there so there's a kind of environmental load at []... I mean the client may not have said let's make a sustainable development, the environmental load of the building is massively reduced in comparison to any new development...

I

We were just talking about materials and sourcing them and specifications and so on, I was asking about consideration given to long term durability, recyclability and reparability.

E2

I mean the way we specify at the minute, we try to specify sustainable materials like [part inaudible] timber, etc whether it's in cladding or joinery items, or whatever.

E1

...Sustainable, recognised hard woods as well as soft woods.

E2

Anything we do specify we will be sources, recognised suppliers also with regards to preservative treatments used on....we have residential projects which are not in [] at the moment but we are doing research on projects in [] which we reclaim slate and reclaimed stone....

E1

We actually don't get that involved in the new build housing you see...we get involved in a lot of conversion, extension etc where you've got all the using materials which are in-keeping with the old buildings which are still good materials...

E2

You've got to weigh up what's there and what's the benefit. you look at material like aluminium, obviously its environmental load potentially far outweighs any benefit of the fact that it's recyclable and exceptionally hard wearing, there are a lot of things like that, where you have to find the balance..

E1

..between the longevity and the maintenance and ideas of 'maintenance free'...

E2

...yes which makes it appealing to the client but if you think in environmental terms aluminium it really isn't great.

I

Is it the case that sometimes the client perhaps makes a call on this you don't particularly agree with?

E2

I think it's down to us to provide sustainable spec which doesn't impact economically, on the development, or on the client themselves. Most clients would probably say yes I want to be sustainable, the actually getting there is often, they're not that interested in it, so I think it's down to us on a basic level when you compare the basic spec what you want. A lot of items sometimes are way more expensive and you want to go down the route and look into it and you can fight and argue the case with your client. Solar Pvs or whatever there're things like yes you want to use in certain situations obviously clagging it onto an existing building isn't economically viable and often isn't the best way of doing it but I think on a basic level when we should be specifying product which we know to be sustainable and...you shouldn't be ringing the client and saying....just giving you info on general ply wood we're using to build is it OK if its FSC rated... I mean it should be FSC rated anyway...(Forest Stewardship Council)

I

Have you any experience of green roofs?

E1

(Laughs) yes! Are experience is basically we couldn't get anyone to do one

E2

Very difficult things to get constructed...

E1

We literally...I tried to get someone to do a green roof into the end and I couldn't get anyone interested...

E2

I've organise CPD in the office and I have trying to get a CPD on the construction of green roofs for 3 months now and I'm ringing and ringing and ringing to get someone to come out and do it...

E1

I was offering them money and they still wouldn't do it!

I

I was just about to ask you what the barriers to creating green roofs are but I think you've answered that!!

E2

We're willing to do it but it's finding....I imagine that green roofs are one of the first things that are cut out on a cost cutting exercise and it could be that basic economic turns of their company it's just not worth them letting people pursue them.

E1

Well I've ended up to probably a hugely environmentally unfriendly lead roof which cost more but it had look good and of the only two companies that I could find that could do it and I couldn't get either of them to do it...

I

Is that because it was a one off building or because.....

E1

It might well have been and it might have been too small a project but on the other hand I would have said if I was a green roofing company, I've got an architect who wants put a green roof on his own house, you would think that they would make an effort to do it so they can get their work out there...

E2

Some of the projects which, say for instance [] their green roof is no bigger than a domestic house would have.....I think there is a lot of design input on the green roof...[tape inaudible, *tape continues*]

Longevity and maintenance

I

In terms of housing, do you think it's cost effective to build a house with an expected life span of 100 years or more?

E1

I would expect a house to last more than 100 years, 100 years is really not long enough, though I'd have to have a think...

Internal aspects

I

Do you experience in designing flexible internal spaces in residential developments so that walls can be easily added, removed or moved and do you think this would be a positive selling point of a development...

E1

No I don't think so, not in the sense of building in that degree of adaptability...

E2

..we have schemes where the client has asked that we designed in future change ...if he doesn't want it to be student residential any longer, and they are not bog standard student accom, they are built to a high spec, then...internal walls aren't structural walls they're just there to divide the space so at a later date, the actual density of how many people are living there e.g. as a family can change ...it's not a case of just....

E1

...but it's not very sophisticated

E2

No, no it not

I

Do you build to 'life-time' homes standards?

E2

I've not come across them

E1

No me neither

E2

We have quality indicators and various other standards and checks, but no.

I

What's your understanding of the term 'loose fit' buildings?

E2

None

E1

...nope!

Thermal performance

I

What is your experience of building with high thermal massing?

E1

None

I

Do you have any opinions on how much greater the cost would be to building to a SAP rating of 100 or more? Do you think it would greatly affect the design of the building?

E1

No and no!

I

Do you think improved thermal performance can be used as a potential selling point to an end user?

E1

Well we don't have this experience because of the nature of our work but you would have thought it would have an appeal.....

E2

Yeah, I think it would have an appeal to a certain area of the market but I don't see it as being an important element of why people would buy the property.

CO2 Emissions

I

Turning to CO2 emissions, do you believe you could deliver a carbon neutral development?

E1

Yes

E2

Research wise it's something we're interested in the office and we do have a scheme which one option will be carbon neutral, whether the client is prepared to do that or not is another matter, but it definitely something worth pursuing

I

Do you think there's a market for carbon neutral in the Northeast?

E1

Yes, I do

I

Can I ask about renewable energy sources, do you believe you can provide a development that produces enough energy for itself on site, though renewable sources?

E2

Whether we could do it is another matter, but I believe it's possible.

I

Have you used renewable energy sources?

E2

In projects?

I

Yes

E2

No.

Energy efficiency

I

..In terms of energy efficiency measures, do you consider things like fitting energy efficiency appliances in projects

E2

The legislation that's coming in is down to the level of boilers...I think everybody has to....

Recycling

I

Would you be willing to provide some kind of recycling scheme in your developments instead of just normal waste disposal?

E1

Yes if the development was of a size that would allow it and make it desirable...

I

How willing do you think potential buyers of your schemes would be to fully compartmentalise their household waste?

E1

Probably not the right sort of questions to be honest with you...

E2

..though these issues are all worth thinking about.

Water

I

Yes and I think it's good to get a range of opinions from people involved in different levels of housing development. Er, Have you been involved in any of the developments that use grey water recycling systems?

E1

No...but we have looked into it....

I
SUDS systems?

E1
No again we looked at them but have no practical experience

Ecology

I
Ecology...in terms of landscaping schemes, do you consider using native species?

E1
Can't remember the last time we had a landscaping scheme associated with a building but the answer would almost certainly be yes.

ICT

I
ICT...how much ICT infrastructure do you usually install into a residential development

E2
In residential? Broadband....

I
Do you design in the ability for utility companies to easily lay cabling through developments and into residential units?

E2
Yes for example with [] this is all there...

Safety

I
Safety, do you give importance to 'Secure by Design' standards....?

E2
Yes we have projects where that's part of the brief of the project, key planning it has to be pre-planning really because secure by design is often very particular about what they have...[tape inaudible, *tape continues*]

E1
What kind of things have you incorporated in your design to reinforce perceptions of safety?

E2
One scheme I'm thinking of was a housing scheme but here it never got beyond, the general surveillance, the openness of the space so you don't create any little corners or crannies, everything was quite open, windows, shutters etc..it wasn't that sort of shop style approach they wanted to balance the security against living in a prison environment.

I

The last section is marketing which I know you don't get directly involved in but perhaps you might have some thoughts on these...do you perceive sustainable housing as gaining a market lead or do you think it's a fringe activity with little long term relevance overall?

E1

I would say the later because I think the housing field is controlled by people who don't seem to exhibit any interest sustainability whatsoever who still sell 95% of the houses in the country, it is a depressing picture...'.

E2

On a honest true level it is infringing less...larger developments are always...it's always the minimum...it's always what they can get away with, percentages are so small that it's the bare minimum to get through the planning.....

I

Do you think there is anything we can do to introduce more sustainable housing to the mass market?

E1

I mean we were talking about cycling and pedestrian routes etc and I mentioned [] and said how ideal it was for these – well I'd bet a pound to a penny the [] and [] wouldn't have done anything if the local authority hadn't insisted on them being there

E2

I mean it's like the percentage of photovoltaics up there it's an absolute minimum in comparison with the size of that huge development.. as take the first left to the initial phase there are few houses there I think there are 6 houses in the entire development...

E1

Mind you I trued to include those on a development and the pay back period was just too long... about 100 years the client baulked at the cost...

I

What do you think would be the single greatest inducement to building and delivering sustainable housing for the mass-market

E1

Well it has to be further regulation...

E2

Yes tighter building regulations to force the issue

I

Just picking up on what you were saying about the photovoltaic panels can I just run through a few other things and see what your reactions to them in terms of being viable elements in terms of providing a positive cost-return ratio as marketing features... Green roofs?

E1

I don't think they're cost viable no...

E2

If you have heavy duty you could possibly provide another space in the development I'm sure there's... if you could provide someone with a roof garden, there's a difference between a lightweight green roof something to look at and something that offer additional space which is perceived by the buyer as useful space...but it's still not a cheap roof...

I
Solar water heating panels

E1
I've no direct experience but informal experience suggests that has the same problem as photovoltaics

I
Triple glazed windows?

E2
I think to look at items individually when you're talking about a housing development or a whole one house, you've got to take a holistic approach because often a lot of these factors are linked together you've got to make the building work as one not just say we'll put the insulation on, well do this... which is often why the bulk of large schemes, mass developments, it doesn't work and it's then seen not the pay off because they're using one item and they want to see the benefits of this one item which may have been costed as part of the scheme, but the rest of the scheme is very traditional, minimum regs housing and the benefits are fighting all that then. If you look holistically, that's when you really start to see a difference.

E1
I've only ever done one building triple glazing and that was because the client was going to Sweden all the time and came back with the spec for the windows

I
Very lastly SUDS drainage system...

E2
I really don't think we have the experience to comment...

I thank E1 and E2 for their participation.

Interview F

General sustainability standards

Do you have a good working knowledge of BREEAM Eco-home standards?

Yes

Do you feel you could viably produce housing, and any other construction linked to it, to BREEAM “Very Good” or “Excellent” standard?

We've only once put a site through eco-homes rating because there's no requirement for us to do it on sites we've done, because we've been ahead of the game we've not been working to try to achieve a certain standard we've been working on our own standards. We know we're ahead of the standards required so we're chasing after our own standards rather than meet anyone else's. We've not found the eco-homes ratings system has been marketed to the purchasers in a way that makes them come to us. If eco-homes was marketed to users so when they went to new developments they were saying 'I want an eco-excellent house' there would be a big incentive for us to use that system.

That's why we haven't used it a lot, we probably will do in the future. It's not over onerous to achieve the, even excellence isn't too onerous, but it does add cost.

What would you perceive to be the barrier to this?

Competing for land against standard house-builders

I

what kind of things planning authorities might do to give yourselves a level playing field in terms of content of development briefs for sites.

F

The bluntest instrument is building regs, if the regs demanded everybody built to eco-excellence for e.g. then the cost of construction would be increased but when companies were bidding for land people's calculations would be the same. Unfortunately I don't think there's quite yet a direct return from building to a higher spec in terms of the additional figure you can ask for property because the market isn't that educated as yet. So it's not like a car manufacturer, can decide we're going to build a higher spec vehicle because there's a market for it. It doesn't work like that in the housing market as yet.

So one way is through regulation, either through building regs, planning systems, English partnerships are trying in a way by putting in a two tier bidding process in for land so if you're bidding for land you've got to specify, people give them the spec you're going to build to and they are prepared to sell you the land for a lower price because you're delivering the higher spec. The other way is to do something like reduce stamp duty on properties that are built to a certain spec, so if buildings were built to eco-excellence and zero stamp duty on that then a developer can see that he can charge less for his money, or charge more because the purchaser isn't going to be paying stamp duty. There has to be some financial incentive. It's either got to be mandatory spec, which is probably difficult to implement straight away, and some financial incentive for developers to build to a higher spec. Because, I haven't got any confidence in the market doing it.

Have you produced schemes to this standard before?

Yes

Neighbourhood services

What are your views on building shops and services within housing developments?

A good thing

Are there any drawbacks?

Not if part of a well-integrated design

Would you be willing to build housing above shops, and if not why?

Yes

How significant is the presence of local shops to the marketing or sales of a housing scheme?

Quite important

Transportation and circulation

What are your views on Home Zone principles? Do you believe you could fully encompass them within a development without additional costs?

Yes, dependant on highways

Do you employ other design features to ameliorate the impact of cars and parking onsite?

Yes

Under what circumstances do you believe a car-free development would be possible?

In a concept community, with exceptional transport options

If a brief insisted that a development was car-free, what measures do you think could compensate for it (a good local bus service for instance, or communal car pooling schemes)?

It would be to do with the scale of development, we've got a development on drawing board at moment and things like that would be part of that development. English partnerships are doing a development in [] development – and they are specifying car sharing scheme. It is something we would do, because we've run electric powered vehicles – we've three within the company – we've always had a pool car. We've not taken that concept and made it available to people who buy our houses because we've not had the scale of development to do that but our view is that housing developments can offer more, there's more opportunities for an ongoing relationship between the company and the people that buy the houses.

One thing we've done on the millennium green development, we've put a business centre on site and because we've got that amongst houses we've got an ongoing relationship with the people living in the houses. If they have internet deliveries quite often they're dropped off at the centre. There're opportunities for interaction and once you've got that you can have a pool car whereas if you just build 100 houses and walk away from it you've not got the infrastructure to interact with them. You need to come up with a concept for mixed development, part of which is to interact with the people that buy the houses.

Would you be willing to provide cycle paths in a development physically separated from the roads?

Provided they linked into other cycle routes

What features do you currently employ or would consider to encourage walking/cycling within developments?

Access roads & cycle storage areas

Building materials & Construction details

Do you make attempts to source all materials locally?

Yes

Do you believe that doing so would raise building costs?

No

What consideration is given to long-term durability, recyclability and reparability of materials?

Key part of buying decision

Would you be willing to source and use recycled materials?

Yes

How much emphasis is placed upon using renewable materials with low embodied energy?

Where cost-effective

Do you have experience of building either 'extensive' or 'intensive' green roofs?

No

What are the barriers to creating green roofs as standard (if any)?

They interfere with our preferred option of rainwater harvesting

What experience do you have of prefabrication?

None

What impact do you believe prefabrication will have on your business in future?

Growing

Longevity and Maintenance

Do you believe it would be cost effective to build housing with an expected lifespan of 100 years or more?

Yes

Would 100 year housing be a selling point?

Yes

How could this goal be achieved to the benefit of:

The developer

Brand value

The building industry in general

Industry reputation

To the end customer

Low maintenance property

Orientation and solar gain

How much experience do you have of passive solar gain?

Lots – standard in our properties

Do you believe you could deliver a housing development involving sunspaces or highly glazed southern elevations?

Yes

Internal aspects

Do you have any experience of designing flexible internal spaces in residential developments i.e. where walls can be easily added, removed or moved?

Simple avoidance of using load bearing walls and it was designing, we got a couple of house types that we created some big spaces in them where we could give the purchaser an opportunity to put dividing walls in but what we'd do, if we leave it with a big space, the way we wire that particular room and the way the room is designed, it's designed to be split at a later date. These houses have ventilation systems so we put two ventilation systems into the room, it was basically making it adaptable but using conventional technology

Do you think this could be a selling point?

Yes

What is your understanding of “loose fit” buildings?

?

Do you build to Lifetime Homes standards, and if not what are the barriers to doing so?

Yes

Thermal performance

What is your experience of building with high thermal massing?

Lots; standard in our properties

How much greater do you believe the costs would be of building to a SAP rating of 100 or more?

C +5%

Do you believe it would greatly affect the design of the building?

No

Could improved thermal performance be a selling point? Would it recoup any additional costs?

A good selling point, but difficult to quantify cost-recouping aspect

CO₂ Emissions

Do you believe you could deliver a carbon-neutral development?

Yes, there's one on the drawing board, in terms of carbon neutral we've not built a development that doesn't have any form of fossil fuel heating. We always buy green energy for the houses so the initial energy supply to the site is bought through green energy and the users are then connected to a supply that supplies them with renewable electricity.

The design of the houses is to minimize energy use and technologies like solar water heating, rain water harvesting and other technologies in the house but they are not zero energy and not tapped into their own renewable energy system. Again, it's a question of scale.

Do you believe there is a market for carbon-neutral housing strong enough to be commercially viable?

Yes, but extra costs would need to be covered

Would such a high level of sustainability add value to a development?

Depends on locations and property types

Renewable energy sourcing

Do you believe you could provide a development that produced enough energy for itself, on-site, through renewable sources?

Possible but difficult

Which renewably energy sources have you previously used, and which would you see as being viable now?

Solar-thermal & geothermal; PV not financially viable

Other energy efficiency measures

What would make you consider fitting condensing boilers as standard?

We already do

Do you now, or would you consider, fitting energy efficient appliances as standard?
Yes, we do now.

Recycling

Would you be willing to provide a recycling scheme to be used instead of the normal waste disposal system?

Yes

How willing do you think potential buyers would be to fully compartmentalising their household waste?

Very, if made easy

Would you be willing to establish composting facilities and management onsite?

Depends upon the size of the site

Water

Have you used grey water recycling/re-use systems in previous developments?

No

What measures would be necessary to reduce mains water usage by 50% ?

Freerain, rainwater harvesting plus aerated taps & showers,

Would this be easily attainable?

Yes, we already do

What is your previous experience of SUDS?

We've got a company that sells rain water harvesting systems so we're involved with other developers on their schemes where they're looking at surface water problems. A number of different solutions from large pipes to open swales to balancing ponds to underground filtration systems, crate systems, there's all sorts of different solutions to deal with surface water. To deal with the surface water on site rather than send it off site, which is my interpretation of what SUDS is about.

We've put rain water harvesting systems in as part of a SUDS solution on site so rain water harvesting systems obviously collect rain water, attenuate it and then it's used back into the property. If you had the capacity of that so you've always got vacant capacity that allows you to attenuate store water situations and then if it ever flows from there to try to get the water back into the ground. What we've not done is schemes with large swales, that is not something we've done because we've always seemed to work on rather tight sites and there's not the opportunity to do that, though even on tight sites you can harvest rainwater effectively without too much difficulty. Saying that, we've tried to put permeable surfaces down to try to maximise the amount of water that falls back into the ground so minimize the amount of water that needs to be collected in terms of store water.

Do you now, or would you consider, fitting water efficient appliances, toilets and showers as standard?

Yes

Ecology

Can you see any disadvantages to using only native species?

No

Would it be viable to set aside part of a site purely for an ecological garden?

Depends upon planning and finances of the development

In your experience, what is the best way to resolve conflicts between environmental consideration and development on a site?

The planning system

ICT

How much ICT infrastructure do you usually install into a new house (e.g.: broadband cabling)?

Good standard

Do you design in the ability for utility companies to easily lay cabling through the developments and into the housing?

Yes

Would this be a selling point sufficient to cover any additional costs incurred in construction?

Yes

Safety

What importance do you give to building to ‘Secure By Design’ standards?

Modest

What means do you incorporate to ensure security onsite, or to reinforce perceptions of safety?

Marketing

What is your normal target market?

Upper end

Would sustainable housing represent added value to your average customers, sufficient to cover additional building costs?

It would add value, but difficult to quantify

Do you perceive sustainable house builders as gaining a market lead, or as a fringe activity with little long-term relevance?

Market-lead

What would be the single greatest inducement to building and delivering sustainable housing for the mass-market?

Insertion in planning requirements, and compensating financial benefits – such as stamp-duty waivers for compliant houses

What are the current barriers to doing so?

Cost

Which viable elements of sustainable building would provide the best (on a ‘cost : return’ ratio) marketing features? Or create the greatest barriers?

Green roofs 6

Photovoltaic panels 5

Solar water heating panels 1

Triple glazed windows 3

Landscaping with native species 4

SUDS drainage systems 2

Interview G

I

BREEAM eco-homes. Do you use BREEAM standards?

G

We do yes we have a development brief and we ask all architects to go for excellence in the eco-home standard and we're building at the moment to the excellence standard in the [] project and a couple of the new ones.

I

Neighbourhood services. What are your views on building shops and services within housing developments and do you feel there are any problems in doing so?

G

We've always prided ourselves on mixed use in city centres; you know loft accommodation, so from the outset we've always wanted mixed use, including shops and services within our development. I'd struggle to think of one where we haven't done mixtures within shops, I suppose [] was 100% residential, the [] scheme was 100% residential but by and large we're very keen to do that for many different reasons. One of those was services and sustainability arguments but also we like the idea of having animated ground floors which help in terms and security and well-being and bring life to those streets and generally reinforce the viability of schemes by making sure people have got necessary services.

I

Do you feel there are problems with doing so? Some people have mentioned the issue of getting shop units occupied, other people have talked about the complications of financial and legal issues, is there anything like that that concerns you?

G

There are issues, but it depends what you want to do in life, if you're looking for an easy way out of everything it's probably too much hassle. Our view is the benefits outweigh the negatives. The negatives would include things like, physical planning things, shops, services, bins, how that works and what's the relationship. We've also had things where we've had restaurants and bars and on one level that can work very well but another level if the bar operators starts going bonkers and starts playing loud music that becomes a negative rather than positive. There's legal things, issues about having different leases in buildings and the complications of managing that but our gut feeling is to hell with that, by and large it's positive and where we've had trouble, you know with noisy tenants, you work to sort it out.

I

Can I ask about home zone, have you built developments using this?

G

We haven't as such built a home zone, the nearest we've come to it is [] so I think the principles of home zone, I think we probably started before they started coming in, or we started building it so it's very much, the millennium village in [] is very much based on the big principles of sustainability so we're building social housing rented and shared ownership, straight owner occupation, ground floor shops and restaurants and services and offices and things like that and then school and a health facility. Lots of green spaces, lots of water, trying to undermine or

reduce the impact of cars, we're creating streets on the European module which are basically pedestrian friendly and trying to inhibit the fast flow of vehicles.

I think all of that is in the [] and Home Zone principles are close to our hearts. We've been bidding recently for various schemes and the Home Zone principle is one of the key elements of what we're trying to do so yes, we're familiar with it and we're keen with it and I think we're building it but we're probably not calling it a Home Zone.

I

Do you think it's possible to create a car free development?

G

It's tricky one, because we sell accommodation the first 8-10 developments we did never had car parking and we were happy with that because our emphasis was rather than dig out the basement and put in car parking we always felt you need to have life in those spaces, so we'd have the shops and offices and services and forget about the car parking.

As time has gone on we've found increasingly that occupiers want car parking space so we have a dilemma so what we've done is try to reduce the impact of cars so if we are going to have cars we'll spend a lot of money to build the car parking underground. So everything goes underground if it's a new build scheme and then we put a landscape deck on the top of it so we create a green space for the residents. It costs us a fortune but we think it's the right way forward.

We're looking at the moment at some semi-car free developments. We're doing a scheme in [] that I'm involved in where we're got shared ownership, social rented, private owner-occupation. What we're saying for the shared ownership occupation is that it won't have car parking because it's about key workers walking into your place of work in the middle of town and you don't need a car. There is a bit of a dilemma and I'd be fibbing if I said we're doing all car free because we're not, the market and certainly people even if the middle of town seem to want places for their car.

I

Have you ever considered car pooling?

G

We have and I think we looked at it in [] and we're looking at it with [] in [] so that's something that is a possibility. We're waiting for [] to come back with some info about the potential operators and how we do that and that might be how we get round the shared ownership thing, rather than saying you need to have a car parking space you will have access to a car pool, depending how successful that is we'll spread it out and try and use it alongside other developments.

I

Building materials, do you attempt to source materials locally?

G

I think we probably do but some packages are of national importance, national market, so for example where we put windows in we go to a very high specification but there's only 3 or 4 people nationally that can do it. So yes, and when we get established in an area our sourcing stuff starts to focus in a bit so we're also looking to work and we always say to local councils that if you've got a local procurement strategy we'll work with that both in terms of staff and materials

and supple chain. We started that in [] initially all of our procurement was geared towards [] and [] where we're based but as time has gone on we've built up the links within [] and I think the same would happen in [] it will take a while but we would obviously like to work, and it makes a lot of sense you have to try and keep your supply chain service as much as possible and try and get some immediate...we make attempts to source locally sometimes we do it v well, sometimes less so.

I

You've already talked about the high specs for certain components; can you just make some general comments about the consideration you give to issues of recyclability, reparability and durability?

G

Well it's all wrapped up in our brief so we're asking the architects to be mindful of long term issues, particularly things like reparability of it all and recyclability. Now we've got a few examples of schemes where we're starting consciously to recycle materials and we tend to do this in a v modern way so our design idiom is a v modern approach which puts you in a tricky position when it comes to steel and glass and things like that which are clearly not very green materials. But then we're looking at things like cladding, where we're looking to, the scheme we're about to start in [] where we're using recycled material as part of the cladding material, so it's recycled. We did a scheme recently in [] which is now complete which, in collaboration with the housing association, where we used French oak from the storm damage. We imported a lot of that and that became a structural member within the development to recycle the oak knocked down in the storms in France.

We're doing things with combined heat and power and things like, in this scheme in [] and [] and other schemes, one in [] is the combined heat and power to try and reduce the energy consumption in relation to buildings so I think there's probably a mixed result on this. We're certainly using the governments recommended lists for capital allowances so everybody has to access into that to get the best quality greener material in the supply chain so we can claim capital allowance on that so we do that as a general principles as part of our work.

I

Have you ever used Green Roofs?

G

Not really although, I know our Chief Executive on his own home and used a green roof as part of that. We've looked at other things like photo-voltaics, but we don't think they work in terms of the capital investment at the moment. Our general approach is to get the levels on insulation as high as possible which is our general passive stuff...I'm struggling to find anything where we've done a proper green roof apart from the one [] did on his own house. The ambition is there, in terms of things like pre-fabrication we're doing work on that, I think we're the first private sector developer to work with a private speculative pre-Gab system which is in []. Called [], modular housing, which we did in partnership with [] which has got very very high levels of passive insulation within the development and out view was lets try and get the energy consumption down as bets we can and do that through insulation. We're still failing in some of the heating systems in that we're using things like economy 7 which aren't great but we're also, where we've got the volume of the unit, we're trying to go for combined heat and power but obviously that needs a certain volume of both mixed usage and apartments to give the quantum that's required for that.

I

Are you building to a SAP rating of over 100?

G

I don't know what we're building to be honest, I'm a planner myself, but I can find out....we have had SAP ratings done I can find out.

I

What is the life expectancy of the developments you're creating?

G

The honest answer is that it's dictated by mortgages and what the mortgage companies are saying. I think 100 years minimum, we should be saying a lot longer and I think that is a v worthwhile ambition. On our pre-fab we've hit problems, one of the problems I mean, how is this likely to be used this information?

I

its completely confidential don't worry nothing will be attributable to anyone to be honest.

G

There are issues on the pre-fab system because no-one in the lending industry has the foggiest about pre-fab they're used to a standard product. When we came to the pre-fab system there were worries about the shelf life of the buildings, it's our view this is a good shelf life it will last as long as if not longer than a traditional build but I think if someone was to say we should be building houses for 200 years or 150 years life we would look to sign up for that. What the cost implications of it all, it's not so much that it's getting the lenders and other people to believe it and then have the proof to say it's going to last for 150 year because no-one bloody knows!

I

Orientation and Solar gain. Have you used passive solar gain in your developments?

G

We have yes, the whole orientation thing is critical to us we did a project once [] there we made for a design competition we made a fundamental error in the layout, it was just locked into RIBA design instead of the orientation and we've learnt a lot of lessons from that. It was clearly v strong and things like using orientation to heat and wind to cool is important to us.

I

In-built flexibility into buildings? The idea of loose fit buildings?

G

Yes we're v much into that, we've been doing it for quite a while and is a strong selling point. I think adaptability generally is important, we like loose Fit, we've certainly been doing work with [] and [] about loose Fit which I think is important. How successful have we been? It's an interesting one; the whole thing about adaptability of buildings is something which we've got a long way go on.

I

What about lifetime home standards? Do you use those?

G

Not really no.

I

Do you know lifetime home standards?

G

I've heard of them yeah, People seem to have v mixed reactions to them to be honest, they're inflexible and the detailing is not necessarily that good.

I

CO2 omissions. Do you think you can deliver a carbon neutral development?

G

We've attempted to do that, the CHT scheme we were doing in [] was an attempt to do that, but I don't think it's going to be carbon neutral. We're aiming to do a carbon neutral hotel scheme mixed use development in [] but again, you start off trying to be carbon neutral and as you go on it starts to slip, particularly when you've got budget problems, a lot of our scheme rely on grants initially so we do have problems.

We might even say in our brief that we aim for carbon neutral but it's been tricky to deliver one so Gar but it's our ambition we'd love to do it.

I

Have you tried to produce a development that produces enough energy for itself on site through renewable sources?

G

We've looked at wind power, we're looking at a scheme for some terrace conversion to try and out some little turbines but the general feedback we get is it will never keep the energy going. We've looked at photo-voltaic? And again the costs of the running to deliver 100% energy sustainability are horrendous at the moment so it's always been outside of our remit, but I think what we're increasingly trying to do is look and explore and the wind turbines is one which is more gimmicky at the moment but it's not sufficient volume of energy to deliver the full hit. Probably not is the honest answer but we're looking at the possibility of generating a proportion of the energy in [] but we've not had the funding of that confirmed and it's added a lot to the capital costs of the building which we don't know whether we can Gill that gap because it's a grant scheme.

I

Would you be willing to provide recycling schemes on your developments instead of the normal waste disposal system?

G

We put in as standard in the kitchen the bins For different types of waste, that ties in the management regime of the buildings in terms of the removal of the waste and tied into collection so yes we've started on that and it depends on individual architects but it Forms part of our brief to try and start putting the different bins so materials can be separated at source and then moved to the collection point.

I

What about the use of grey water in developments?

G

We haven't done that, we looked at it in [] but I think when we looked at the logistics of collecting the brown water and storage it became pretty awkward. There's quite a lot of kit to go into the building which turned out to be prohibitively expensive.

I think we've been looking at something for gardens, instead of disposing it goes into, certainly within the [] scheme we've got a huge amount of water and swampland and that is geared towards taking the waste material and using it in an ecological environment to sustain wildlife and for horticultural purposes and we're also looking at bore holes as well so we have been looking at the possibility of drawing our own water for drinking as part of an integrated set of circumstances. [] is our most advanced system.

I

Are you using SUDS at []?

G

Don't know, I know one of the reasons why we had the water there was to use some of the rain water so I don't know whether that forms part of that.

I

It may well do, I can check that up. Have you been looking at anything else to reduce mains water usage like fitting aerating taps and those kinds of things?

G

I think by and large as standard now we're trying to use this kit in everything, sometimes some architects will go off on one... but as ambitions that's what we're aiming for. Is this covered by the capital allowances thing because our general strategy now is everybody is procuring the kit to go into bathrooms needs to specify from these lists which then give us agreed capital allowances so certainly in our office here the toilet system is limited flush and things like that.

I

In terms of general ecology do you try and use things like native species in your landscaping schemes and things like that?

G

Yes

I

Have you ever set parts of sites aside purely for ecological gardens or ecological areas?

G

We may be in [] it's really about the scale of things most of the stuff we've done historically has been v urban, redevelopment of a brown field site on a fairly small scale we're not a big house builder, we're growing obviously but we've only ever built 2000 homes in total, most of those have been in multi-level brown field developments in the middle of town so we've never had a great deal of space to play with but I think if you look at the [] model, we'd be v happy to talk to you and councillors in due course, within that obviously there are waterways, there's a big canal system but there are also the ecological gardens, swamps, things like that to get some diversity into the ecological picture.

I

ICT, do you install ICT infrastructure into your new houses?

G

Increasingly, it's growing and certainly our most recent schemes the one at [] and [] we've got a Gull ICT infrastructure to the building and a household management system so people can have the intranet and internet between them and the management of the company so certainly in terms of, and I think it goes up to CAT 6 on that within the most recent stuff so part of the problem is the speed with which technology is changing. Ideally we would have liked to go for cable free things, portable systems I think in [] we've put a category 6 system in there but the moment it goes in its redundant.

Our ambition is to do that, on the bigger schemes, all of our office schemes – half of our development is office schemes – we do mixed usage anyway and all of our office schemes are up to category 6. We'd like to use the ICT as the backbone for the management of the housing bits of it so the concierge and management are all tied into it.

I

Safety, do you build to secure by design standards?

G

We have discussions with the people but we find them a little bit conservative. If we can put up a big fence or roll of shutter they're happy but we don't want to put those on our buildings. I think secure by design is flawed, I haven't had dealings with it for 2/3 years with the police, when we last had it they were just saying stick some big roll of shutters up and we were saying no, we don't want to, we'll take the cost of having the windows broken on the basis that that stops and you end up having light and life coming onto the streets which is important so secure by design – unless it's improved recently – I mean it's important don't get me wrong but we have a slightly different view on it to the police.

I

In terms of your approach to security is that basically about trying to have natural surveillance?

G

Yes we're committed to the secure by design principles, but I don't think we're committed to the specifics of how some police implement them and our view is that natural surveillance, mixed usage, these are security things that during the day when people are away at work you've got people in the offices downstairs and when it comes to night time that's turned round and it all helps each other so you get life and light and eyes and supervision and people willing to lend a hand to people who gets in trouble, all of that good neighbourliness is critical to what we're doing and we have steadfastly refused to put solid rolls, we have some on the inside of buildings, you know a metre back for the frontage, but they tend to be lattice rather than big heavy ones.

We've done moved office and after two years of having our windows broken they've just given up and we've still got the open glass and I think that's important because places like Newcastle and Liverpool, also there's suffering from too much physical intimidation with roller shutters all over the place.

I

Who do you see as being your target market?

G

We have a fairly broad base, obviously half of the business is commercial so commercial operators in key sectors but mainly something like creative industries, young entrepreneurial types, small businesses, growth sectors in tiers of design, professionals. In terms of housing we're looking at a whole range, [] and the schemes in [] the housing market ranges from people in housing needs such as rented, to people suffering problems with affordability in terms of shared ownership and straight owner-occupier buying 100% equity in our development and that varies from young yuppie types- first or second time buyers – young couples just getting together, people getting divorced, people retiring the 'grey market'.

We did a survey ¾ years ago of the average age of residents was 46. We were staggered we were ending up with quite a lot of young people and old people.

I

Do you feel sustainability housing a beginning to get a market lead or do you still feel it is a fringe activity?

G

I have problems with the big house builders because they tend to be a lot of elephants and they're not really....and part of the dilemma is that they're ruthless in their pursuit of build and I think that show in the product so even the top end of what they do is pretty tacky. I don't think, the costs of what we put into our developments is way above what they do and we then have to rely on the premium on the design of Urban Splash to deliver the profitability of the scheme. I think generally, I presume, that general bog standard housing, the insulation and the running with the gas fired central heating condensing boilers and all that, I'm sure it's a lot better than it used to be and it's improved dramatically but I don't get any sense of any great enthusiasm For it all and I think there are a lot of things in terms of the fundamental, what they're approaching to do and that I think boils down to low density, suburban housing, mono-tenure, mono-culture, trying to build on green field sites, all that stuff is a big negative For them all and I think, mainly because they're under the cost from government, some of them are saying we're green, this that and the other, which is a big fucking joke to be honest – I don't think many are.

I

Is there any solution to try and great sustainable housing delivered into the mass market do you think?

G

I don't know, it's a lot of different things and in some ways it's back to the old problem that the big boys do what they're good at. They are very very good at building mass housing, they do it v efficiently, but I think you've got to look to the smaller companies who are entrepreneurial in the original sense of the word, because of the unusual structure – the company's owned by 6 of us who run the company and that's concentrated amongst 4/5 of us and it's an enthusiasm For us and I think in some way it's getting these exemplars working so you can say – look at this estate and see how well this works and how affordable, popular it's been, and the big boys if you look at the way we've worked as a company we're were set up 11/12 years ago in [] to do city centre loft living and when we did it everybody said it will never work, people don't want to live in the middle of UK cities. We pinched the idea from London and the Manhattan Loft Company and they'd stolen that from New York and what had been happening on the continent but at the time, 12 years ago in [] and [] we couldn't get any banks, any institutions, anybody to sign up to the notion of city centre living and everyone said it will never work. Then we did a could and they

said you'll never make it work again, and 10 years later you can't move in areas like this because all the big boys now they see it work and they see companies like [] making good returns and then all of a sudden – this is why I call them elephants – the herd of elephants stops eating its pasture, turns, has a huge collective and storms in. I think in some ways it's about showing they can make money out of this, they have to think long term, they have to think sustainability, it's probably going to be a mix of the stick and the carrot and say, look you can do things here and that's for local authorities to work with little companies like to deliver demonstration projects as we did here. We worked with [] because they were keen to encourage City Centre living.

We relate to that area because once we could pick up any building in these areas for next to nothing now you can't buy them for a fortune because the big boys are paying way over the odds for it. I think the public authorities need to take a much more clever view on procurement on development partners, there's no point in them getting developers to bid for a piece of lands because we know that [] and [] will spend a fortune for the land and knock that out of the bill cost. The propositions that we've been putting to local authorities recently has been – you throw your land in and we'll do a proper chair? With you so over the 5 or 10 years of a scheme when we start to increase values you get the benefit of that and we're not just increasing the values for property we're also trying to incorporate best practice, best design, green developments and all that. You do a land deal, and that land value might be wrapped up into the sale of apartments so there's retained equity and things like that so that the in perpetuity there's a subsidy for occupants to take the space.

Interview is interrupted and I and G agree to terminate the interview, I thanks G for participation.

Appendix D – Summary interviews with volume house-builders

Summary Interview (i)

General Sustainability Standards

i) had heard of BREEAM but was not sure what it was but once again he feels that (i) could produce a scheme that would be rated highly with BREEAM. (i) have, however, produced eco homes. They see sustainable development as being a limited selling point.

Internal Aspects

(i) are aware of flexible buildings but are not producing any yet but are looking at them. (i) have started building to lifetime home standards but are only doing so in their affordable home range.

Impact of Transportation

(i) have mixed feelings about home zones because they find it difficult to produce in a high density scheme and have had problems with the Caulders site implementing the home zone. They do however use landscaping and PPG3 layouts to reduce the impact of cars on the site. (i) is not convinced that a car free development could be possible and if a brief insisted on it then (i) would not bid for the site as they don't think it would work.

They would provide cycle paths and on flatted schemes cycle stores.

Building Materials

(i) seek to purchase their heavy materials from local sources and find it cost effective. Long term durability and recyclability is critical and use recycled materials often. Because of the refuse costs of the government (i) are trying to lower costs by recycling as many of their materials as they can.

(i) will use low embodied materials that are fit for purpose only and feel that they are being driven down a route that is forcing them to use such materials and they will not be durable enough to do the job.

(i) has looked at green roofs but find them too problematic and risky.

[] in [] was prefabricated and [] see developments such as flatted schemes becoming increasingly system built.

Longevity and Maintenance

(i) think that brick/block built housing should last 100 years but are not sure how new methods of construction will hold up. They do not see it as a selling point.

Orientation and Siting

(i) try to incorporate passive solar gain and have realised that customers will pay more for housing with western and southern layouts.

Thermal Performance

(i) build to high SAP ratings but do not think the extra costs worth the effort for the return.

CO2 Emissions

(i) do not think they could produce a carbon neutral development and do not think that the customer would pay extra for the homes.

Renewable Energy Sourcing

(i) believe that they could produce a scheme that would produce enough energy on site but are not sure if their customers would be willing to pay extra for it. They have used PV's etc on some of the more expensive homes as an optional extra.

Other Energy Efficiency Measures

(i) do already fit condensing boilers and energy efficient appliances.

Recycling

(i) have introduced recycling schemes but have worries on how much space it takes up in the development. (i) so think that people will eventually be willing to compartmentalise all of their waste.

(i) have put composting facilities on site.

Water

Grey water systems have been used in (i) developments before. They are trying to reduce water usage but find it difficult because people are not willing to do so.

(i) have also had problems with SUDS as they can not get them adopted but think they are better for the developer. All appliances are water efficient.

Ecology

(i) does not see any problems with using native species and have set out areas for ecological gardens.

(i) has often tried to set aside areas for ecological gardens but have found resistance from local residents as they can look unsightly and overgrown. Educating local residents they find is the best way to avoid any conflicts.

Provision of Local Services

If the scheme is big enough then (i) will provide shops and services. Timing can be a problem with delivering such services as the market has to be right for one and not just forced in by the local authority. (i) are willing to build housing above shops but see it as a limited market. Local shops are not seen as a major marketing area as people are always willing to get into their cars and drive to the nearest shop.

ICT

If (i) have enough demand then they would be willing to put extra ICT into a property. Utility companies pay (i) to design their homes to make it easier to lay cabling etc and find it a good enough selling point to cover their additional costs.

Safety

Cost is a big issue and (i) build to secure by design where cost is permissible. They have also had conflicts with the local authority and the police.

Marketing

(i) targets everyone in the market who can get a market and also get the rest of the market with their schemes with Housing Authority.

Sustainable housing does not represent added value to their customers and do not see sustainable house builders as having a market lead on other house builders but think that they should show that they are doing something to show local residents that they do really care to keep a good name in the market.

Very educated purchasers would be the only inducement that would persuade (i) to produce such developments.

Landscaping would provide the best visual feature. If you could prove and persuade the customer that PV and solar water heaters will reduce their bills then that might be a positive but people in their experience do not care of the management costs of the property.

Summary Interview (ii)

General Sustainability Standards

(ii) did not know what BREEAM was. After explaining what it was (ii) felt that their homes were of sufficient standard that they would meet many of the BREEAM targets to produce high standards.

(ii) do not feel that Sustainability is a selling point.

Internal Aspects

(ii) have no experience of building homes with flexible internal spaces. They do not see how this could be a selling point. They have also no experience and understanding of loose fit buildings.

With regard to building lifetime homes, (ii) stated that all house builders build homes for life and (ii) are no exception.

Impact of Transportation

(ii) to conform to parking policy in PPG3 have reduced the number of parking spaces in their developments but do not see any market benefits into building home zones. With regards to reducing the car parking facilities on site they take each scheme on its own and see what conditions the local authority put in place. (ii) think that the only time a car free scheme could be possible is on a city centre scheme that has tight constraints. Other than that there would be no circumstances that would warrant a car free development and feel that it would be financial suicide to do so.

If a brief insisted that it was to car free (ii) would be willing to pay for cycle paths and other cycle facilities.

Building Materials

Most of (ii) materials are sourced locally because it is more cost effective and do not raise building costs. The materials used are of the highest quality and are designed and chosen for long term durability and would be willing to use re-cycled materials.

(ii) did not know what a green roof was and have no plans to green roofs. They see that barriers to the green roofs as being a put off to potential customers.

(ii) are using pre-fabrication on a site currently and are using it a testing case to see whether the company will be willing to use it more in the future.

Longevity and Maintenance

House lifespan can vary and they do not feel that housing that would last more than 100 years would not be a selling point.

Orientation and Siting

(ii) have no experience of passing solar gain and they fell that they could deliver such a scheme but do not feel that there is sufficient market out there to make it viable.

Thermal Performance

(ii) have no experience of thermal massing. (ii) did not know what a SAP rating is and could not comment on the building costs of producing a development with SAP ratings of more than 100 but stated that they only build to Building Regs.

They feel that none of these issues would be a selling point.

CO2 Emissions

(ii) know that they could deliver a carbon neutral development but haven't done so as they again feel that it is not a selling point to there customers.

Renewable Energy Sourcing

The location of the development would greatly influence what types of renewable energy could be used on a (ii) development. (ii) didn't think that you could produce enough renewable energy to power a development on its own. (ii) have not used any renewable energy sources on any of its previous developments.

Other Energy Efficiency Measures

(ii) would not consider using condensing boilers as those boilers that they use are of high quality and have good efficiency.

Recycling

Because most local authority already have kerb recycling schemes that do not see why they should have to provide extra facilities. They do not feel that customers would be willing to compartmentalise their household waste.

(ii) would not be willing to introduce and manage composting facilities on site.

Water

(ii) did not have any knowledge on any water facilities that (ii) use.

Ecology

(ii) are not interested in ecology and do not consider it in any of their schemes.

Provision of Local Services

If there is a requirement by a local authority then (ii) will be prepared to build shops and services as long as it does not make the scheme financially viable.

With regard to housing above shops (ii) only build family and starter homes and do not have any plans to build such a development. They feel that having local shops close by is a good marketing point.

ICT

(ii) neither put a phone line in to the property and do nor provide any additional ICT within the property. They do not feel that they would not recoup the extra costs of additional ICT.

Safety

(ii) have a problem with secure by design as the local authority want a permeable scheme but the police liaison officer has wanted that scheme to look inwards and have very limited access to the scheme. This creates a lot of confusion and contradicts PPG 3.

Marketing

(ii) target all markets from affordable partnerships housing to high quality family homes. Sustainable housing would not add value to (ii) current customers and would not cover additional building costs.

Sustainable housing could have more relevance and do not get a head start in the current market. (ii) feel that it will be a trend and that all of the house builders will jump on board at the same time.

To build sustainable housing for the mass market the biggest inducement would be being able to make it affordable to build and this would mean it would be possible for people to buy a sustainable property at the current market prices.

None of the mentioned visible elements that were mentioned were perceived to be barriers.

Costing

(ii) has no firm knowledge if the company has sat down and discussed sustainable building practices but is sure that upper management will have discussed it at some point.

Summary Interview (iii)

General Sustainability Standards

(iii) did not know what BREEAM was. After an explanation of BREEAM they said that they considered most of the principals when designing a scheme.

(iii) does feel that sustainability can be marketed in way that is beneficial to the company. They are currently using laminated floor joists to reduce floor movement and squeaking

Internal Aspects

(iii) do use as an optional extra to be able to move walls and feel it is a good selling point as it gives customers more options when purchasing a property.

(iii) has no experience of loose fit buildings.

(iii) does not know what lifetime home standards are but believe their homes are built well. They build to NHBC standard but no more after that.

Impact of Transportation

(iii) feels that the home zone principal will not be successful as there is not sufficient public transport to cater for people who want a car. They do however put traffic calming measures within their developments, speed bumps, chicanes etc.

A car free development is not possible and if a brief insisted that a development was car free then (iii) would not undertake the project.

(iii) does and has put cycle lanes into and development. They try to put central boulevards through a scheme with a cycle path on it. On flatted schemes they provide cycle stores etc.

Building Materials

Most of (iii) materials are sourced within the North East as there is a strong market and keeping the sourcing in the North East creates good competition and lowers prices.

(iii) has been using sustainable laminated joists but most keeping the cost down is the most important consideration when choosing materials.

Green roofs are seen as problematic and to risky to consider.

Prefabrication has not been used in any of (iii) homes so far. But there are plans to use it in the future and they see it as only being a matter of time before it breaks through into mainstream construction.

Longevity and Maintenance

(iii) feels that their houses will last for more than 100 years but would not guarantee that and do not feel it would be a selling point.

Orientation and Siting

Passive solar gain is not considered on the design of the main house but is considered for and optional conservatory but are looking at some new elevations that can be fully glazed.

Thermal Performance

Sap ratings must be over 100 and (iii) are striving to use high massing but find this a problem as the tighter a house is sealed then less ventilation goes into the house and this can create a poor living environment with the acceleration of bacterial growth. They do believe that thermal massing is a selling point but has put the cost up.

CO2 Emissions

Because they could not build a car free development then they feel that a carbon neutral development would not be possible. Conservatories are also a problem as they let out a lot of heat.

At present there is not a strong enough market to produce carbon neutral developments and high levels of sustainability would not add value to a development.

Renewable Energy Sourcing

(iii) believes that a development that produced enough energy on site for itself could be possible but it would be very expensive and would look unsightly and have not used any renewable energy sources on their development.

Other Energy Efficiency Measures

As far as (iii) is aware from 1st April 2005 it will be legislation to use condensing boilers so is currently fitting them in their developments.

Recycling

Because most local authority already have kerb recycling schemes that do not see why they should have to provide extra facilities. They do not feel that customers would be willing to compartmentalise their household waste.

(iii) would not be willing to introduce and manage composting facilities on site.

Water

No grey water facilities have been used in any schemes. They feel it would not be possible to reduce water consumption by 50% and do not see why they should as there is enough water around and it “falls out of the sky to flood places.”

They have no experience of SUDS.

(iii) fit water efficient appliances.

Ecology

(iii) does not see any problems with using native species and have set out areas for ecological gardens.

The best way they feel to resolve conflicts is early talks with the local planning authority.

Provision of Local Services

(iii) has not previously put and shops in any of their developments but if it was part of the panning then they would be willing to provide them and also build residential

accommodation above them. They do however feel that it is very important to have local shops and services near to the development.

ICT

(iii) put very little ICT into the properties.

Safety

All of the windows and doors are built to secure by design.

Marketing

(iii) targets everyone in the market and has even branched into retirement homes.

They do not feel that sustainable housing add significant value to their average customers and do not think that any company who are developing such schemes have a market lead.

The greatest inducement is legislation forcing them to develop sustainable developments and the main barrier to building such a scheme is cost.

Triple glazing and landscaping are probably the best visible marketing features.
Green roofs are the biggest visible barrier.

Summary interview (iv)

General Sustainability Standards

(iv) representing (iv) was unable to comment on the questions as he/(iv) have never heard of a BREEAM rating but when explained what it was believes that (iv) build to a standard that would conform to many of the key factors of BREEAM

Internal Aspects

(iv) do not build any flexible internal spaced housing and do not intend to as they do not see it as a selling point and tend to stick to the same traditional housing designs and have no knowledge of loose fit buildings. They are however looking to build Lifetime homes and but are only doing so because they believe that a lot of the aspects of lifetime homes are covered in the building regs and policy is forcing their hand. Ultimately they don't see why the home buyer should be penalised for higher design costs in their house price.

Impact of Transportation

(iv) are currently using Home Zone principals in some of their current schemes but cannot fully encompass them without any additional costs. PPG 3 has made them look at car parking but they believe that developments in North East cannot be fully car free as there is not the Infrastructure in place for other transport methods to be used and ultimately the market that (iv) are aiming for will need to have 2 cars. They have however undertaken schemes with 1 to 1 parking but this is entirely dependent on the location. (iv) firmly believe that a car free development is not possible and if a brief insisted that it was car free then they would not undertake the scheme. They however are willing and have in past schemes delivered cycle paths and have put in cycle stores in flats etc. none of these have been negotiated in sec106 but have been in design briefs.

Building Materials and Construction Details

As much as they can materials and sub-contractors are sourced locally and they don't find that it raises building costs but obviously they can't always source materials locally. (iv) do not specifically look at the longevity and Recyclability of materials but feel because they use the best materials that they can find that their materials will have very good durability. The MD has handed a report for employees to read with regard to social responsibility. But as previously mentioned they do not specifically look for these types of materials.

(iv) do not and are not planning on building green roof developments because they claim to have customer resistance to it because the customers that (iv) attract are conservative people.

The company in the past have used pre-fabrication and used to have a factory across from the head office but they have not used this method of building for quite a long time but they are looking towards methods of modern construction because of partnership housing and are having a board meeting to discuss. Although pre-fabrication will cost more to produce (iv) are not adverse to the idea because it will open up new avenues of business with RSL's and local government.

Longevity and Maintenance

(iv) believe that their houses are built to last more than 100 years but do not see it as a direct marketing or selling point as people buy houses on location, accommodation, kitchens and bathrooms and only buy houses for a minimum of 25 years or mortgage length.

Orientation and Siting

(iv) are aware of passive solar gain especially on flatted developments but do not feel it is a major issue on housing design and do not feel they could deliver better PSG on their current designs and are not sure whether they would be willing to undertake one of designs and schemes.

Thermal Performance

(iv) will build to conform to building regs and not much more but say they receive good SAP ratings. Building to a Sap rating of 100 or more would affect the design of the building and have already had redesign some of their schemes to comply with revised building regs in relation to thermal insulation of party walls. The majority of (iv)s customers are not interested in thermal performance and therefore they do not see it as a selling point and don't believe that it would be marginal to see whether they could recoup any additional costs.

C02 Emissions

(iv) were uncertain if they could deliver a carbon-neutral development and don't believe that there is a strong enough market for such a scheme and do not think that it could add value to a development.

Renewable Energy Sourcing

Other Energy Efficient Measures

(iv) would possibly consider using condensing boilers. They use high quality appliances that all have energy efficient rating "A".

Recycling

(iv) do not put extra recycling schemes in as the Local Authorities already have schemes in place. (iv) do not know if their potential customers would be willing to

compartmentalise their waste. They would not be willing to establish and manage composting facilities on site.

Water

(iv) have not used grey water recycling/re-use systems but are aware of them. (iv) do not know what measures would be necessary to reduce water usage by 50%. They believe that SUDS in theory are a good idea and can be a cost effective measure that drainage pipes but they have had numerous problems with the local water board and local authority. The problem that they encountered is that the Water Board says that the only people who can manage a SUDS scheme are the Local Authority or English Partnerships and the Local Authority where not willing to manage the scheme and therefore it could not go ahead. The high standard of water appliances that (iv) use are all water efficient.

Ecology

Most of the planting that is done on developments are native and would be willing to put in an ecological garden as long as the L/A would be willing to adopt it. Open communication is the best way to resolve ecological conflicts.

Provision of Local Services

If economically viable than (iv) are willing to build and have built shops and services into developments and from their point of view the only drawbacks are fiscal. (iv) would be willing to build flats above shops in the right location. (iv) view the local shops as a secondary factor in the marketing of a scheme but find that schools are a bigger factor.

ICT

(iv) only place the minimum in services in a property and do not design housing for utility companies to lay service wiring.

Safety

(iv) are looking at building to secure by design standards.

Marketing

(iv) target market is the conventional family homes market and do not feel sustainable homes as having added value to their customers sufficient to cover building costs. They do not see sustainable home builders as having a market lead. A change in government thinking would be the greatest inducement to delivering a sustainable development.

None of the listed would make a good visible marketing feature.

Summary interview (v)

General Sustainability Standards

S had not heard of BREEAM but once explained felt that (v) could achieve such a standard.

Internal Aspects

S did not know if (v) are using flexible internal spaces as he is only involved with the Land and Planning side of the company.

(v) are aware of lifetime home standards but are trying to resist it and are not currently building to lifetime home standards.

Impact of Transportation

(v) have experimented with home zones and think it works in smaller schemes but would not work on large developments. have employed architects to look at home zones and take a holistic view on designing to lower the impact of the car.

Car free developments would not be possible to enforce and (v) do not feel that such a development could work in the North East. If the local government insisted on a car free development they would not be able to produce one.

(v) currently provide cycle paths in a development but have not provided any other features to encourage cycling.

Building Materials

The general policy of (v) is to source all materials locally and find it more cost effective.

S could not answer the re-cyclability, durability questions as he did not have the knowledge to do so.

(v) do not build green roofs and think that it would be problematic and customers would not want it.

Prefabrication is currently used by (v)'s American Sister Company and they are looking to see how they can start to move some of that operation and technology over to England as they see it as being the future of house building.

Longevity and Maintenance

S did not have the knowledge to answer these questions.

Orientation and Siting

The designing architects are aware of passive solar gain and have been introduced in the larger schemes that (v) are producing. (v) do not feel that they could produce highly glazed elevated properties.

Thermal Performance

S could not answer these questions as he did not have the knowledge to do so but does feel that customers will become more aware of it so the company will have to look at it.

CO₂ Emissions

(v) do not feel that they could produce a carbon neutral development. S did not know whether it would be cost effective as it was a technical issue.

(v) don't think that sustainability dose add a high level of value but will in the future.

Renewable Energy Sourcing

(v) do not think that they could produce a scheme that could produce enough energy to power its self. They have however provided a wind turbine at one of their schemes.

Other Energy Efficiency Measures

S did not know if they fit condensing boilers as standard but did say that they fit energy efficient appliances as standard.

Recycling

(v) would provide re-cycling facilities onsite and feel that in the future buyers would be more willing to compartmentalising their waste.

(v) have provided composting facilities on site but was not sure on the management of it.

Water

S did not know if they had used grey water systems. (v) have not used SUDS because they have issues with adoption.

Ecology

S did not know if there would be any disadvantages of using only native species. (v) have not provided an ecological garden.

Provision of Local Services

If the site is big enough and there is a market for it then (v) would be willing to provide shops and local services. (v) have not built homes above shops. They see local shop and services as being fairly important but not as significant as schools.

ICT

S could not answer any of these questions.

Safety

Secure by design standards are causing problems because the standards conflict with PPG3.

Marketing

S was not sure what (v)s target market was. They do not see sustainable housing as sufficient value to cover costs and do not see any sustainable developers as having a market lead.

Lower costs would be the greatest inducement to delivering sustainable developments.

Green roofs would be the biggest barrier and photovoltaic panels would provide the best return.

